Earnings Management, Management Compensation, Managerial Ability and Market Competition

by

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Intellectual Property Statement

The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

Dedication

To the memory of my father.

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Abstract

As a result of the agency problem, earnings management may take place due to the high contracting costs, shareholders' bounded rationalities, and information asymmetry. Therefore, three main groups of motives have been identified to explain earnings management behaviour at the contracting, capital market, and external levels. While the previous studies have individually examined those motives, this thesis provides evidence that they interact in determining earnings management behaviour.

The first empirical chapter of this thesis focuses on the contracting factors and examines the impact of earnings management on executive compensation conditioned on managerial ability. It finds that managers who utilize accrual earnings management receive higher compensation than those who undertake real earnings management. However, high quality managers are rewarded less for accrual earnings management and punished less for real earnings management.

The second empirical chapter examines the non-linear effect of market concentration as an external motive of earnings management. It documents that accrual earnings management increases in concentrated markets as the quantity of information decreases. However, the sophisticated real earnings management starts to substitute for discretionary accruals at higher levels of market concentration when the quality of information declines.

The third empirical chapter combines factors from the contracting and external motives. It examines the effect of market competition on the relationship between managerial ability and earnings management. The results show that in the face of increased competition, high quality managers manipulate earnings via accruals rather than more costly real earnings management.

Overall, the results of this thesis show that management compensation is a crucial factor in assessing the costs of earnings management at the firm level. An optimal level of market concentration exists and should be considered by the regulators. Finally, understanding how industry level factors influence managerial decisions at the firm level is essential to explaining earnings management behaviour.

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List of Abbreviations

GAAP	Generally Accepted Accounting principles
PPS	Pay-Performance Sensitivity
SFAC	Statement of Financial Accounting Concepts
ERC	Earnings Response Coefficient
MNC	Multinational Corporations
EPS	Earnings Per Share
SPV	Special Purpose Vehicle
SOX	Sarbanes-Oxley Act
KS	Kang and Sivaramakrishnan model
GMM	Generalized Method of Moments
OLS	Ordinary Least Square
R&D	Research and Development
SG&A	Selling, General, and Administrative
IE	Information Efficiency
FRREE	Fully Revealing Rational Expectations Equilibrium
EU	Expected Utility
PCAOB	Public Company Accounting Oversight Board
CEO	Chief Executive Officer
CFO	Chief Financial Officer
DMU	Decision Making Unit
DEA	Data Envelopment Analysis
IPO	Initial Public Offerings
SEO	Seasoned Equity Offerings

SEC	Securities and Exchange Commission
IFRS	International Financial Reporting Standards
UK	United Kingdom
US	United States
WG	Within Groups estimator
IV	Instrumental Variable
LTIP	Long Term Incentive Plan
NPV	Net Present Value
VIF	Variance Inflation Factor
LRT	Linear Restriction Test
FE	Fixed Effects estimator
SME	Small and Medium Enterprise
EI	Elasticity Index

Chapter 1
Introduction

1.1 Introduction

As a result of separating ownership from control in public companies, an agency problem appears between the principals (shareholders) and the agents (managers) (Holmström and Milgrom, 1987). Under this conflict in interests, managers might not reveal the truth because of the high contracting costs between managers and firms, shareholders' bounded rationalities that do not enable them to understand management actions, and the information asymmetry derived from the costly communication in the market (Milgrom and Roberts, 1992; Ronen and Yaari, 2008; Walker, 2013). In this sense, managers may exercise discretion over financial reporting that can take the shape of earnings management if performed under the umbrella of Generally Accepted Accounting principles (GAAP). Based on the previous theoretical perspectives, earnings management might be explained by three main theories that involve contracting theory, bounded rationality theory, and information asymmetry theory (Harris and Raviv, 1979; Fama, 1980; Strong and Walker, 1987; Walker, 2013). From these theories, modern research has introduced three different groups of motives to explain earnings management behaviour including contracting motives that arise from the deficiencies in the contract terms between the firm and its stakeholders, capital market motives that are related to the inefficiencies of stock markets, and third-party motives driven by external parties that influence the cost of communicating information in the market (Ronen and Yaari, 2008; Walker, 2013).

The earnings management literature has separately studied the previous groups of motives and identified a number of factors under each group. Among the contracting motives, management compensation, CEO turnover, managerial ability, corporate governance, and loans were identified (Godfrey et al., 2003; Boone et al., 2004; DeFond and Francis, 2005; Yu, 2008; Iatridis and Kadorinis, 2009; Laux and Laux, 2009; Demerjian et al., 2013b). To examine capital market motives, the literature has focused on the influence of the stock market, issuance of equity, new listing and cross-listing,

mergers and acquisitions, insider trading, management buyouts, meeting or beating a benchmark, and the effect of analysts on earnings management (Kothari, 2001; Lang et al., 2006; Efendi et al., 2007; Fan, 2007). Finally, from the external motives the literature has studied the impact of industry, industrial diversification, regulations, political environment and country-specific policies, accounting standards, tax considerations, competitors, suppliers and customers (Bagnoli and Watts, 2000; Goldman and Slezak, 2006; Jiraporn et al., 2006; Barth et al., 2008).

At the contracting level, management compensation is part of the contract structure between the firm and its managers that aims to link between firm performance and managerial payment to resolve the conflict of interests arising from the separation of ownership from control (Strong and Walker, 1987; Bergstresser and Philippon, 2006). Compensation has been frequently examined as an incentive of earnings management because managers might attempt to extract higher rewards by using earnings management to signal better performance (Healy, 1985; Cohen et al., 2008). However, compensation can be also viewed as an outcome of management behaviour as firms tend to reward or punish their managers based on the consequences of their activities (Adut et al., 2013; Dutta and Fan, 2014; Sun, 2014). The previous studies have emphasized the outcomes of earnings management activities to the firm but ignored the costs that managers might incur upon using accrual and real earnings management (Graham et al., 2005). While real earnings management is more costly to the firm because it contributes to losing cash flows and sacrificing future projects, it is also more likely to influence managers' future compensation. Understanding the impact of earnings management on managers' future benefits would assist in explaining their current behaviour e.g., the behaviour of high quality managers who select using more accrual and less real earnings management (Demerjian et al., 2013b).

At the external level, market concentration is considered as another motive of earnings management behaviour as it influences the communication of information in the market and ultimately contributes to moral hazard and adverse selection problems (Walker, 2013). While the previous studies have focused on a linear effect of market concentration on earnings management (Dalia and Park, 2009; Markarian and Santalo, 2010; Karuna et al., 2012; Datta et al., 2013), a non-linear effect is more plausible because of the concurrent opportunistic and disciplinary incentives in concentrated

markets. By the time earnings management is likely to occur because of the lack of information needed for monitoring performance, the presence of fewer competitors creates less communication pressure to manipulate earnings (Strong and Walker, 1987; Milgrom and Roberts, 1992). In this sense, the changes in the quantity and quality of information are likely to create a situation of uncertainty that explains the trade-off between earnings management activities (Hart, 1995; Arroyo, 2007). Analysing earnings management behaviour in concentrated markets would contribute to identifying an optimal level of market concentration that should mitigate the negative consequences of accrual and real earnings management.

Finally, the external and contractual motives can be combined to further understand earnings management behaviour. Within the earnings management literature, neither competition nor managerial ability has been found to have consistent effects on the earnings management behaviour of firms. Demerjian et al. (2013b), for example, examine the impact of managerial ability on earnings management and find less able managers undertake more earnings management. Conversely, Francis et al. (2008) find higher earnings management where managers have higher abilities. This conflicting evidence also occurs in the presence of competition with some studies finding a negative relation between competition and earnings management (Dalia and Park, 2009; Markarian and Santalo, 2010), while others document a positive relationship (Karuna et al., 2012; Datta et al., 2013). However, the effects of competition and managerial ability are unlikely to be independent. Therefore, understanding whether managerial ability explains the earnings management behaviour in the presence of differing levels of competition would contribute to highlighting the importance of simultaneously considering the different groups of earnings management motives when studying earnings management behaviour.

Overall, this thesis aims to examine the relations between the previously selected motives and earnings management, and subsequently studies whether the interaction between those contractual and external factors contributes to further understanding earnings management behaviour. At the contracting level, the thesis examines the influence of accrual and real earnings management on the future compensation of managers based on their different abilities. At the external level, the thesis studies the impact of market concentration on accrual and real earnings

management taking into consideration the changes in information quantity and quality in concentrated markets. Finally, at an external-contractual level, the thesis examines how market competition influences the amounts of accrual and real earnings managed by high quality managers. Earnings management was the underlying reason for some of the financial scandals of large companies like Enron, WorldCom, Adelphia, and Tyco in the early 2000s and ultimately resulted in the failure of those companies. These incidences have raised more concern about the role of financial reporting in reflecting the performance of firms (Giroux, 2004). Therefore, understanding the relations suggested in this thesis is expected to have implications to the regulators, policy makers, shareholders, investors, academics, and some of the gatekeepers e.g., auditors and analysts.

The remainder of this chapter is organized as follows. Section 1.2 explains the effect of earnings management on management compensation taking into consideration the variation in managerial abilities. Section 1.3 discusses the relationship between market concentration and earnings management based on the changes in information in the market. Section 1.4 presents the joint effect of managerial ability, as one of the contracting motives, and market competition, as an external factor, on earnings management. Section 1.5 summarizes the research questions. Section 1.6 explains the significance and contributions of this research. Finally, section 1.7 outlines the structure of the thesis.

1.2 Management Compensation

The first empirical chapter of this thesis (Chapter 6) examines the impact of earnings management exercised by managers at different levels of abilities on their future compensation. While the previous literature documents that managerial ability has a positive effect on accrual earnings management and a negative one on real earnings management, it explains the previous findings based on the consequences of earnings management on the firm (Demerjian et al., 2013b). From the firm perspective, accrual earnings management is considered less costly than real earnings management because it only allows for discretion over accrual accounting and subsequently unwinds in the next accounting period. In contrast, real earnings management involves actions that

have severe economic consequences to the firm's operating and stock return performance because they result in losing cash flows and ultimately sacrificing future projects (Graham et al., 2005; Merkl-Davies and Brennan, 2007; Cohen et al., 2008). Although accrual and real earnings management are likely to influence managers' welfare as well, the previous literature does not explain their costs from management perspective. Compensation is one of the major rents managers extract; hence creating a contractual motive that has been frequently examined as an incentive of earnings management behaviour (Healy, 1985; Gao and Shrieves, 2002; Cheng and Warfield, 2005; Graham et al., 2005; Bergstresser and Philippon, 2006; Burns and Kedia, 2006; Cohen et al., 2008; Carter et al., 2009; Feng et al., 2011; Oberholzer-Gee and Wulf, 2012). However, in this chapter, compensation is treated as an outcome of managerial activities because firms tend to evaluate their consequences to determine management rewards.

According to the principal-agent theory, the separation of ownership and control leads to specialized risk bearing and specialized decision skills in the organization (Holmström and Milgrom, 1987; Strong and Walker, 1987). This conflict in interests raises a situation of uncertainty due to the information asymmetry and moral hazard between the two parties. Therefore, an optimal structure of contracts is required that links managerial compensation to firm earnings in an optimal pay-performance structure and hence motivates managers to exert effort to enhance earnings and ultimately resolves the previous conflict (Jensen and Meckling, 1976; Harris and Raviv, 1979; Strong and Walker, 1987; Hart, 1995; Bergstresser and Philippon, 2006; Dutta and Fan, 2014).

Because of the previous situation of uncertainty, managers send signals in the reported earnings to improve their performance measures that are tied to their compensation plans (Strong and Walker, 1987; Carter et al., 2009). On the other side of the agency problem, shareholders deal with this situation of information asymmetry by screening the consequences of the information provided by managers before deciding on management compensation (Adut et al., 2013). As accrual earnings management is considered less costly from the firm perspective, it is also less likely to harm managers' future payments compared to real earnings management that is screened as a costly activity and thus might negatively influence managers' future compensation.

High quality managers are also motivated to use earnings management to signal their performance because shareholders might not be able to distinguish the quality of the reported earnings due to their bounded rationalities. Meanwhile, shareholders are less likely to detect or understand those signals because of the high contracting costs and the big knowledge gap between the more able managers and the less informed shareholders (Oberholzer-Gee and Wulf, 2012; Demerjian et al., 2013b; Walker, 2013). Consequently, while firms are more likely to pay higher incentives to managers with better abilities to compensate them for their superior efforts, a lesser impact of earnings management is expected on managers' future compensation (Hart, 1995; Stathopoulos et al., 2007; Baranchuk et al., 2011).

The previous studies that focus on management compensation as an outcome of earnings management behaviour are quite few. Empirically, Adut et al. (2013) document a negative relation between poor earnings quality and management compensation; hence showing that firms tend to punish managers for providing less informative earnings. The analytical modelling of Sun (2014) shows that when managers have more opportunities to manage earnings and shareholders are less likely to detect earnings management, the pay-performance sensitivity increases in order to eliminate managers' desire to manipulate earnings. Therefore, the positive association between earnings management and executive compensation reflects optimal contracting in this setting. In a similar way, the study of Dutta and Fan (2014) documents that when the cost of earnings management increases, e.g., under strong governance mechanisms, managers are motivated to exert more efforts which requires the firms to pay higher compensation. Thus, the study documents a positive relation between the cost of earnings management and managerial compensation.

This chapter contributes to the literature by examining the effects of both accrual and real earnings management on management compensation and explaining how these effects change when taking the different abilities of managers into consideration. To my knowledge, both questions have not been answered in the earnings management literature so far and would help in evaluating the costs of accrual and real earnings management at the management level along with the documented costs at the firm level. The answers to these questions would assist in drawing the regulators' attention to mitigating the costly activities of earnings management and emphasizing the role of

compensation and managerial ability as governance mechanisms that enhance firm performance.

1.3 Market Concentration

The second empirical chapter of this thesis (Chapter 7) examines a non-linear effect of market concentration on earnings management based on two different perspectives of the revelation principle. On the one hand, the information asymmetry in concentrated markets results in the absence of common knowledge and thus allows earnings management as it becomes more difficult for the shareholders to understand or monitor management activities. On the other hand, the presence of fewer competitors decreases the chances of comparisons between firms; hence makes communication less costly and ultimately offsets the previous positive effect of market concentration on earnings management (Strong and Walker, 1987; Milgrom and Roberts, 1992; Walker, 2013). The studies in the literature tend to favour only one of the previous points of view at a time and, therefore, they present a linear relationship between market concentration and earnings management and document a positive effect in some cases and a negative one in the others (Dalia and Park, 2009; Markarian and Santalo, 2010; Karuna et al., 2012; Datta et al., 2013). However, the previous arguments suggest a contrasting effect of market concentration ranging between the opportunistic incentive and the disciplinary function and, therefore, this chapter introduces a non-linear relationship between market concentration and earnings management.

As earnings management behaviour in concentrated markets depends on information asymmetry, it may take the form of a moral hazard as shareholders face difficulties in monitoring performance or an adverse selection as managers solely have access to private information (Milgrom and Roberts, 1992; Boujelbene and Besbes, 2012). While the quantity of information is expected to decrease with market concentration, the information quality fluctuates due to the discretion exercised by managers over financial reporting (Gunny, 2010; Walker, 2013). Therefore, the changes in information raise a situation of uncertainty that is expected to explain earnings management behaviour in concentrated markets (Hart, 1995; Arroyo, 2007).

Few studies in the literature have viewed market concentration or information asymmetry in non-linear relations. Guo et al. (2015) introduce a non-linear quadratic effect of market concentration on earnings quality. They document that while earnings quality decreases at lower levels of market concentration as the firm faces the threat of losing its competitive advantage, the marginal benefit of earnings quality increases at higher levels of market concentration. In the same line, Bhattacharya et al. (2013) present a non-linear quadratic relationship between earnings quality and information asymmetry; hence considering information asymmetry as an alternative measure for the quality of disclosure (Bhattacharya et al., 2013). However, no study has examined the non-linear relation between market concentration and the different earnings management activities so far.

This chapter contributes to the literature by explaining the effect of market concentration on earnings management through a non-linear relationship based on the changes in information quantity and quality in concentrated markets. This shape of analysis has not been considered yet in the literature and would help in identifying the levels of market concentration where both accrual and real earnings management decline. As a result, it would assist regulators and policy makers in emphasizing the optimal range of market concentration by evaluating its consequences at different levels.

1.4 Managerial Ability and Market Competition

The last empirical chapter of this thesis (Chapter 8) studies how the interaction between motives at the external and contractual levels may influence earnings management behaviour. While high quality managers possess superior skills that allow them to extract better rents from their firms, they may avoid earnings management as they are able to evaluate its bad consequences on their future benefits (Francis et al., 2008; Demerjian et al., 2013b). At the same time, superior managers may operate firms in different business environments and thus different levels of competition may influence their motivations to manage earnings (Dalia and Park, 2009; Markarian and Santalo, 2010; Karuna et al., 2012; Datta et al., 2013). Therefore, this chapter examines whether market competition has an impact on the relation between managerial ability and earnings management.

Managerial ability is one of the contractual motives that might be viewed from different perspectives regarding its influence on firm performance and moral hazard between managers and shareholders (Francis et al., 2008; Demerjian et al., 2013b). According to the rent extraction hypothesis, the high contracting costs with more able managers, e.g., the need to write, negotiate, and renegotiate the contracts, result in establishing simplified general contracts that are more difficult to be monitored and thus give managers the opportunity to achieve more personal benefits (Hart, 1983; Walker, 2013). In contrast, the efficient contracting hypothesis implies that superior managers appreciate the value of maximizing firm wealth on their future benefits and, therefore, they provide a better quality of performance that contributes to aligning their interests with those of the shareholders (Hart, 1983; Walker, 2013). Therefore, the impact of managerial ability on earnings management is still debateable.

At the macro-level, market competition is one of the motives that is also expected to influence earnings management behaviour in two different directions (Dalia and Park, 2009; Markarian and Santalo, 2010; Karuna et al., 2012; Datta et al., 2013). Competition may play a disciplinary function in mitigating earnings management as it contributes to improving the information symmetry in the market and allowing better monitoring of management performance (Dalia and Park, 2009). In contrast, communicating more information allows the stakeholders to exert pressure on managers to imitate the aggressive behaviour of others in the same industry; hence aggravating adverse selection and motivating earnings management (Lieberman and Asaba, 2006; Walker, 2013). Accordingly, the influence of market competition on earnings management is also controversial.

The literature that studies managerial ability and market competition supports the previous points of view and documents contrasting results. While more able managers avoid real earnings management activities that are associated with high costs to their firms in the future, they prefer achieving personal benefits by managing accruals and providing lower earnings' quality (Francis et al., 2008; Demerjian et al., 2013b). Similarly, market competition drives more accrual and real earnings management because it encourages aggressive herding behaviour (Karuna et al., 2012; Datta et al., 2013). However, it may serve as an alternative governance mechanism as communicating more information in the market contributes to mitigating the conflict of

interests between management and shareholders; hence making it costlier to manipulate earnings in the same business environment (Holmstrom, 1982; Hart, 1983; Dalia and Park, 2009; Markarian and Santalo, 2010; Chhaochharia et al., 2012).

This chapter contributes to the existing literature by examining the effect of market competition on earnings managed by high quality managers. While the previous question has not been answered in the earnings management literature so far, it allows an understanding of the determinants of earnings management behaviour at two different levels by analysing the impact of industry factors on management decisions. The answer to this question would assist in drawing the regulators' attention to the simultaneous role of managerial ability and market competition as governance mechanisms that enhance firm performance and mitigate the agency problem.

1.5 Research Questions

Based on the previous arguments, the major objectives of this thesis can be summarized in the following research questions:

1. Do firms reward/punish their managers for using accrual and real earnings management through an increase/decrease in their future compensation?
2. Do firms reward/punish their high quality managers for using accrual and real earnings management in the same way they do other managers?
3. Do the levels of accrual and real earnings management activities change at different levels of market concentration?
4. Do the changes in information quantity and quality in the market explain the fluctuations in accrual and real earnings management at different levels of market concentration?
5. Does market competition influence the levels of accrual and real earnings managed by high quality managers?

1.6 Significance and Contributions

This thesis studies earnings management behaviour at two different levels - contracting and external - and subsequently examines whether factors at both levels interact in

determining earnings management behaviour. While the previous studies in the earnings management literature have individually focused on the contracting, capital market, or external motives of earnings management at a time, they have ignored the interrelations between the motives of these different groups (Bagnoli and Watts, 2000; Kothari, 2001; Godfrey et al., 2003; Boone et al., 2004; DeFond and Francis, 2005; Goldman and Slezak, 2006; Jiraporn et al., 2006; Lang et al., 2006; Efendi et al., 2007; Fan, 2007; Barth et al., 2008; Yu, 2008; Iatridis and Kadorinis, 2009; Laux and Laux, 2009; Demerjian et al., 2013b). Examining the motives at different levels simultaneously allows for understanding their influence at the firm level while taking into consideration the strategic objectives and competitive advantages at the market level; hence extending the research benefits beyond the firm borders.

Starting at the contracting level, this thesis is the first to study the impact of earnings management on managers' welfare by examining the effect of accrual and real earnings management on management compensation in the future. While the previous studies focus on management compensation, and particularly performance-based payments, as an incentive of earnings management (Healy, 1985; Gao and Shrieves, 2002; Cheng and Warfield, 2005; Graham et al., 2005; Bergstresser and Philippon, 2006; Burns and Kedia, 2006; Cohen et al., 2008; Carter et al., 2009; Feng et al., 2011; Oberholzer-Gee and Wulf, 2012), few studies look at compensation as an outcome of management behaviour (Adut et al., 2013; Dutta and Fan, 2014; Sun, 2014). Therefore, this thesis provides new empirical evidence of firms punishing their managers for real earnings management but not for accrual earnings management. This evidence provides a better understanding of the costs of accrual and real earnings management from managers' perspectives and assists in implementing regulations that mitigate costly real earnings management activities.

The thesis also provides the first empirical evidence on the firm's response to earnings managed by managers with different levels of abilities. While the previous studies find that more able managers prefer using accrual than real earnings management (Demerjian et al., 2013b), the thesis finds that their compensation is negatively influenced by accrual earnings management and positively influenced by real earnings management. Nevertheless, real earnings management remains more costly to this type of managers as the firms generally punish this activity regardless of their

managers' abilities. In this sense, the thesis provides an explanation of earnings management behaviour of managers with high abilities and shows that their skills can contribute to enhancing firm performance in the future as far as they are appropriately rewarded.

Moving to the external level, the thesis examines the effect of market concentration on earnings management taking into consideration the opportunistic and disciplinary incentives in concentrated markets simultaneously. While the majority of the previous studies have focused on a linear positive or negative influence of market concentration (Dalia and Park, 2009; Markarian and Santalo, 2010; Karuna et al., 2012; Datta et al., 2013), very few ones have viewed its effect as non-linear (Guo et al., 2015). Therefore, this thesis provides the first empirical evidence of a non-linear impact of market concentration on earnings management where accrual earnings management increases at lower levels of market concentration while real earnings management dominates at higher levels. The findings contribute to identifying an optimal level of market concentration that needs to be emphasized by the regulators and policy makers to mitigate the negative consequences of accrual and real earnings management.

Furthermore, the thesis examines a non-linear effect of market concentration on information asymmetry measures taking into consideration the quantity and quality of information in the market. While the previous studies have linearly examined the effect of market concentration on information asymmetry (Ali et al., 2014; Dalia and Park, 2009; Markarian and Santalo, 2010), this thesis provides the first non-linear empirical evidence and documents that the fluctuation in the quality of information in concentrated markets is associated with the switching between accrual and real earnings management. The results assist in explaining the previous effect of market concentration on earnings management and emphasizing the importance of information quality in enlarging the optimal level of market concentration.

Finally, the thesis is the first study that examines the impact of managerial ability and market competition on earnings management and thus it contributes to the earnings management literature by introducing the combined influence of contractual and external motives. The previous studies have focused on the individual effects of managerial ability and market competition on earnings management and documented contradictory results (Holmstrom, 1982; Hart, 1983; Francis et al., 2008; Dalia and Park,

2009; Markarian and Santalo, 2010; Chhaochharia et al., 2012; Karuna et al., 2012; Datta et al., 2013; Demerjian et al., 2013b). However, this thesis provides new empirical evidence on the simultaneous influence of both factors on earnings management and shows that the behaviour of high quality managers changes under the pressure of market competition through using more accrual and less real earnings management. This evidence highlights the importance of understanding the consequences of the interaction between the different earnings management motives on firm performance.

1.7 Thesis Structure

This thesis is divided into nine chapters. Chapter 1 provides an introduction about this thesis and summarizes the motivation and main questions for each empirical chapter. In addition, it explains the significance of this thesis and the expected contributions of its empirical results. Finally, the chapter presents the structure that will be followed for the remaining parts of the thesis.

Chapter 2 explains the definitions of earnings management and its specific characteristics compared to fraud, earnings quality, impression management, and expectation management. It presents the different activities of earnings management and how they might be traded off in addition to the models of measuring accrual and real earnings management. Finally, the chapter discusses some special issues in measuring earnings management including the combined models, the specific measures in the financial sector, and the qualitative measures.

Chapter 3 provides a brief description of the firm and agency theories. It discusses the revelation principle and the relevant theories to explain its conditions including contracting theory, bounded rationality theory, and information asymmetry theory. Finally, it presents the three main theoretical approaches of earnings management that include the costly contracting approach, the decision-making approach, and the legal-political approach.

Chapter 4 provides a comparison between earnings management and truth telling. It explains the contracting motives of earnings management that include management compensation, CEO turnover, managerial ability, corporate governance, and loans. It also presents the capital market motives of earnings management that

consist of the effect of the stock market, issuance of equity, new listing and cross-listing, mergers and acquisitions, insider trading, management buyouts, meeting or beating a benchmark, and the role of analysts. Finally, the chapter discusses the third-party motives of earnings management including industry and industrial diversification, regulations, political environment and country-specific policies, accounting standards, tax considerations, competitors, suppliers and customers.

Chapter 5 discusses the data and methodology of this thesis. It explains the overall sample construction of the three empirical chapters and the sources used to collect data. It also presents the different models that will be used in the following empirical chapters to measure accrual and real earnings management. Finally, the chapter discusses the general basis for selecting the methodology of the thesis.

Chapter 6 represents the first empirical chapter of this thesis and examines the effects of accrual and real earnings management on management compensation in the future. It also studies whether managerial ability influences the previous effects of earnings management on compensation and thus explains the documented behaviour of high quality managers using accrual rather than real earnings management. Data, variable definitions, methodology and statistical analysis are discussed in detail in the chapter.

Chapter 7 is the second empirical chapter of this thesis and introduces a non-linear effect of market concentration on earnings management based on two contrasting points of view in the theory. As the previous effect is likely to be determined by the asymmetry of information in the market, the chapter examines the changes in the quantity and quality of information in concentrated markets to explain that effect. Data, variable definitions, methodology and statistical analysis are discussed in detail in the chapter.

Chapter 8 is devoted to the last empirical chapter of this thesis and examines accrual and real earnings managed by high quality managers at different levels of market competition. In this sense, this chapter studies the mutual influence of contractual and external motives of earnings management compared to the majority of the studies in this area that emphasize the individual effects of earnings management motives at a time. Data, variable definitions, methodology and statistical analysis are discussed in detail in the chapter.

Finally, chapter 9 concludes this thesis by providing a summary of the objectives and results of the three empirical chapters. It explains the implications of the thesis to the regulators, policy makers, shareholders, investors, gatekeepers, and academics. Furthermore, the chapter presents the limitations of this research and suggests some recommendations for future studies to take into consideration based on the results of this thesis.

Chapter 2
Definitions, Activities, and Measurement of Earnings Management

2.1 Introduction

This chapter starts by providing a summary of the definitions of earnings management in the literature and accordingly it suggests a four-stage process for a comprehensive definition of earnings management that includes its characteristics, conditions, activities, and targets. Following this approach, the chapter attempts to distinguish between earnings management and other concepts like fraud, earnings quality, impression management, and expectation management.

The chapter also explains the different methods of earnings management and how managers trade them off based on their different needs. It also discusses in detail the models to calculate the different activities of earnings management - particularly focuses on the measurement of accrual and real earnings management and evaluates each of the models introduced in this area. Finally, the chapter throws some light on special issues in measuring earnings management including the models that combine between more than one manipulation activity and the measurement of earnings management in the financial sector and qualitative research.

The remainder of this chapter is organized as follows. Section 2.2 explains the definitions of earnings management and its specific characteristics compared to fraud, earnings quality, impression management, and expectation management. Section 2.3 presents the different activities of earnings management and how they might be traded off. Section 2.4 explains the models of measuring accrual earnings management. Section 2.5 explains the models for measuring real earnings management. Section 2.6 discusses some special issues in measuring earnings management including the combined models, the specific measures in the financial sector, and the qualitative measures. Finally, section 2.7 provides a conclusion to the chapter.

2.2 Definitions

In this section I discuss some of the most common definitions of earnings management in the literature. Afterwards, I introduce my own definition of earnings management taking into consideration some of the deficiencies in the previous definitions of the literature. Because earnings management has been frequently confused with other concepts like fraud, earnings quality, impression management, and expectation management, I also discuss each of these definitions separately and distinguish them from earnings management.

2.2.1 Earnings Management Definition

No single definition exists for earnings management in the literature. Researchers have provided different explanations that mainly define earnings management as the manipulation of financial reporting to achieve specific targets. I present here some of the most common definitions of earnings management in a chronological order. Schipper (1989, P.92) focuses in her definition on the manipulation of external reporting to achieve private benefits like improving managers' compensation whereby,

> *"Earnings management means disclosure management in the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain as opposed to, say, merely facilitating the neutral operation of the process".*

Healy and Wahlen (1999, P.368) also focus on changing financial reporting to mislead the stakeholders and achieve contractual benefits where,

> *"Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers".*

Mulford and Comiskey (2002, P.3) emphasize management discretion to meet earnings targets which may be set by internal or external parties. In this sense, their definition of earnings management is as follows:

> *"The active manipulation of earnings toward a predetermined target, which may be set by management, a forecast made by analysts, or an amount that is consistent with a smoother, more sustainable earnings stream"*.

Phillips et al. (2003, P.493) provide a brief definition of earnings management that emphasizes the manipulation of accounting choices and operating cash flows as follows:

> *"Managerial discretion over accounting choices and operating cash flows".*

Giroux (2003, P.280) also focuses on management discretion to achieve specific income targets. Therefore, he defines earnings management as:

> *"The operating and discretionary accounting methods to adjust earnings to a desired outcome"*.

In his second definition, Giroux (2004, P.2) emphasizes the incentives of management to manipulate earnings under different conditions and thus defines earnings management as follows:

> *"The planning and control of the accounting and reporting system to meet the personal objectives of management".*

Ronen and Yaari (2008, P.5) provide a general definition for earnings management that focuses on the target of management to influence the interpretation of its reported earnings, whereby earnings management involves:

> *"Deliberate actions to influence reported earnings and their interpretation"*.

However, Ronen and Yaari (2008, P.27) later provide a comprehensive definition for earnings management that distinguishes between the two main activities to manipulate earnings – real vs. accrual - and shows that such activities are not necessarily bad all the times whereby,

> *"Earnings management is a collection of managerial decisions that result in not reporting the true short-term, value-maximizing earnings as known to management. Earnings management can be beneficial: it signals long-term value; pernicious: it conceals short- or long-term value; neutral: it reveals the short-term true performance. The managed earnings result from taking production/investment actions before earnings are realized or making accounting choices that affect the earnings numbers and their interpretation after the true earnings are realized"*.

Finally, Walker (2013, P.446) also emphasizes both the accrual and real earnings management in the following definition:

> *"The use of managerial discretion over (within GAAP) accounting choices, earnings reporting choices, and real economic decisions to influence how underlying economic events are reflected in one or more measures of earnings".*

While some of the previous definitions are brief, others might better explain the meaning of earnings management. Overall, they emphasize how managers manipulate their earnings. Among the different methods of manipulation, the literature emphasizes the treatment of accruals by using different accounting principles (Baber et al., 2011; Walker, 2013), real economic decisions that influence cash flows (Graham et al., 2005; Roychowdhury, 2006), smoothing earnings to decrease their volatility over time (Coffee, 2003; Graham et al., 2005; Walker, 2013), shifting the classification of some items in the financial statements (McVay, 2006; Athanasakou et al., 2009; Barua et al., 2010; Walker, 2013), and other advanced methods like using derivatives and special purpose entities (Giroux, 2004; Petrovits, 2006; Feng et al., 2009). I will discuss these activities in detail in the next section of this chapter.

The previous definitions have also emphasized the motives that drive managers to manage earnings. There are different incentives of earnings management at the contracting level like compensation (Healy, 1985; Jensen and Murphy, 1990; Dechow and Huson, 1994; Laux and Laux, 2009), capital market level like improving the stock prices (Lev, 1989; Ramakrishnan and Thomas, 1998; Kothari, 2001; Gelb and Zarowin, 2002), and the external level like the influence of regulators and competitors (Jones, 1991; Cahan, 1992; Cahan et al., 1997; Kallunki and Martikainen, 1999; Bagnoli and Watts, 2000; Goldman and Slezak, 2006). Most of the empirical literature has emphasized examining the impact of these motives on earnings management as I will discuss in detail in chapter 4.

However, the previous definitions have ignored the conditions that allow management to manipulate earnings like managers' incomplete contracts that give them more flexibility in their decisions, stakeholders' limited capabilities to understand management sophisticated decisions, and the selective communication of information by management to stakeholders (Walker, 2013). Therefore, I define earnings

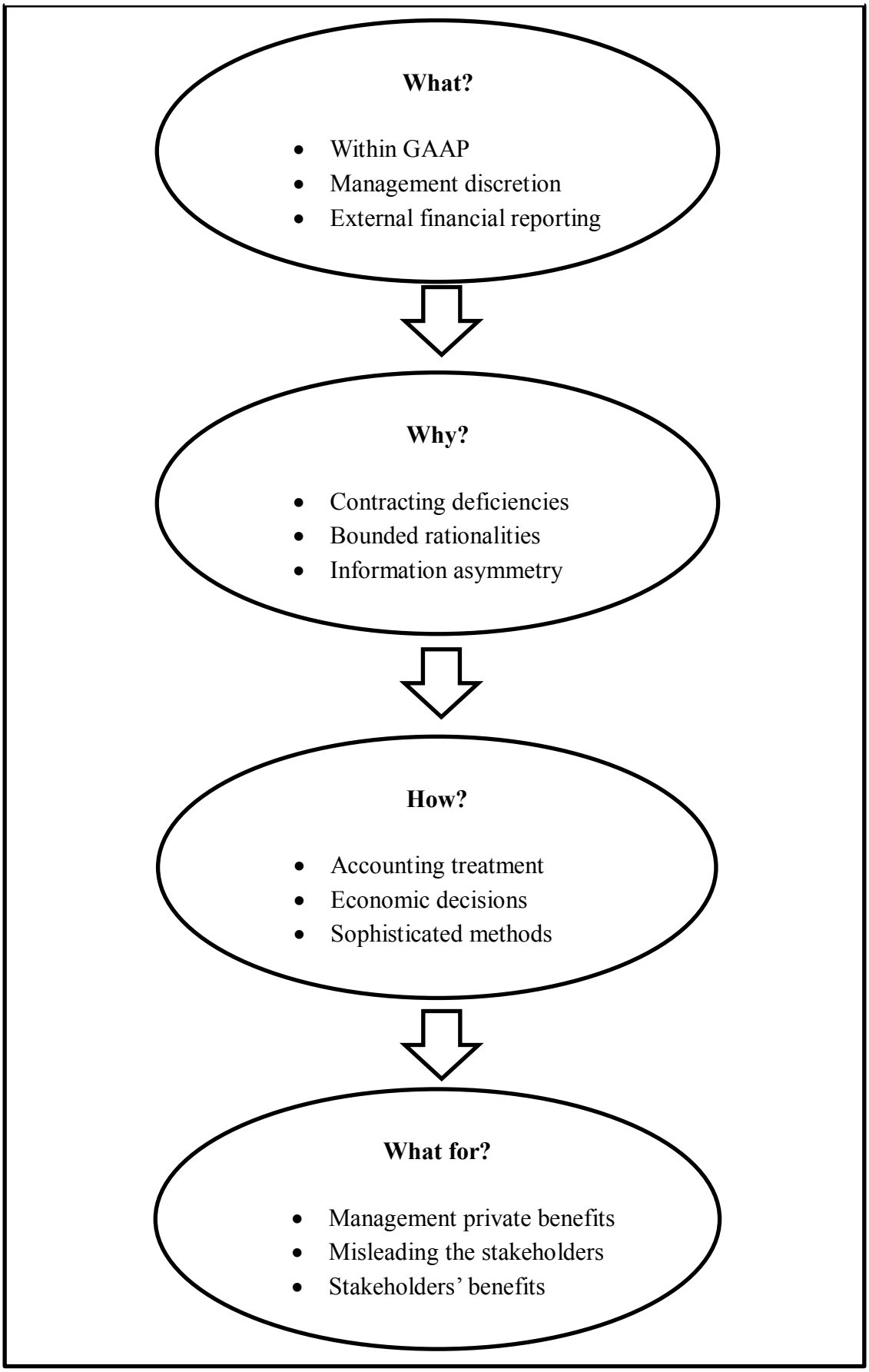
management as the within GAAP management discretion over external financial reporting by abusing some contracting deficiencies, stakeholders' bounded rationalities, and information asymmetry in the market, through some economic decisions, a change in the accounting treatment, or other sophisticated methods. The purpose of management is to present earnings in a way different (up or down) from what is known to them to achieve private benefits while misleading the stakeholders; although such discretion may not always be harmful to them. Figure 2.1 illustrates the previous definition in four stages.

In spite of the previous efforts to explain the definition of earnings management, it has been always confused with other concepts like fraud (Dechow and Skinner, 2000), earnings quality (Dechow et al., 2010), impression management (Merkl-Davies and Brennan, 2007), and expectation management (Das et al., 2011). Although my previous definition distinguishes earnings management from the previous activities in the 'What?' part of Figure 2.1, I explain all these concepts in detail in the following sections and show how they differ from the concept of earnings management.

2.2.2 The Difference between Earnings Management and Fraud

Based on the previous definition, earnings management may take place through the aggressive or conservative accounting within the Generally Accepted Accounting Principles (GAAP) that happens usually at the end of the fiscal year, e.g., decreasing or increasing the estimation of some provisions. It may also happen through some aggressive or conservative economic decisions that managers may take anytime during the fiscal year to influence cash flows, e.g., accelerating or delaying sales. Earnings management may result in increasing or decreasing the reported earnings. It can be considered pernicious if it contributes to minimizing firm value but beneficial if it allows signaling more information about the firm in the future. Nevertheless, earnings management does not involve any violation of the accounting principles (Dechow and Skinner, 2000; Ronen and Yaari, 2008).

Figure 2.1 Earnings management definition



In contrast, fraud involves a violation of GAAP, e.g., ignoring some required provisions or recording fictitious or unrealized sales. Managers may commit fraud within or after the fiscal year to increase or decrease the reported earnings. Fraud generally follows aggressive earnings management behaviour; hence it is considered extremely aggressive compared to earnings management (Dechow and Skinner, 2000; Ronen and Yaari, 2008; Walker, 2013). In this sense, fraud is always harmful to the firm and its stakeholders.

2.2.3 The Difference between Earnings Management and Earnings Quality

According to the Statement of Financial Accounting Concepts No.1 (SFAC 1), earnings quality is related to providing information about firm performance that is relevant for decision making (Dechow et al., 2010). Therefore, earnings quality is different from earnings management because it measures the overall relevance of earnings for stakeholders to make decisions, whether that quality was related to management discretion or not. In contrast, earnings management focuses only on the discretionary aspect of financial reporting and does not consider factors outside management control, e.g., errors.

While there are specific models that measure earnings management which will be discussed in detail later in this chapter, there are three groups of proxies that measure earnings quality. The first group includes some external measures like the earnings restatements reported by the SEC. The second group represents the measures of earnings properties like earnings persistence, errors in the bad debt provision, and the mapping of accruals into cash flows according to the Dechow and Dichev (2002) measure that will be explained in detail later in section 2.4.9. Finally, the third group includes the measures of investors' responses to earnings like the earnings response coefficient (ERC) (Dechow et al., 2010; Demerjian et al., 2013a). High earnings quality is associated with low earnings restatements, high earnings persistence, lower probability of errors in the bad debt provision, better mapping of accruals into cash flows, and high investors' response to earnings announcements (Adut et al., 2013). However, there is no single appropriate measure for earnings quality as each proxy

measures a specific aspect of the variable and supports different type of decision (Dechow et al., 2010).

2.2.4 The Difference between Earnings Management and Impression Management

Impression management is a group of strategies used by firms to opportunistically manage discretionary narrative disclosures and thus influence stakeholders' perceptions and decisions based on the asymmetry of information between the two parties (Merkl-Davies and Brennan, 2007). In line with this explanation, Clatworthy and Jones (2001, P.311) define impression management as a method *"To control and manipulate the impression conveyed to users of accounting information"*. Similarly, Hooghiemstra (2000, P.60) defines impression management as *"A field of study within social psychology studying how individuals present themselves to others to be perceived favourabley"*. In this sense, while earnings management emphasizes management discretion over the numerical part of the earnings component of the financial statements, impression management focuses on manipulating the narrative part in the financial reports.

There are seven strategies of impression management. The first strategy is manipulating the ease of reading in order to make the narratives more difficult to read and ultimately not easily understood by the stakeholders. Second, management may use rhetorical manipulation to make the language of the narratives more convincing to the readers. The first two strategies are mainly used by management to hide bad news. Third, thematic manipulation can be used to emphasize the good information in the narratives. The fourth strategy involves the use of visual and structural effects by manipulating the presentation like the order of the presented information. The fifth strategy is the use of performance comparisons where management benchmarks its performance to cases that relatively emphasize its better current achievements. Sixth, the choice of earnings numbers might allow management to selectively emphasize specific numbers in the financial reports that reflect its better performance. Finally, firms may use the attribution of organizational outcomes strategy to emphasize that all successes have resulted from the superior current management performance. The last

five strategies aim basically to signal good news about management performance to the stakeholders (Merkl-Davies and Brennan, 2007).

Like earnings management, impression management involves managers' judgment in financial reporting to hide or signal information about the underlying economic performance of the firm that may ultimately mislead the readers of the financial reports and, therefore, result in short-term capital misallocation. Both activities are based on the assumption that a weak form of market efficiency exists resulting from the bounded rationalities of the different stakeholders. However, while earnings management activities involve the manipulation of accruals or real economic transactions that may influence the future cash flows, impression management relies only on the presentation of the narrative disclosures of the financial reports. In this sense, impression management can be considered as a more indirect way to influence stakeholders' decision making than earnings management. Nevertheless, it may involve high risk especially with the increase in the amount of narrative disclosures that occupy more than half of firms' annual reports and that are difficult to be monitored and regulated (Merkl-Davies and Brennan, 2007).

2.2.5 The Difference between Earnings Management and Expectation Management

Expectation management is often used to guide the perceptions of the different stakeholders whether explicitly through firm announcements to influence analysts' forecasts or implicitly by staying silent without advising the stakeholders about the truth of the underlying transactions. One common way of guiding expectations is the use of unaudited pro-forma earnings, particularly in the US where pro-forma statements are commonly announced. In this sense, firms may exclude or include specific items from these statements that may influence the forecasts of analysts about their overall earnings numbers (Walker, 2013).

According to the previous explanation, both earnings management and expectation management are used to meet earnings targets and avoid losses. However, while earnings management involves the manipulation of the reported earnings, expectation management emphasizes communicating specific information that

indirectly influences stakeholders' decisions. Das et al. (2011) find that the relationship between expectation management and earnings management is complementary. Managers even make more use of expectation management when earnings management activities involve higher costs; e.g., in the fourth quarter of the financial year when auditors' scrutiny increases. In addition, the market tends to discount the meet or beat premium when using both methods but the overall stock price generally benefits when a firm meets its earnings benchmarks (Das et al., 2011).

In summary, earnings management is the within GAAP manipulation of earnings for managers to achieve specific targets. However, it is essential to distinguish earnings management from other concepts like fraud, earnings quality, impression management, and expectation management. The main differences between these activities can be evidenced in their level of aggressiveness, violating the accounting principles, management control, and the numerical vs. narrative focus in the financial statements. Figure 2.2 summarizes the main differences between the five activities. As far as this thesis is concerned with the within GAAP discretion over financial reporting, I discuss earnings management activities in detail in the next section.

Figure 2.2 The differences between earnings management, fraud, earnings quality, impression management and expectation management

Difference	Earnings management	Fraud	Earnings quality	Impression management	Expectation management
Aggressive	Sometimes	Extremely	Sometimes	Sometimes	Sometimes
GAAP violation	No	Yes	Sometimes	No	No
Management discretion	Yes	Yes	Sometimes	Yes	Yes
Focus	Numerical disclosure (direct)	Numerical disclosure (direct)	Numerical disclosure (direct)	Narrative disclosure (Indirect)	Announcements (Indirect)

2.3 Earnings Management Activities

Earnings management mainly takes place by selecting a specific accounting treatment of certain transactions or by taking some economic decisions that may influence the cash flows, investments, or production of the firm. Both actions aim to improve earnings presented in the financial statements and, ultimately, stakeholders' interpretations of the accounting numbers. Other strategies for the within GAAP earnings management may involve earnings smoothing, classification shifting, and some advanced methods. However, while earnings management may take several forms, revenue recognition seems to be the most common area of manipulation (Ronen and Yaari, 2008). I explain each of the earnings management activities in detail in this section.

2.3.1 Accrual and Real Earnings Management

Until recently, the main focus of the literature was on accrual earnings management which involves the within-GAAP manipulation of accruals through the discretionary choices of accrual accounting, e.g., depreciation rates, inventory valuation methods, and bad debt calculation. Therefore, accrual earnings management does not influence the firm's underlying economics but involves the change in the accounting presentation of these economics. As accruals play a role in determining earnings, they ultimately influence the distribution of wealth between the stakeholders. In addition, management discretion over accruals allows conveying information about firms' future cash flows and, therefore, may result in decreasing the information asymmetry between management and shareholders. While accrual earnings management may influence the claims to cash flows, it does not influence firms' value which is basically determined by these cash flows (Walker, 2013). However, the reversal of accruals in the next accounting period creates a limitation on the subsequent use of accrual earnings management. The high magnitude of the previously managed accruals and the fast accruals' reversal impose more restrictions on the use of accrual earnings management in the same direction in the next accounting period (Baber et al., 2011).

In contrast, real earnings management has started to receive more attention since 2005, after the studies of Graham et al. (2005) and Roychowdhury (2006) which highlighted the importance of understanding such activity in evaluating management behaviour. Roychowdhury (2006, p. 336) defines real earnings management as,

> *"Management actions that deviate from normal business practices, undertaken with the primary objective of meeting certain earnings thresholds".*

Real earnings management involves economic decisions like accelerating sales through more lenient credit terms and higher discounts to the clients (Cohen and Zarowin, 2010), timing the sale of long-term assets and investments in periods of low earnings (Bartov, 1993), overproduction to decrease the fixed cost per unit and ultimately the unit cost and the cost of sales (Chi et al., 2011), and manipulating discretionary expenses like research and development, advertising, selling and administrative expenses (Cheng, 2004; Osma, 2008). In this sense, real earnings management ultimately changes the free cash flows of the firm as it involves sacrificing

some value maximizing activities and thus negatively influences its operating performance and stock returns in the future (Graham et al., 2005; Cohen et al., 2008; Kothari et al., 2016). However, Gunny (2010) documents a positive effect of real earnings management on future performance when it is used by a firm to meet some benchmarks that ultimately improves its reputation in the market. Because of the strong relation between accruals and free cash flows that are concurrently determined, both have to be considered in modelling earnings management to avoid endogeneity problems (Zang, 2012; Walker, 2013).

If the earnings management strategy attempts to increase earnings above the true level, it is referred to as a maximization strategy. On the other hand, if it attempts to reduce earnings below the true earnings, it is called a minimization strategy. Overall, because a firm's resources are limited, earnings maximization and minimization are likely to take a loop form. In other words, the current maximization will drive future minimization and vice versa. As companies tend mostly to maximize, rather than minimize, their earnings to improve their images to the stakeholders, maximization strategies have received more attention in the literature. Maximizing current earnings arises from consuming old earnings reserves or reducing those expected in the future. Overall, managers attempt to maximize their earnings to improve the market valuation of their firms' stocks, achieve better rewards, be able to renegotiate their contracts, and get a better shape compared to competitors (Healy, 1985; Demski and Frimor, 1999; Fischer and Verrecchia, 2004). In contrast, earnings minimization implies conservative reporting and hence it has not received lots of attention in the earnings management literature. Minimization results in shifting current earnings to future periods. One of these strategies is the "cookie jar reserves" when a firm decreases its current earnings to report higher numbers in the future when performance deteriorates (Giroux, 2004). The strategy of "taking a bath" is an extreme form of earnings minimization to report extremely low earnings which mostly happens when management does not expect any bonuses in the current period or attempt to meet high earnings' targets in the future (Scott, 1997; Levitt, 1998; Ronen and Yaari, 2008).

2.3.2 Earnings Smoothing

In addition to the previously mentioned two major strategies that management can use to manipulate earnings, other activities can be implemented to signal or hide information. Earnings smoothing is another way of management discretion which gives a chance for managers to decrease the volatility of their earnings and, therefore, influences the stakeholders' risk perceptions (Coffee, 2003; Walker, 2013). According to Graham et al. (2005), earnings smoothing is likely to be appealing to managers because it basically allows presenting the business in a more stable shape and hence it is perceived to be less risky by stakeholders.

According to the nature of the strategy, earnings smoothing can be classified into real and artificial types (Ronen and Yaari, 2008). Real earnings smoothing involves economic decisions related to firm's operating or investing activities that aim to decrease the volatility of earnings. Such activities are more complex and difficult to be detected; and thus may severely influence firm value in the future (Ewert and Wagenhofer, 2005). On the other hand, artificial earnings smoothing involves the accounting discretion to over- or understate firm's earnings; and hence may build on the economic decisions of the real smoothing strategies.

According to the consequences of the strategy, earnings smoothing can be classified into beneficial, neutral, and pernicious (Ronen and Yaari, 2008). Earnings smoothing might be beneficial when it improves the informativeness of earnings and allows the prediction of future earnings. This occurs when managers exert their best efforts and try to reduce the current high earnings numbers if they expect a decrease in future earnings, and vice versa. In this sense, earnings smoothing makes future earnings more predictable to shareholders especially under uncontrollable conditions, e.g., changes in accounting standards. In contrast, pernicious smoothing occurs when management opportunistically reports different earnings from those that are already known to them in order to hide bad current news. Such activity results in worse earnings in the future when firm performance does not improve; and thus takes the shape of current earnings maximization and subsequent earnings minimization (Dalia and Park, 2009). In this case, the opportunistic behaviour results in lower information quality and ultimately more volatility in stock returns and share prices (Markarian and Gill-de-Albornoz, 2012). Finally, neutral smoothing occurs when it does not influence the firms'

cash flows, and the market is well informed and rational to perceive it (Goel and Thakor, 2003).

As earnings volatility has a negative effect on stock price, firms tend to smooth earnings to avoid a decrease in their prices. However, although beneficial smoothing changes the valuation of the firms, it results in mitigating some of the misrepresentations in their share prices (Sankar and Subramanyam, 2001). Neutral smoothing, on the other hand, has no influence on share prices because the market already knows about it and incorporates it when discounting the firms' values (Goel and Thakor, 2003). Pernicious smoothing may positively influence the stock prices if the market is irrational and less informed. It may also succeed in rational markets under specific conditions, e.g., if it is accompanied with some other good news (Yaari, 2005).

The compensation contracts between shareholders and managers also influence earnings smoothing behaviour. Managers play the "timing game" in order to smooth their abilities to consume over time by shifting earnings from the periods when they receive high pay-offs to the periods when they expect lower ones, so that they guarantee receiving better compensation in bad times (Demski, 1998; Oyer, 1998). The duration of the contract may also motivate such behaviour as earnings smoothing is likely to occur in long-term employment contracts because they allow inter-temporal risk allocation (Allen, 1985). Managers may also "pull in" earnings to the current year if the firm performance is poor in order to guarantee the renewal of their contracts and avoid being terminated (Fudenberg and Tirole, 1995).

Finally, external parties may influence earnings smoothing behaviour. Firms may smooth earnings under the pressure of suppliers, customers, or competitors as the demand of one firm influences the earnings of the others (Graham et al., 2005). Regulators may interfere to mitigate earnings smoothing. However, for their role to succeed, they have to essentially focus on curbing pernicious earnings smoothing rather than eliminating the beneficial one, and hence contribute to improving shareholders' value.

2.3.3 Income Shifting

Firms may sometimes use classification shifting instead of accrual or real earnings management when managers are more concerned about net income rather than earnings' numbers. As a result, they transfer items from the operating activities to other activities and vice versa in order to improve the performance of the core business which is considered more important for the stakeholders, e.g., transferring small operating losses into the exceptional items (McVay, 2006; Athanasakou et al., 2009; Barua et al., 2010; Walker, 2013). Opposite to accrual earnings management, classification shifting neither changes the net earnings number nor reverses over time, and therefore it is a less costly activity than accrual earnings management (McVay, 2006). However, Athanasakou et al. (2009) document that the market rewards firms that achieve their targets by classification shifting less than those that genuinely perform the job.

In another form, income shifting may take place in multinational corporations (MNCs) by shifting income between the parent and its subsidiaries to avoid high taxes. In this setting, companies shift more income to their subsidiaries in low-tax countries and more debts to those in countries with higher statutory taxes to get better deductions on their interest depending on the tax enforcement level in each country (Beuselinck et al., 2015). Multidivisional firms may also manipulate the transfer prices between the divisions to avoid taxes and ultimately maximize net income (Martini, 2015).

2.3.4 Advanced Techniques

Recently, managers have started to use new complicated methods to manage earnings that are difficult for an average shareholder to understand. One of these means is the repurchase of firm stocks from the market which helps in improving the firm stock price as it indicates higher demand. At the same time, it results in an improved earnings per share (EPS) ratio because the profits of the year will be distributed over a lower number of outstanding shares, and hence it assists the firm in meeting analysts' forecasts (Hribar et al., 2006). In the same line, firms may also issue convertible bonds, rather than new shares, because they are excluded when calculating the diluted EPS and thus enable them to achieve higher EPS and reflect a better performance (O'Brien, 2005).

Another method is the use of financial derivatives like options, interest rate swaps, forwards and future contracts. Such instruments are structured on other transactions and therefore they are associated with sophisticated valuation and high risk. Derivatives can be used for speculation or for hedging to counterbalance the accompanying risk of other transactions. The gains and losses on some of these instruments are reflected in the income statement e.g., interest rate swaps for fair value hedge, while others are not e.g., the effective portion of interest rate swaps for cash flow hedge. Therefore, earnings management may take place when managers shift the related gains and losses between the two previous categories (Giroux, 2004).

A more complicated technique to manage earnings is the special purpose vehicles (SPVs) like the ones which were used by Enron before the 2001 scandal. Firms may establish an SPV as a separate legal entity to execute specific transactions like sales, loans, receivables' factoring, and transfer of assets. Therefore, an SPV allows firms to manage earnings especially that it stays off the balance sheet according to the US regulations as far as a third party owns 10% of its equity. However, strong corporate governance may mitigate the misuse of SPVs (Giroux, 2004; Feng et al., 2009). Similarly, firms may use corporate-sponsored foundations for their charitable contributions which allow for discretion over the amount of contribution from their earnings and flexibility in reporting them as an off-balance sheet reserve (Petrovits, 2006).

2.3.5 The Trade-off between Earnings Management Activities

Companies trade off accrual and real earnings management activities according to their relative costs, and hence accrual earnings management and real earnings management are commonly perceived as substitutes (Cohen et al., 2008; Bartov and Cohen, 2009; Baber et al., 2011; Zang, 2012). Cohen et al. (2008) document that firms switched from discretionary accruals to real earnings management after the release of Sarbanes-Oxley Act (SOX) in 2002. In this sense, the costs of accrual earnings management are different from those of real earnings management and thus managers tend to implement more real strategies when the costs of accrual activities are higher and vice versa. The costs of accrual earnings management include stakeholder scrutiny, audit quality, and

accounting flexibility (Zang, 2012). Analysts also influence accrual earnings management behaviour and encourage switching to real activities once their expectations fall (Bartov and Cohen, 2009). On the other hand, the costs of real earnings manipulation contain the competitive status in the industry, financial health, institutional ownership, and the tax consequences of manipulation (Zang, 2012). The detailed measurement of the two activities is explained in detail in the next section.

Among the aforementioned costs, stakeholder scrutiny has been emphasized in the various corporate governance codes that influence earnings management behaviour. The release of the Sarbanes-Oxley Act (SOX) in 2002 is considered among the most significant in the United States (US) and in many other countries. Generally, firms tend to replace accrual earnings management by real activities in periods following huge corporate failures as they become subject to detection by regulators and auditors due to the strict governance codes that aim to prevent the recurrence of such events and regain the public confidence in the market (Cohen et al., 2008; Bartov and Cohen, 2009; Nordberg and McNulty, 2013). While real earnings management activities remain less detectable because they need specialized knowledge that is not available for most of the stakeholders, they are considered more costly as they lead to sacrificing the long term objectives of the firm and hence negatively influence its future performance (Graham et al., 2005; Cohen et al., 2008; Kothari et al., 2016). Therefore, the increased scrutiny by regulators drives managers to utilize different forms of earnings management activities rather than entirely eliminating such behaviour (Badertscher, 2011).

The trade-off between accrual and real earnings management can be viewed as a sequential relationship. Managers focus on real earnings management activities throughout the accounting period because they have the flexibility of using the real earnings management activities that are based on their own decisions (Cohen and Zarowin, 2010). However, they tend to use more accrual earnings management after the period ends and before issuing the financial statements to achieve their targets as they miss the chance to manipulate the real activities to any further extent (Zang, 2012). Firms also utilize more accrual activities in periods when their stocks are overvalued in order to maintain the price for longer, but they may also switch to real earnings management based on the intensity and length of the overvaluation period (Badertscher, 2011). The trade-off is also noted in periods of seasonal equity offerings when the

utilization of one activity is positively correlated with the costs of the other (Cohen and Zarowin, 2010).

Managers may also trade-off accrual and real earnings management activities with other practices depending on their costs (Das et al., 2011; Haw et al., 2011). They can utilize expectation management by minimizing analysts' perceptions about firm performance to convince them that their expectations have been met (Bartov and Cohen, 2009). The nature of the relation between earnings management and expectation management depends on the constraints of using each activity (Das et al., 2011). Similarly, earnings management can be substituted with classification shifting in the financial statements. This technique is basically used to improve earnings from the major operations but does not tend to change the bottom line of the firm's earnings. Therefore, classification shifting is considered to be less costly than the other forms of earnings management activities, and can be used as a substitute when managers face strict constraints on managing their earnings (Haw et al., 2011).

Overall, there are different methods for firms to manage earnings that vary in their nature, timing, aims, costs, and consequences. Managers do not adhere to a specific technique and usually switch to the one which is more difficult to be detected, relatively less costly, and attains the short term goals of the firm. Although all these methods have to be taken into consideration to understand earnings management behaviour, the literature has mostly emphasized accrual and real earnings management. Therefore, I discuss the measurement of these two activities in detail in the next sections.

2.4 Accrual Earnings Management Models

The models of aggregate discretionary accruals have dominated the earnings management literature rather than those that measure a single component of accrual accounting choices, e.g., depreciation and inventory valuation, because aggregate models are more comprehensive in measuring accruals' manipulation. Although the Jones Model and the Modified Jones Model have been the most prominent in this area, other models were also introduced to solve for the numerous modelling problems. In this section, I discuss the different models that were introduced in the literature and

explain their main advantages and disadvantages then provide an overall evaluation of all the attempts of measuring accrual earnings management.

2.4.1 The Ronen and Sadan Model

Ronen and Sadan (1981) only incorporate sales in their regression to calculate discretionary accruals compared to the Jones model that uses both sales and PP&E. Their model also takes classification shifting into consideration as another earnings management strategy. They measure how a company may use real, accrual, or classification smoothing to reduce the fluctuations in its reported earnings. To achieve this, they run their regressions at different levels of the income statement to calculate abnormal sales, abnormal extraordinary expenses, and abnormal ordinary income. Ronen and Sadan run the following regressions:

$$L_t = a_{0L} + a_{1L}t + u_t \tag{2.1}$$

$$OP_t = a_{0P} + a_{1P}t + a_{2P}u_t + s_t \tag{2.2}$$

$$X_{2t} = f_0 + f_{1t}t + f_{2t}u_t + q_t \tag{2.3}$$

Where L is the sales number from the income statement, OP is the operating income from the income statement, X_2 is the extraordinary expenses from the income statement, t is the time impact (i.e. year), u is the abnormal sales, s is the abnormal ordinary income, and q is the abnormal extraordinary expenses. By including the abnormal sales in the other two regressions, the model ensures controlling for any exceptional performance (e.g., a non-linear relation between performance and normal accruals). However, the model ignores the relations between working capital items and its regressands.

2.4.2 The Healy Model

Similar to the Jones model, Healy (1985) considers discretionary accruals as the difference between total accruals and normal (nondiscretionary) accruals. However, the model uses the average of total accruals over the last five years as a measure of normal accruals to reflect the long-term average. Therefore, Healy's model considers earnings management as a systematic event that repeats over time. Then, the model compares between the group of observations where earnings management is expected to be managed upwards and that where it is expected to be managed downwards based on the accounting flexibility available to management. The main contribution of Healy is defining normal accruals in the following way:

$$NDA_t = \frac{1}{n} \sum_{i=t-n}^{t} \frac{TA_i}{A_{i-1}} \tag{2.4}$$

Where NDA is the non-discretionary accruals, TA is the total accruals, A_{i-1} represents the lagged assets, n is the number of years over which the long-term accruals are averaged which has been set as 5 years by Healy (1985). Based on the previous equation, discretionary accruals are calculated as:

$$DA = TA - NDA \tag{2.5}$$

Where DA is the discretionary accruals and TA is the total accruals calculated as the difference between reported earnings and operating cash flows. However, as accruals reverse over time, the average normal accruals might be zero, and in this case discretionary accruals will be equal to total accruals. Therefore, some of the normal accruals might be mistakenly classified as discretionary in some years (Dechow et al., 1995).

2.4.3 The DeAngelo Model

DeAngelo (1986, 1988) studies consider last year's total accruals as a measure of normal accruals and hence any change in accruals this year compared to the previous year is considered discretionary. The model calculates non-discretionary accruals using the following equation:

$$NDA_t = \frac{TA_{t-1}}{A_{t-1}} \quad (2.6)$$

Where NDA represents the non-discretionary accruals, TA_{t-1} is the lagged total accruals, A_{i-1} represents the lagged assets. Similar to Healy model, DeAngelo calculates discretionary accruals according to the following equation:

$$DA = TA - NDA \quad (2.7)$$

Where DA is the discretionary accruals and TA is the total accruals calculated as the difference between reported earnings and operating cash flows.

Although there is high association between the DeAngelo model and the Healy model, the DeAngelo model reduces the serial correlation that might exist in Healy's model because it only takes the last year's total accruals rather than the last five years' total accruals into consideration when calculating normal accruals. Nevertheless, DeAngelo's assumption is still not valid all the time (Dechow et al., 1995).

2.4.4 The Industry-Based Model

Dechow and Sloan (1991) introduce an industry-based model to measure normal accruals because firms within the same industry face the same motives for discretionary behaviour. Therefore, the model uses the median of total accruals for all firms in a specific industry sector and in a specific year as a measure of non-discretionary accruals according to the following equation:

$$NDA_t = \gamma_1 + \gamma_2 median(TA_t) \quad (2.8)$$

Where NDA represents the non-discretionary accruals and $median(TA_t)$ is the median value of total accruals scaled by lagged assets for all firms in the same industry and in a specific year.

In this sense, earnings management will be the difference between a firm's accruals and those of other firms in the same industry. However, the assumption that all firms in the same industry operate under exactly the same conditions is weak (Dechow et al., 1995). Furthermore, if the other firms which do not have the motive to manage

earnings in the industry manage earnings, then earnings management measure will be biased upwards, and vice versa (Ronen and Yaari, 2008).

2.4.5 The Jones Model

The Jones model (1991) represents one of the most famous models in calculating accrual earnings management. It starts by measuring the following regression for the total accruals of the firms in the estimation period per year-industry:

$$\frac{TA_{it}}{A_{avg}} = \alpha + \alpha_1 \frac{1}{A_{avg}} + \beta_1 \frac{\Delta R_{it}}{A_{avg}} + \beta_2 \frac{PPE_{it}}{A_{avg}} + \varepsilon_{it} \quad (2.9)$$

The coefficients from the previous regression are used to determine the normal (non-discretionary) accruals in the following regression in the event period for each firm within a specific year and industry group:

$$NA_{it} = \hat{\alpha} + \hat{\alpha}_1 \frac{1}{A_{avg}} + \hat{\beta}_1 \frac{\Delta R_{it}}{A_{avg}} + \hat{\beta}_2 \frac{PPE_{it}}{A_{avg}} + \varepsilon_{it} \quad (2.10)$$

The residual (ε_{it}) from the second regression is the measure of normal accruals. Discretionary accruals are calculated as the difference between a firm's total accruals and normal accruals from the previous equation:

$$DA_{it} = \frac{TA_{it}}{A_{avg}} - NA_{it} \quad (2.11)$$

Where TA represents total accruals measured following the balance-sheet-approach or the cash-flow-statement-approach;[1] A represents total assets; R represents revenues; PPE represents the gross value of property, plant, and equipment; NA represents normal accruals; and DA represents discretionary accruals. An intercept is included and all variables are scaled by average total assets (A_{avg}) of the beginning and ending asset balances to avoid heteroskedasticity problems. A cross sectional model is used in the calculations for each year and each industry classified by its four-digit SIC code so that

[1] The balance sheet approach calculates total accruals as the change in current assets (except cash items) minus the change in current liabilities (except the current portion of long term debt) minus depreciation. On the other hand, the cash-flow-statement-approach measures total accruals as the difference between earnings before extraordinary items and discontinued operations and the operating cash flows. Hribar and Collins (2002) document that the cash flow statement approach is more reliable, and thus I follow this approach for calculating accrual earnings management in this thesis.

while taking the time influence into consideration the model controls for the economic variations between industries.

The model focuses on the changes in revenues as the main source of change in working capital accruals including accounts receivable, inventory, and accounts payable. Hence β_1 is expected to be positive as sales increase, but if sales are mostly in cash and purchases are in credit, a negative working capital appears that makes the coefficient negative. On the other hand, the gross property, plant, and equipment reflects the accruals related to total depreciation expense. Therefore, β_2 is expected to be negative as huge PP&E result in bigger depreciation expense. The impact of depreciation on regression (2.9) is usually more than that of current working capital accruals and hence it is excluded by some studies when applying the Jones model (Barth et al., 2001).

However, the Jones model does not take other expenses into consideration as explanatory variables although they influence total accruals. In this sense, the model suffers from the problem of omitted variables. Yaari et al. (2007) show that the omission of variables results in a model that does not explain discretionary accruals well and thus generates lower R^2 and F statistics. The omitted variables will be captured in the error term that might correlate with the existing explanatory variables and result in biased estimation of earnings management and subsequently biased results in any study that examines accrual earnings management as a dependent variable (Dechow et al., 1995; Young, 1999).

Meanwhile, measurement errors may influence the results obtained using the Jones model. When examining the effect of a specific factor on discretionary accruals, the correlation between the independent variable and the measurement error captured in the error term may result in biased inferences (McNichols, 2002). Similarly, some bias may rise because of the flexibility in calculations like using the balance-sheet-approach or the cash-flow-statement-approach in calculating total accruals. (Hribar and Collins, 2002). The Jones model also suffers from a simultaneity problem as account receivable influences the explanatory variables (ΔR) and the dependent variable (TA) at the same time.

The Jones model originally followed a time-series approach in the calculation of the coefficients in equation (2.9); and thus raised concerns about the stationarity of

accruals over the estimation period. Therefore, a cross-sectional model has been mostly followed by the subsequent studies that mainly uses firms within the same industry and in the same time period (Yaari et al., 2007), or a group of matched firms (Kothari et al., 2005) or the performance of the industry in the previous years (Xie et al., 2003) to determine the level of normal accruals. However, the sample used to estimate normal accruals may itself include some firms that have managed accruals as well; which makes benchmarking inappropriate (Shivakumar, 2000). It is also not reasonable to assume the homogeneity of all firms in the same industry. In addition, small samples are ignored in cross-sectional analysis as they result in violating the assumption of Ordinary Least Square (OLS) regression regarding the normality of the error term (Bernard and Skinner, 1996).

The Jones model might detect discretionary accruals in some firms not because of earnings management but due to specific business conditions that drive a change in accruals like acquisitions, capital expenditure, discontinued operations, and sale of long-lived assets (Ronen and Yaari, 2008). A similar problem appears in firms with extreme performance because they do not show a linear relationship between performance and normal accruals; thus the Jones model may end up categorizing high normal accruals as discretionary accruals. The same may occur in large random samples when firms manage earnings in different directions that will finally offset each other and result in an average normal accruals of zero which results in inappropriate benchmarking when determining the discretionary accruals (Dechow et al., 1995). In the three previous cases, there is a higher probability of type I error where the null hypothesis that earnings management did not occur might be rejected. To mitigate this problem, some studies add new explanatory variables to the model like acquisitions, capital expenditure, discontinued operations, and sale of long-lived assets (Hansen, 1999). Other studies exclude certain firms in the calculations like high-growth ones as they generally show high accruals which are not necessarily due to earnings management (Ye, 2006). Some studies even control for performance in the model by incorporating the return on assets or cash flows (Jeter and Shivakumar, 1999; McNichols, 2000).

More seriously, the Jones model may not allow detecting earnings management especially in small samples that generate high standard errors and thus increase the probability of type II error and ultimately accepting the null hypothesis that earnings

management did not occur. However, as top journals tend to reject such papers, type II error seems more limited than type I error explained earlier (McNichols, 2000). To overcome this problem, large samples are recommended in a cross-sectional approach when using the model. However, large samples can hide the individual firm characteristics that might differ from the group and thus the homogeneity assumption is not valid (DeAngelo, 1986; Bernard and Skinner, 1996). Therefore, some studies add firm-specific characteristics to the model to overcome this homogeneity problem (Ye, 2006).

2.4.6 The Modified Jones Model (Dechow et al., 1995)

To mitigate some of the previous shortcomings of the Jones model, a number of studies have tried to modify it by adding the omitted variables, controlling for performance, taking the dynamic nature of accruals and cash flows into consideration, eliminating extreme observations, or applying different estimators to solve the model. Dechow et al. (1995) developed a new model from the Jones model (1991); which has been referred to as the modified Jones model (1995). It again starts by measuring the following regression for the total accruals of a firm in the estimation period:

$$\frac{TA_{it}}{A_{avg}} = \alpha + \alpha_1 \frac{1}{A_{avg}} + \beta_1 \frac{\Delta R_{it}}{A_{avg}} + \beta_2 \frac{PPE_{it}}{A_{avg}} + \varepsilon_{it} \tag{2.12}$$

The coefficients from the previous regression are used to determine the normal (non-discretionary) accruals in the following regression in the event period:

$$NA_{it} = \hat{\alpha} + \hat{\alpha}_1 \frac{1}{A_{avg}} + \hat{\beta}_1 \frac{(\Delta R_{it} - \Delta AR_{it})}{A_{avg}} + \hat{\beta}_2 \frac{PPE_{it}}{A_{avg}} + \varepsilon_{it} \tag{2.13}$$

The equation, however, adjusts the change in revenues for the change in accounts receivable here to avoid any discretion in credit sales while calculating normal accruals; compared to the first equation where total accruals were measured (Cohen et al., 2008). Discretionary accruals are calculated as the difference between a firm's total accruals and normal accruals from the previous equation:

$$DA_{it} = \frac{TA_{it}}{A_{avg}} - NA_{it} \tag{2.14}$$

Where TA represents total accruals measured following the balance-sheet-approach or the cash-flow-statement-approach as mentioned above; A represents total assets; R represents revenues; AR represents accounts receivable; PPE represents the gross value of property, plant, and equipment; NA represents normal accruals; and DA represents discretionary accruals. All variables are scaled by average total assets (A_{avg}) of the beginning and ending asset balances to avoid heteroskedasticity problems. A cross sectional model is used in the calculations for each year and each industry classified by its four-digit SIC code so that while taking the time influence into consideration the model controls for the economic variations between industries.

Although the modified Jones model takes into account the possibility of manipulating accounts receivable in the event period, it ignores this fact in the estimation period; which leads to inconsistency in the calculations. This implies that the use of cash sales in both periods, rather than the event period only, is a better approach and can mitigate the simultaneity problem of having accounts receivable on both sides of the equation (Ronen and Yaari, 2008). Consequently, some studies in the earnings management literature have started to adopt the cross-sectional version of the modified Jones model that considers the adjustment for both the estimation and event periods rather than the time-series version of the modified Jones model that makes the adjustment in the event period only; e.g., Dechow et al. (2003) and Kothari et al. (2005). Compared to the Jones model, the modified Jones model overestimates discretionary accruals and therefore it is less likely to fall in type II error (Ronen and Yaari, 2008). However, the influence of measurement errors also applies on the modified Jones model.

2.4.7 The Forward-Looking Model

The forward-looking model developed by Dechow et al. (2003) also tries to solve some of the problems associated with the Jones model. In addition to excluding the change in accounts receivable from the change in revenues like the modified Jones model, it also excludes the discretionary part of credit sales by adding back the non-discretionary component calculated as the change in sales multiplied by the sensitivity of the change in accounts receivable to sales. The model also controls for lagged accruals that are expected to influence current discretionary accruals when they reverse. Finally, the

model is forward-looking as it controls for the growth in sales that is expected to result in a growth in accruals as well and thus it avoids misclassifying such growth as earnings management. The forward-looking model is estimated per industry-year as follows:

$$TACC_{it} = \propto + \beta_1 \left((1+k)\Delta Sales - \Delta AR \right) + \beta_2 PPE + \beta_3 TACC_{it-1} + \beta_4 GR\_sales_{it+1} \quad (2.15)$$

Where $TACC$ is total accruals; k is the slope coefficient obtained from regressing the change in accounts receivable on the change in sales; $\Delta Sales$ is the change in sales from the previous accounting period; ΔAR is the change in account receivables from the previous accounting period; PPE is property, plant, and equipment; and GR_sales is the change in sales compared to the previous year. Discretionary accruals are again calculated as the difference between total accruals and normal accruals similar to the Modified Jones model. However, the model still suffers from the problems of simultaneity and measurement errors.

2.4.8 The Competing-Component Model (The K S Model)

As performance influences accruals, some models have attempted to control for specific performance characteristics that may result in classifying normal accruals as discretionary. Kang and Sivaramakrishnan (1995) introduce the competing-component model that incorporates more regressors to match the transactions and assets, e.g., revenues, expenses, and PP&E with their related working capital accruals, e.g., accounts receivable, accounts payable, inventory accruals, and depreciation. Identifying each of the previous items separately reduces errors that may arise because of the variation in the credit policies related to revenues and expenses. The model also considers the time impact on accruals by taking the lags of revenues and expenses in determining current accruals because previous year's credit policies will influence the current year's accruals. In addition, the model solves for the problems of endogeneity that arise from the simultaneity, omitted variables, and measurement error with a generalized method of moments (GMM) estimator that uses some instrumental variables rather than a pooled OLS estimator. Kang and Sivaramakrishnan (1995) document that the new estimator results in reducing type I and II errors. The competing-component model is as follows:

$$AB_{it} = \emptyset_0 + \emptyset_{AR}\left[\frac{AR_{t-1}}{REV_{t-1}} REV_{i,t}\right] + \emptyset_{APB}\left[\frac{APB_{t-1}}{EXP_{t-1}} EXP_{i,t}\right] + \emptyset_{DEP}\left[\frac{DEP_{t-1}}{GPPE_{t-1}} GPPE_{i,t}\right] + \varepsilon_{i,t} \quad (2.16)$$

Where AB_{it} represents the unmanaged accruals; AR is accounts receivable accruals; REV is revenues; APB is the aggregate of inventory accruals, other non-cash current asset accruals, and current liability accruals; EXP is the expenses related to the APB like cost of sales and selling and administrative expenses; DEP is depreciation expense; and $GPPE$ is gross property plant and equipment. However, the model does not control for major performance measures like the return on assets or sales growth; which may give some space for misclassifying normal accruals as discretionary.

2.4.9 The Cash-Flows Model

Dechow and Dichev (2002) introduce the cash-flows model that controls for firm performance by incorporating its cash flows to measure how accruals map into these cash flows. As accruals are linked to the timing of cash recognition, cash flows of the past, current, and future periods are included in the explanatory variables to represent the probable returns of previous sales, current sales, and expected bad debt in the future, respectively. The model does not use accruals as the dependent variable as its calculation is based on cash flows and thus results in a simultaneity problem when cash flows variable is introduced as a control. Instead, the model uses the working capital as the regressand. The cash-flows models is as follows:

$$\Delta WC_t = b_0 + b_1 CF_{t-1} + b_2 CF_t + b_3 CF_{t+1} + \varepsilon_t \quad (2.17)$$

Where ΔWC is the change in working capital; CF is operating cash flows; and ε is the residual from the regression which is considered as the measure of accrual earnings management. However, the residual is likely to capture some non-discretionary aspects that might be related to firm characteristics like the volatility of the transactions and thus better represents the overall quality of earnings as discussed earlier in section 2.2.3 (Ronen and Yaari, 2008).

2.4.10 The Cash-Flows Jones Model

McNichols (2002) develops the previous model further by combining it with the original Jones model. She finds that the explanatory power of the model increases and thus confirms the importance of controlling for performance when measuring accrual earnings management. The McNichols model is as follows:

$$\Delta WC_t = b_0 + b_1 CF_{t-1} + b_2 CF_t + b_3 CF_{t+1} + b_4 \Delta Slaes + b_5 PPE + \varepsilon_t \quad (2.18)$$

Where ΔWC is the change in working capital; CF is operating cash flows; PPE is the gross property, plant and equipment, and ε is the residual from the regression which is considered as the measure of accrual earnings management. Although the residual is less likely to capture non-discretionary accruals in this case, the model suffers from simultaneity and measurement error problems.

2.4.11 The Performance-Matching Model

Kothari et al. (2005) introduce the performance-matching model that further develops the Jones model and the modified Jones model by controlling for firm operating performance. They match the discretionary accruals of firms in the sample with those of firms in a control group within the same industry. This way, they control for the effect of any extreme performance that results in a non-linear relation between performance and accruals and thus type I error, e.g., growth firms. In its simple form, the model considers accrual earnings management as the difference between a firm's accruals and its peer's accruals from the control group without running any regression. In a more sophisticated format, the model calculates accrual earnings management for each firm using the Jones model while incorporating the lagged return on assets ratio (ROA) as a control and then makes the comparison. As a result, discretionary accruals can be calculated in the linear-performance-matching model as follows:

$$DA_{it} = \frac{DA_{it}}{A_{avg}} - \frac{DA_{icont}}{A_{avg}} \quad (2.19)$$

Where DA represents discretionary accruals; A represents total assets; and $icont$ represents a firm from the control group close to firm i in its return on assets (ROA) within the same year and industry sector. The performance-matching model shows

better explanatory power than the Jones model (Ye, 2006). However, a problem appears in identifying the matched group of firms as it is not always possible to obtain a homogenous relation between performance and accruals for two different groups. In this sense, selecting the inappropriate matched group will cause biased results. For example, selecting a matched firm that manages earnings may result in a type II error (Kothari et al., 2005).

2.4.12 The Business Model

Ye (2006) developed the business model which solves for more than one deficiency in the Jones model at once. The model controls for performance, takes the dynamic nature of abnormal accruals into consideration, adds the intensity of working capital to control for sales growth related to the short-term accruals, and finally incorporates depreciation to control for the impact of long-term accruals. This way, the model controls for firm-specific characteristics that were ignored in cross-sectional models. The business model looks as follows:

$$TA_{i,t}=\alpha_0+\left(\frac{\beta_0+\beta_1\Delta REV_{i,t}+\beta_2 PPE_{i,t}}{A_{i,t-1}}\right)+\beta_4 ROA_{i,t-1}$$
$$+\left(\beta_5 NCWC_{i,t-1}-\beta_6\overline{NCWC}_{i,t}\right)$$
$$+\beta_7 NCWC_{i,t-1}X\Delta REV_{i,t}+\beta_8 dep_{i,t-1}+\beta_9 dep_{i,t-1}PPE_{i,t}+\varepsilon_t \quad (2.20)$$

Where, TA is the total accruals; $\frac{\beta_0+\beta_1\Delta REV_{i,t}+\beta_2 PPE_{i,t}}{A_{i,t-1}}$ is the Jones model where ΔREV is the change in revenues, PPE is property, plant, and equipment, and A is total assets; ROA is the return on assets to control for firm performance; $NCWC_{i,t-1}-\overline{NCWC}_{i,t}$ represents the abnormal lagged accruals where $NCWC$ is the non-cash working capital and $\overline{NCWC}$ is the normal non-cash working capital calculated as the average non-cash working capital over the last three years; dep is the depreciation rate; and $dep_{i,t-1}PPE_{i,t}$ is the historical depreciation used to anticipate the depreciation expense for the current period. However, the model still suffers from an unsolved endogeneity problem due to the simultaneity between the dependent and explanatory variables.

2.4.13 The Stubben Model

Stubben's Model (2010) focuses on discretionary revenues which are the largest component of earnings in most firms (Stubben, 2010). Using revenues as an estimate of discretion reduces measurement error and makes the model less biased and more specified than other accrual models due to three reasons. First, Discretionary revenues reflect receivables' accruals, rather than aggregate accruals. Receivable accruals, in turn, are more directly related to revenues than other working capital accruals. Second, the model focuses on reported revenues rather than on cash revenues. While this results in understating discretionary revenues estimate, it is unlikely to overestimate discretion for firms that are less expected to collect their credit revenues by the year end like growth firms. Finally, the model examines receivable accruals for the fourth quarter separately because they are less likely to be collected before the year end. As a result, it prevents overstating discretion when the revenues of the fourth quarter are relatively high or understating discretion when the revenues of the fourth quarter are relatively low (Stubben, 2010).

$$\frac{\Delta AR_{it}}{A_{avg}} = \propto + \propto_1 \frac{1}{A_{avg}} + \beta_1 \frac{\Delta R1\_3_{it}}{A_{avg}} + \beta_2 \frac{\Delta R4_{it}}{A_{avg}} + \varepsilon_{it} \tag{2.21}$$

Where AR represents accounts receivable; A represents total assets; $R1\_3$ represents revenues in the first three quarters; and $R4$ represents revenues in the fourth quarter. All variables are scaled by average total assets (A_{avg}) to avoid heteroskedasticity problems. A cross sectional model is used in the calculations for each year and each industry classified by its four-digit SIC code. The residual (ε_{it}) from the regression is the measure of discretionary revenues ($DiscRev$) that represents accrual earnings management ($AccrualEM$). However, the model ignores other working capital accruals that might be material in some firms depending on the nature of their transactions. In addition, by using a pooled OLS estimator, the model still suffers from a problem of endogeneity. Finally, it does not control for any measures of firm performance.

2.4.14 The Single-Item Models

Although the models of aggregate discretionary accruals have dominated earnings management literature as mentioned earlier, single-item models have been introduced in certain occasions. Based on materiality criterion, these models select one item of the income statement that can be manipulated within GAAP, like estimating the bad debt expense, reserves, or even aggregate accounts like total tax expense which includes deferred tax as well (McNichols and Wilson, 1988; Dhaliwal et al., 2004). This methodology allows better identification of discretionary accruals in a specific account. However, the discretionary part might be covered by the non-discretionary part if the latter is higher than the earlier. Furthermore, although I can accept the fact that total earnings management exists if discretionary accruals were detected in a specific account, the opposite may not apply and thus the results cannot be generalized to total accruals.

2.4.15 The Distributional Approach

A final methodology of measuring earnings management is by studying the distribution of earnings or earnings per share (EPS). This kind of methodology is referred to as the distributional approach. The approach assumes that unmanaged earnings follow a normal distribution and thus earnings management is measured by how each observation deviates from that normal distribution (Thomas, 1989; Burgstahler and Dichev, 1997). However, determining the boundaries of the normal distribution remains a subjective matter. In addition, having high or low earnings may reflect firm performance and does not necessarily imply the existence of earnings management.

2.4.16 Evaluation of Accrual Earnings Management Models

Overall, the majority of accrual earnings management models consider total accruals as the dependent variable, measured by using the balance sheet approach (working capital items) or the cash flow approach (the difference between earnings and operating cash flows). However, some models use a single item of the total accruals, e.g., Stubben's Model, because they want to emphasize the relative importance of this particular account among other accruals. While using total accruals allows for a more

comprehensive measure of accrual earnings management, it is difficult to specify the degree of influence for each of the explanatory factors on each item within total accruals (McNichols and Wilson, 1988). The opposite applies on using a single accrual item as a dependent variable.

Different factors have been included within the explanatory variables of accrual behaviour. The most commonly used ones were revenues, PP&E, and expenses. Meanwhile, some models take the time effect on accruals' manipulation into consideration, e.g., the Ronen and Sadan Model, or incorporate the role of time in the form of the lagged accruals value, e.g., the Forward-Looking Model, the Business Model, and the Competing-Component Model. Furthermore, some models control for performance using sales growth (Forward-Looking Model), cash flows (Cash-Flows Models), return on assets (Performance-Matching Model and Business Model), abnormal sales (Ronen and Sadan Model), matching performance to a benchmark (Performance-Matching Model), or working capital items (Competing-Component Model and Business Model) to avoid misclassifying normal accruals as discretionary. However, some models still ignore this type of control, e.g., the Jones Model, Modified Jones Model, and Stubben's Model; and thus are more likely to fall in type I error.

For measuring accrual earnings management, some of the models do not even run any kind of regression, e.g., the Healy Model, DeAngelo Model, the Industry-Based Model, and the Distributional Approach. Instead, they consider accrual earnings management as the deviation of current accruals from the past or current accruals' values. Therefore, these models are less powerful in detecting earnings management because they do not consider the influence of the different firm operations and characteristics on the manipulation. On the other hand, almost all the models that run regressions use a pooled OLS estimator to solve for accrual earnings management. The Competing-Component Model is the only one that uses a system generalized method of moments (GMM) estimator which allows for resolving the endogeneity that arises because of the problems of simultaneity, omitted variables, and measurement errors.

Although the previous models have tried hard to provide reliable measures of accrual earnings management, they still suffer from different problems like the omitted variables, simultaneity between the dependent and explanatory variables, type I error due to ignoring performance effect, weak assumptions that result in biased measurement,

and unsuitability for extremely small or large samples. Although some studies have documented high correlation between the different aggregate models of accrual earnings management (Guay et al., 1996), others have found that some models are better in measuring accrual earnings management than others (Dechow et al., 1995; Thomas and Zhang, 2000). As each model measures a different aspect of accrual earnings management, choosing the best measure is still a subjective matter that depends on the different needs of each researcher. Using more than one model is always a good approach in avoiding biased results, but developing more precise models remains one of the challenges for future research. For the measurement purpose of this thesis, I will select the Modified Jones Model which shows strong power in explaining total accruals and Stubben's Model which specifically emphasizes the receivable accruals related to discretionary revenues (Dechow et al., 1995).

2.5 Real Earnings Management Models

Before the introduction of the Roychowdhury Model in 2006, studies used to focus only on individual economic choices for measuring real earnings management activities and emphasized the manipulation in a specific industry sector, e.g., Baber et al. (1991) examine the manipulation of R&D expense in the manufacturing sector in the US. Afterwards, studies have started to implement more than one aspect of real earnings management in more than one industry sector. The most commonly used models that measure the overall real earnings management across industries and over time include the Roychowdhury Model and the Gunny Model.

2.5.1 The Roychowdhury Model

Based on the study of Dechow et al. (1995), Roychowdhury (2006) developed a model that represents one of the most commonly used measures of real earnings management in the non-financial sectors and consists of three components (Cohen et al., 2008; Walker, 2013). The first component represents the decrease in operating cash flows as a result of sales discounts and flexible credit terms in order to increase the sales volume and improve earnings in a specific period. Therefore, the model starts by establishing

the normal level of operating cash flows based on sales level and changes in sales according to the following regression.

$$\frac{CFO_{it}}{A_{avg}} = \propto + \propto_1 \frac{1}{A_{avg}} + \beta_1 \frac{Sales_{it}}{A_{avg}} + \beta_2 \frac{\Delta Sales_{it}}{A_{avg}} + \varepsilon_{it} \quad (2.22)$$

In the previous equation, CFO represents operating cash flows; $Sales$ represents the sales for the current period; $\Delta Sales$ represents the change in sales during the current period. I scale all variables by average total assets (A_{avg}) of the beginning and ending asset balances to avoid any heteroschedasticity. I use a cross sectional model in the calculations for each year and each industry classified by its four-digit SIC code. The abnormal operating cash flows are calculated as the difference between the normal operating cash flows and the actual operating cash flows. For the resulting measure to reflect the upward earnings management, it is multiplied by -1.

The second component of real earnings management according to Roychowdhury model (2006) is the decrease in discretionary expenses in order to improve earnings and current cash flows. Discretionary expenses include research and development (R&D), advertising, and selling, general, and administrative (SG&A) expenses. The model starts by establishing the normal level of discretionary expenses based on sales level according to the following regression.

$$\frac{DiscExp_{it}}{A_{avg}} = \propto + \propto_1 \frac{1}{A_{avg}} + \beta_1 \frac{Sales_{it-1}}{A_{avg}} + \varepsilon_{it} \quad (2.23)$$

In the previous equation, $DiscExp$ represents discretionary expenses that include research and development (R&D), advertising, and selling, general, and administrative (SG&A) expenses; $Sales_{it-1}$ represents the sales of the previous period which is used rather than the current period sales ($Sales_{it}$) to avoid the mechanical decrease in discretionary expenses in case of managing sales upwards during the current period. I scale all variables by average total assets (A_{avg}) of the beginning and ending asset balances to avoid any heteroschedasticity. I use a cross sectional model in the calculations for each year and each industry classified by its four-digit SIC code. The abnormal discretionary expenses are calculated as the difference between the normal discretionary expenses and the actual discretionary expenses. For the resulting measure to reflect the upward earnings management, it is multiplied by -1.

The third component of real earnings management according to Roychowdhury model (2006) is the increase in operating costs like the increased inventory production in order to decrease the cost of goods sold and ultimately improve earnings. As the fixed costs are split over a bigger number of units, the unit cost will decrease. The production costs, however, will still be high relative to sales and result in an overall decrease in operating cash flows. The model again starts by establishing the normal level of production costs based on sales level and changes in sales according to the following regression.

$$\frac{Prod_{it}}{A_{avg}} = \propto + \propto_1 \frac{1}{A_{avg}} + \beta_1 \frac{Sales_{it}}{A_{avg}} + \beta_2 \frac{\Delta Sales_{it}}{A_{avg}} + \beta_2 \frac{\Delta Sales_{it\text{-}1}}{A_{avg}} + \varepsilon_{it} \quad (2.24)$$

In the previous equation, $Prod$ represents the production costs which includes the costs of goods sold ($COGS$) in addition to the change in inventory (ΔInv) during the period; $Sales$ represents the sales for the current period; $\Delta Sales$ represents the change in sales during the current period; $\Delta Sales_{it-1}$ represents the change in sales during to the previous period. I scale all variables by average total assets (A_{avg}) of the beginning and ending asset balances to avoid any heteroschedasticity. I use a cross sectional model in the calculations for each year and each industry classified by its four-digit SIC code. The abnormal production costs are calculated as the difference between the normal production costs and the actual production costs.

However, the model still suffers from the problem of omitted variables. Furthermore, the assumption that the sample used to measure normal real earnings management is by itself normal cannot be valid all the time as it may include some firms that manipulate earnings, and thus benchmarking to this group is not appropriate and the results might be biased. The model is also not suitable for extremely small samples due to violating the OLS assumption regarding the normality of the error term. The same applies to extremely large samples where the individual characteristics of the firms are hidden.

2.5.2 The Gunny Model

Gunny's Model (2010) for real earnings management measures four types of real earnings management activities. These include decreasing discretionary research and

development expense (REM_{RD}) as in equation (2.25), decreasing discretionary selling, general, and administrative expense (REM_{SGA}) as in equation (2.26), timing of fixed asset sales to report gain (REM_{Asale}) as in equation (2.27), and overproduction (REM_{Prod}) to cut prices or decrease the cost of goods sold (COGS) as in equation (2.28) (Gunny, 2010).

$$\frac{RD_t}{A_{avg}} = \alpha_0 + \alpha_1 \frac{1}{A_{avg}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{avg}} + \beta_4 \frac{RD_{t-1}}{A_{avg}} + \varepsilon_t^{R\&D} \tag{2.25}$$

$$\frac{SGA_t}{A_{avg}} = \alpha_0 + \alpha_1 \frac{1}{A_{avg}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{avg}} + \beta_4 \frac{\Delta S_t}{A_{avg}} + \beta_5 \frac{\Delta S_t}{A_{avg}} * DD + \varepsilon_t^{SG\&A} \tag{2.26}$$

$$\frac{GainA_t}{A_{avg}} = \alpha_0 + \alpha_1 \frac{1}{A_{avg}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{avg}} + \beta_4 \frac{ASales_t}{A_{avg}} + \beta_5 \frac{ISales_t}{A_{avg}} + \varepsilon_t^{Asset} \tag{2.27}$$

$$\frac{PROD_t}{A_{avg}} = \alpha_0 + \alpha_1 \frac{1}{A_{avg}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{S_t}{A_{avg}} + \beta_4 \frac{\Delta S_t}{A_{avg}} + \beta_5 \frac{\Delta S_{t-1}}{A_{avg}} + \varepsilon_t^{Production} \tag{2.28}$$

The previous equations are initially used to calculate normal real earnings management, where RD represents R&D expense; SGA represents selling, general and administrative expense; $GainA$ represents income from asset sales; $PROD$ represents COGS plus change in inventory; A represents total assets; MV represents the natural logarithm of market value calculated as the number of common shares outstanding multiplied by the share price; Q represents Tobin's Q calculated as the sum of the market value of common shares, the book value of preferred shares, long term debt and current debt divided by total equity and liability; INT represents internal funds calculated as the sum of income before extraordinary items, research and development expense, and depreciation and amortization expenses; DD represents an indicator variable that reflects the sticky cost behaviour for the intentional reduction in SG&A when the demand drops, which equals 1 when total sales decrease between t-1 and t, and zero otherwise; $ASales$ represents the sales of long-lived assets; and $ISales$ represents the sale of long-lived investment. To keep the relation between $GainA$, $ASales$, and $ISales$ monotonic in equation (2.27), I make all their signs negative when $GainA$ is negative. I scale all variables by average total assets (A_{avg}) of the beginning and ending asset

balances to avoid any heteroschedasticity. I use a cross sectional model in the calculations for each year and each industry classified by its four-digit SIC code. The residuals ($\varepsilon_t^{R\&D}$, $\varepsilon_t^{SG\&A}$, ε_t^{Asset}, $\varepsilon_t^{Production}$) from the regressions represent the measures for the R&D, SG&A, fixed assets' sale, and production components of real earnings management (REM_{RD}, REM_{SGA}, REM_{Asale}, REM_{Prod}) respectively. Imultiply the first and second residuals by negative one so that cutting the discretionary expense reflects an increase in real earnings management.

For the purpose of obtaining an overall estimate for real earnings management in this thesis, and similar to what I have done earlier when applying the Roychowdhury model, a principal component analysis with varimax rotation is performed (Demerjian et al., 2013b). This step prevents the inclusion of highly correlated variables in the measure. Although the model incorporates more variables to explain each measure of real earnings management, it suffers from the problem of endogeneity due to the simultaneity between the dependent and explanatory variables. Meanwhile, it is vulnerable to error in the measurement of any of the included variables. Similar to Roychowdhury Model, measuring normal real earnings management does not provide a valid benchmark as it may include some firms that already use real earnings management. Furthermore, the model would not be suitable for extremely small or large samples.

2.5.3 Evaluation of Real Earnings Management Models

Very few models have been developed to measure real earnings management compared to those that measure accrual earnings management. The models of Roychowdhury (2006) and Gunny (2010) seem to be the only ones in this area. Both models emphasize management decisions to manipulate discretionary expenses and production to improve earnings. However, while the Roychowdhury Model takes into consideration some of the managerial decisions related to manipulating sales transactions, the Gunny Model emphasizes those that allow for manipulating the sale of assets and investments.

Although the Gunny Model incorporates more variables to explain its dependent variables than the Roychowdhury model, both models still suffer from endogeneity due to the problems of simultaneity, omitted variables, and measurement error. Therefore,

applying an OLS regression is not the optimal way to solve the previous models and it is essential to use alternative estimators, e.g., a generalized method of moments (GMM) estimator. In addition, both models suffer from some inappropriate assumptions and may generate problems when applied on small or large samples.

Similar to the case of accrual earnings management, selecting a model to measure real earnings management remains a subjective matter depending on research needs. However, using more than one model is recommended and therefore I apply both of the previous models in this thesis because they measure different aspects of real earnings management. Meanwhile, future research has to take into consideration introducing new models that assist in solving some of the problems encountered by the previous models.

2.6 Special Measures of Earnings Management

To complete the previous discussion, I also cover some special issues encountered in the literature regarding the measurement of earnings management. Some of the models in the earnings management literature have tried to solve for the mutual effect between accrual and real earnings management. In addition, specific models have been introduced to measure earnings management in the financial sector because of its characteristics that require special attention in measurement. Finally, some attempts to measure earnings management have been evidenced in the qualitative research. All these topics are covered in some detail in this section.

2.6.1 Combined Models

Zang (2012) introduces a model that tackles the endogeneity problem between accrual and real earnings management. The model considers the sequential nature of the two activities - while real earnings management takes place within the financial year, accruals' manipulation is generally performed after the year end. Therefore, the level of accrual earnings management depends on the previously manipulated real activities, but not the other way round. In this sense, real earnings management is introduced as an exogenous variable when solving for accrual earnings management equation but accrual

earnings management is excluded when solving for real earnings management equation. The model emphasizes the trade-off between accrual and real earnings management activities based on their costs and benefits that vary across firms according to the following two equations:

$$RM_t = \beta_0 + \sum_k \beta_{1,k} Cost\ of\ RM_{k,t} + \sum_l \beta_{2,l} Cost\ of\ AM_{l,t} + \sum_m \beta_{3,m} Control_{m,t} + u_t \quad (2.29)$$

$$AM_t = \gamma_0 + \sum_k \gamma_{1,k} Cost\ of\ AM_{k,t} + \sum_l \gamma_{2,l} Cost\ of\ RM_{l,t} + \gamma_3 Unexpected\ RM_t + \sum_m \gamma_{4,m} Control_{m,t} + v_t \quad (2.30)$$

Where RM_t represents real earnings management measured using the Roychowdhury model (2006); AM_t represents accrual earnings management measured using the Jones model (1991); *Cost of RM* is the cost of real earnings management which include the competitive status in the industry, financial health, institutional ownership, and the tax consequences of the manipulation; *Cost of AM* is the cost of accrual earnings management which include audit quality, public scrutiny, and accounting flexibility; $Control_{m,t}$ include predetermined firm characteristics; and *Unexpected* RM_t is the estimated residual from the first equation (u_t).

Although Zang (2012) has introduced the first model that considers the simultaneous measurement of accrual and real earnings management, it strictly relies on the assumption that both activities are sequential (Walker, 2013). However, firms are not prohibited from manipulating accruals within the accounting period. Furthermore, the model ignores the trade-off with other activities like earnings smoothing and classification shifting. The model also ignores the dynamic nature of earnings management by only examining the impact of the unexpected portion of real activities on the levels of discretionary accruals in the same year. However, it does not consider the missed chances to manipulate earnings in prior years on the current levels of earnings management. Incorporating the cumulative impact of both activities in the previous periods may assist in explaining the trade-off behaviour over time. Finally, some elements which may also influence earnings management behaviour are missing in Zang's model; e.g., managerial ability which influences the costs of both accrual and real activities.

2.6.2 Earnings Management Measures in the Financial Sector

The financial sector has its unique accounting and financial practices and is subject to distinct regulations. Therefore, managers in this sector have different motivations to manipulate earnings than those of managers in other industry sectors. Accordingly, different proxies are used to measure earnings management in the financial sector compared to other industries. One of the most commonly used ones is income smoothing through loan loss provision which represents the difference between the amount of the loan loss estimated and the amount actually required to set the provision. Earnings management in the financial sector can be also measured by earnings smoothing calculated as the correlation between the change in cash flows from operations and the change in total accruals or the volatility of earnings relative to the volatility of cash flows. Finally, benchmark beating can be used to measure earnings management in the financial sector, e.g., meeting or beating analysts' forecasts or reporting small profits or losses compared to the previous year (Imperatore and Trombetta, 2015; Martinez et al., 2015; Vlad, 2015).

2.6.3 Earnings Management in Qualitative Research

Although earnings management involves lots of behavioural perspectives, very few studies in the literature have examined it qualitatively. The most famous study in this area is the study of Graham et al. (2005) which performed a survey of 400 executives in addition to 20 interviews from the US firms. The study mainly finds that most executives in the sample are likely to use real earnings management than accruals' manipulation in order to achieve their earnings benchmarks. Executives are also more inclined to use earnings smoothing because it involves lower risk and tend to use aggressive smoothing strategies under the pressure of meeting earnings targets. The study also documents that earnings are more important numbers to the outsiders than revenues or cash flows; and prior earnings and analysts' forecasts are important benchmarks for management to meet in order to avoid negative market reactions. Similar findings were observed in a smaller scale survey and interviews in the UK performed by Choi et al. (2006) where analysts reported that UK executives are more likely to use real rather than accrual earnings management.

Another survey was performed by De Jong et al. (2014) and covered 306 analysts in addition to interviews of 21 analysts from the biggest investment banks in the world to examine the influence of earnings management on investors' reactions. Their results show that analysts believe in the influence of earnings management on firms' stock prices; and therefore firms manage earnings to meet earnings benchmarks and boost firm value. To achieve the previous target, managers prefer to increase earnings by reducing discretionary costs although it may contribute to destroying the value of the firm in the future. However, analysts believe that stock repurchase is a better choice for management to influence investors' perceptions.

Finally, Nelson et al. (2002) perform a qualitative study to examine the relation between earnings management and audit quality. To achieve this target, they use a questionnaire to collect data from 253 auditors in one of the big 5 audit firms in the US. Their results show that auditors do not request their clients to adjust for their misstatements that are structured to conform to precise standards e.g., manipulating leases and consolidations, or unstructured under imprecise standards e.g. manipulating reserves. Accordingly, auditors are likely to request an adjustment when there is a material unstructured misstatement under a precise standard.

Given all the limitations of qualitative research such as the respondents' bias and the low response rate; the previous findings have shifted the attention of modern research in earnings management to some of the manipulative activities that have underlying economic consequences. For future research, using such qualitative methodology is recommended besides the widely used quantitative methods to obtain new insights in the earnings management literature.

2.7 Conclusions

This chapter has attempted to provide a comprehensive definition of earnings management taking into consideration its characteristics, conditions, methods, and targets. Identifying the characteristics of earnings management allows for distinguishing it from fraud which involves a violation of GAAP, earnings quality that might be influenced by factors unrelated to management discretion, impression management that

involves the narrative part of the annual reports, and expectation management that focuses on firm announcements.

The within GAAP managerial discretionary methods over financial reporting include accrual earnings management, real earnings management, earnings smoothing, income shifting, and other advanced techniques. Each of the previous methods has its unique features and hence managers tend to trade-off between them according to how their features fit into their needs. Although the earnings management literature has mostly focused on one method per study, it is more meaningful to analyse more than one of these methods at a time when examining earnings management behaviour.

Lots of models have been introduced for measuring accrual earnings management compared to very few ones for measuring real earnings management which is a relatively new topic in the literature. Almost all the models in both areas suffer from a problem of endogeneity due to the simultaneity between the dependent and explanatory variables, the omission of some of the independent variables, or errors in measuring any of the variables. In addition, the models sometimes make weak assumptions that lead to biased results and they are not always suitable to be applied in any context. Using more than one model may help in mitigating some of the previous problems, but researchers still have lots of flexibility in choosing between the different models; which may sometimes result in 'research management of earnings management'.

The previous models for measuring earnings management discussed in sections 2.4 and 2.5 cannot be applied to the financial sector due to its unique accounting characteristics. Therefore, specific measures have been developed in the literature for this task. The only model that takes the mutual impact of accrual and real earnings management is that of Zang (2012). However, it suffers from some problems that create a need for developing new models to solve for the trade-off between more than one earnings management activity at a time. Finally, the earnings management literature has been dominated by quantitative research although the qualitative methodology has already made significant contribution to the literature. Therefore, qualitative studies are worth considering by the current researchers in the field.

In this chapter, the conditions that allow earnings management to occur have been briefly described. However, each of the identified conditions has a theoretical basis

in contracting theory, bounded rationality theory, or information theory. Therefore, the following chapter discusses in detail how earnings management theories have evolved based on each of these theories.

Chapter 3
Theoretical Framework

3.1 Introduction

This chapter establishes the theoretical framework of earnings management by focusing on the agency aspect of firm theory that best explains management opportunistic behaviour due to the separation of ownership from control in public companies. It also discusses the model developed by Walker (2013) to explain earnings management through the violation of the revelation principle and identifies the main conditions that allow for this behaviour. Then, the chapter discusses in detail the theory behind each of those conditions based on contracting theory, bounded rationality theory, and information asymmetry theory.

The chapter also discusses the three major theoretical approaches to explain earnings management based on Ronen and Yaari (2008). These include the costly contracting approach that is based on contracting theory, the decision-making approach that is based on information asymmetry theory, and the legal-political approach that takes into consideration the theories of contracting, bounded rationality and information asymmetry altogether. The chapter finally explains how all these theories contribute to explaining earnings management behaviour.

The remainder of this chapter is organized as follows. Section 3.2 provides a brief description of firm theory. Section 3.3 explains the agency aspect of firm theory. Section 3.4 discusses the revelation principle and the relevant theories to explain its conditions that include contracting theory, bounded rationality theory, and information asymmetry theory. Section 3.5 presents the three main theoretical approaches of earnings management that include the costly contracting approach, the decision-making approach, and the legal-political approach. Finally, section 3.6 concludes the chapter.

3.2 Firm Theory

A firm is considered as a black box that contains participants with conflicting objectives who aim to maximize their utilities (Jensen and Meckling, 1976). Therefore, a firm needs to organize the control and power between the different parties in the relationships within and outside its boundaries. As a result, the theory of the firm has been developed to provide a comprehensive view of the firm taking into consideration different factors at the agency, contracting, and property rights levels. To explain the internal and external relations, the modern perspective of firm theory emphasizes some behavioural aspects; e.g., it explains managerial performance through the motivation of managers to control the firms without owning them (Fama, 1980). For the purpose of this thesis, I emphasize the agency perspective of the firm because it assists in explaining earnings management behaviour as discussed in the following section.

3.3 Agency Theory

The agency theory, also referred to as the principal-agent theory, was established by Holmström and Milgrom (1987) based on the previous work of Jensen and Meckling (1976). It assumes that there are two parties involved in the employment contract: the agent (manager) and the principal (shareholder). The main problem between the principal and the agent is a problem of information. As the manager is more informed than the shareholders, a situation of information asymmetry arises which gives a chance for adverse selection by management. The different motivations and attitude towards risk by the different decision makers leads to an incentive problem that also contributes to the agency problem and referred to as moral hazard (Harris and Raviv, 1979). Adverse selection and moral hazard give rise to the problem of coordination in making decisions regarding what information is reported, how it is communicated, and who makes the decision. Thus, shareholders delegate the task of decision making to the managers while trying to maintain some control over their performance.

The different preferences and objectives of the principals and agents also contribute to the agency problem. The separation between ownership and control leads to specialized risk bearing and specialized decision skills in the organization. In this sense, principals generally prefer high payoff and are indifferent to the agent's effort.

On the other hand, agents possess the decision making skills regardless of their personal wealth and thus prefer gaining high payoffs and expending less effort. Each party aims to maximize its utility function and ultimately the overall agency payoff depends on the agent's effort (Strong and Walker, 1987). The difference in the intensity of the agency problem results in different behaviours of management ranging from obedience to self-interest and further to opportunism that involves earnings manipulation (Giroux, 2004).

Furthermore, shareholders and managers differ in their interests to emphasize firm horizons when making their decisions. Shareholders may focus on the short- or long-term horizons because they are heterogeneous in their rationalities and ways of thinking. Therefore, some of them can get more benefits by maximizing firm's short-term value like speculators, while others' interests are linked to maximizing firm's long-term value like long-term investors. Similarly, managers may focus on the long-term horizons of their firms as they are concerned about their careers in the long-run and, thus, they care about their reputations which will enable them to enter into more rewarding contracts in the future. In this sense, managers are motivated to maximize firms' long-term values which emphasize shareholders' value. On the other hand, managers may focus on the short-term horizons, so that they can extract better compensation by maximizing firms' short-term value and, therefore, they invest in short-term projects to signal a high-quality performance while ignoring shareholders' value. A post-horizon problem arises sometimes when managers aim to reflect better current performance that would open more chances for their future employment after retirement or after they leave their current firms. Consequently, when shareholders and managers focus on different aspects of the firm's horizons, a conflict of interests appears that contributes to the agency problem (Ronen and Yaari, 2008).

As a result of the agency problem, agency costs arise like the monitoring costs incurred by the principal, bonding costs incurred by the agent, and the residual loss represented by the decrease in principals' welfare as a result of their conflicting interests with the agents (Jensen and Meckling, 1976). However, the agency costs can be controlled by mechanisms like the hierarchical control systems in the organization, managerial labour market penalties, outsider experts in the boards of directors, the relative performance evaluation of the manager compared to other agents within the

same industry, and incentives like the performance-based rewards (Strong and Walker, 1987).

Managerial incentives have received most of the attention among the control mechanisms of the agency problem, especially that they are dependent on different factors. On the one hand, there is an inverse relation between pay performance sensitivity (PPS) and firm risk and, hence, an efficient contract has to combine between incentives and risk sharing. The previous relation was emphasized in the studies of Lambert and Larcker (1987), Garen (1994) and Aggarwal and Samwick (1999). On the other hand, the study of Demsetz and Lehn (1985) documents a positive relation between the pay performance sensitivity and firm risk. They find that firm risk increases under higher levels of uncertainty leading to more discretion in managerial decisions which makes them more difficult for shareholders to understand. As a result, shareholders offer more incentives to the managers to deal with this information gap. The previous relation was also emphasized in the studies of Core and Guay (1999, 2001, 2002) and Prendergast (2000, 2002). In this sense, the use of managerial incentives to mitigate the agency problem depends on how the shareholders view the relation between firm risk and the incentives.

Determining the type of managerial incentive is also dependent upon the risk attitude of management. Managers who are risk averse are associated with less information uncertainty about their decisions. Therefore, they require less monitoring as shareholders possess enough information to evaluate their performance. As a result, their incentives would be based more on their current salaries. On the other hand, managers who are risk takers are associated with more information uncertainty in their decisions, which increases the information problem. Therefore, their incentives would rely more on their delayed compensation as the firm obtains more information in the future (Eaton and Rosen, 1983).

Furthermore, determining management incentives depends on the costs of contracting like the monitoring cost. If the shareholders can observe the performance of the managers, then fixed wage contracts are optimal for the contracting between the two parties. However, if the agent's performance is difficult to be observed, then it would be better for the two parties to engage in an incentive scheme that allows for the trade-off between optimal incentives and optimal risk sharing.

Overall, although viewing earnings management as a beneficial activity may imply a resolved agency problem because it is used to convey firm private information according to the stewardship theory (Barney, 1990; Donaldson, 1990; Davis et al., 1997; Jiraporn et al., 2007; Gunny, 2010), earnings management is mainly perceived as a conflict of interest between management and shareholders. The problem originates from the information asymmetry between the principal and the agent, the difference in risk attitudes of the two parties or their focus on different aspects of the firm horizons. Managerial incentives have been the most commonly introduced mechanism to mitigate the agency problem. However, inappropriate incentives may lead to a productivity crisis because managers who are unsatisfied with their incentives may continue using the same old production tools to avoid any new investments. While the resulting high profits allow them to extract more compensation and get better reputations to further develop their careers, they can have a negative impact on firms' future productivity.

3.4 Revelation Principle

The revelation principle represents the ideal situation where no agency problem exists. In such a situation, the outcome of the game when all information is revealed can be generalized to situations with restrictions on information. Therefore, in the presence of information asymmetry, the revelation principle assumes that privately informed managers achieve more benefits from revealing the truth as they avoid any subsequent penalties on misreporting bad results (Ronen and Yaari, 2008). At the same time, shareholders would maximize their expected utilities as managers are motivated to act for improving firm performance (Milgrom and Roberts, 1992). In this sense, the revelation principle helps in solving the conflict between principals and agents and emphasizes truth telling equilibrium where the truthful revelation of private information by managers leads to maximizing the utility functions of all players in the game.

For the truth telling equilibrium to take place, the revelation principle assumes the following sequence of events. First, principals design the truth inducing contracts then agents do their efforts to meet these contracts, which are not observable by the principals. When the economic profits of these efforts are achieved, the agent produces a report about the economic results he/she obtains. Finally, the audit report is issued, the

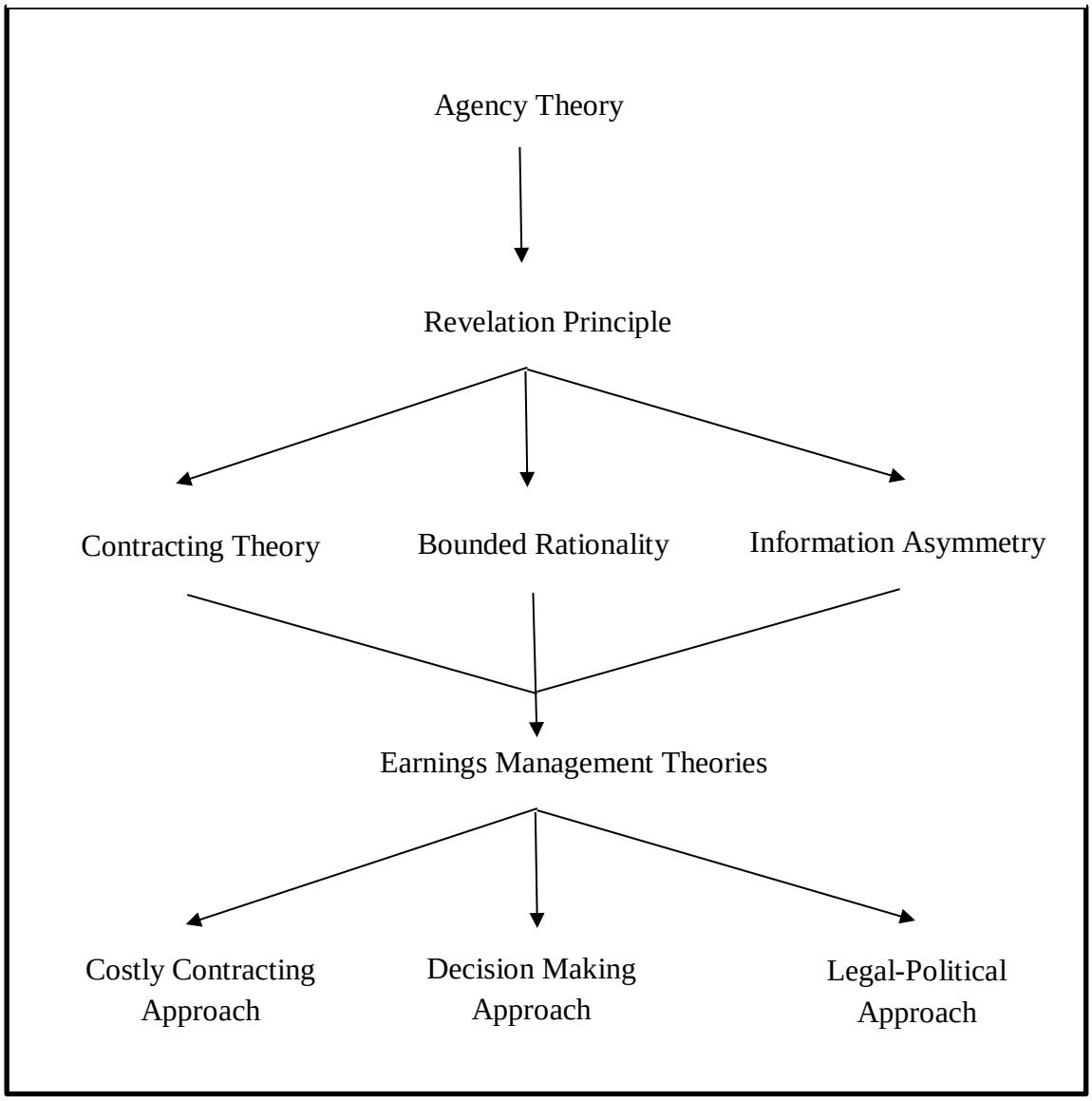
agent gets his/her payment based on the contract terms with the firm, and the principals receive the residual share (Ronen and Yaari, 2008).

However, the revelation principle does not apply when any of the following four conditions is violated (Walker, 2013). The first condition is violated when contracting costs are high, especially with the need for regular renegotiation to co-ordinate between management and the large number of shareholders. This renders contracts imperfect and difficult to enforce; and ultimately results in the use of simplified contracts with general terms and conditions (e.g., the use of GAAP to prepare the financial statements) that give more chances for earnings' manipulation (e.g., the within GAAP discretion by management). Second, the revelation principle is violated because of shareholders' imperfect rationalities especially under conditions of market uncertainty, which makes them unable to take wealth maximizing decisions all the time. The third condition of the revelation principle is violated when there is no common knowledge, in the form of a management information system, which is well known to shareholders and enables them to understand management actions. Finally, the revelation principle is violated when managers find that communicating with shareholders is costly due to the presence of third parties like regulators, competitors, and tax authorities. Any of the previous violations of the revelation principle results in aggravating the agency problem and is sufficient to give managers the chance to manage earnings (Walker, 2013).

Although the revelation principle provides a solid explanation for the motives of earnings management, it does not take into consideration the cost variation of earnings management activities. Therefore, the revelation principle cannot explain the different motivations of management to use more than one activity to manage earnings at a time or to trade off these activities based on their consequences. To improve the quality of research, the cost of each activity has to be considered simultaneously based on the four previous conditions to explain earnings management behaviour.

The previous four conditions of the revelation principle are based on three major aspects of the economic theory that include contracting, bounded rationalities and information asymmetry. Each of these theories is going to be discussed in detail in this section. Then, I show how earnings management theories have been developed from these three theories in the following section. The overall flow of the theory discussion in this thesis is displayed in Figure 3.1.

Figure 3.1 The flow of the theoretical framework



3.4.1 Contracting Theory

Contracting theory views the firm as a nexus of contracts that identify the rights and obligations of the different parties involved in relations with the firm (Fama, 1980). The need for contracts rises because of the uncertainty in situations of information asymmetry or complete absence of information, which lead to variation in the costs and benefits of information to decision makers. Furthermore, the different attitudes towards risk by the different decision makers lead to an incentive problem, which is referred to as a moral hazard. The situation of uncertainty together with the incentive problem can

be mitigated by an optimal structure of contracts between the firm and the other parties that allows for the optimal sharing of risk (Harris and Raviv, 1979).

The written contracts attempt to solve the conflict of interests that mainly appears in the relations between the firm and its executives on the one hand and the firm and its creditors on the other hand. In this sense, two main types of contracts are identified: reward contracts between the firm and its executives that separate between the control role of management and the risk bearing role of the owners, and financial contracts between the firm and its creditors that specify their subsequent rights and obligations upon borrowing and lending (Walker, 2013). Each party is assumed to possess sufficient rationality and thus uses logic and experience in collecting information and evaluating its costs and benefits when signing a contract (Salop, 2015).

In line with the previous discussion about the role of managerial incentives in section 3.3, the reward contracts represent one of the most common ways to mitigate the agency problem by motivating managers to improve shareholders' wealth through their compensation (Garen, 1994). Reward contracts assume a situation of uncertainty due to the imperfect information about the agents' performance, which makes it difficult for the principal to observe the agent. Therefore, high managerial incentives may improve the communications between managers and shareholders leading to less false information (Strong and Walker, 1987). An optimal reward contract involves a fixed payoff to the principal and a residual payoff to the agent. In this sense, the utility functions of both parties can be improved by sharing risk; hence solving moral hazard problem.

Managerial incentives in the reward contracts depend on managers' performance, which is likely to be determined by their abilities to make better decisions and take more risk (Baranchuk et al., 2011). Managers' performance is evaluated using different kinds of measures which mainly include the security market performance measures (e.g., security market returns) and accounting measures (e.g., return on equity). The informational properties of these measures play an important role in determining managers' compensation in their contracts with the firms. The less the noise and the higher the sensitivity of the measures to managerial actions, the more reliable they are in establishing the compensation contracts.

The informational properties of the performance measures change over time and thus time plays a role in determining the reward contracts. According to Harris and Holmstom (1982), firms prefer to be engaged in full insurance contracts (e.g., fixed wages) with their managers in the short run because of information uncertainty about their abilities. The uncertainty arises in a single period agency model because the nature of managers' actions would lead to ambiguity in evaluating their efforts and thus ending with imperfect information about their performance (Lambert and Larcker, 1987). However, in the long run, firms can assess the labour marginal product of their mangers because the performance measures of prior periods, referred to as memory, provide more information about management performance in a multi period agency model (Lambert and Larcker, 1987). The better information raises the need for partial insurance contracts (e.g., variable wages) that help companies in avoiding inter-firm mobility of their managers, especially the high quality ones who might be targeted by competitors (Hayes and Schaefer, 1999).

In addition to taking the firm's own performance into account, reward contracts also rely on the relative performance evaluation of a manager compared to others in the industry. The strategic interaction with the competing firms, however, contributes to decreasing the relative performance-based incentives. In this sense, the relative performance evaluation contract helps in softening the competition among firms by decreasing managers' exposure to risk while increasing the probability of overall lower industry returns. In contrast, the strategic interaction between firms in highly competitive markets becomes more difficult and thus compensation is less based on the relative performance evaluation. Therefore, competition leads to more managerial efforts to improve firm efficiency thus mitigating the principal-agent problem (Aggarwal and Samwick, 1999).

The nature of the contracts, in turn, influences management performance. Contracts which involve fixed rewards drive less managerial efforts because mangers have low incentives to improve performance. Thus the principal will carry all the risk; which may result in low payoff to the principal. On the other hand, forcing contracts lead to more managerial efforts as they involve high monitoring to the agent's performance. They ultimately lead to high payoff to the principal but cannot be considered a practical solution for the agency problem as they assume the availability of

perfect information that always allows the principals to observe the agent (Strong and Walker, 1987).

However, contracts are incomplete as they cannot cover all the rights and obligations for all parties involved in the current and all possible future conditions. Therefore, contracting always involves some costs like the contract structuring, contract monitoring and contract bonding, in addition to the residual loss of output as the cost of contract's enforcement may exceed its benefit (Strong and Walker, 1987). Contracts also involve the costs of thinking, negotiating, writing, and renegotiating contingencies that are expected to happen in the long run based on the changes in economic conditions (Hart, 1995).

Due to the previous contracting costs, the hold-up problem arises when the firm gets engaged in long-term agreements with other parties who may not fulfil their duties in the future regarding price or quality and thus use their power to bargain. The hold-up problem is also influenced by the bounded rationalities of the parties in a contract that render them unable to carefully evaluate the utility consequences of their actions, and ultimately create the need for renegotiating the contract. Similarly, the changes in information asymmetry may affect the hold-up problem. Consequently, the hold-up problem may result in changing firms' decisions when signing contracts.

A number of ideas have been suggested to solve the hold-up problem. Competition can mitigate such problem because any party can switch to another supplier/client when it realizes that it is bounded with inappropriate terms (Hart, 1995). The allocation of the rights to control, according to the property rights theory, may also solve the hold-up problem as it specifies some of the rights that are usually ignored in the contracts based on a clear definition of the firm boundaries. In this sense, defining the firm as a legal fiction with a group of contracting relations makes it difficult to distinguish between the relations inside and outside of the firm and thus may mix the behaviour of the firm with the behaviour of the market (Jensen and Meckling, 1976). Furthermore, developing contingent contracts that specify all possible future conditions or the use of cost/revenue sharing contracts among the parties of the contract sound impractical solutions to the hold-up problem.

Overall, contacts have been developed to solve the conflict of interests related to the information asymmetry and moral hazard. Among the number of contracts that a

firm might sign, optimal reward contracts have been emphasized to encourage managers to improve productivity by sharing risk. The relation between the reward contracts and management performance is mutual – while management performance is an important determinant of the reward contracts' structure, the nature of the contract shapes management performance as well. Because contracts are incomplete, contracting costs arise between the firm and its management and, therefore, encourage the use of simplified general contracts that give management the chance to hide information from the stakeholders (Walker, 2013).

3.4.2 Bounded Rationality

According to the agency theory, individuals exhibit rational behaviour and, therefore, utilize an expected utility approach in decision making by ranking the alternative actions according to their expected outcomes and ultimately selecting the best alternative that maximizes their objective utility functions. The expected utility approach assumes that rational individuals have a minimum level of consistency in their choices and will ignore any situation with equal consequences when selecting the optimum action. It also assumes that tastes are independent of beliefs and vice versa (Strong and Walker, 1987).

The concept of rationality is strongly related to the ideas of individualism and equilibrium. Individualism underlies the selective behaviour of the individuals to maximize their objective functions subject to their own constraints. Meanwhile, rationality is complementary with the equilibrium situation within the group, so that all the individuals' choices are consistent and implementable under the availability of different information to each individual in the group (Strong and Walker, 1987).

Based on the previous argument, all stakeholders take into consideration the possibility of management opportunistic behaviour and factor its costs opposite to its expected benefits. In this sense, the rational abilities of the shareholders can offset the high costs of contracting like thinking, negotiating, renegotiating, and writing; hence drive efficient contracting and mitigate opportunistic behaviour (Walker, 2013).

However, individuals suffer from cognitive limitations and partial mental capabilities to evaluate the different events in the exogenous environment (Strong and

Walker, 1987). Furthermore, decision makers may not obtain all information they require about the available alternatives. Therefore, under the need to make the decision of selecting only one of the alternatives, they are likely to face a situation of uncertainty. In this sense, individuals' complete rationality is questionable and they are more likely to possess bounded rationality instead.

The bounded rationalities of the shareholders and their inabilities to completely understand management actions create a weak form of market efficiency where some of these actions are not reflected in the share prices (Merkl-Davies and Brennan, 2007). The bounded rationalities also contribute to developing incomplete contracts because the shareholders cannot foresee all the contingencies, determine the course of action for each contingency, or abide by the contract terms as they may need to renegotiate them in the future. Under such conditions, managers may behave opportunistically through imperfect commitment, hold-up problem, and signalling private information to achieve personal benefits (Milgrom and Roberts, 1992). Consequently, they may use their judgement to alter the financial statements and manipulate the reported earnings (Ronen and Yaari, 2008).

To summarize this part of the theory, an ideal case might be assumed if the individuals act rationally in order to maximize their utility functions based on their individual needs while maintaining equilibrium with the other players in the market. However, in reality individuals suffer from bounded rationalities due to the limitations in their cognitive and mental capabilities. Consequently, the bounded rationalities of the different stakeholders contribute to a weak form of market efficiency and creating incomplete contracts that may give management the chance to avoid revealing all information to the stakeholders.

3.4.3 Information Asymmetry

Information plays an essential role in the capital market functioning as it contributes to minimizing the levels of uncertainty by assisting to detect or forecast the different possible situations in the market. Accordingly, information allows the decision maker to take an action strategy in the form of a combination of different choices that increase his/her expected utility function. Meanwhile, the effect of information on the utility

function is based on the individual's ability to utilize that information and revise his/her action according to information available. In this sense, information contributes to the welfare of the society by improving the decisions of the different parties in the market.

Information efficiency (IE) exists in ideal markets that are characterized by perfect competition where no individual has power over information and thus all individuals receive the same input. In such an environment, market prices fully reflect and react instantaneously to the information available in the efficient market and, therefore, a fully revealing rational expectations equilibrium (FRREE) is achieved (Strong and Walker, 1987).

However, markets cannot be considered completely efficient as management prepares the financial statements that shareholders have to rely on for part of their information. The resulting information asymmetry can take one of the two forms: moral hazard and adverse selection. Moral hazard happens because shareholders do not possess the information to monitor management and assess whether it works for maximizing their firms' values; resulting in different attitudes and motivations for each party. On the other hand, adverse selection happens because managers have access to private information that allows them to make decisions for their own benefits and ignore shareholders' value (Walker, 2013). Therefore, a condition of imperfect information in the market can be assumed where information is neither absent nor complete.

Under such uncertainty, shareholders who are at different levels of sophistication will not be able to make their decisions based on rationality. Meanwhile, the uncertainty gives managers the chance to obfuscate their failures or send the messages they wish to deliver to the outsiders. Accordingly, signaling and screening take place when there is informational asymmetry between the insiders (e.g., management) and the outsiders (e.g., investors). While the insiders possess superior information, the outsiders are imperfectly informed about product quality and firm performance. Accordingly, the outsiders pay the prices that reflect the quality they perceive about the firm and its products; which drives the insiders to offer different qualities to the different outsiders (Walker, 2013).

Signaling occurs when the market does not distinguish between the performance of a good firm and that of a bad one. Investors would consider reporting bad financial results as a consequence of the auditors' efforts and thus would take their value with

high confidence. On the other hand, they might consider reporting good financial results as a consequence of audit failure and thus discount the auditee's price. In this sense, the price of a good performer will be understated and that of a bad performer will be overstated. This will stimulate good firms to signal messages to the market based on a self-selection principle (e.g., paying dividends) to inform the outsiders about the quality of their products and thus improve their prices. The above informational asymmetry can result in high quality firms to withdraw from the market as the outsiders do not distinguish the quality provided and thus do not pay the expected prices. The overall result is lower quality and prices in the market as the poorest quality products remain, ending up in a market break down. However, if good firms are more, the higher prices in the market would drive bad firms to manage earnings in order to signal better performance (Ronen and Yaari, 2008).

Signals can be non-dissipative when the outsiders have the ability to observe the insiders' quality subsequent to a contingent contract. Here, both parties share the risk, thus signalling cost is inversely proportional with quality. On the other hand, signals can be dissipative if the outsiders cannot observe the insiders' quality and thus only the outsiders carry the risk.

The most common example of signalling is firm's capital structure that reflects management choice of debt and equity and thus can be used for signalling firm value. In this sense, management choses capital structure that maximizes its expected utility and thus takes into consideration both the increase in firm value and the risk of bankruptcy when deciding on the signalling equilibrium. Another example of signalling is firm's dividends policy that reflects firm profitability and the investment and financing plans for the future. Once more, management choses dividends policy that maximizes its expected utility and takes into consideration both the increase in firm value and the subsequent adjustment penalty when deciding on the signalling equilibrium.

On the other hand, screening is another consequence of the information asymmetry between insiders and outsiders. The less information available to the outsiders creates an incentive for them to sort firms of different quality products. A common example is the credit rationing by banks where they sort firms by using loan agreements according to their credit risk. With higher firm risk, banks charge higher interest and request more securities to maximize their returns and offset any risk in case

a firm's projects fail to achieve the required returns. However, under informational asymmetry, banks attempt to charge optimal interest rates in order to balance between risk and return, thus they avoid the extremely risky or safe clients (Strong and Walker, 1987).

Information asymmetry and the resulting signalling and screening may influence the contracting between the firms and the managers. In situations where information is available, individual managerial reward schemes are optimal as managers' efforts can be easily evaluated. However, with imperfect information, relative managerial performance reward schemes are expected as they provide more chances for adjustment according to the uncertainty in the environment. In this case, the optimal reward structure includes an incentive level (e.g., basic salary), a risk component (e.g., bonus), and some flexibility based on the level of uncertainty in the environment (Nalebuff and Stiglitz, 1983).

Overall, information theory assumes an ideal case of information efficiency where all players in the market are equally informed and, thus, prices fully reflect market information. However, incomplete efficiency exists in reality because of the information asymmetry between the firms and the stakeholders. The resulting uncertainty drives the good performers to signal information that emphasizes their quality and bad performers to signal information that enables them to stay comparable to others. On the other hand, the uncertainty drives the stakeholders to screen information in order to make their decisions. The interaction between information signalling and screening determines the market utility equilibrium.

3.5 Earnings Management Theories

The theories of contracting, bounded rationality, and information asymmetry discussed above have contributed to developing three main approaches to explain earnings management behaviour according to Figure 3.1. In all of these approaches, I focus on the conflict of interests between shareholders and management while excluding other stakeholders, e.g., lenders, employees, etc. This is because managers generally attempt to meet the expectations of other stakeholders as far as they are in line with shareholders' interests. The three approaches are explained in the following sections.

3.5.1 The Costly Contracting Approach

The costly contracting approach supports the contractual view of the firm emphasized in the positive accounting theory. It implies that contracting is the major motive for earnings management behaviour because of its high costs. Contracts between shareholders and managers attempt to solve the conflict of interests between the two parties who behave rationally to achieve their own benefits. However, individuals cannot expect all contingencies in the future because of their bounded rationalities. As a result, contracts are imperfectly adjustable because they are incomplete; and individuals may exhibit opportunistic behaviour to fulfil the conditions of the contract when an unforeseen contingency occurs.

The costs of contracting and renegotiating contracts, however, can be avoided by using some accounting measures. Earnings are usually used as performance measures by shareholders to monitor management behaviour; thus mitigate the conflict of interests. Nevertheless, the costly contracting approach assumes that shareholders have full knowledge of the underlying economic conditions of the market and, therefore, there is no informational asymmetry between shareholders and managers. In this sense, contracts are expected to adjust optimally to economic changes; hence accounting is considered irrelevant and earnings do not have an intrinsic value. Therefore, opportunistic behaviour applies only to contracts that are un-adjustable to economic conditions or that are costly to renegotiate; which creates a limitation to the costly contracting approach.

Accordingly, earnings management in the costly contracting approach can be defined as an opportunistic behaviour in choosing an accounting treatment to achieve specific target numbers in firms' contracts; which results in the deterioration of firm's value. If this behaviour, however, leads to the maximization of firm's value, it is considered economically efficient rather than opportunistic (Ronen and Yaari, 2008).

3.5.2 The Decision-Making Approach

The decision-making approach focuses on the decision makers who design the contracts in order to achieve their interests, and emphasizes the value of earnings in decision making. Thus, the approach assumes that a firm is an interaction of decision makers. According to the game theory, decision makers are rational and set their preferences as ranked alternatives in the form of utility functions, while each decision maker aims to maximize his/her own expected utility (EU).

The maximization of the individual's expected utility depends on the decision taken by other decision makers to establish an equilibrium situation. Achieving the equilibrium relies on information to make decisions that require estimating future earnings or require assessing future risk. Information comes in the form of earnings and accounting numbers; which create a common knowledge structure for decision makers. The decision-making approach, however, assumes that decision makers are not fully informed about the underlying economic events and thus emphasizes the demand for information. In this sense, the different decision makers cannot perfectly predict management opportunistic behaviour.

Therefore, even if the financial statements provide useful information to shareholders, they would not make a difference unless they are relevant in decision making and have economic consequences. As shareholders are considered rational, the opportunistic behaviour takes place with an explicit or implicit consent from the shareholders. Earnings management would be good if it has no effect on decision making. The opposite applies if earnings management is bad and, therefore, the harmed parties will take actions to prevent earnings management as far as the benefits of these actions are greater than their costs (Ronen and Yaari, 2008).

3.5.3 The Legal-Political Approach

The legal-political approach emphasizes the current legal systems in the US and the UK. It considers the weaknesses in shareholders' rights as the main source of earnings management. Compared to the previous approach, it assumes that the shareholders are neither powerful nor knowledgeable to make decisions and, therefore, they cannot design complete contracts to maximize their utilities.

Although shareholders possess the rights to firm assets and cash flows, they do not have high power over management performance or the major decisions of the firm, e.g., dividend payments or the power over directors' performance. In contrast, management possesses the right to make decisions for managing assets and, therefore, earnings management arises when shareholders cannot effectively direct management especially with the presence of poor governance systems. In this sense, the legal-political approach emphasizes the importance of improving the legal systems at the levels of investor protection, ownership structure, and legal enforcement in order to prevent earnings management. One of the most prominent regulations in the modern accounting scene is the Sarbanes-Oxley Act (SOX) of 2002 which had a noticeable influence on improving the governance systems. Although such a regulation comes at a cost in the form of investment in governance systems, it provides benefits in the form of a decline in earnings management behaviour which, in turn, contributes to improving the quality of financial reporting and restoring public confidence in the market (Ronen and Yaari, 2008).

In addition, the legal political approach assumes that shareholders are not knowledgeable of the economic conditions and, therefore, a situation of information asymmetry exists. Accordingly, they cannot direct management with the limited amount of information provided to them; hence management opportunistic behaviour becomes more likely. In this sense, shareholders are considered ignorant rather than rational; and accounting information would be more valuable.

According to the legal-political approach, earnings management can have good and bad implications. In the good sense, earnings management is a way to please the shareholders by providing summary information about the firm which, in turn, enhances firm value. In the bad sense, earnings management results from moral hazard, poor governance, and the shareholders' ignorance, thus devastating the value of the firm (Ronen and Yaari, 2008).

In summary, each of the previous approaches has explained earnings management behaviour by emphasizing a major cause of earnings management while ignoring the others. The costly contracting approach emphasizes the contracting costs, the decision-making approach focuses on the availability of information for decision making, and the legal-political approache pays more attention to the lack of the legal

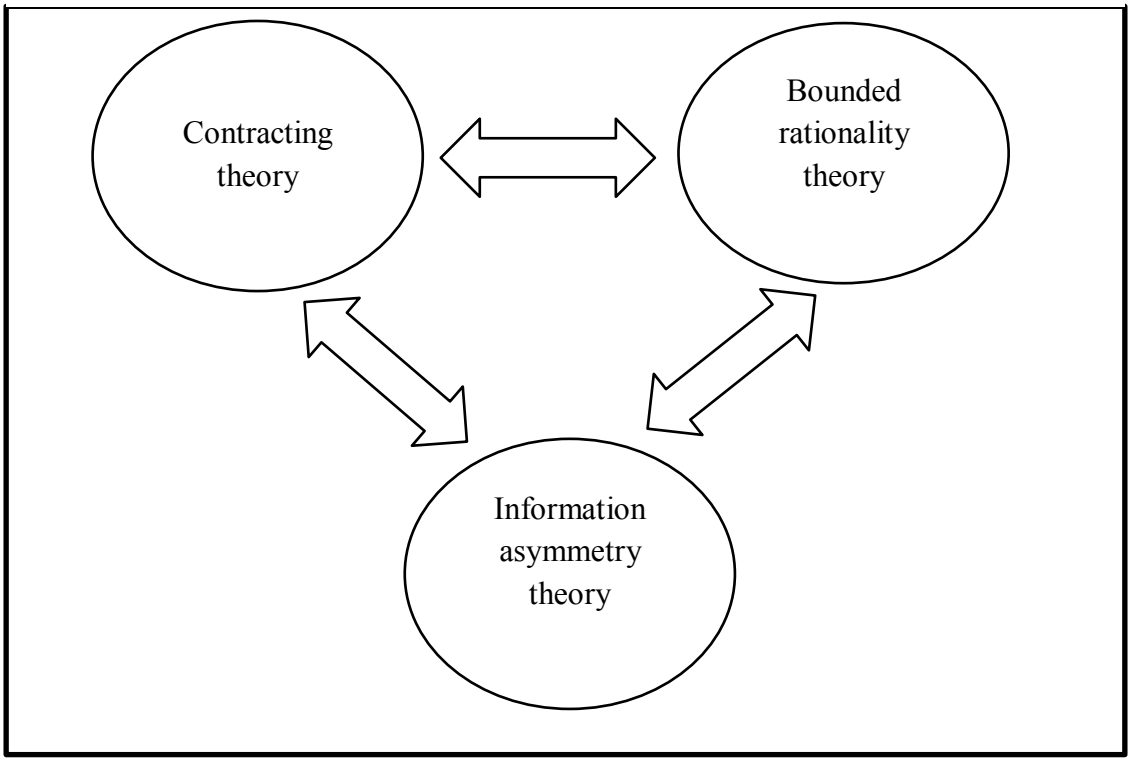
power for shareholders to monitor management performance. However, the previous approaches are based on some invalid assumptions e.g., the symmetry of information in the costly contracting approach and the rationality of shareholders in the decision-making approach. The legal-political approach seems to be closer to reality as it takes shareholders' lack of knowledge and power into consideration. Consequently, to obtain a comprehensive theory of earnings management, it has to be viewed as an interaction between the nature of contracts, information asymmetry, and the individuals' bounded rationalities.

3.6 Conclusions

This chapter has established the theoretical framework for this thesis. Earnings management reflects the conflict of interests between the principal (shareholders) and the agent (managers), and thus the main theory that explains this phenomenon is the agency theory. Earnings management is the opposite of truth telling; hence there has to be a violation of the revelation principle for earnings management to occur. The violation may happen because of the costly contracting between the management and the shareholders based on contracting theory, the limitations in the abilities of the shareholders to understand management actions based on bounded rationality theory, or problems in communicating information to the shareholders based on information asymmetry theory.

There are no distinct boundaries between the previous theories as they might interact to determine earnings management behaviour. While complete contracting allows the shareholders to overcome some of their cognitive limitations in making decisions, the shareholders' bounded rationalities contribute to establishing incomplete contracts. Similarly, information enables shareholders to improve their decisions but selecting the appropriate alternative depends on the abilities of the shareholders to understand and use information. Finally, while the degree of contract completeness influences the level of information asymmetry, the available information contributes to determining the structure of the contracts. The previous relations are depicted in Figure 3.2 below.

Figure 3.2 The interaction between earnings management theories



All these theories have contributed to establishing the three earnings management approaches that include the costly contracting approach, the decision-making approach and the legal-political approach. However, while the first two approaches focus on a specific aspect of the theory, the third approach is more comprehensive in considering the different parts of the relevant theory when explaining earnings management behaviour. Furthermore, from the previous three theories, researchers have derived three main groups of motives that include the contracting motives, the capital market motives, and the third-party motives. The next chapter is going to discuss these motives in detail.

Chapter 4
Motives of Earnings Management

4.1 Introduction

Based on the discussion in the previous chapter, the three main theories that explain earnings management suggest three main groups of motives for this phenomenon as shown in Figure 4.1. According to contracting theory, contractual motives exist based on the contract terms between the firm and its stakeholders that are linked to firm performance. Bounded rationality theory implies the inefficiency of the market and thus suggests the existence of capital market motives that influence firms' stock values. Finally, external (third-party) motives arise from parties that have current or future interests in the firm and thus interfere in the way it communicates information to the stakeholders (Ronen and Yaari, 2008; Walker, 2013). Under each of the previous three groups, different motives have been identified in the literature. They are summarized in Figure 4.2 and will be explained in detail in the subsequent sections.

Figure 4.1 The relation between the theoretical framework and earnings management motives

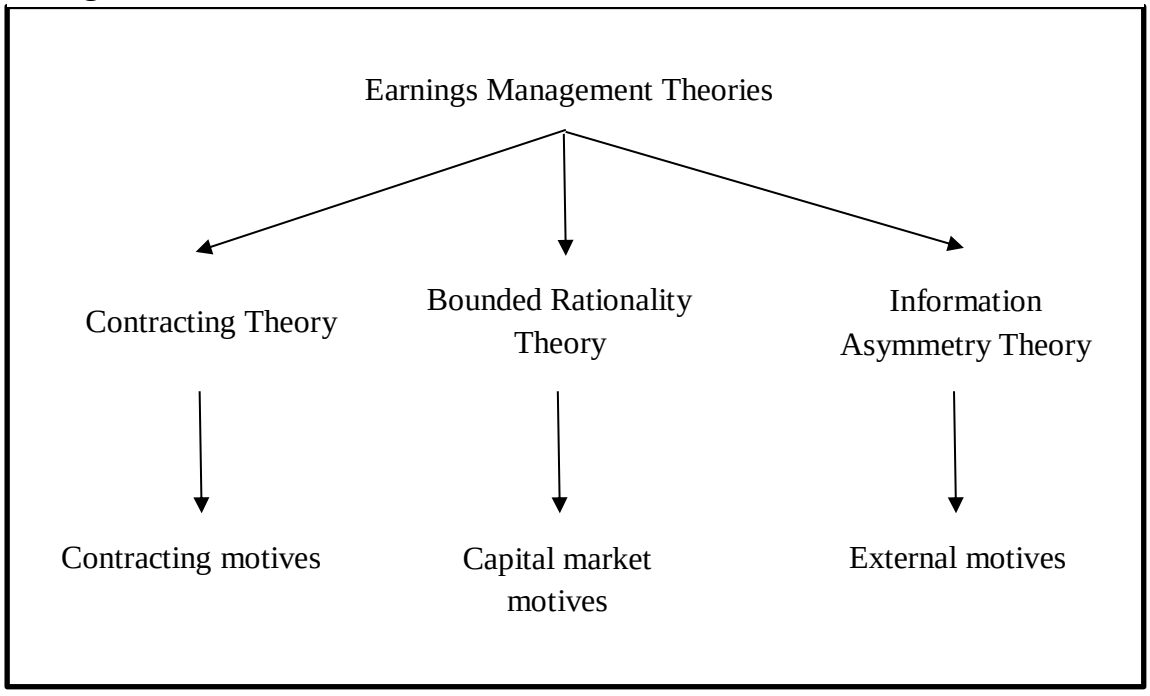


Figure 4.2 Earnings management motives

Contracting Motives	Capital Market Motives	External Motives
Management compensation	Stock market	Industry
CEO turnover	Issuance of equity	Industrial diversification
Managerial ability	New listing and cross-listing	Regulations
Corporate governance	Mergers and acquisitions	Political environment and country-specific policies
Loans	Insider trading	Accounting standards
Firm characteristics	Management buyouts	Tax considerations
	Meeting or beating a benchmark	Competitors
	Analysts	Suppliers and customers

The remainder of this chapter is organized as follows. Section 4.2 compares between earnings management and truth telling. Section 4.3 explains the contracting motives of earnings management. Section 4.4 presents the capital market motives of earnings management. Section 4.5 discusses the third-party motives of earnings management. Finally, section 4.6 concludes the chapter.

4.2 Earnings Management vs. Truth Telling

Earnings management is the opposite of truth telling and, therefore, it sounds helpful to learn about telling the truth first in order to understand the motives of earnings management later. Managers may have incentives to avoid earnings management when they expect more benefits and less costs subsequent to their true earnings' disclosures (Verrecchia, 1983; Hellman, 1999). Meanwhile, the stakeholders have to be able to

verify management disclosures and make decisions that protect their interests (Dye, 1985).

Firms also tend to report the truth and communicate their private information in situations of separating equilibrium. This happens when the good firms in the market are less than the bad ones so that the market will not be able to distinguish the difference in performance especially under the imperfect audit. In this case, a good-performing firm tends to separate itself from bad-performing firms by incurring some costs e.g., paying dividends. In this sense, the stock price of the good firm after incurring such cost will be higher than its price when the market does not distinguish its performance. On the other hand, the stock price of a bad firm that does not incur any cost is already higher than its expected price even if it does not manipulate its earnings. Under such equilibrium, both types of firms are motivated to report the truth (Ronen and Yaari, 2008).

Furthermore, truth revelation happens in case of signal jamming equilibrium when the market knows and understands the signal properly (Stein, 1989). In this case, if the firm starts by manipulating earnings, the market follows by discounting the firm price with the same amount of the inflated earnings (Elitzur, 1995). Although the situation involves earnings management, firms are motivated to reveal the truth and thus they do not mislead the stakeholders. In this sense, equilibrium may occur when firms use mixed strategies between truth reporting and misrepresentation depending on the cost and benefit of each strategy (Ronen et al., 2006).

According to the revelation principle, a manager is motivated to tell the truth when the compensation benefit from revealing the bad news is the same or higher than his/her expected outcome when misrepresenting earnings to communicate better news (Milgrom and Roberts, 1992). Even if they are expecting to extract rents from earnings management, managers tend to avoid the subsequent penalty of misrepresenting the financial reports. This equilibrium is likely to happen under the presence of auditors who may reveal earnings management as far as the shareholders themselves cannot monitor management actions (Ronen and Yaari, 2008).

In addition, firms prefer to tell the truth to avoid losing credibility in the market when the misrepresentation is detected subsequently. Even when not detected, such misrepresentation may drive third parties to react to the communicated information in

an unfavourable manner, e.g., the aggressive response of a competitor (Ronen and Yaari, 2008). Furthermore, the cooperation with third parties is not always possible to enable a firm to manage its earnings, e.g., for a supplier to manage earnings, it needs the cooperation of the buying firms by purchasing goods in specific quantities or at specific prices. In other instances, management might get motivated to tell the truth because of the conflicting interests between the external parties it has to deal with, e.g., a firm might choose to manage earnings upwards to discourage new firms from entering the market while it may need to manage earnings downwards in face of the labour unions' demands. Finally, mandatory regulations may enhance truth telling, e.g., the audit-related rules imposed by the Sarbanes Oxley Act (SOX) and the Public Company Accounting Oversight Board (PCAOB). In response to such regulations, management may tell the truth when it expects higher pay-off from its good performance compared to the penalties it might face from violating the regulation through managing earnings (Ronen and Yaari, 2008).

Overall, truth telling is dependent on management perception of its benefits and costs. In this sense, management is likely to avoid earnings management when it expects more benefits from telling the truth, e.g., better compensation, higher stock prices, superior credibility in the market, milder third party reactions, or less regulatory penalties. In contrast, earnings management occurs when management does not expect high benefits from telling the truth under the three groups of motives identified earlier and which are going to be discussed in the next three sections of this chapter.

4.3 Contracting Motives of Earnings Management

As discussed in the previous chapter, the principal-agent relationship involves a conflict of interests between management and shareholders. As shareholders cannot monitor management performance, they elect a board of directors to act as an agent to the shareholders and a principal to the management. However, managers are averse to work and risk and thus incentive contracts are designed to mitigate this conflict. Similarly, conflicts in interests may appear in the contracts between the firm and the other stakeholders. As a result, factors incorporated in the internal or external contracting of

the firm are expected to influence the motivation to manage earnings (Ronen and Yaari, 2008).

4.3.1 Management Compensation

If management objectives were aligned with shareholders' objectives, there would not be any incentive for earnings management. However, the objectives of management and shareholders in reality are different because they may want to emphasize different horizons when making their decisions. Shareholders and managers also carry different risks – while the shareholders bear the risk of their equity in the firm, managers are generally risk averse because the risk involved with their human capital is not diversifiable. As a result, managers enjoy benefits without bearing any risk; which creates an agency cost against shareholders' desire.

To avoid the previous cost, shareholders design compensation schemes that align their interests with those of the management (Laux and Laux, 2009). Therefore, they link management compensation to shareholders' equity using equity-based compensation, e.g., stocks and options that change the risk-taking behaviour of managers. Even though, compensation may still drive managers to manage earnings because their incentives depend on these earnings. In addition, managers enjoy limited liability and can influence the decision of compensation which is made by the board of directors and not directly by the shareholders. Finally, mangers tend to sell their stocks and options immediately compared to shareholders who aim to keep them for the long-run (Ronen and Yaari, 2008). Under such circumstances, management opportunistic behaviour is still probable even if they are compensated with valuable rewards.

Management compensation is determined by some measures that provide signals to the shareholders about management performance (Healy, 1985; Jensen and Murphy, 1990; Dechow and Huson, 1994). Earnings is one of the commonly used measures that reflect the effort made by management during the current accounting period. However, they may not reflect some managerial decisions that influence future cash flows (Basu, 1997; Barclay et al., 2005).

Conventionally, management compensation includes a fixed payment in the form of salaries. Performance-based payments in the form of bonuses, stock grants, and stock options has been gradually incorporated in management compensation packages recently (Perry and Zenner, 2001; Balsam et al., 2003; Jensen et al., 2004). Opposite to the performance-based payments, salaries are generally not perceived as incentives of earnings management (Gao and Shrieves, 2002).

As bonuses create an incentive to manage earnings, managers try to keep the earnings between the minimum and maximum limits set by the board of directors to get eligible to receive bonuses (Healy, 1985). Evidence of discretionary accruals is, however, obtained when earnings fall below the minimum limit (Gaver et al., 1995; Holthausen et al., 1995). Gao and Shrieves (2002) also confirm the positive effect of bonuses on discretionary accruals. However, long-term bonus plans seem to mitigate earnings management (Richardson and Waegelein, 2002).

Equity-based compensation comes in the form of stocks and options. Stock compensation can take the shape of stock grants, restricted stock grants[2], phantom stocks and stock appreciation rights[3], and performance units[4] (Ronen and Yaari, 2008). Options are instruments granted to the managers to exercise after paying certain fees. Managers only exercise their options when the share price becomes more than the exercise price. In this sense, options are granted to the managers to motivate them to improve firm value by making benefit from the increment between the stock price and the exercise price (Coles et al., 2006; Ronen and Yaari, 2008).

Equity-based compensation aims to increase a manager's utility with the increase in the firm's equity value. Nevertheless, the role of equity-based incentives in aligning the interests of managers and shareholders, and hence their effect on earnings management, are controversial. In the short run, equity-based compensation is expected to stimulate earnings management, so that managers can cultivate the benefits of an

[2] Restricted stock grants are stocks granted to a manager with restriction on their sale. The manager can only sell this type of stocks when a specific condition is met, e.g., after a specific period of time passes or a specific goal is achieved.

[3] Phantom stocks and stock appreciation rights link between management compensation and stock prices by rewarding managers in cash, and to a lesser extent by distributing stocks. The two types of incentives mainly differ in terms of settlement dates and dividends payments.

[4] Performance units give a reward promise to a manager in the form of stocks if the firm achieves a specific level of performance.

increase in stock prices. Meanwhile, the high stock values of the current year increase shareholders' expectations in the long run and thus may drive managers to avoid earnings management; a phenomenon referred to as the ratchet effect (O'Connell, 2004).

In support to the first point of view, Gao and Shrieves (2002), Cheng and Warfield (2005), Bergstresser and Philippon (2006), and Feng et al. (2011) find a positive effect of equity-based incentives on discretionary accruals, so that managers can show better performance to the outsiders and meet analysts' expectations. Burns and Kedia (2006) document that options are the only component of management compensation which is positively related to accounting restatements because the expected increase in management's wealth from exercising options overcomes any punishments that may occur when earnings management is detected. Options also give a manager a chance to pool with other managers in order to minimize the market reaction to bad information. Cohen et al. (2008) also find a positive effect of management's unexercised options on accruals' manipulation, especially in the period preceding the release of the Sarbanes-Oxley act.

In line with the second point of view, Bauman et al. (2005) document that management compensation in the form of stock options drive managers to implement guidance to analysts in order to meet their forecasts. In this sense, managers seem to guide analysts by reducing their expectations rather than manipulating accruals. Coles et al. (2006) document that before the issue of options, managers tend to avoid discretionary accruals in order to keep stock prices as low as possible and, therefore, decrease the exercise price which is determined at the grant date. Managers may even make use of income-decreasing discretionary accruals to achieve the previous target (Baker et al., 2003; Balsam et al., 2003).

4.3.2 CEO Turnover

As the turnover process involves the predecessor CEO and the successor CEO, it is essential to understand the differences in the incentives of each of them to manage earnings. The predecessor CEO can get more benefits from inflating earnings, so that he/she hides any bad performance, extracts more earnings-based benefits in his/her last year onboard, and creates better chances for moving to another job (Hazarika et al.,

2012). On the other hand, the successor CEO gets more benefits from deflating earnings, usually by taking a big bath, so that he/she decreases shareholders' expectations that allow reflecting better future performance (Geiger and North, 2006; Ronen and Yaari, 2008). In this sense, the successor CEO establishes low benchmarks for his/her performance in the future based on the current year's bad results attributed to the poor performance of the predecessor CEO, especially if the later is not moving to serve on the board of directors (Murphy and Zimmerman, 1993; Pourciau, 1993; DeFond and Jiambalvo, 1994; Godfrey et al., 2003; Florou and Conyon, 2004).

The non-routine CEO departure is generally associated with poor performance compared to the routine (peaceful) departure. In such case, shareholders tend to punish management for making bad decisions by replacement and thus the CEO is suddenly forced to leave the firm because of the negative implications of performance on the stock price (Warner et al., 1988; Brickley, 2003; Lehn and Zhao, 2006). The frequency of senior management turnover is higher in distressed firms that suffer from default on debt, bankruptcy, or debt covenant violations (Gilson, 1989; DeFond and Jiambalvo, 1994). As a result, poorly performing managers may manipulate earnings upwards to postpone the announcement of bad performance and, thus, avoid being ousted as long as possible (Fudenberg and Tirole, 1995). In this sense, poor performance is perceived as a motive of management discretionary behaviour and, therefore, drives higher management turnover (Murphy and Zimmerman, 1993; Desai et al., 2006). In contrast, Pourciau (1993) document that departing managers manage earnings downwards in their last years of service because of the high monitoring of the poorly performing firms.

Even in the case of peaceful termination, a retiring manager manages accruals upwards in the year of departure to improve the short-term performance of the firm, so that he/she can get higher bonus or a chance of employment in the board of directors (Reitenga and Tearney, 2003). Real earnings management is also evidenced as CEOs might decrease research and development (R&D) and capital expenditures during their last years of service (Dechow and Sloan, 1991; Florou and Conyon, 2004).

When the nature of the departure (routine vs. non-routine) is ignored, evidence of downward earnings management is observed in the year of CEO change (Godfrey et al., 2003). Ahmed et al. (2006) provide more specific results and document that the new managers tend to manage accruals upwards in the current year when future performance

is expected to be bad, while they manage accruals downwards in the current year if the firm performance is expected to be good, so that they create some reserves to enable them to secure their jobs (Ahmed et al., 2006).

Overall, the CEO turnover is positively related to earnings management. Earnings management is more evidenced when managers are at the beginning of their tenure as they are more expected to leave their firms. Earnings management is also expected in firms with old managers as they are not highly concerned about their future in the market (Ronen and Yaari, 2008).

4.3.3 Managerial Ability

Different managers have dissimilar styles in running their firms as they vary in their accounting preferences, disclosure choices, tax positions, and selecting and implementing corporate policies and earnings management strategies (Bertrand and Schoar, 2003; Bamber et al., 2010; Dyreng et al., 2010; Ge et al., 2011; Graham et al., 2012). Those differences arise from managers' personal characteristics such as age, education, inborn capabilities, personalities, the tendency to take risk, individual beliefs, military service, early life experience, career background, communication, interpersonal, and execution skills (Bertrand and Schoar, 2003; Bamber et al., 2010; Malmendier et al., 2011; Graham et al., 2012; Kaplan et al., 2012). The overall result is different managerial abilities that contribute to the variation in performance among firms at the operating, investing, financial, and organizational levels (Bertrand and Schoar, 2003; Jian and lee, 2011; Malmendier et al., 2011).

Several measures have been introduced to quantify managerial ability such as firm size, past abnormal performance, compensation, tenure, media mentions, and manager fixed effects[5] (Demerjian et al., 2012). However, they were always criticized for the high noise arising from the influence of other firm characteristics. In contrast, the measure of Demerjian et al. (2012) has been the most credible so far because it reflects

[5] According to Bamber et al. (2010), the manager fixed effect is estimated as the residual from regressing management forecast characteristics (e.g., forecast frequency, precision, and bias) on the specific determinants of voluntary disclosure (e.g., change in EPS, R&D expenditure, market to book ratio, the quality of governance, market value of equity, number of analysts, litigation risk, etc.), after excluding the firm fixed effect and time influence.

the role of the management in enhancing firm efficiency after excluding the impact of other factors that may also interfere with firm performance (Demerjian et al., 2012). The new measure calculates the ability of a manager relative to others within the same industry and focuses on managerial operating and investing skills. It correlates well with the old measures of managerial ability mentioned earlier (Demerjian et al., 2012).

The measure of Demerjian et al. (2012) represents how efficiently managers generate revenues from the available firm resources. They divide the process of quantifying managerial ability into two steps. In the first step, they consider each firm as a decision-making unit (DMU) that converts inputs into outputs. Inputs include net property, plant, and equipment (PPE), net operating leases (OpsLease), net research and development expenditure (R&D), purchased goodwill (Goodwill), other intangible assets (OtherIntan), cost of inventory (CoGS), and selling, general, and administrative expenses (SG&A). Firm revenues (Sales) are the only output in the calculation of managerial ability. Subsequently, Demerjian et al. (2012) perform Data Envelopment Analysis (DEA) to calculate firm efficiency as shown in equation (4.1):

$$Firm\ Efficiency = \frac{\sum_{i=1}^{s} u_i y_{ik}}{\sum_{j=1}^{m} v_j x_{jk}} \tag{4.1}$$

In equation (4.1), s represents the outputs; m represents the inputs; u represents the output weight; v represents the input weight; y represents the output quantity; x represents the input quantity; and k represents a number from 1 to n. To obtain the weights of inputs and outputs (u, v), Demerjian et al. (2012) use the optimization model that appears in equation (4.2). They then divide the firm efficiency scores they get from equation (4.1) by the highest number obtained in each industry, so that they get an efficiency measure ranging from zero to one.

$$max\theta = (u_1 Sales).(v_1 CoGS + v_2 SG\&A + v_3 PPE + v_4 OpsLease + v_5 R\&D + v_6 Goodwill + v_7 OtherIntan)^{-1} \tag{4.2}$$

In the second step, Demerjian et al. (2012) exclude some firm specific characteristics from the firm efficiency score obtained from the previous step. They believe that such firm attributes enhance or impede the performance of managers. Therefore, they eliminate those characteristics in order to reach a score that purely represents managerial ability. For this purpose, they execute a Tobit regression model in equation

(4.3), so that the remaining residual (ε_i) is the ultimate measure of managerial ability. Finally, they take the decile ranks of these measures by industry-year to obtain better comparability and to avoid the effects of outliers.

$$\begin{aligned} Firm\ Efficiency_i = {} & \alpha + \beta_1\, ln(Total\ Assets)_i + \beta_2 Market\ Share_i \\ & + \beta_3 Free\ Cash\ Flow\ Indicator_i + \beta_4 ln(Age)_i \\ & + \beta_5 Business\ Segment\ Concentration_i \\ & + \beta_6 Foreign\ Currency\ Indicator_i + Year_i + \varepsilon_i \end{aligned} \tag{4.3}$$

Nevertheless, the Tobit model of Demerjian et al. (2012) does not eliminate all firm specific characteristics that influence firm efficiency. Some of the variables that are expected to interfere with the measure include corporate governance, firm auditor, ownership, and employee turnover. Finally, the measurre mainly focuses on core business activities by incorporating the operating and investing aspects of the firm. However, it ignores other firm activities like the financing, social, and environmental aspects.

As discussed above, managerial ability influences firm performance and thus it is expected to have an impact on earnings management. Two plausible approaches are suggested in this regard. On the one hand, more able managers tend to avoid earnings manipulation in order to safeguard their precious reputations in the market (Demerjian et al., 2013b). Instead, they invest their high competencies in improving firm operations and mitigating financial distress (Demerjian et al., 2013a). In this sense, better managerial ability is associated with high earnings quality to allow the managers to maintain their reputation-based compensation premium; which is in line with the efficient contracting hypothesis (Bertrand and Schoar, 2003; Jian and Lee, 2011; Graham et al., 2012). On the other hand, superior managers may invest their high skills in using more earnings management with the purpose of maintaining their personal welfare. Managers' private benefits include increasing the value of their stock compensation and drawing the attention to their performance in the labour market; which is in line with the rent extraction hypothesis (Jian and Lee, 2011; Demerjian et al., 2013b).

Following the first explanation above, several positive consequences of managerial ability can be identified. Superior managers are expected to show fewer

subsequent financial restatements, less errors in accruals, better earnings persistence and enhanced mapping of accruals into operating cash flows (Demerjian et al., 2013a). Their role may even become more evident in the future as they are generally associated with enhanced subsequent business performance, better stock market responses to their decisions, and lower exposure to litigation (Jian and Lee, 2011; Kaplan et al., 2012; Demerjian et al., 2013a). Managerial ability also moderates the negative relationship between equity financing and future abnormal returns (Demerjian et al., 2012). Even if superior managers engage in earnings manipulation, they seem more likely to use the accrual activities rather than the costly real practices. Such consequences are attributed to the high knowledge of superior managers in their business conditions, more experience with market competitors, and higher capability to understand and implement accounting standards. Accordingly, better managers use their abilities to accomplish both their own benefits and maintain stakeholders' welfare at the same time (Graham et al., 2005; Demerjian et al., 2013b). In contrast, managerial ability may have some negative consequences in the future - although not frequently documented. According to Francis et al. (2008), more reputable managers do not necessarily produce better disclosures (Francis et al., 2008). On the contrary, earnings quality may decrease with the increase in managerial ability (Demerjian et al., 2013a). The contrasting consequences of managerial ability raise some dispute around how superior managers invest their talents and the purpose of their different decision.

4.3.4 Corporate Governance System

The studies that have examined the effect of the corporate governance on earnings management have mainly documented that the quality of corporate governance influences the quality of earnings. In this sense, strong governance mechanisms can generally decrease earnings management behaviour. However, some studies find that corporate governance can stimulate earnings management because managers are under more pressure to improve firm value (Siregar and Utama, 2008). In the following subsections, the major components of the governance system are discussed which include the ownership structure of the firm, board of directors, and the audit committee.

4.3.4.1 Ownership

The shareholders of a firm can be institutional owners or individual retail owners (Koh, 2003, 2007; Zang, 2012). Both types of owners use earnings information to make their decisions. However, the institutional owners are more sophisticated and, thus, more able to detect earnings management and beat the individual owners (Shang, 2003). Meanwhile, the investment horizons of the institutional shareholders influence earnings management behaviour. Short-term institutional owners may drive firms to manage earnings in order to buy shares at a lower value or sell their investments at a higher price (Lakonishok et al., 1991; Yu, 2008). On the other hand, long-term institutional owners have more influence on firm decisions because they hold their shares for more than a year. Therefore, they use earnings information to monitor management performance and prevent earnings management behaviour that might be discounted by the market. As a result, long-term institutional owners serve as gatekeepers that reduce the noise associated with earnings compared to the short-term institutional owners (Bushee, 1998; Koh, 2005; Srivardhan, 2009).

Based on their listing status, public firms are less inclined to manage earnings than private firms because of the monitoring by the stock market and the higher governance requirements (Prencipe and Bar-Yosef, 2011). However, some studies document the opposite because private firms are more closely monitored by their owners (Burgstahler et al., 2006). Therefore, the public listing of a firm cannot guarantee a better earnings quality as the stock market may sometimes create pressure on the listed firms to manage earnings (Jeong-Bon and Cheong, 2006; Givoly et al., 2010).

Furthermore, family ownership may stimulate earnings management because of the less visible performance to the public and the higher probability of collusion between the owners (Siregar and Utama, 2008; Jaggi et al., 2009; Haw et al., 2011; Prencipe and Bar-Yosef, 2011). Therefore, family-owned businesses are expected to receive less monitoring than other firms. However, the lower agency problem in such firms may mitigate earnings management (Dechun, 2006).

4.3.4.2 Board of Directors

The board of directors is the body charged in governance for maintaining the interests of the shareholders. To achieve the previous target, the board of directors monitors management using the available information (McAnally et al., 2008; Jaggi et al., 2009; Prencipe and Bar-Yosef, 2011). However, information is provided by management which makes the board's monitoring role difficult to be achieved. Furthermore, management may have some control over the appointment of the board members and thus both parties may collude in managing the earnings of the firm (Boone et al., 2004).

The emphasis of the Sarbanes-Oxley act (SOX) on the role of the board of directors in improving firm performance has resulted in an overall increase in board size in public companies (Linck et al., 2006). Although this increase can be beneficial in some aspects, it may have some negative consequences. On the bright side, a larger board may result in lower levels of earnings management because of the higher number of independent and more experienced directors who are more able to monitor management activities (Chtourou et al., 2001; Xie et al., 2003). On the dark side, larger board size may drive more earnings management because of the high cost and time required for information flow between the firm and the directors. It also results in a bigger free-rider problem where the directors tend to rely on each other due to the distributed responsibility (Lipton and Lorsch, 1992; Blair, 1995; Yermack, 1996). In this sense, the board of directors is less effective because it basically serves as part of the public firm's prestige to impress investors (Hermalin and Weisbach, 2003). In addition, the more diverse and conflicting demands of a larger board may impose more pressure on managers to manipulate earnings (Aggarwal and Nanda, 2004).

The effect of the board independence on earnings management is also debatable. On the one hand, more independent directors can be associated with better earnings quality because they do not have direct employment benefits to collude with management compared to the internal directors (Vancil, 1987; Blair, 1995; Klein, 2002; Peasnell et al., 2005). In this sense, independent directors are in a better position to monitor management and take critical decisions, e.g., the restructuring and layoffs, and thus serve in aligning the interests of shareholders and management (Weisbach, 1988; Perry and Shivadasani, 2005; Visvanathan, 2008). On the other hand, more independent directors can stimulate earnings management because they are less knowledgeable about

firm-specific operations; hence result in higher communication costs (Yermack, 2004). In addition, no pure independent board members exist because management frequently interferes in the nomination of those members (Monks and Minow, 2004).

Other board attributes, e.g., the multiple directorships, position-duality, number of board meeting, directors' equity holdings, age and tenure, and staggered boards, may also influence earnings management behaviour. Multiple directorships, in the form of a single director holding a similar position in the boards of other companies, contribute more experience to the firm and allows for more connections; hence result in better earnings quality (Conyon and Read, 2006). A position-duality happens when a board chairman holds the position of the CEO at the same time. As a result, he/she obtains more power and control over the firm that may allow for more earnings management (He et al., 2003). The number of board meetings indicates the efforts made by the directors in monitoring management performance which may prevent earnings management (Jiraporn et al., 2007). Long-term equity holdings of the directors may align their interests with shareholders, but short-term holdings may encourage the collusion of the directors with the management (Perry, 2000; Chtourou et al., 2001). Age and tenure of a board member indicate more experience and familiarity with firm transactions and thus enhance better monitoring. However, they result in closer relations with management that may allow collusion to occur (Niskanen, 2005). Finally, staggered boards appear when the directors are elected partially each year; resulting in better earnings quality because they do not suffer from the takeover risk (Zhao and Chen, 2008).

4.3.4.3 Audit Committee

The audit committee is part of the board of directors and plays an important role in corporate governance that has been emphasized in most of the regulations, e.g., SOX. Overall, the empirical evidence documents that a strong audit committee provides high earnings quality. However, different attributes of the audit committee contribute to determining earnings management behaviour. The independence of the committee's members, their financial and governance expertise, and the higher frequency of meetings contribute to mitigating earnings management. However, while the high tenure implies more experience, it may allow the collusion with management. Similarly,

the larger size may result in including more experienced members in the committee but higher cost of communication. The terms of the directors' equity holdings may also align their interests with the shareholders or drive them to collude with the management (Klein, 2002; DeFond and Francis, 2005; Zhang et al., 2006). On the other hand, Peasnell et al. (2005) document that the audit committee does not influence earnings management behaviour or even does not create any market response (Peasnell et al., 2005; Anderson et al., 2006). Finally, the high quality of the internal audit results in less earnings management (Prawitt et al., 2009).

4.3.5 Loans

Before taking a loan, firms might be motivated to manipulate earnings upward in order to avoid reporting low earnings (Iatridis and Kadorinis, 2009). This way, they aim to get a better evaluation by debtors about their credit worthiness and, consequently, receive debt at a lower cost according to the debt hypothesis (Das and Shroff, 2002). Firms may also manipulate earnings downward because entering a loan agreement means a long term commitment that requires firms to meet the debtors' expectations over time. Therefore, firms would be motivated to report conservatively in order to mitigate the conflict between shareholders and creditors; hence keep the expectations of creditors and shareholders as low as possible (Ahmed et al., 2002). On the other hand, debt contracts may include restrictions on how management reports earnings (Smith Jr, 1993). In this sense, firms may not be motivated to use earnings management before taking a loan (DeAngelo et al., 1994).

After taking a loan, the probability of earnings management depends on the financial health of the borrowing firm and the flexibility of the lender to renegotiate the debt (Zang, 2012). Financially distressed firms are more likely to manage earnings when there are difficulties in renegotiating debt according to the debt-covenant hypothesis (Hassabelnaby et al., 2005). As a result, the borrower may manage earnings upward to relax the debt covenants or manage earnings downward to influence the future renegotiation of the debt (Jaggi and Picheng, 2002).

4.3.6 Firm Characteristics

Firm attributes related to the contracting between the shareholders may also influence management behaviour. Although some studies document that the size of the firm has an impact on its earnings management behaviour (Lee and Choi, 2002), others document no influence (Siregar and Utama, 2008). It is difficult to distinguish between earnings management behaviour of small and large firms because both types of firms face pressure to manage earnings in order to maintain them at an optimal level (Moses, 1987; Albrecht and Richardson, 1990; Michelson et al., 1995; Lee and Choi, 2002). Earnings management is expected in small firms because they have less predictable operations and less diversified businesses. Similarly, managers of large firms have opportunities to manipulate earnings because of their huge number of transactions and complicated operations (Demerjian et al., 2013b). Another firm attribute that may influence earnings management is its operating cycle. Longer operating cycles increase the levels of uncertainty and therefore, the potential for earnings management (Dechow and Dichev, 2002). Finally, business complexity in the form of the number of business segments and the frequency of foreign transactions may drive managers to use more earnings management, and particularly real earnings management because it is less likely to be detected than discretionary revenue manipulation (Karuna et al., 2012).

4.4 Capital Market Motives of Earnings Management

This group of motives involves factors that drive earnings management through their impact on the firm's stock price. If the stock price fully reveals information about the firm's underlying economic value, then the capital market motives are not expected to have any influence on earnings management. However, because of the noisy nature of the capital markets, stock prices do not completely reflect the firms' values; hence earnings management is likely to occur. (Ronen and Yaari, 2008).

4.4.1 Stock Market

Earnings are associated with stock prices and, therefore, managers are motivated to manage earnings in order to improve stock prices and raise more capital (Lev, 1989;

Ramakrishnan and Thomas, 1998; Kothari, 2001; Gelb and Zarowin, 2002). As a result, earnings management creates a difference between the stock price of a firm and its fundamental economic value[6] which is unknown to most of the shareholders (Ronen and Yaari, 2008; Beyer, 2009). The previous effect is evidenced in inefficient markets where discretionary accruals influence stock prices and, therefore, managers may opportunistically manipulate accruals to improve the capital market valuation of their firms (Guay et al., 1996; Subramanyam, 1996). Badertscher (2011) finds that with longer periods of overvaluation, more total earnings management is evidenced with a tendency to switch from the within-GAAP to the non-GAAP accounting discretion.

The market reaction to the reported earnings is measured by the earnings response coefficient (Feltham and Jinhan, 2000). In cases of unmanaged earnings, a linear earnings response coefficient with a unit slope is expected (Sankar, 1999). The reaction of the market to earnings management, however, depends on the ability of the market to detect earnings management which, in turn, relies on the firms' disclosures, investors' sophistication, and the market optimism (Shivakumar, 2000; Balsam et al., 2002; Coles et al., 2006). Although the chance that the market learns about earnings management attempts after the announcement of earnings always exists, detecting earnings management may sometimes take years (Karpoff et al., 2008). Furthermore, the market needs time to collect more information before it reacts to the manipulation. Earnings management may even go undetected and, thus, the market may over-value firms that manage their earnings upwards and undervalue those that manage their earnings downwards (Chambers, 1999). The tendency to detect earnings management increases with the sophistication of the investors and decreases in optimistic environments where the investors more readily believe the reported earnings (Daneshfar et al., 2009; Coffee, 2003; Roychowdhury, 2006).

If the market detects the manipulation, it negatively prices any upward earnings management and positively prices the downward attempts. The response of stock prices is expected to be less than a unit slope in the case of myopic earnings management that emphasizes the short-term horizons (Sankar, 1999). Similarly, Feltham and Jinhan (2000) find that the earnings response coefficient is lower with more noise associated in

[6] The fundamental economic value is calculated as the discounted dividends expected to be distributed by the firm in the future.

communicating the earnings. While the market discounts any good news when it doubts the occurrence of earnings management, Ronen et al. (2003) document that the reaction to the negative earnings surprises is higher than that to the positive ones. Furthermore, investors consider firms that meet analysts' forecasts with zero or small earnings as a signal of earnings management and, therefore, punish management with a lower earnings response coefficient (Lin and Shih, 2006).

Management may also use earnings smoothing to positively influence their share prices and reduce their volatility. However, the market responds negatively to the lower quality of information when earnings smoothing is used opportunistically and thus it discounts them to end up in more volatile share prices. In this sense, the investors demonstrate a sophisticated response to earnings smoothing by incorporating their perceptions about the risk of the different management activities when determining shares' values (Markarian and Gill-de-Albornoz, 2012).

Overall, the results of the previous studies show that the response of the stock market to earnings management is debatable between the 'accruals anomaly' stream and the 'cost of capital' stream (Walker, 2013). According to the 'accruals anomaly' stream, accrual earnings management may allow managers to beat the market because it results in low correlation between accruals and cash flows and ultimately drives the mispricing of accruals by the stock market. In this sense, earnings management can be used as a method to positively influence market prices and ultimately improve stock returns (Sloan, 1996; Xie, 2001; Collins et al., 2003; Beneish and Nichols, 2005; Chan et al., 2006; Pincus et al., 2007; Soares and Stark, 2009). On the other hand, the 'cost of capital' stream is in line with the efficient markets hypothesis and assumes that markets are smart enough to discount earnings management. In this sense, the cost of capital depends on earnings quality i.e. accruals' quality is a priced risk factor. Although most of the studies in this regard have emphasized the efficient markets hypothesis (Francis et al., 2004; Francis et al., 2005; Lambert et al., 2007; Francis et al., 2008; Ogneva, 2012), other studies document insignificant results (Core et al., 2008; McInnis, 2010).

4.4.2 Issuance of Equity

Initial public offerings (IPO) and seasoned equity offerings (SEO) can create incentives for managers to manipulate earnings. Earnings at IPOs are important because some investors may request earnings information before purchasing stocks and subsequently will compare firms' future performance to the IPO earnings (Ronen and Yaari, 2008). At the same time, IPOs are associated with high information asymmetry between management and shareholders because little information is known about the firms before they go public (Cheung and Krinsky, 1994). In addition, IPOs might be perceived as a final stage for the early investors who want to convert their investments to cash (Li and Zhou, 2006). All the previous reasons may drive managers to manipulate earnings in order to influence the valuation of their firms in the market (Fan, 2007). Mainly, high quality firms are expected to send signals that reflect their superior performance because they might be underpriced (Fan, 2007). The selection of a specific type of earnings management at the IPOs depends on the relative importance of the financial statements' items for each firm. Science- and internet-based firms are more inclined to manipulate their research and development costs, while asset-based firms are more likely to exert discretion over sales' accruals (Singer, 2007). Overall, IPOs may motivate both accrual and real earnings management (Darrough and Rangan, 2005; Lo, 2008).

On the other hand, earnings can be considered invaluable in the case of IPOs because they might not reflect a firm's future performance and, therefore, the market values the firms based on other criteria e.g., cash flows (Cheng and Firth, 2000; Bartov et al., 2002b). Meanwhile, an IPO might be perceived as a first stage to raise capital for future growth. Furthermore, reporting misleading earnings may drive shareholders to sue the firms once the manipulation is detected (Ronen and Yaari, 2008). In this sense, IPOs would not create an incentive for management to manipulate earnings. On the contrary, they would demotivate earnings management behaviour so that firms maintain their credibility and keep their future financing opportunities necessary for their growth, especially under the higher monitoring of IPO firms (Li and Zhou, 2006; Ball and Shivakumar, 2008).

SEOs also have a dual effect on earnings management. Firms manage earnings around SEOs in order to improve their stock prices and, therefore, increase the wealth of

the current owners (Teoh et al., 1998; Cohen and Zarowin, 2010). On the other hand, a number of restrictions appear around SEOs including the high analysts' coverage, information requirements by the market and the auditors, and the possibility of being sued when the manipulation is detected (Teoh et al., 1998). Therefore, the market discounts earnings management, especially when real earnings management is used, because it expects bad performance after the SEOs (Teoh et al., 1998; Shivakumar, 2000; Cohen and Zarowin, 2010). The previous factors drive the firms to avoid earnings management in the periods of SEOs. Overall, there is a general trend of a drop in stock prices after SEOs because investors consider an SEO as a way of raising capital due to bad financial situation or stocks being overpriced (Brazel and Webb, 2006).

4.4.3 New Listing and Cross-Listing

New listings influence earnings management in two opposing ways. Firms listed in a new market have incentives to manage earnings in order to improve their stock prices; although such aggressive behaviour may result in negative returns in the future (Lin, 2003; Lang et al., 2006). From another point of view, firms may avoid earnings' manipulation due to the restrictions they face in the new markets where they are listed (Ronen and Yaari, 2008).

Earnings management appears more vividly in firms listed in non-US markets as they have less restrictions in terms of investor protection and legal requirements. Even if a firm is listed in the US at the same time, the SEC conventions cannot replace the local regulations in the firm's home country (Lang et al., 2006). Firms usually select the time of peak performance when they attempt to list in a new market. At this point, they are more likely to use earnings management in order to improve their stock prices and get more cash infusion (Ndubizu, 2007).

4.4.4 Mergers and Acquisitions

The acquirer firm aims to improve its stock price in order to decrease the number of stocks transferred to the target firm in case of stock mergers and acquisitions; hence avoids the dilution of the current shareholders' ownership. In this sense, acquirers select

to manage earnings in order to avoid bad results that might drive the market to discount their stock prices. Acquiring firms also tend to manage earnings to sell their shares at a higher price so that they can finance a cash acquisition with a lower cost (Erickson and Wang, 1999; Efendi et al., 2007). On the other hand, the length of the negotiation process between the acquirer and the target firm may prevent earnings management behaviour because it gives a chance for the target to understand the acquirer's transactions and detect the manipulation, especially the discretionary accruals that reverse in the next accounting period. Therefore, target firms are required to perform their due diligence in evaluating the acquirer's financial statements; otherwise they might get subsequently sued by their shareholders (Erickson and Wang, 1999; Gong et al., 2008).

The target firms may also manage earnings to improve their stock prices and, consequently, get a higher value for the acquisition transaction. This particularly applies to hostile takeovers where targets attempt to avoid the acquisition (Easterwood, 1997). On the other hand, the target firms may be less inclined to manage earnings because the price of the transaction is mostly determined by the bargaining power of the acquirer and the target rather than the reported earnings of the target firm (Erickson and Wang, 1999).

4.4.5 Insider Trading

According to the Security and Exchange Act of 1934, insiders are defined as parties that own more that 10% of any class of firm's equity. The definition includes any employees or beneficial owners in the firm like lawyers and accountants. The act considers trading based on private information illegal if such information has material consequences on decision making (Ronen and Yaari, 2008). Since then, the Securities and Exchange Commission (SEC), the Congress, and the courts in the United States have been attempting to prevent insider trading especially before critical corporate announcements e.g., earnings' announcements (Bainbridge, 2001).

Managers may achieve self-benefits by making use of their access to private information and, thus, they buy stocks if their values are expected to increase in the future while sell those whose values are expected to decrease (Lakonishok and Lee,

2001; Brochet, 2016). In this sense, insider trading is likely to motivate earnings management to meet analysts' expectations and, thus, managers can sell their stocks at better prices (Beneish and Vargus, 2002; Hochberg et al., 2003; Park and Park, 2004; McVay et al., 2006; Sawicki and Shrestha, 2016). Elitzur and Yaari (1995) document that the effect of insider trading on earnings management is based on how the market reacts to earnings management. If managers expect the market to react positively, they buy more shares at the current cheaper prices and manage earnings upwards to increase their wealth. They may also sell their shares at the current higher prices and subsequently manage earnings downwards. The opposite applies if the managers expect the market to react negatively to earnings management. Therefore, insider trading is a good tool to predict the direction of earnings' manipulation (Elitzur and Yaari, 1995).

On the other hand, insider trading is sometimes perceived as an efficient contractual arrangement, which is part of management compensation scheme, to maximize the welfare of both the managers and the shareholders (Dye, 1984; Seyhun, 1992; Noe, 1997; Bainbridge, 2001; Bolton et al., 2006). In this sense, insider trading mitigates the agency problem as it allows private information to be reflected in the stock prices (Manne, 1966). In this line, Boyer et al. (2003) emphasize the ethical, rather than the opportunistic, aspect of insider trading. They suggest that the relation between insider trading and earnings management depends on the degree of optimism/pessimism of the managers about the firm performance. Optimistic managers tend to manage earnings upwards and still buy more stocks. Pessimistic managers, however, manipulate earnings downwards while selling more shares (Boyer et al., 2003). Their findings suggest the need for selective, and not prohibitive, regulations to control the insider trading phenomenon (Manne, 1966).

4.4.6 Management Buyouts

Mangers may attempt to purchase the firm they are working for. A conflict of interests appears between managers and shareholders as the managers want to pay less while the shareholders want to receive more (Ronen and Yaari, 2008). Therefore, managers are expected to manage earnings downwards before the buyout, so that they can purchase the firm at a lower price. In this line, Wiedman and Marquardt (2002) document that

managers tend to defer revenue recognition before the buyout announcement. Wu (1997) find that managing discretionary accruals downwards before the announcement of the buyout bid drives stock prices down; which is not observed in the case of third party takeover. Therefore, management buyouts raise concerns about the negative consequences on the shareholders' interests (Perry and Williams, 1994).

4.4.7 Meeting or Beating a Benchmark

Managers may get motivated to manage earnings under the incentive of meeting or beating a benchmark. Based on the degree of information asymmetry, the firm and the market implicitly agree on the benchmarks. Benchmarks can take the form of zero earnings, prior years' earnings, or analysts' forecasts (Xue, 2003). Managers generally try to avoid reporting losses (Burgstahler and Dichev, 1997). They also prefer to show an increase in their earnings compared to a similar prior period and, therefore, even profitable firms would have the incentives to manage earnings (DeAngelo et al., 1996; Ayers et al., 2006; Barua et al., 2006; Roychowdhury, 2006; Myers et al., 2007; Cohen et al., 2008; Osma and Young, 2009). In addition, managers try to meet analysts' forecasts because they reflect the general market expectations that will give the firms more credibility in the market if they are met (Graham et al., 2005).

The market takes into consideration meeting the benchmarks when valuing the firms (Burgstahler and Dichev, 1997; Barua et al., 2006). Firms that meet their benchmarks are valued at different valuation models than those which do not. Therefore, meeting or beating a benchmark is expected to have a positive influence on firms' stock prices (Durtschi and Easton, 2005). Because of the important role of the analysts as gatekeepers in preventing market deception by earnings management, their effect on earnings management is going to be discussed separately in the next section.

4.4.8 Analysts

Analysts are gatekeepers that monitor management performance in order to protect the shareholders' welfare. Consequently, they reduce the agency costs and improve the public confidence to invest in the markets (Ronen and Yaari, 2008). Analysts' coverage

is negatively associated with information asymmetry and, thus, it is used as a measure of information asymmetry variable in some studies (Houston at al., 2008). They play an important role in simplifying the complicated information reported by management to the users of the financial reports and providing relevant analysis about the future for decision making (Brennan and Hughes, 1991).

Analysts' coverage has been increasing over time leading to a more influential role in the stock market (Francis et al., 2004). Analysts' forecasts influence market prices as they improve the efficiency of communicating the financial information and, thus, allow a closer view by the investors (Barth and Hutton, 2000; Brennan and Tamarowski, 2000; Shroff at al., 2004). Therefore, investors prefer to invest in firms that are covered by more analysts (O'Brien and Bhushan, 1990; Brennan and Hughes, 1991). The response of the stock market to earnings' announcements revised by analysts is higher than the response to other strategic business information because analysts provide information that can be directly used in firm valuation models (Bagnoli et al., 2005).

Analysts are expected to provide accurate forecasts because the clients pay commissions to the brokers and investment banks where analysts work (Ronen and Yaari, 2008). In this sense, analysts use their professional experience in analyzing the financial information and identifying management incentives and, therefore, providing valuable information in their forecasts to the different users (Gu and Chen, 2004; Barton and Mercer, 2005; Lin and Shih, 2006). As a result, analysts mitigate earnings management because they are able to detect opportunistic behaviour and discount inflated earnings, especially in environments where transparent financial disclosures exist (Ke, 2001; DeGeorge et al., 2004; Brown, 2004; Yu, 2008).

Astonishingly, most of the literature provides evidence on the positive effect of analysts on earnings management. Analysts' may face pressure from their employers or clients to make optimistic forecasts (Francis and Philbrick, 1993; O'Brien et al., 2005). They are also limited to the amount of information provided by the management. In this sense, analysts are more inclined to tolerate earnings management or even collude with the management by reducing their expectations to be easily met; hence reflecting better market values (Bartov et al., 2002a; Griffin, 2003). Under the previous incentives, analysts may not report overestimated accruals that might reduce firms' future earnings.

They may even not distinguish between discretionary and nondiscretionary accruals when making their forecasts. Consequently, analysts do not always discount earnings management and thus may ultimately provide biased forecasts (Bradshaw et al., 2001; Abarbanell and Lehavy, 2003; Ahmed et al., 2005).

Accordingly, meeting analysts' expectations is more subjective compared to meeting other benchmarks (e.g., prior years' earnings), and thus firms may not only use earnings management but also expectation management to achieve their opportunistic targets (Barua et al., 2006; Kross et al., 2011). Expectation management allows for guiding the perceptions of the analysts whether explicitly through firm announcements or implicitly by staying silent without advising the analysts to review their forecasts. Das et al. (2011) find that the relationship between expectation management and earnings management is complementary. Managers tend to manage analysts' expectations when earnings management activities involve higher costs (Das et al., 2011). Similarly, management may use classification shifting to meet or beat analysts' forcasts (McVay, 2006; Athanasakou et al., 2009; Yun et al., 2010). However, Athanasakou et al. (2009) document that the market rewards firms that manipulate their accounts' classification less than those that genuinely achieve their targets.

4.5 Third-Party Motives of Earnings Management

The relations of the firm with the external parties may shape its earnings management behaviour to be able to maintain its future interests with them. Third parties need the accounting information to make decisions related to directly entering into business transactions with the firm or indirectly revising the structure of the environment where the firm is operating. In this sense, third parties influence the firm's strategies in managing its resources to generate earnings (Ronen and Yaari, 2008). The third-party motives are also referred to as the external motives of earnings management in this thesis.

4.5.1 Industry

Firms within the same industry generally have similar legal and financial incentives, and thus they tend to take into consideration the behaviour of the other firms in that industry when making their decisions (Kallunki and Martikainen, 1999; Popp et al., 2003; Othman and Zeghal, 2006). Consequently, earnings management activities of a firm are correlated with the levels of comparable activities in the same industry (Bagnoli and Watts, 2000). In contrast, different industries develop based on different resources that ultimately determine their distinct structures and characteristics and contribute to the variation in performance and profitability between them (McGahan and Porter, 1997; Popp et al., 2003). Eventually, the variation in managerial incentives between the different industries results in the variation in the type and extent of earnings management activities used in each sector (Aharony et al., 2000; Gu et al., 2005). In this sense, industry may have an impact on discretionary accruals as well as real earnings management activities (Roychowdhury, 2006; Toniato et al., 2006; Sundvik, 2013).

The accounting choices available to the managers in an industry may allow the use of earnings management practices specific to each sector. For example, firms in the manufacturing sector have the opportunity of manipulating the amount of units produced. Overproduction as a real earnings management strategy would lead to a lower cost of goods sold and ultimately improve net revenue figures (Gu et al., 2005; Roychowdhury, 2006). Under different conditions, firms in the retail sectors are expected to have higher receivable balances and, therefore, may be subject to more bad debt manipulation (Gu et al., 2005).

In the same way, the technology associated with specific industry sectors may create incentives for the firms to manage earnings. Industries which share chemical or physical technologies tend to use less real earnings management activities because of the information shared with the competitors that imposes a restriction on earnings manipulation (Bagnoli and Watts, 2010). In contrast, industries with less similar technologies, such as services, are more likely to smooth their earnings since it is more difficult for other firms to obtain knowledge about their unique transactions (Bagnoli and Watts, 2010). Overall, high-tech firms exhibit better earnings quality due to industry specific factors like litigation, the funding needs, and the bigger investments (Kwon et al., 2006).

Regulation and state-protection also play an important role in determining earnings management behaviour in the different industries; hence differences in earnings manipulation are evidenced between regulated and unregulated sectors. In this line, lower levels of earnings management are expected in highly regulated industries as there is less space for management discretion in selecting and using the accounting principles (Gu et al., 2005). High-tech firms represent an example of a highly regulated industry sector that exhibits more conservatism in financial reporting (Kwon et al., 2006). The same applies to the state-protected industries due to the high supervision and distinctive treatment by the regulatory bodies (Aharony et al., 2000).

Furthermore, differences in earnings management appear between core and peripheral industries as the core sectors are less likely to manage earnings than the peripheral sectors (Sun and Rath, 2009). Core sectors represent industries with more economic and political influence like the construction, manufacturing, and extraction industries in the US. The enhanced earnings quality in such industries is attributed to the lower competition and environmental uncertainty, along with the higher profitability, unionization, capital investments, and more sophisticated regulations (Albrecht and Richardson, 1990).

While the previous studies focus on a dual-industry view, others implement a multiple perspective to examine the effect of industry on earnings management. Toniato et al. (2006) consider the impact of industry on accrual earnings management activities in Brazil and document that most of the industry sectors do not have a significant impact on discretionary accruals. On the other hand, Sundvik (2013) applies the same idea on the industries in Finland and identifies some differences in using discretionary accruals between the different sectors. The results of the two studies reflect the differences in industry characteristics and earnings management behaviour between the different economies.

Overall, industry reflects firms' strategic objectives and competitive advantages; hence plays a major role in determining managerial choices and earnings quality (Demerjian et al., 2013a). However, all of the studies in this area of research focus on accrual earnings management. Furthermore, although the multiple-economy approach followed by Toniato et al. (2006) and Sundvik (2013) allows the revelation of each

industry's behaviour separately, the specific industry characteristics need to be examined in order to explain their influence on earnings management.

4.5.2 Industrial Diversification

The operations of industry-diversified firms are complex for the shareholders to understand and thus create more information asymmetry between the managers and the shareholders and more chances for earnings management. On the other hand, diversified firms may not need to manipulate earnings because they have different sources for earnings and cash flows. In addition, the correlation between accruals of the divisions in the different industries makes it difficult for top management to decide on the overall result of earnings management activities that may cancel each other. In this line, Jiraporn et al. (2006) provide empirical evidence on the low association between industrial diversification and earnings management.

4.5.3 Regulations

Although regulation is generally perceived as a mechanism that limits opportunistic behaviour (Graham et al., 2005), it may have the opposite effect (Goldman and Slezak, 2006). While it controls financial disclosures, regulation may prohibit firms from disclosing their private information and thus end up in violating the revelation principle (Ronen and Yaari, 1993). In the same line, while regulations generally aim at enhancing management incentives to improve performance and firm value, such incentive may create a pressure to manage earnings and thus reduce firm value (Cheng et al., 2011). The emphasis of regulations on the role of auditors can also mitigate earnings management, but it contributes to a decrease in the value of the firm as it encourages management conservative behaviour (Goldman and Slezak, 2006).

Firms may manage earnings in different ways under the pressure of regulation. Regulatory investigations or new regulatory projects drive firms to manage discretionary accruals downwards in order to demotivate the regulators from issuing strict regulations that might harm the firms (Jones, 1991; Cahan, 1992; Cahan et al., 1997). Poorly performing firms in regulated industries, however, manage earnings

upwards by decreasing their reserves and allowances to avoid any intervention that might result in losing some of their benefits or even getting their businesses closed (Petroni, 1992; Gaver and Paterson, 2000; Gray and Clarke, 2004). Firms may also respond to the regulatory power by manipulating their non-operating activities (Chen and Yuan, 2004). In contrast, the lack of regulation can drive firms to manage earnings upwards due to the absence of protection in the market (Aharony et al., 2000).

The Securities and Exchange Commission (SEC) in the US is the main body that regulates the capital market and the listed firms' affairs (Giroux, 2004). One of the most famous and recent regulations is the Sarbanes-Oxley act (SOX) that followed the Enron scandal in 2002. SOX incorporated lots of emphasis on corporate governance including the independence of the board of directors, the audit committee, and the external auditor (Hossain et al., 2011; Krishnan et al., 2011). While such regulatory intervention seems to decrease accrual earnings management and the opportunistic non-GAAP disclosures, firms tend to use other methods to achieve their opportunistic targets like real earnings management or the abuse of special items (Ewert and Wagenhofer, 2005; Cohen et al., 2008; Heflin and Hsu, 2008; Kolev at al., 2008; Bartov and Cohen, 2009; Hutton et al., 2009; Baber et al., 2011; Badertscher, 2011). Ghosh et al. (2010), however, document that SOX did not have any significant influence on earnings management behaviour; hence they raise concerns about the context and conditions of applying the different studies in this area.

4.5.4 Political Environment and Country-Specific Policies

Firms are inclined to manage earnings under political pressure. For example, oil firms managed earnings downwards during the Second Gulf War in order to avoid any unfavourable interventions after the sudden increase in petrol prices (Han and Shiing-wu, 1998). The distinct policies of each country also influence earnings management behaviour. Firms in countries with strong investor protection policies are involved in less earnings management compared to those in other countries (Leuz et al., 2003; Lang et al., 2006; Haw et al., 2011; Gopalan and Jayaraman, 2012; Houqe et al., 2012). Firms in countries with common laws use less earnings smoothing than firms in countries with

code laws[7] (Gassen et al., 2006). However, Gaio (2010) document that the differences in policies between countries do not influence earnings quality as it is basically attributed to the differences in individual firm characteristics.

4.5.5 Accounting Standards

Although the voluntary adoption of the International Financial Reporting Standards (IFRS) has resulted in a better quality of earnings, the bright side of the effect needs to be interpreted with care (Barth et al., 2008). In this sense, the researchers have to take into consideration that the adoption of IFRS allows firms to have a fresh start. Therefore, making a fair comparison between the pre-adoption period and the post-adoption period might be impractical (Walker, 2013).

In contrast, examining the influence of the mandatory adoption of IFRS in 2005 on earnings management is difficult because of the continuous changes in the economic conditions before and after the adoption, e.g., the financial crisis in the late 2007. In addition, the mandatory adoption of IFRS has provided the firms with the chance to clean-up their financial statements before the adoption (Garcia-Osma and Pope, 2011; Walker, 2013). The empirical evidence shows that the influence of the mandatory adoption of IFRS differs in different countries. While no influence was noticed in Australia, a significant increase in accrual earnings management has occurred in the French firms (Jeanjean and Stolowy, 2008). Meanwhile, the mandatory adoption of IFRS depends on the enforcement regime in a particular country, e.g., the adoption of IFRS in the UK has resulted in less accrual earnings management because of the strong enforcement regime (Ipino and Parbonetti, 2011). It has been also noticed that income smoothing has increased in the European Union firms after the adoption of IFRS in 2005 because of the clean-up that was taken by most firms prior to the adoption (Callao and Jarne, 2010; Capkun et al., 2016).

Similar to the regulatory intervention effect on earnings management, the adoption of IFRS has driven the trade-off between the different earnings management methods. Ipino and Parbonetti (2011) document that while the adoption of IFRS in the

[7] While the common laws develop based on the cases experienced in the courts of a specific country over time, code laws represent systematic legislation enforced by law.

UK has resulted in a decrease in accrual earnings management, firms have started to use more real earnings management and earnings smoothing (Ewert and Wagenhofer, 2005). Furthermore, managers develop the skills to manipulate the new accounting standards over time; hence there is a continuous need for updating the accounting regulation (O'Brien, 2005).

4.5.6 Tax Considerations

Firms may manage earnings downwards to decrease their tax expenses which are calculated based on their earnings' numbers (Boynton et al., 1992). In this sense, taxation mitigates the upward earnings management and, thus, decreases the pernicious manipulation (Eilifsen et al., 1999). Furthermore, taxation mitigates aggressive earnings management as huge differences between book income and tax income can be easily noticed by the tax authorities and the stock market. Therefore, while the managers aim to achieve tax benefits, they take into consideration the costs of earnings management they will subsequently incur (Badertscher et al., 2006).

To achieve tax advantages, firms manage earnings through their deferred tax allowances that are kept open until the last moment before the financial reporting to the public. Therefore, the allowances allow managerial judgment to manipulate the tax expenses so that firms can meet their earnings' targets (Bauman et al., 2001; Kumar and Visvanathan, 2003). In addition, the flexibilities in tax laws give a suitable chance for earnings management behaviour. For example, allowing income adjustment for tax purposes drives firms to manage earnings downwards, while reducing tax rates over specific periods in the future drives firms to shift earnings forward (Gramlich, 1991; Maydew, 1997).

4.5.7 Competitors

Market competition influences earnings management behaviour as firms in the same industry tend to take each other's performance into consideration when manipulating their earnings (Kallunki and Martikainen, 1999; Bagnoli and Watts, 2000). Therefore, incentives of the opportunistic behaviour exist within the same sector so that a firm

manages its earnings when the expected costs of this behaviour are lower than those of the rival firms (Bagnoli and Watts, 2010). While some of the studies perceive competition as a motive of earnings management (Karuna et al., 2012; Datta et al., 2013), the opposite results have been also documented (Dalia and Park, 2009; Markarian and Santalo, 2010).

The relationship between competition and earnings management can be interpreted based on two different perspectives in information theory. From one point of view, market competition is associated with more information and thus allows the stakeholders to make comparisons between the firms. Therefore, managers face more pressure to improve performance relative to their rivals and more incentives exist for managerial myopia and earnings management (Karuna et al., 2012; Datta et al., 2013). From another point of view, the less information asymmetry raises the managerial concerns about market punishment due to the higher monitoring by the stakeholders (Dalia and Park, 2009). In this sense, market competition moderates the agency problem and contributes to minimizing managerial incentives to manage earnings in order to protect their firms and individual reputations (Tinaikar and Xue, 2009; Bagnoli and Watts, 2010; Datta et al., 2013).

In addition, the impact of competition on earnings management can be explained from two different points of view based on profit volatility. Market competition increases price elasticity and, therefore, makes profits more volatile. As a result, the cost of borrowing, the required rate of return, and the audit fees are expected to increase leading to more incentives for the firms to manage earnings in order to avoid such costly outcomes. At the same time, it becomes difficult for the stakeholders to understand management sophisticated activities or build expectations under the higher levels of uncertainty; hence profit volatility may create less pressure on management to manipulate earnings (Kole and Lehn, 1999; Christie et al., 2003; Tinaikar and Xue, 2009).

Furthermore, managerial incentives can explain the effect of market competition on earnings management from two different points of view. On the one hand, firms in competitive markets are likely to hire more skilled managers and offer better incentives to maintain a competitive advantage (Hubbard and Palia, 1995; Kole and Lehn, 1999; Karuna, 2007). In this sense, competition enhances the disciplined behaviour of

management. On the other hand, the lower rewards to the managers in competitive markets compared to those in less competitive industries e.g., monopolies, may discourage innovation and productivity and stimulate indifference and demoralization (Karuna, 2007). Therefore, competition may be perceived as a motive of earnings management.

Various proxies have been used to measure market competition in the industrial organization and accounting literature e.g., product substitutability, market size, entry barriers, pricing power, and market concentration (Dalia and Park, 2009; Markarian and Santalo, 2010; Karuna et al., 2012; Datta et al., 2013). Product substitutability reflects the amount of similar products produced by rival firms; market size represents the number of customers demanding those products in the market, entry costs reflect the hurdles in front of the new entrants to go into the market, and market pricing power implies the firms' abilities to set higher price-cost margins (Tinaikar and Xue, 2009; Karuna et al., 2012; Datta et al., 2013). While higher product substitutability and bigger market size reflect more intense competition, higher entry costs and greater pricing power imply less competition in the industry. In contrast, while higher market concentration implies less competition, it might result from the excessive competitive forces that drive less competent companies to exit the market (Markarian and Santalo, 2010; Karuna et al., 2012; Datta et al., 2013).

The previous measures have been used by different studies to examine the effect of market competition on earnings management. Datta et al. (2013) focus primarily on pricing power and its impact on accrual earnings management. They find that firms with higher pricing power exhibit less discretionary accruals because it is a cushion that can absorb any revenue shocks and, therefore, relieves management from the need to manage accruals. In addition, firms with higher market pricing power have less pressure to meet market expectations or hide information from the other competitors. Datta et al. (2013) conclude that the mechanisms of pricing power and discretionary accruals are used as substitutes. Overall, the results emphasize a positive impact of market competition on accrual earnings management.

Karuna et al. (2012) focus on other measures of competition which include product substitutability, market size, and entry costs. Their study is the only one, to my knowledge, that covers both accrual and real earnings management activities in its

scope. They extend the results of Datta et al. (2013) by documenting a positive impact of market competition on both accrual and real earnings management. According to their explanation, competition enhances managerial incentives to improve firm efficiency and thus may drive earnings management. However, the reverse result is achieved when using market concentration as a measure of competition because of the imprecise meaning of market concentration relative to the other competition measures. In particular, Karuna et al. (2012) believe that high competition drives less competent companies to exit; ending up with a more concentrated market in the long run. Therefore, although higher concentration intuitively implies less competition, it can be sometimes associated with high competition. As a result, the study of Karuna et al. (2012) claims that market concentration does not reflect a precise meaning of competition.

The study of Markarian and Santalo (2010) uses market concentration measure to examine the relation between market competition and discretionary accruals from a different perspective. It uses information as a basis for explaining the previous relation and documents that competition mitigates discretionary accruals because of the decreased information asymmetry in the market. According to their explanation, earnings management becomes costlier when the stakeholders can access more information about the firm and its competitors. Similarly, Dalia and Park (2009) examine the impact of market concentration on accrual earnings management and document that competition discourages discretionary accruals. According to Dalia and Park (2009), information in competitive markets allows the stakeholders to punish the firms engaged in the manipulation. However, the study is exclusively performed in the manufacturing sector in the US and focuses on accrual earnings management and earnings smoothing while entirely ignores real earnings management activities.

Other measures of competition exist at the individual firm level e.g., market leadership, and the international market levels e.g., foreign markets' entry barriers. At the firm level, a market leader in the industry tends to use more real earnings management because of its high competitive status, specialized knowledge, bargaining power, and economies of scale (Zang, 2012). At the international market level, competition also tends to enhance earnings management behaviour as the imposed

pressure from foreign suppliers and the low price-cost margins result in more profit uncertainty (Tinaikar and Xue, 2009).

Overall, the role of market competition has been perceived from the bright side as enhancing firm performance to attain a competitive advantage in the market. However, it might be viewed from the dark side as one of the motives of earnings management because it results in lower profits to the existing firms, stimulates harmful signals from the rivals, and motivates hiding private information from the stakeholders e.g., new entrants, suppliers, customers, and investors (Fudenberg and Tirole, 1986; Bolton and Scharfstein, 1990; Ettredge et al., 2002; Dharan, 2003; Karuna et al., 2012). Competition may even result in aggressive forms of earnings management which take the shape of structured transactions or huge restatements e.g., the cases of Enron, WorldCom, and Xerox Corporations (Dharan, 2003; Ronen and Yaari, 2008).

4.5.8 Suppliers and Customers

Earnings management is also determined by the extent to which the firm depends on its suppliers in providing the raw materials and customers in purchasing its final products. A firm that extensively relies on specific suppliers or customers is more inclined to manage earnings in order to influence their perception of its performance (Raman and Shahrur, 2008; Ronen and Yaari, 2008). As the relationships between the firm and its suppliers and customers last over the long horizons, its reputational concerns may also drive upward earnings management so that it can meet their expectations in the long run (Bowen at al., 1995). Overall, further research is recommended in this area.

4.5.9 Auditors

Auditors provide an attestation function that gives credibility to the financial statements and thus they are important gatekeepers for maintaining earnings' quality and protecting the shareholders' welfare. The role of the independent auditors has been emphasized by the SOX through its Public Company Accounting Oversight Board (PCAOB) that regulates their work. To maintain their independence, the regulation has assigned the responsibility of dealing with auditors to the audit committee instead of management. In

this sense, auditors are expected avoid earnings management to protect their reputations and avoid the costly litigation.

However, auditors may fail to detect and report earnings management because of some uncontrollable factors like the increased complexity of business transactions in the modern firms (Ronen and Berman, 2004). In addition, audit failure may occur because of the auditor's fear of losing its clients, especially under the growing competition in the audit market (Antle and Nalebuff, 1991; Nelson et al., 2002, 2003). In this sense, auditors are not independent anymore and may act for the interest of management who directly pays their fees and determines their employment terms (Abdel-Khalik, 2002). The situation gets worse when the auditor highly relies on a specific client in its income or when its non-audit services make a major source of its income e.g., the consulting services that have been increasingly provided by the auditors over time (Coffee, 2003; Walker, 2013). Therefore, auditor's service has been always criticized for targeting money instead of aiming at protecting the shareholders' welfare (Branson, 2006).

Different audit-related factors influence earnings management behaviour e.g., the auditor's opinion, quality, fees, effort, tenure, experience, and turn over. The auditor's opinion may provide an idea about the occurrence of earnings management, e.g., the auditor is expected to give a qualified opinion after incidences of earnings management to drive a negative market response (Lennox, 2005). The auditor's quality also influences earnings management as it is generally associated with better earnings quality. For example, big audit firms have more economies of scale and valuable reputations that motivate more due diligence (Danos and Eichenseher, 1981; Coffee, 2003; Kim et al., 2003; Francis and Wang, 2004; Larcker and Richardson, 2004; Francis and Wang, 2008). However, while high quality auditors do not accept discretionary accruals, they may allow real earnings management as a substitute (Cohen and Zarowin, 2010; Chi et al., 2011). Overall, the auditor's quality depends on the business environment e.g., stronger investor protection policies assist the high quality auditors in assuring high quality earnings (Francis and Wang, 2008). The audit fees are negatively associated with earnings management while the non-audit fees are positively associated with earnings management; hence the emphasis of SOX on increasing the audit fees and avoiding the non-audit services can be justified (Frankel et al., 2002). Auditor effort in the form of more working hours and skeptical attitude contributes to mitigating earnings

management (Caramanis and Lennox, 2008; Cohen et al., 2008; Chen et al., 2012). Audit tenure and the industry experience result in better earnings quality attributed to the extensive knowledge about the client (Gul et al., 2009). Meanwhile, long tenure results in closer auditor-auditee relations and thus may violate the auditors' independence requirement (Davis et al., 2006). Auditors leaving their audit firms and moving into managerial positions in one of their clients are more likely to manage earnings; hence a cooling-off period has been required by SOX (Lennox, 2005). Finally, the resignation of the current auditor and assigning the job to a new one may imply the occurrence of earnings management (DeFond and Subramanyam, 1998; Davidson et al., 2006).

Overall, although auditors are one of the critical gatekeepers that monitor firms' performance and protect shareholders' interests, the auditing standards have ignored their role in mitigating earnings management. Instead, they only focus on assuring the fair presentation of the financial statements according to the generally accepted accounting principles (GAAP) and reporting material misstatements whether due to fraud or error in the audit report. As a result, auditors are not expected to detect and report earnings management because it is within GAAP and thus does not violate the accounting standards. In this sense, the matter of reporting earnings management by the auditors remains subjective although it may materially influence decision making.

4.5.10 Other Gatekeepers

The press is one of the most influential gatekeepers in the market and thus contributes to mitigating earnings management. It provides stakeholders with information about accounting manipulation, fraud, and changes in the regulations and, therefore, it assists them in making their decisions (Borden, 2007). Turner (2001) reports that the Securities and Exchange Commission (SEC) may rely on the press more than it does on its own investigations to learn about cases of accounting restatements. As a result, the revelation of bad news about a firm in the press e.g., fraud or earnings management attempts, will negatively influence its stock price (Foster, 1987).

Lawyers have been criticized for losing their influence as gatekeepers and transforming their profession to a routine job recently (Branson, 2006). They basically

play a role in structuring the contracts and thus establishing the relations between the firm and the external or internal parties (Giroux, 2004). However, lawyers' role can be more influential in mitigating earnings management if they provide advice on those contracts to the less knowledgeable shareholders and thus contribute to maximizing firm wealth.

Employee unions are also important gatekeepers in preventing earnings management. Firms negotiating their contracts with the employees have incentives to manage earnings downwards so that they can convince the employee unions to accept lower payments (Liberty and Zimmerman, 1986; Bowen at al., 1995). However, restrictions on earnings management may exist when a firm negotiates its employment contracts because the employees are able to expect the earnings and the employee unions usually hire experts who assist in making their decisions (Liberty and Zimmerman, 1986). A poorly performing firm is less likely to face a pressure from its employees and the involved unions because they already have low expectations based on its poor performance (Liberty and Zimmerman, 1986; Peltier-Rivest, 1999).

Finally, investment banks are responsible for arranging the new share issues of the firms in addition to hiring analysts to provide their forecasts and recommendations (Giroux, 2004). In this way, investment banks play an important role as gatekeepers to mitigate earnings management. Credit rating agencies play a similar role by rating the firms according to their credit worthiness and thus contribute to decreasing the information asymmetry in the market.

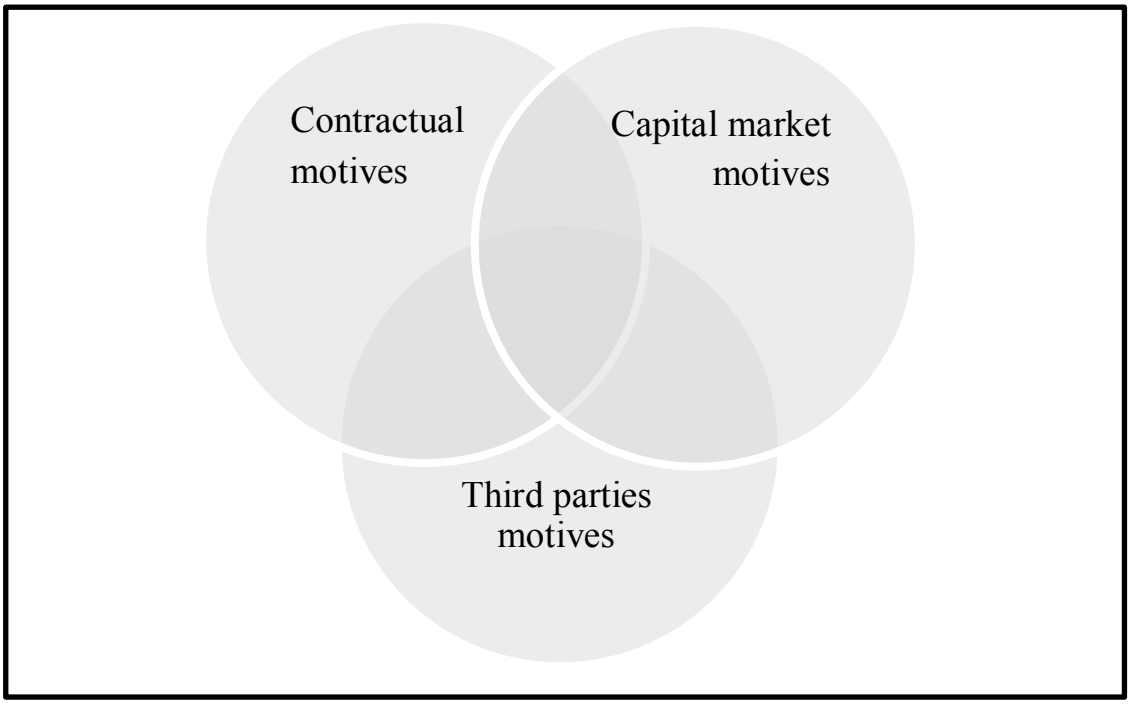
4.6 Conclusions

This chapter has summarized the motives of earnings management that have already been identified in the literature. Based on the theories of earnings management discussed in the previous chapter, three groups of motives have been identified. First, contracting motives arise from the conflict of interests in the contracts between the firm and the other stakeholders. Second, capital market motives exist because of the inefficiency of the stock markets to reflect firms' intrinsic values. Finally, third-party motives appear due to the influence of external parties on firm performance. Overall,

the previous motives are influential when the managers expect to achieve more benefits from earnings management than those from revealing the truth.

The three groups of earnings management motives are not completely distinct because more than one theory may explain a specific motive. For example, while auditors are considered as a third-party motive because it is related to the influence of an external party on the firm, auditors are involved in contracts with the firm to avoid any conflict of interests. Similarly, although the role of analysts is included in the capital market motives because they influence firms' stock values, they are also considered as external parties that may exert pressure on the firm to manage earnings. For the purpose of this thesis, I have classified each of the previous motives based on its major role in determining earnings management behaviour that has been identified in the literature. The overlap between the three groups of motives appears in Figure 4.3.

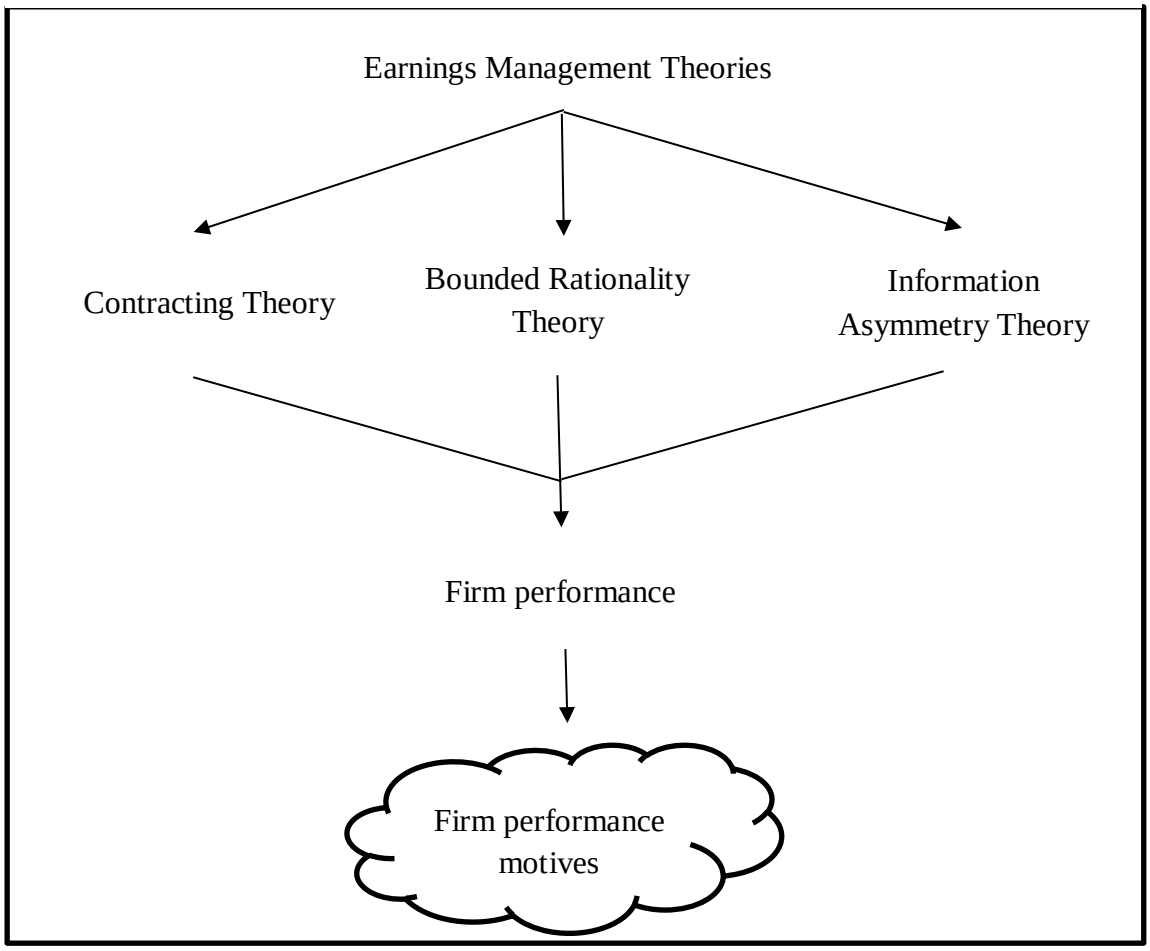
Figure 4.3 The motives of earnings management



Finally, the three main theories that have explained earnings management behviour so far i.e., contracting theory, bounded rationality theory, and information theory, shape firm performance which, in turn, plays a mediating role in determining earnings

management behaviour. Therefore, I suggest identifying firm performance as a fourth group of motives for earnings management according to Figure 4.4. The group includes factors like firm profitability and social responsibility. While less profitable firms are motivated to manage earnings to avoid reporting losses, more profitable firms may also manage earnings to meet the expected dividends, improve their share prices, and beat benchmarks (McVay, 2006; Roychowdhury, 2006; Kerstein and Rai, 2007; Cohen et al., 2008; Daniel et al., 2008; Iatridis and Kadorinis, 2009). In addition, firms that perform ethically at the social and environmental levels are more likely to report earnings with better quality (Patten and Trompeter, 2003; Kim et al., 2012). The next chapter explains the data and methodology of this thesis.

Figure 4.4 A fourth group of earnings management motives



Chapter 5
Data and Research Methods

5.1 Introduction

This chapter constructs the data and methodology for the thesis to examine the influence of some contracting motives (executive compensation and managerial ability) and external motives (market concentration and market competition) on earnings management. It explains the procedures followed to select the sample and presents the sources used to collect data, models used in estimating accrual and real earnings management, and the methodology that will be adopted in the empirical analysis.

The remainder of this chapter is organized as follows. Section 5.2 explains the overall sample construction of the thesis. Section 5.3 presents the sources used to collect data. Section 5.4 explains the different models that will be used in the following empirical chapters to measure accrual and real earnings management. Section 5.5 discusses the general basis for selecting the methodology of the thesis. Finally, section 5.6 concludes the chapter.

5.2 Sample Construction

For the empirical work of Chapter 6, I select all the firms in the United States that have the required data for calculating the measures of managerial ability, management compensation, and earnings management. However, the Execucomp database only provides compensation data starting from 1992. Furthermore, I use the number of board meetings among the controls for corporate governance, which is only available until 2006. As a result, Chapter 6 only covers the period from 1992 to 2006 with a sample of 6,974 observations.

To perform the empirical analysis of Chapter 7, I include all the firms in the United States that have the required data for calculating the measures of market concentration, information asymmetry, and earnings management during the time

period between 1989 and 2011. The time period begins in 1989 because the cash flow statement has been adopted since 1988 and a minimum of one year for cash flow data is needed as a basis for the calculation of earnings management metrics. The analysis ends in 2011 when the work on this thesis has started. As a result, Chapter 7 ends up with a sample that consists of 25,119 observations only.

Finally, the sample of Chapter 8 includes all the firms in the United States that have the required data for calculating the measures of earnings management, managerial ability, and competition for the same previous period from 1989 to 2011. As a result, the sample ends up with 66,695 observations. The samples used in the three empirical chapters of this thesis are summarized in Table 5.1.

Table 5.1 Summary of the samples used in the thesis

Empirical chapter*	Major variables	Sample size	Start date	Reason	End date	Reason
Ch 6	Managerial ability Management compensation Earnings management	6,974	1992	Compensation data availability on Execucomp database	2006	Availability of governance variables
Ch 7	Market concentration Information asymmetry Earnings management	25,119	1989	Cash flow statement availability	2011	Not applicable
Ch 8	Managerial ability Market competition Earnings management	66,695	1989	Cash flow statement availability	2011	Not applicable

The table presents the differences in sample construction between the three empirical chapters of the thesis based on the major variables, the sample size, the start date, the reason of selecting the start date, the end data, and the reason of selecting the end date. Each of these samples will be discussed individually in the related chapters. * indicates the chapter number in the thesis.

In all of the previous samples, and following Cheng et al. (2011), I exclude regulated industries such as banks, credit institutions, brokers, insurance, real estate, holding companies, and investment firms. These industries have their unique accounting and

financial practices and are subject to distinct regulations. Therefore, managers in these industries have different motivations to manipulate earnings than those of managers in other industry sectors.[8] In addition, I exclude firm-years where accounting changes, merger and acquisition activities, or discontinued operations occur.[9]

Furthermore, following prior literature I exclude any industry with fewer than six observations for each SIC code in a specific year to ensure sufficient data exists to calculate earnings management measures and the Ordinary Least Square (OLS) assumption regarding the normality of the error term holds (e.g., Rosner, 2003; García Lara et al., 2005; Kothari et al., 2005; Athanasakou et al., 2009; Iqbal et al., 2009). For that purpose, I follow the SIC classification of Fama-French (1997). As the models introduced in the thesis are dynamic, I ensure that information is available for at least five consecutive years for each firm over the study period (Miguel et al., 2004).

5.3 Data Sources

I use different data sources that include the Annual Compustat, Quarterly Compustat, and Historical Segments Compustat to collect data from the financial statements i.e., statement of financial position, income statement, and cash flow statement. I use the IBES database to collect data related to the analysts and their forecasts. Execucomp database is used for management compensation data. Finally, I use the dataset made available by Demerjian et al. (2012) for the estimates of managerial ability.[10] The sample construction of each of the empirical chapters is discussed in detail in Chapter 6, 7, and 8.

[8] I exclude firms with the following SIC codes: $4000 \leq SIC \geq 4900$ and $6000 \leq SIC \geq 6300$.

[9] According to McNichols (2002), I specifically exclude firm quarters or years with non-blank values for accounting changes cumulative effects (ACCCHGQ_FN), or merger and acquisition activities (ACQMETH_FN), or discontinued operations (DOQ_FN) in the Compustat database.

[10] Data are obtained from the following link:
https://community.bus.emory.edu/personal/PDEMERJ/Pages/Home.aspx.

5.4 The Estimation of Earnings Management

5.4.1 Accrual Earnings Management

Stubben's Model (2010) is primarily used for measuring accrual earnings management in this thesis. The model focuses on discretionary revenues which are the largest component of earnings in most firms (Stubben, 2010). Using revenues as an estimate of discretion reduces measurement error and makes the model less biased and more specified than other accrual models due to three reasons (Demerjian et al., 2013b). First, discretionary revenues reflect receivables' accruals, rather than aggregate accruals. Receivable accruals, in turn, are more directly related to revenues than other working capital accruals. Second, the model focuses on reported revenues rather on cash revenues. While this results in understating discretionary revenues estimate, it is unlikely to overestimate discretion for firms that are less expected to collect their credit revenues by the year end e.g. growth firms. Finally, the model examines receivable accruals for the fourth quarter separately because they are less likely to be collected before the year end. As a result, it prevents overstating discretion when the revenues of the fourth quarter are relatively high or understating discretion when the revenues of the fourth quarter are relatively low (Stubben, 2010). Discretionary revenues are estimated using the following cross sectional OLS regression for each industry-year group with at least 6 observations.

$$\frac{\Delta AR_{it}}{A_{avg}} = \propto + \propto_1 \frac{1}{A_{avg}} + \beta_1 \frac{\Delta R1\_3_{it}}{A_{avg}} + \beta_2 \frac{\Delta R4_{it}}{A_{avg}} + \varepsilon_{it} \quad (5.1)$$

In equation (5.1), *AR* represents accounts receivable; A_{avg} represents average total assets calculated as the average of total assets at the beginning of the year plus total assets at the end of the year; *R1_3* represents revenues in the first three quarters; and *R4* represents revenues in the fourth quarter. All variables are scaled by average total assets (A_{avg}) to avoid heteroskedasticity problems. The residual (ε_{it}) from the regression is the measure of discretionary revenues (*DiscRev*) that represents accrual earnings management (*AccrualEM*). The measure is decile ranked for better comparability and to avoid outliers biasing the results.

In addition to using Stubben's Model (2010) as the main proxy for accrual earnings management based on the previously mentioned reasons, the Modified Jones'

Model is also used as a corroborating measure (Cohen et al., 2008).[11] Again, a cross sectional model is used in the calculations of this measure for each industry-year group with at least 6 observations. Finally, the decile ranks are taken for better comparability and to mitigate for the effect of the outliers. The measurement of the Modified Jones' Model has been already explained in detail in section 2.4.6.

5.4.2 Real Earnings Management

To estimate real earnings management, the model of Gunny (2010) is used as it captures more aspects of real earnings management activities compared to other models (Gunny, 2010; Demerjian et al., 2013b). The model measures four components of real earnings management that include reducing discretionary research and development expense (REM_{RD}) as in equation (5.2), decreasing discretionary selling, general, and administrative expense (REM_{SGA}) as in equation (5.3), timing of fixed asset sales to report gain (REM_{Asale}) as in equation (5.4), and overproduction (REM_{Prod}) to cut prices or decrease the cost of goods sold (COGS) as in equation (5.5) (Gunny, 2010). The following cross sectional OLS regressions for each industry-year group with at least 6 observations are used to estimate real earnings management proxies.

$$\frac{RD_t}{A_{avg}} = \alpha_0 + \alpha_1 \frac{1}{A_{avg}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{avg}} + \beta_4 \frac{RD_{t-1}}{A_{avg}} + \varepsilon_t^{R\&D} \tag{5.2}$$

$$\frac{SGA_t}{A_{avg}} = \alpha_0 + \alpha_1 \frac{1}{A_{avg}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{avg}} + \beta_4 \frac{\Delta S_t}{A_{avg}} + \beta_5 \frac{\Delta S_t}{A_{avg}} * DD + \varepsilon_t^{SG\&A} \tag{5.3}$$

$$\frac{GainA_t}{A_{avg}} = \alpha_0 + \alpha_1 \frac{1}{A_{avg}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{avg}} + \beta_4 \frac{ASales_t}{A_{avg}} + \beta_5 \frac{ISales_t}{A_{avg}} + \varepsilon_t^{Asset} \tag{5.4}$$

$$\frac{PROD_t}{A_{avg}} = \alpha_0 + \alpha_1 \frac{1}{A_{avg}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{S_t}{A_{avg}} + \beta_4 \frac{\Delta S_t}{A_{avg}} + \beta_5 \frac{\Delta S_{t-1}}{A_{avg}} + \varepsilon_t^{Production} \tag{5.5}$$

[11] The results using the Modified Jones' Models are presented in the appendices of this thesis. The inferences are the same as those I make from the Stubben's model.

In the previous equations, *RD* represents R&D expense; *SGA* represents sales and general admin (SG&A) expense; *GainA* represents income from asset sales; *PROD* represents cost of goods sold (COGS) plus change in inventory; *A* represents total assets; *MV* represents the natural logarithm of market value calculated as the number of common shares outstanding multiplied by the share price; *Q* represents Tobin's Q calculated as the sum of the market value of common shares, the book value of preferred shares, long term debt and current debt divided by total equity and liability; *INT* represents internal funds calculated as the sum of income before extraordinary items, research and development expense, and depreciation and amortization expenses; *S* represents total sales; *DD* represents an indicator variable that reflects the sticky cost behaviour for the intentional reduction in SG&A when the demand drops, which equals 1 when total sales decrease between t-1 and t, and zero otherwise; *ASales* represents the sales of long-lived assets; and *ISales* represents the sale of long-lived investment. To keep the relation between *GainA*, *ASales*, and *ISales* monotonic in equation (5.4), all their signs are made negative when *GainA* is negative according to Gunny (2010). All variables are scaled by average total assets (A_{avg}) of the beginning and ending asset balances to avoid any heteroschedasticity. A cross-sectional model is applied in the calculations for each year and each industry classified by its four-digit SIC code. The residuals ($\varepsilon_t^{R\&D}$, $\varepsilon_t^{SG\&A}$, ε_t^{Asset}, $\varepsilon_t^{Production}$) from the regressions represent the measures for the R&D, SG&A, fixed assets' sale, and production components of real earnings management (REM_{RD}, REM_{SGA}, REM_{Asale}, REM_{Prod}) respectively. However, the first and second residuals are multiplied by negative one so that cutting the discretionary expense reflects an increase in real earnings management. Finally, the four measures are decile ranked for better comparability and to avoid the effect of the outliers.

Using the sample of 66,695 observations identified above that includes all data required to calculate the four components of real earnings management, I follow Demerjian et al. (2013b) in performing a principal component analysis with varimax rotation to obtain an overall estimate for real earnings management. This step prevents

the inclusion of highly correlated variables in the measure.[12] As a result, I obtain two real earnings management factors according to the following equations:

$$REM_{SGA\_Prod} = (0.22REM_{RD}) + (0.64REM_{SGA}) + (0.22REM_{Asale}) + (0.64REM_{Prod}) \quad (5.6)$$

$$REM_{RD\_AssetSale} = (0.66REM_{RD}) + (0.25REM_{SGA}) + (-0.65REM_{Asale}) + (-0.25REM_{Prod}) \quad (5.7)$$

The first factor represents discretionary reduction in SG&A expenses and overproduction to cut prices or to decrease the cost of goods sold. The second factor reflects the discretionary reduction in R&D expense and the sale of fixed assets to report gains. As the first factor explains most of the variance in the dataset, it is used for the discussion of real earnings management (*RealEM*) results in this thesis.[13]

In addition to using the Gunny's Model (2010) as the main proxy for real earnings management, the Roychowdhury's Model (2006) is used as a corroborating measure for real earnings management (Cohen et al., 2008).[14] Again, a cross sectional model is used in the calculation of this measure for each industry-year group with at least 6 observations and the decile ranks are taken for better comparability and to mitigate for the outliers' impact. The measurement of the Roychowdhury's Model has been already explained in detail in section 2.5.1.

5.5 Methodology

To solve the models introduced in the empirical chapters of this thesis, the Ordinary Least Squares (OLS) estimator is not used because the models suffer from unobservable individual heterogeneity (Pindado and Requejo, 2014). This heterogeneity is attributed to time-invariant firm and/or managerial effects (Graham et al., 2012; Demerjian et al., 2013b). The selection of managers by the boards of directors in line with their firms'

[12] The principal component analysis step turns the set of correlated variables to be linearly uncorrelated according to the weights of their variances, thus reducing the number of variables to their principal components.

[13] The same inferences are obtained using the two factors in this thesis.

[14] The calculations and results of the Roychowdhury's Model are presented in the appendices of this thesis. The inferences are the same as those made from the Gunny's Model.

strategies or corporate cultures results in managers with specific abilities to end up in firms with specific earnings' qualities. Similarly, hiring managers with specific inborn capabilities, personalities, or tendencies to take risk leads managers with certain skills to arrive at firms with specific earnings' qualities. Consequently, the samples are expected to be heterogeneous, as some companies are more predisposed to earnings management than others because of their own specificities. The models introduced later in the empirical chapters can be expressed in general terms according to the following equation for the *ith* observation at time *t*:

$$Y_{it} = \propto_0 + \propto_1 X_{i,t} + \propto_2 Y_{i,t-1} + \varepsilon_{it} \qquad 5.8$$

Whrere, (Y_{it}) is the dependent variable, (X_{it}) is the explanatory variables, and (ε_{it}) is an error term. However, to avoid bias in the error term (ε_{it}) it is split it into three components. First, I introduce (η_i) to control for the impact of the unobserved effects in any model.[15] Second, I add a time specific effect (d_t) to control for the macroeconomic variables that may interfere with the results over the period of the study. Finally, I consider the remaining part of the error term (ε_{it}) to be a random disturbance (v_{it}).

$$Y_{it} = \propto_0 + \propto_1 X_{i,t} + \propto_2 Y_{i,t-1} + \eta_i + d_t + v_{it} \qquad 5.9$$

The correlation between the unobservable heterogeneity (η_i) and the explanatory variable (X_{it}) violates one of the key assumptions of OLS [$E(\varepsilon_{it} X_{it}) = 0$]. As a result, I replace the OLS estimator with a static fixed effects model that takes the impact of the unobservable heterogeneity into consideration by demeaning the variables in the equation.

The empirical model, however, suffers from endogeneity problem because of the mutual causality and/or simultaneity between the explanatory variable and the dependent variable. In addition, some variables might be omitted, and measurement errors could be expected in the proxies of the different variables. The three factors result in correlation between the explanatory variable (X_{it}) and the error term (ε_{it}) expressed as [$E(\varepsilon_{it} X_{it}) \neq 0$]. Therefore, the endogeneity problem leads to violating the OLS assumption mentioned above.

The static fixed effects model disregards the endogeneity problem. It assumes strict exogeneity [$E(\varepsilon_{it} X_{it}) = 0$] where the error term is always uncorrelated with the

[15] η_i controls for both firm specific effects and manager specific effects.

explanatory variables. This assumption never occurs in the micro/macroeconomic field. Therefore the within groups estimator (WG) is also invalid and gives a biased estimation in dynamic models (Nickell, 1981). The common use of the fixed effects estimator by researchers in earnings management literature is an outcome of ignoring its dynamic behaviour. Passing over this problem results in another source of endogeneity and ultimately biased inferences (Wintoki et al., 2012).

To deal with the previous problem, I treat the explanatory variable as a predetermined variable that, over different periods (s), is influenced by present and past, but not future, economic shocks [$E(\varepsilon_{it} X_{it}) = 0$, for all $s \geq t$]. I then introduce an instrumental variable (IV_{it}) to solve for the endogeneity in the conditional expectation function [$E\left(Y_{it} - \alpha_0 - \alpha_1 X_{i,t} - \alpha_2 Y_{i,t-1} \middle/ IV_{it}\right) = 0$] (Pindado and Requejo, 2014). Using one instrument, however, is inefficient because it makes the model less informative. Therefore, I use a generalized method of moments (GMM) estimator that uses more than one instrument for each variable.

When selecting an instrument (IV_{it}), it is essential that it satisfies two conditions. First, it has to be highly correlated with the instrumented variable, so that it explains it. Second, it has to be uncorrelated with the error term [$E(\varepsilon_{it} IV_{it}) = 0$] (Pindado and Requejo, 2014). Because it is difficult to obtain external instruments that satisfy the two previous conditions, I use internal instruments in the form of lagged values of the instrumented variables (the right-hand side variables of the model). Such instruments obviously satisfy the first condition. Besides, current shocks in performance have no effect on historical characteristics; hence the instruments are uncorrelated with the error term and ultimately satisfy the second condition.

Although the first differenced GMM estimator uses all available instruments, it incorporates weak ones because they are inadequately correlated with the differenced predetermined variables (Alonso-Borrego and Arellano, 1999). In this situation, the autoregressive parameter (α_2) approaches unity and the relative variance of fixed effects (σ_η^2/σ_v^2) becomes high. Therefore, although no correlation exists between the instruments and the error term, this estimator does not properly explain the model. Consequently, I use a system GMM estimator that uses level equations in addition to difference equations (Blundell and Bond, 1998). System GMM solves for errors in

levels; thus adds more instruments to the linear dynamic model and makes it more efficient and informative (Pindado and Requejo, 2014).

The equation in levels of the system GMM estimator, however, may still include unobserved heterogeneity. To solve this problem, I presume that the correlation between the variables to be instrumented and the unobserved individual effects (η_i) is constant over time (Pindado and Requejo, 2014). By applying the assumption on the explanatory variable, I find that the increments in (X) are uncorrelated with the unobserved heterogeneity [$E(\Delta X_{i,t-1}\ \eta_i)=0$]. In this way, I transform the instruments to be exogenous to η_i. Therefore, in addition to using the moment conditions of the first difference equations [$E(\Delta v_{it}\ X_{i,t-s})=0$], I invest the previously explained lack of correlation in the level equations of the system GMM estimator according to Blundell and Bond (1998) as:

$$E(\Delta X_{i,t-1}\ \varepsilon_{it})=E(\Delta X_{i,t-1}\ \eta_i)+E(\Delta X_{i,t-1} v_{it})-E(\Delta X_{i,t-2}\ v_{it})=0+0-0=0 \quad 5.10$$

To justify the stationarity assumption, the unobservable individual effects identified earlier in the model have to be considered. The impacts of self-selection, corporate culture, inborn capabilities, personality, and the tendency to take risk are all constant over time. In addition, the change in the explanatory variable over time ($\Delta X_{i,t-1}$) does not depend on those unobserved factors, e.g., managerial ability is the aptitude to generate revenues from firm resources and thus depends on factors like the amount of experience and training managers receive. Therefore, I expect the correlation of the unobservable effects with the explanatory variable to remain constant over time. The same logic is applied to the remaining instrumented variables.

Nevertheless, because the thesis is covering a relatively long time period, remote lags are weak instruments. They are not highly correlated with the current values of the instrumented variables. The poor correlation violates the first condition of IV_{it} mentioned above. To avoid the decrease in statistical efficiency due to the high number of instruments, I reduce the width of the instruments matrix. Therefore, I choose the closest instruments (Pindado and Requejo, 2014), which include the first to third lagged values in the difference equations and only one lag in the level equations (Hillier et al., 2011).

Finally, I present the system GMM results compared to those obtained using the OLS and the within-groups estimators for two of the basic models in the thesis. Panel A

in Table 5.2 shows the results from examining the impact of managerial ability on management compensation that is examined in detail in Chapter 6 (see Table 6.5), while Panel B in the same table presents the effect of managerial ability on accrual earnings management discussed further in Chapter 8 (see Appendix C Table V). In line with the previous studies, the results show that the coefficients estimated by the OLS estimator are biased upwards while those estimated by the within-groups estimator are biased downwards (Hillier et al., 2011; Nickell, 1981). The system GMM estimator provides lowest error and highest significance compared to the other estimators as it solves for the problems of heterogeneity and endogeneity in these models as explained above.

Table 5.2 The selection of estimator

Panel A: The effect of managerial ability on management compensation

Variable	Ordinary least squares estimator	Within-groups estimator	System generalized method of moments estimator
$MgrlAbility_{it}$	0.085***	0.013	0.076***
	(0.0166)	(0.012)	(0.001)
z_1	598.723	2.854	10,640.780
m_1			-1.490
m_2			-1.520
Hansen			482.630

Panel B: The effect of managerial ability on accrual earnings management

Variable	Ordinary least squares estimator	Within-groups estimator	System generalized method of moments estimator
$MgrlAbility_{it}$	0.988***	0.650**	0.973***
	(0.055)	(0.035)	(0.004)
z_1	144.293	4.634	627.450
m_1			-17.950
m_2			-0.760
Hansen			1,512.910

Notes: This table presents the key parameter estimates for two basic models examined in the thesis later. Panel A presents the effect of managerial ability on management compensation examined in Chapter 6 (see Table 6.5) and Panel B presents the effect of managerial ability on accrual earnings management examined in Chapter 8 (see Appendix C Table V). The most common estimators are used to solve the models in the following order: (1) ordinary least squares, (2) within-groups and (3) system generalized of moments estimators. Each coefficient represents the change in the dependent variable based on a one unit change in the determinant. Variables are defined in the (Variable Definitions) sections in Chapter 6 and 8. Standard errors are displayed in parentheses. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

5.6 Conclusions

This chapter has explained the sample construction, data sources, the models used in estimating accrual and real earnings management, and the panel data methodology used in solving the empirical models of the thesis. Three different samples have been selected and different databases have been used for the three empirical chapters because of the different data requirements of each chapter.

For measuring accrual earnings management, I select Stubben's Model because it emphasizes the receivable accruals that are closely related to discretionary revenues, in addition to the Modified Jones Model which shows strong power in explaining total accruals (Dechow et al., 1995). For measuring real earnings management, I use the Gunny's Model and the Roychowdhury's Model because they measure different aspects of this activity.

Finally, to solve the empirical models of this thesis, panel data methodology is implemented using a system Generalized Methods of Moments (GMM) estimator that solves for the problems of unobservable individual heterogeneity and endogeneity encountered by those models. In this sense, the pooled OLS estimator, the fixed effects estimator, and the differenced Generalized Methods of Moments (GMM) estimators have been ignored.

Data and research methods identified in this chapter will be used in the next three chapters i.e., Chapters 6, 7, and 8, that represent the empirical chapters of the thesis. Each of these chapters will examine a specific question about the variables identified earlier. As will be discussed soon, Chapter 6 examines the impact of earnings management behaviour on executive compensation taking into consideration the variation in managerial abilities of those executives.

Chapter 6
Management Compensation: The Impact of Earnings Management and Managerial Ability

6.1 Introduction

This chapter examines management compensation and managerial ability, which form part of the contractual motives of earnings management, to explain the previous finding in the literature of high quality managers using more accrual and less real earnings management (Demerjian et al., 2013b). Compared to accrual earnings management that only allows discretionary choices of accrual accounting, real earnings management involves undertaking actions that have economic consequences for the firm, such as cutting R&D expenditure, and thus may adversely affect its future performance. However, it is questionable whether accrual and real earnings management influence managers' welfare by tarnishing their reputations and future compensation or allowing them to achieve more benefits. Therefore, this chapter examines the impact of earnings management on management compensation conditioned on managerial abilities.

If managerial quality was to be viewed as homogenous, then managers may use earnings management to signal better performance as a result of information asymmetry and incomplete contracting between managers and shareholders (Strong and Walker, 1987; Carter et al., 2009). However, shareholders monitor managerial activities by evaluating the wealth consequences of managerial actions and pay incentives to reinforce those that are likely to improve firm value in the future (Adut et al., 2013). In this sense, firms are likely to reward or punish earnings management activities based on the pay-performance sensitivity (PPS) in their compensation contracts with management (Strong and Walker, 1987; Hart, 1995; Dutta and Fan, 2014).

Managerial ability is, however, heterogeneous and allowing it to vary adds considerable complexity to the situation. Superior managers, therefore, may manage earnings to draw attention to their own performance, and shareholders may adjust their rewards by reducing their compensation. However, the PPS in firm contracts with more

able managers is influenced by the higher costs of contracting that involve a lot more negotiation and rewriting, and the better skills of more able managers that result in a greater knowledge gap between shareholders and managers (Oberholzer-Gee and Wulf, 2012; Demerjian et al., 2013b). In support of this view, superior managers are likely to be aware of the consequences of their behaviour on their firms and personal benefits in the short- and long-run, and thus less monitoring might be required from shareholders to evaluate the performance of management (Oberholzer-Gee and Wulf, 2012; Walker, 2013). Therefore, it can be more difficult for shareholders to detect or completely understand the sophisticated behaviour of superior managers and they may be less likely to punish their value-reducing activities (Demerjian et al., 2013b).

Based on the documented individual effects of managerial ability and earnings management and the expectation that both influence firms' managerial compensation decisions, I examine how managerial ability influences the relation between earnings management and management compensation. I use total compensation that includes salaries, bonuses, option awards, stock awards, and long term incentive plans (LTIPs) (Adut et al., 2013). In measuring managerial ability, I follow the model developed by Demerjian et al. (2012) who define it as the leverage to generate revenues from firm resources. Finally, to measure earnings management I use both the Stubben (2010) and the Modified Jones (1995) models to measure accrual earnings management, and the Gunny (2010) and Roychowdhury (2006) models to measure real earnings management.

I contribute to the literature by documenting that firms punish their managers for real earnings management more than accrual earnings management. Furthermore, I find that firms respond more carefully when the compensation decision is related to top quality managers; and thus they punish/reward them less extremely than they do other managers. The results further explain those of Adut et al. (2013) by distinguishing between the effects of accrual and real earnings management on management compensation.

The remainder of this chapter proceeds as follows. In the next section, I review the related studies from the literature and build the hypotheses of the chapter. In section 6.3 I explain the process of data collection, variable definitions, and the descriptive statistics. In section 6.4 I explain the methodology used in this chapter. In section 6.5 I

present and explain the results. In section 6.6 I perform some additional analysis. Finally, in section 6.7 I conclude the chapter.

6.2 Literature and Hypotheses Development

The previous literature has documented that superior managers use more accrual and less real earnings management compared to other managers in the market (Demerjian et al., 2013b). To explain this behaviour, it is essential to understand how high quality managers trade-off between the benefits and costs of earnings management activities. In particular, I focus on management compensation which represents one of the major rents managers extract from their firms. To achieve the goal, I first examine how managerial ability and earnings management individually influence future management compensation. Then, I test the simultaneous effect of managerial ability and earnings management on future management compensation.

6.2.1 Managerial Ability and Management Compensation

The principal-agent theory (Jensen and Meckling, 1976; Holmström and Milgrom, 1987) assumes that there are two parties (shareholders and managers) who attempt to maximize their expected payoffs (Stathopoulos et al., 2007). The separation of ownership and control between these parties leads to specialized risk bearing and specialized decision skills in the organization. While shareholders are assumed to carry the risk, managers are expected to possess the decision making capabilities regardless of their personal wealth (Strong and Walker, 1987).

The conflict in interests between the risk bearing shareholders and the decision making managers raises uncertainty due to the information asymmetry and potential moral hazard between the two parties. Therefore, an optimal structure of contracts is required that links managerial compensation to firm earnings in an optimal pay-performance structure (PPS) and hence motivates managers to exert effort and enhance earnings (Strong and Walker, 1987; Hart, 1995; Dutta and Fan, 2014). Furthermore, because of the strong relation between PPS and firm risk, an efficient contract ideally combines incentives and risk sharing (Stathopoulos et al., 2007). As a result, it helps in

resolving the previous conflict by minimizing the monitoring costs incurred by the principals and the bonding costs incurred by the agents (Jensen and Meckling, 1976; Harris and Raviv, 1979; Bergstresser and Philippon, 2006).

Managerial ability is likely to influence the PPS as able managers possess the skills to improve firm performance (Strong and Walker, 1987). In essence, shareholders tend to offer greater incentives to managers with better abilities to compensate them for their superior efforts and minimize the information gap - especially under high levels of uncertainty (Hart, 1995; Stathopoulos et al., 2007; Baranchuk et al., 2011). While the optimal incentive scheme allows the trade-off between optimal incentives and optimal risk sharing, it enables the firm to attract new superior managers and prevents the mobility of the current ones to competing firms - thus avoiding productivity crises (Eaton and Rosen, 1983; Hart, 1995; Hayes and Schaefer, 1999).

As high quality managers are able to implement more discretion in their decisions, there is higher uncertainty about the outcomes of such decisions in the short-run (Eaton and Rosen, 1983). Therefore, the current firm performance measures will be associated with more noise; and hence management compensation is likely to be determined by future results (Lambert and Larcker, 1987). In a multi period agency model, a firm can assess the labour marginal product in the long-run and thus reveal more information about the quality of managerial performance (Hayes and Schaefer, 1999). Consequently, I expect more able managers to be associated with higher compensation in the long-run and, therefore, I develop the following hypothesis.

H1: Managerial ability has a positive effect on future management compensation.

6.2.2 Earnings Management and Management Compensation

Prior research has focused on management compensation, particularly performance-based payments in the form of bonuses, stock grants, and stock options, as an incentive for earnings management behaviour (Healy, 1985; Gao and Shrieves, 2002; Cheng and Warfield, 2005; Graham et al., 2005; Bergstresser and Philippon, 2006; Burns and Kedia, 2006; Cohen et al., 2008; Carter et al., 2009; Feng et al., 2011; Oberholzer-Gee and Wulf, 2012). As compensation relies on reported earnings, managers attempt to

reflect better performance and meet earnings' targets to extract more benefits. Goldman and Slezak (2006) document that managers are inclined to manage earnings upwards in the periods when they are expecting low rewards from their firms. In this sense, the association between earnings management and executive compensation in firms with low-compensation schemes implies a lack of efficiency in contracting (Sun, 2014). Dutta and Fan (2014) examine the same behaviour over a two-year period and document that managers shift earnings from periods with low pay-performance sensitivity to periods with high pay-performance sensitivity. Managers' opportunistic behaviour is supported by their limited liabilities, intentions to sell their stocks and options in the short-run, and their ability to influence the compensation decision that is made by the board of directors and not directly by the shareholders of the firm (Ronen and Yaari, 2008).

In contrast, some studies consider compensation as a governance mechanism that mitigates managerial discretion over financial reporting, especially under the long-term compensation plans where managers aim to reduce analysts' future expectations or decrease the exercise price of their option rewards (Richardson and Waegelein, 2002; O'Connell, 2004; Bauman et al., 2005; Coles et al., 2006; Carter et al., 2009). Therefore, while a compensation contract may fail to improve a firm's intrinsic value and eliminate earnings management when viewed as an incentive, it may be considered as a device that mitigates the conflict of interests between managers and shareholders when viewed as a governance mechanism according to the positive accounting theory (Sun, 2012; Dutta and Fan, 2014).

However, the empirical literature that examines the effect of earnings management on compensation has basically focused on the impact during the same period and documented a negative relation. Adut et al. (2013) point out that bad earnings quality, measured as the poor accruals mapping into cash flows, is associated with lower management compensation as firms tend to punish managers for providing less informative earnings. In other words, firms only offer compensation to managers when the net present value (NPV) of the additional incentive is positive i.e. the expected marginal outcome is more than the compensation paid; which is likely to occur when earnings quality is high. In essence, the better the earnings quality, the higher the tendency of firms to rely on earnings in determining management compensation (Peng,

2011). However, Adut et al. (2013) focus on the mapping of discretionary accruals into future cash flows according to the Dechow and Dichev (2002) model; which creates a link between accrual and real earnings management but does not distinguish between the individual effects of each activity per se.

Theoretically, the study of Sun (2014) develops a model to study the relation between earnings management and executive compensation. The pay-performance sensitivity increases when managers have more opportunities to manage earnings and shareholders are less likely to detect earnings management. Put differently, the additional incentives are required to eliminate the desire of management to manipulate earnings; and thus the positive association between earnings management and executive compensation reflects optimal contracting. As compensation incentives motivate managerial effort as well as the desire to manipulate earnings, managers are always expected to manage earnings as part of their optimal contracts with their firms. In a similar way, the study of Dutta and Fan (2014) develops a model to examine the effect of earnings management cost on managerial compensation through its impact on the pay-performance sensitivity. As the cost of earnings management decreases (e.g., due to the lack of effective governance mechanisms), managers are more inclined to use earnings management to extract rents and thus firms tend to pay lower compensation. In contrast, when the cost of earnings management increases (e.g., under strong governance mechanisms), managers are motivated to exert more effort which requires firms to pay higher compensation. Thus the study documents a positive relation between the cost of earnings management and managerial compensation.

Although earnings reflect the effort made by management during the current accounting period, such effort may influence firms' future cash flows (Basu, 1997; Barclay et al., 2005). Therefore, this chapter examines the effect of earnings management on future compensation to see whether shareholders reward or punish managers for this behaviour when detected. Because of the information asymmetry between insiders and outsiders, shareholders are imperfectly informed about firm performance. As shareholders might not distinguish the quality of earnings because of their bounded rationality, managers send signals in their reported earnings to improve the performance measures that are tied to their compensation plans (Strong and Walker, 1987; Carter et al., 2009). Earnings management assists in improving the security

market performance measures and hence results in better market valuation that allows managers to exercise larger amounts of their stock options and/or sell their stock compensation before the higher anomalous returns disappear (Bergstresser and Philippon, 2006). Furthermore, earnings management allows the improvement of some of the accounting measures that reflect a high quality of performance and allow managers to extract better salaries and bonuses (Lambert and Larcker, 1987; Strong and Walker, 1987).

On the other side of the agency problem, shareholders deal with the information asymmetry by screening the information provided by managers and sorting firms according to the quality of their earnings (Strong and Walker, 1987). Shareholders essentially take into account the consequences of the different earnings management activities before deciding on management compensation. As accrual earnings management unwinds in the next accounting period, it does not severely influence future cash flows and hence it would not cause harm to management compensation in the future as far as the net present value of the additional incentive is positive (Adut et al., 2013). In contrast, real earnings management is found to have severe negative consequences for subsequent operating and stock return performance (e.g., Cohen and Zarowin, 2010; Kothari et al., 2016) and thus is likely to have a negative effect on managers' future compensation. Accordingly, I develop the following two hypotheses.

H2a: Accrual earnings management has a positive effect on future management compensation;

H2b: Real earnings management has a negative effect on future management compensation.

6.2.3 Managerial Ability, Earnings Management, and Management Compensation

As shareholders might not be able to distinguish the quality of earnings because of their bounded rationalities, high quality managers are also motivated to use earnings management to signal a better performance quality. While shareholders still screen management signals based on the consequences of earnings management activities as mentioned above, they are more likely to detect earnings management when the

conditions of the revelation principle are satisfied. These conditions include the low contracting costs that allow for perfect contracts between shareholders and management, shareholders' rationalities that enable them to maximize their wealth, the presence of common knowledge that assists shareholders in understanding management behaviour, and the costless communication due to the absence of third parties that might interfere with the transfer of information to shareholders (Walker, 2013).

The high contracting costs between firms and superior managers that include the need to negotiate and rewrite the contracts may render their contracts inadequate to monitor performance. In addition, management activities are unlikely to be detected because of the knowledge gap between the highly able managers and less informed shareholders and the tendency of the shareholders to trust the decisions of superior managers who possess the skills to successfully manage their firms (Oberholzer-Gee and Wulf, 2012; Demerjian et al., 2013b). Consequently, I develop the following two hypotheses.

H3a: Higher managerial ability lessens the positive effect of accrual earnings management on future management compensation;

H3b: Higher managerial ability lessens the negative effect of real earnings management on future management compensation.

6.3 Data, Variable Definitions and Descriptive Statistics

6.3.1 Data

I include all firms in the United States from the Annual Compustat, Quarterly Compustat, Historical Segments Compustat, and IBES databases. I also make use of the dataset made available by Demerjian et al. (2012) for the managerial ability variable during the same time period. [16] For management compensation data, I use the Execucomp database which only provides data from 1992. Among the controls for corporate governance, I use the number of board meetings, which is only available until 2006. As a result, I only cover the period from 1992 to 2006 in the analysis. Finally, I

[16] Data are obtained from the following link:
https://community.bus.emory.edu/personal/PDEMERJ/Pages/Home.aspx.

exclude firm-years experiencing accounting changes, merger or acquisition activities, or discontinued operations.[17]

I start with all firms that have the required data for calculating the measures of earnings management, managerial ability, and management compensation. Following Cheng et al. (2011), I exclude regulated industries that contain banks, credit institutions, brokers, insurance, real estate, holding companies, and investment firms. These industries have their unique accounting and financial practices and are subject to distinct regulations. Therefore, managers in these industries have different motivations to manipulate earnings than those of managers in other industry sectors.[18]

Following the previous literature I exclude any group of firms with fewer than 6 observations for each SIC code to make sure that sufficient data exists to calculate earnings management measures and the Ordinary Least Square (OLS) assumption regarding the normality of the error term holds (e.g., Rosner, 2003; García Lara et al., 2005; Kothari et al., 2005; Iqbal et al., 2009; Athanasakou et al., 2011). For that purpose, I follow the SIC classification of Fama-French (1997). As the model is dynamic, I make sure that information is available for at least five consecutive years for each firm over the study period (Miguel et al., 2004). When combining between the cross-sectional and time-series dimensions of the data, I obtain total observations of 6,974 in an unbalanced panel dataset. I use an unbalanced panel to avoid survivorship bias.

6.3.2 Earnings Management Measures

Based on the discussion in Chapter 5, I use Stubben's Model (2010) for measuring accrual earnings management because it focuses on discretionary revenues which represent the largest component of earnings in most firms (Stubben, 2010). I also use Gunny's Model (2010) for real earnings management because it covers more types of this activity compared to other models (Gunny, 2010). In addition, I use two other widespread models as corroborating measures that include the Modified Jones' Model (1995) for measuring accrual earnings management and Roychowdhury's Model (2006)

[17] According to McNichols (2002), I specifically exclude firm quarters or years with non-blank values for accounting changes cumulative effects (ACCCHGQ_FN), or merger and acquisition activities (ACQMETH_FN), or discontinued operations (DOQ_FN) in the Compustat database.
[18] I exclude firms with the following SIC codes: $4000 \leq SIC \geq 4900$ and $6000 \leq SIC \geq 6300$.

for measuring real earnings management. Again, for each of these measures I use a cross sectional model in the calculations for each year and each industry classified by its four-digit SIC code with at least 6 observations. I also take the decile ranks for better comparability and to avoid the effect of the outliers. For the purpose of calculating an overall measure of real earnings management using Gunny's Model (2010) and Roychowdhury's Model (2006), a principal component analysis with varimax rotation is performed to avoid the inclusion of highly correlated variables in the overall measure (Demerjian et al., 2013b).[19]

6.3.3 Managerial Ability Measure

To calculate the managerial ability variable, I adopt the approach of Demerjian et al. (2012) as discussed in section 4.3.3. The measure represents managerial potential of generating revenues from the available firm resources. It uses Data Envelopment Analysis (DEA) to calculate firm efficiency then excludes some firm specific characteristics that may influence the performance of managers. The remaining residual (ε_i) is the ultimate measure of managerial ability (*MgrlAbility*). Finally, I take the decile ranks of these measures by industry-year to obtain better comparability and to avoid the effects of outliers.

6.3.4 Compensation Variables

I specifically focus on management benefits in the future because earnings management, and particularly real activities, have a long-term influence on firm performance and the consequences of the sophisticated decisions of high quality managers are more likely to be detected and understood over time. As I aim to examine future compensation as an outcome of the current earnings management behaviour, I emphasize total management benefits as the main measure of compensation. Although the type of compensation may influence earnings management behaviour when compensation is regarded as an incentive (Oberholzer-Gee and Wulf, 2012), I do not expect it to make any significant

[19] The principal component analysis step turns the set of correlated variables to be linearly uncorrelated according to the weights of their variances, thus reducing the number of variables to their principal components.

difference when compensation is viewed as an outcome of the manipulation. I take the natural logarithm of the average over the next three years for the measure of management compensation I have identified (Adut et al., 2013).

I include all the executives' team of each firm in the measurement of compensation variables including the Chief Executive Officer (CEO) and the Chief Financial Officer (CFO) because those senior officers make the firms' major operating, financing, and investment decisions and are responsible for financial reporting under the approval of the board of directors. Therefore, they possess enough knowledge that can be used to achieve compensation benefits via earnings management (Ronen and Yaari, 2008). This point of view is based on studies that have attempted to distinguish between the individual members of the management team and provided evidence that both of the Chief Executive Officer (CEO) and the Chief Financial Officer (CFO) manage earnings in order to meet earnings benchmarks (Dechow and Sloan, 1991; Cheng and Warfield, 2005; Jiang et al., 2011).

6.3.5 Control Variables

In the control variables I include some firm characteristics like firm size (*TotalAssets*), sales volatility (*SalesVolatility*), cash flow volatility (*CashFlowVolatility*), operating cycle (*OperCycle*), and loss history (*Losses*) (Dechow and Dichev, 2002; Adut et al., 2013). I use a national auditor indicator (*NationalAuditor*) to control for an auditor effect (Becker et al., 1998), and another indicator variable to control for litigious industries (*LitigationInd)* (Francis et al., 1994). I add the market to book ratio (*MB*) and the one year sales growth (*SalesGrowth*) (Hribar and Nichols, 2007). I also control for analysts' coverage (*NumAnalyst*), industry revenue leadership (*IndRev%*), and returns momentum (*Momentum*) (Dechow et al., 2011; Zang, 2012). I use the number of segments (*Segments*) and the frequency of foreign transactions (*Foreign*) to control for the complexity of businesses (Karuna et al., 2012). Finally, I use a dummy for executives who serve as directors (*ExecDir*), the executive tenure (*Tenure*), and the number of board meeting (*BoardMtgs*) to control for the impact of corporate governance (Adut et al., 2013). I present the detailed calculations for each of the previous variables in Table 6.1.

Table 6.1 Calculation of all variables

Variable	Calculation
AccrualEM	The residual form using Stubben's Model (2010) as explained in the '*Variable Definitions*' section above.
RealEM	The first component generated by using Gunny's Model (2010) that represents the discretionary reduction in SG&A expenses and the overproduction to cut prices or to decrease the cost of goods sold as explained in the '*Variable Definitions*' section above.
MgrlAbility	The potential of generating revenues from firm resources measured by the model of Demerjian et al. (2012) as explained in the '*Variable Definitions*' section above.
TotalCompensation	The natural log of the sum of salaries, bonuses, option awards, stock awards, and long term incentive plans (LTIPs) averaged over the next three years as explained in the '*Variable Definitions*' section above.
FirmSize	The natural log of the firm's assets as of the end of year *t*.
SalesVolatility	The standard deviation of (sales / average assets) over at least three of the last five years (*t*–4, *t*).
CashFlowVolatility	The standard deviation of (cash from operations / average assets) over at least three of the last five years (*t*–4, *t*).
OperCycle	The operating cycle is the natural log of average sales turnover plus days in inventory over at least three of the last five years (*t*–4, *t*).
Losses	Loss history is the percentage of years reporting losses in net income before extraordinary items over at least three of the last five years (*t*–4, *t*).
NationalAuditor	An indicator variable equals one for firms audited by national audit firms in year *t*; zero otherwise.
LitigationInd	Litigious industry indicator that equals one for firms in industries with SIC Codes: 2833-2836 (biotechnology), 3570-3577 and 7370-7374 (computers), 3600-3674 (electronics), and 52(X)-5961 (retailing).
MB	The market to book ratio that equals the firm's market capitalization divided by book value for year t.
SalesGrowth	Current year's sales less prior year's sales less the increase in receivables all scaled by prior year's sales and decile ranked by industry and year.
NumAnalyst	The log of 1+ the number of analysts covering the firm in year t.
IndRev%	Industry revenue leadership measured by the firm's sales in year t-1 divided by the total sales for the firm's industry in year t-1.
Momentum	Returns momentum calculated by the decile rank (by industry and year) of asset returns during the two years preceding the start of year t.
Segments	The natural log of 1+ the number of firm's business segments in year t.
Foreign	The frequency with which the firm has a non-zero foreign currency transactions during the sample period.
ExecDir	A dummy variable that equals 1 if the executive served as director during the year.
Tenure	The log of the executive tenure measured in days.
BoardMtgs	The number of board meetings held during the year.

Notes: This table presents the detailed calculations for each of the variables identified in the model as discussed in the (*Variable Definitions*) section above.

Larger firms have huge and more diversified operations and thus are likely to pay higher compensation to keep managers motivated to successfully manage the massive business (Dechow and Dichev, 2002; Adut et al., 2013; Demerjian et al., 2013a, 2013b). Although sales volatility, cash flow volatility, and the operating cycle reflect higher uncertainty in operations which is expected to negatively influence management compensation, it may result in higher payments especially in optimistic firms or those that aim to motivate managers to improve their business stability (Dechow and Dichev, 2002). Prior losses are likely to result in a lower compensation to management because of the lack of resources to make such payments, but they may also drive firms to pay more rewards so that managers are motivated to improve firm performance to meet investors' expectations (Dechow and Dichev, 2002).

Firms audited by national auditors are expected to pay lower compensation compared to those audited by international audit firms (Becker et al., 1998). I also expect firms in litigious industries to pay less compensation than those in other industry sectors to avoid any subsequent punishments (Francis et al., 1994). Market to book ratio, sales growth, and returns momentum reflect the growth prospects of a firm and hence may lead to a higher management compensation. Meanwhile, the high growth might reduce the need to make high payments to management (Hribar and Nichols, 2007; Dechow et al., 2011).

The presence of more analysts suggests higher management compensation to keep the motivation of meeting the analysts' expectations. I also expect industry leaders to make higher payments to their managers to be able to stay in their leadership positions. The number of segments and the foreign currency transactions reflect the complexity of the business and imply higher payments to compensate management for the greater efforts (Karuna et al., 2012). Finally, I introduce a dummy for executives who serve as directors, executive tenure, and the number of board meetings as controls for corporate governance. I expect these governance factors to significantly influence management compensation based on management performance (Adut et al., 2013). I summarize the expected and actual signs of all control variables in Table 6.2.

Table 6.2 Expected and actual signs of the control variables

Variables	*Compensation*	
	Predicted sign	Actual sign
FirmSize	+	+
SalesVolatility	+/-	-
CashFlowVolatility	+/-	+
OperCycle	+/-	+
Losses	+/-	+/-
NationalAuditor	-	-
LitigationInd	-	-
MB	+/-	+/-
SalesGrowth	+/-	+
LnNumAnalyst	+	+
IndRev%	+	+
Momentum	+/-	+
Segments	+	+
Foreign	+	+
$ExecDir_{it}$	+/-	+
$Tenure_{it}$	+/-	-
$BoardMtgs_{it}$	+/-	+/-

Notes: This table presents the signs expected and actually obtained for the effect of the control variables identified in the models and discussed in the (*Variable Definitions*) section above on management compensation.

6.3.6 Descriptive Statistics

I present the descriptive statistics in Table 6.3. Accrual earnings management, real earnings management, and managerial ability have means of zero. This is because they are calculated as the residuals from the selected models above. The measures of compensation are comparable to those of Adut et al. (2013). However, the differences are due to presenting the untransformed variables in the descriptive statistics. Similarly, the managerial ability measure is in line with that calculated by Demerjian et al. (2013b). The high standard deviations associated with the compensation measures, firm size, and tenure are due to presenting the untransformed variables.

Table 6.3 Descriptive statistics

Variables	Mean	Median	Std Dev	P25	P75
AccrualEM	0.00	0.00	0.05	-0.01	0.01
RealEM	0.00	-0.00	1.00	-0.72	0.70
MgrlAbility	-0.00	-0.01	0.15	-0.09	0.07
TotalCompensation	654.53	493.62	682.93	343.73	731.95
Salary	388.02	348.20	203.08	254.90	475.96
Bonus	266.48	122.21	591.56	32.60	289.36
OptionAwards	483.67	222.68	997.01	24.63	595.90
StockAwards	825.78	462.61	1,295.90	151.55	1,067.88
LTIP	69.07	0.00	261.87	0.00	0.00
TotalAssets	2,835.91	719.07	9,333.30	275.55	2,054.50
SalesVolatility	0.22	0.14	0.31	0.08	0.25
CashFlowVolatility	0.07	0.05	0.15	0.03	0.09
OperCycle	127.19	117.05	69.68	80.58	163.04
Losses	0.17	0.00	0.26	0.00	0.25
NationalAuditor	0.03	0.00	0.16	0.00	0.00
LitigationInd	0.14	2.69	0.34	0.00	0.00
MB	3.94	0.10	14.22	1.69	4.44
SalesGrowth	0.24	4.00	4.06	0.02	0.22
NumAnalyst	3.76	0.04	1.66	3.00	5.00
IndRev%	0.12	0.14	0.18	0.01	0.15
Momentum	0.10	1.00	0.32	0.05	0.22
Segments	2.18	0.00	1.77	1.00	3.00
Foreign	0.25	481.33	0.35	0.00	0.44
ExecDir	0.95	1.00	0.20	1.00	1.00
Tenure	2,833.87	2,010.00	2,684.47	974.00	3,744.00
BoardMtgs	7.32	7.00	3.28	5.00	9.00

Notes: The table presents the descriptive statistics of all the variables identified in the model for 6,974 firm-year observations obtained from Compustat from 1992 to 2006. Variables are defined in the (*Variable Definitions*) section above. I present the untransformed variables for ease of interpretation.

Table 6.4 represents the correlation matrix between the main variables in this chapter: earnings management, managerial ability, and compensation. The correlations between the control variables have not been displayed here for easier demonstration. To control for the multicollinearity between the different variables, however, I make sure that all Variance Inflation Factors (VIF) are less than 10. Managerial ability is positively correlated with accrual earnings management and negatively correlated with real

Table 6.4 Correlation table

	Accrual EM	*Real EM*	*Mgrl Ability*	*Total Compensation*	*Salary*	*Bonus*	*Option Awards*	*Stock Awards*	*LTIP*
Accrual EM									
Real EM	0.00								
Mgrl Ability	0.05***	-0.05***							
Total Compensation	-0.01	-0.01*	0.08***						
Salary	-0.00	0.01**	0.04***	0.56***					
Bonus	-0.01	-0.02***	0.07***	0.95***	0.31***				
Option Awards	0.01	-0.01	0.05***	0.23***	0.31***	0.13***			
Stock Awards	0.00	-0.02	0.00	0.35***	0.44***	0.21***	0.16***		
LTIP	0.00	-0.01	0.00	0.25***	0.31***	0.20***	0.00	0.00	

Notes: This table presents the correlation matrix for 6,974 firm-year observations obtained from Compustat from 1992 to 2006 between the measures of accrual earnings management measured by Stubben's Model (2010), real earnings management measured by Gunny's Model (2010), managerial ability measured by the model of Demerjian et al. (2012), and total management compensation and its individual components that include salaries, bonuses, option awards, stock awards, and long term incentive plans (LTIPs) averaged over the next three years. Variables are defined in the (*Variable Definitions*) section above. Pearson correlation coefficients are presented. To control for the multicollinearity between the different variables I make sure that all VIF factors are less than 10. VIF factors, however, are not tabulated. *, **, *** denotes a statistical coefficient at the 10, 5 and 1 percent alpha level, respectively.

earnings management; which suggests that high quality managers are more inclined to use accrual rather than real earnings management. Managerial ability is also positively correlated with all compensation measures; which implies that more able managers receive higher compensation. The significant correlations between earnings management and compensation measures show mainly a negative correlation between real earnings management and total management compensation; which suggests that firms are inclined to punish this kind of behaviour but not accrual earnings management.

6.4 Methodology

To test the first hypothesis (*H1*), I derive a model that identifies management compensation as the dependent variable ($Y_{i,t+1,t+3}$). I introduce managerial ability ($MgrlAbility_{it}$) as an explanatory variable (X_{it}). [20] To complete the model, I add the previously identified control variables ($Controls_{it}$) and an error term (ε_{it}).

The model suffers from the problem of unobservable individual heterogeneity attributed to time-invariant firm and/or managerial effects. For example, the selection of managers by the boards of directors in line with their firms' strategies or corporate cultures results in managers with specific abilities to end up in firms with specific compensation schemes. Similarly, hiring managers with specific inborn capabilities, personalities, or tendencies to take risk leads managers with certain skills to arrive at firms with specific compensation schemes. Consequently, the sample is expected to be heterogeneous, as some companies would pay higher compensations to their managers than others because of the previous specificities (Graham et al., 2012; Demerjian et al., 2013b).

In addition, the model suffers from an endogeneity problem because of the mutual causality between managerial ability and compensation. While more able managers are expected to be rewarded as they contribute to better performance over time, they are attracted to stay or join firms that are expected to pay higher compensation. This effect would be captured in the error term and ultimately results in a

[20] $MgrlAbilityDum_{it}$ is a dummy variable that equals 1 if the ability of a manager in an industry is high (greater than the median) and zero otherwise.

correlation between the explanatory variable and the error term (Pindado and Requejo, 2014).

Therefore, the OLS estimator will not be able to solve the model as it ignores the impact of the unobservable individual heterogeneity or endogeneity problems. Furthermore, while the fixed effects estimator tackles the unobservable heterogeneity by demeaning the variables in the model it does not solve for the endogeneity problem as it assumes strict exogeneity. Therefore, I solve the model using a system generalized method of moments (GMM) estimator that demeans the variables in the model to solve for the heterogeneity and introduces instrumental variables to solve for the endogeneity problem as explained earlier in the methodology section of Chapter 5.[21]

As a result, I split the error term (ε_{it}) it into three components to avoid the consequent bias. First, I introduce (η_i) to control for the impact of the unobserved effects in the model.[22] Second, I add a time specific effect (d_t) to control for the macroeconomic variables that also interfere with the results over the time period of the study.[23] Finally, I consider the remaining part of the error term (ε_{it}) a random disturbance (v_{it}). Consequently, I express the model in general terms in equation (6.1) and in more specific terms in equation (6. 2).

$$Y_{i,t+1,t+3} = \propto_0 + \propto_1 X_{it} + \propto_{2\text{-}18} Controls_{it} + \varepsilon_{it} \tag{6.1}$$

$$\begin{aligned} Compensation_{i,t+1,t+3} = {} & \propto_0 + \propto_1 MgrlAbility_{it} + \propto_2 FirmSize_{it} + \propto_3 SalesVolatility_{i,t} \\ & + \propto_4 CashFlowVolatility_{i,t\text{-}4,t} + \propto_5 OperCycle_{i,t\text{-}4,t} \\ & + \propto_6 Losses_{i,t\text{-}4,t} + \propto_7 NationalAuditor_{it} \\ & + \propto_8 SalesGrowth_{rk_{it}} + \propto_9 MB_{it} + \propto_{10} LitigationInd_{it} \\ & + \propto_{11} LnNumAnalyst_{it} + \propto_{12} IndRev\% + \propto_{13} Momentum_{it} \\ & + \propto_{14} Segments_{it} + \propto_{15} Foreign_{it} + \propto_{16} ExecDir_{it} \\ & + \propto_{17} Tenure_{it} + \propto_{18} BoardMtgs_{it} + \eta_i + d_t + v_{it} \end{aligned} \tag{6.2}$$

To test the second hypothesis (*H2*), I again derive a model that identifies management compensation as the dependent variable ($Y_{i,t+1,t+3}$). I introduce earnings management

[21] Solving for these two problems using a system GMM estimator allows us to obtain less biased and more significant results compared to the previous studies.

[22] η_i controls for both firm specific effects and manager specific effects.

[23] I do not tabulate the coefficients of time periods later in the results.

($EarningsManagement_{it}$) as an explanatory variable (Z_{it}). To complete the model, I add the previously identified control variables ($Controls_{it}$) and an error term (ε_{it}).

This model also suffers from the problem of unobservable individual heterogeneity attributed to time-invariant firm effects. The selection of earnings management activities in line with firms' strategies results in firms rewarding/punishing earnings management behaviour through specific compensation schemes in the future. Consequently, the sample is expected to be heterogeneous, as some companies are more likely to reward earnings management behaviour than others (Graham et al., 2012; Demerjian et al., 2013b).

In addition, the model suffers from an endogeneity problem because of the mutual causality between earnings management and future compensation. While earnings management behaviour would be reflected on firm performance in the future, it is likely to influence management compensation. On the other hand, the expected compensation would set the current motivation to manage earnings. This effect is captured in the error term and ultimately results in a correlation between the explanatory variable and the error term (Pindado and Requejo, 2014).

Because of the previously explained shortcomings of the OLS and the fixed effects regressions, I solve this model using a system generalized method of moments (GMM) estimator and split the error term (ε_{it}) into three components (η_i,d_t, and v_{it}). I express the model in general terms in equation (6.3) and in more specific terms in equation (6.4).

$$Y_{i,t+1,t+3} = \alpha_0 + \alpha_1 Z_{it} + \alpha_{2\text{-}18} Controls_{it} + \varepsilon_{it} \tag{6.3}$$

$$\begin{aligned} Compensation_{i,t+1,t+3} = {} & \alpha_0 + \alpha_1 EarningsManagement_{it} \\ & + \alpha_2 FirmSize_{it} + \alpha_3 SalesVolatility_{i,t-4,t} \\ & + \alpha_4 CashFlowVolatility_{i,t-4,t} + \alpha_5 OperCycle_{i,t-4,t} \\ & + \alpha_6 Losses_{i,t-4,t} + \alpha_7 NationalAuditor_{it} \\ & + \alpha_8 SalesGrowth_{rk_{it}} + \alpha_9 MB_{it} + \alpha_{10} LitigationInd_{it} \\ & + \alpha_{11} LnNumAnalyst_{it} + \alpha_{12} IndRev\% + \alpha_{13} Momentum_{it} \\ & + \alpha_{14} Segments_{it} + \alpha_{15} Foreign_{it} + \alpha_{16} ExecDir_{it} \\ & + \alpha_{17} Tenure_{it} + \alpha_{18} BoardMtgs_{it} + \eta_i + d_t + v_{it} \end{aligned} \tag{6.4}$$

Finally, to test the third hypotheses (*H3*), I again derive a model that identifies management compensation as the dependent variable ($Y_{i,t+1,t+3}$). I introduce managerial ability ($MgrlAbility_{it}$) and earnings management ($EarningsManagement_{it}$) as explanatory variables (X_{it} and Z_{it} respectively). I also add the interaction term of earnings management ($EarningsManagement_{it}$) and managerial ability $(MgrlAbility_{it})$.[24] To complete the model, I add the previously identified control variables ($Controls_{it}$) and an error term (ε_{it}). This model also suffers from the problems of unobservable individual heterogeneity and endogeneity as explained above (Pindado and Requejo, 2014), and, therefore, I solve it using a system generalized method of moments (GMM) estimator. However, I also present the results of the OLS regression as a robustness test in Appendix A Table II. I express the model in general terms in equation (6.5) and in more specific terms in equation (6.6).

$$Y_{i,t+1,t+3} = \propto_0 + \propto_1 Z_{it} + \propto_2 X_{it} + \beta_1 X_{it} Z_{it} + \propto_{3\text{-}19} Controls_{it} + \varepsilon_{it} \tag{6.5}$$

$$\begin{aligned} Compensation_{i,t+1,t+3} = {} & \propto_0 + \propto_1 EarningsManagement_{it} + \propto_2 MgrlAbility_{it} \\ & + \beta_1 MgrlAbility_{it} * EarningsManagement_{it} \\ & + \propto_3 FirmSize_{it} + \propto_4 SalesVolatility_{i,t\text{-}4,t} \\ & + \propto_5 CashFlowVolatility_{i,t\text{-}4,t} + \propto_6 OperCycle_{i,t\text{-}4,t} \\ & + \propto_7 Losses_{i,t\text{-}4,t} + \propto_8 NationalAuditor_{it} \\ & + \propto_9 SalesGrowth_{rk_{it}} + \propto_{10} MB_{it} + \propto_{11} LitigationInd_{it} \\ & + \propto_{12} LnNumAnalyst_{it} + \propto_{13} IndRev\% + \propto_{14} Momentum_{it} \\ & + \propto_{15} Segments_{it} + \propto_{16} Foreign_{it} + \propto_{17} ExecDir_{it} \\ & + \propto_{18} Tenure_{it} + \propto_{19} BoardMtgs_{it} + \eta_i + d_t + v_{it} \end{aligned} \tag{6.6}$$

After examining the individual effect of the moderating variable ($MgrlAbilityDum_{it}$) and the independent variable ($EarningsManagement_{it}$), I test for their combined influence. For this purpose, I use a linear restriction test (LRT) that examines the significance of ($\propto_1+\beta_1$). The results of this test are presented in Table 6.7 and show that the combined effect of managerial ability and earnings management is statistically significant.

[24] $MgrlAbilityDum_{it}$ is a dummy variable that equals 1 if the ability of a manager in an industry is high (greater than the median) and zero otherwise. Therefore, $\propto_1$ is the coefficient of ($EarningsManagement_{it}$) when managerial ability is low; ($\propto_1+\beta_1$) is the coefficient when managerial ability is high.

To ensure that the assumptions of the estimator hold and the model is valid, I initially test whether the GMM estimator properly addresses the problem of endogeneity. For this purpose, I use the Hansen test for over-identifying restrictions. It takes a χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The models use multiple lags of the right-hand side variables as instruments, which make them over-identified. Consequently, if I accept Hansen's null hypothesis that the instrumental variables (IV_{it}) and the error term (ε_{it}) are uncorrelated, I guarantee that the instruments are valid and that the estimator is appropriate. I present the results of Hansen test in tables 6.5, 6.6 and 6.7, which show that the instruments are valid.

Additionally, I implement Arellano and Bond (1991) to check for the validity of the model. It takes the shape of a normal distribution with N(0,1). It mainly examines the serial correlation in the first difference residual (v_{it}) over different periods (s) by using the (m_j) statistic [$E(v_{it}\ v_{is})=0$, while $t \neq s$]. I accept first order serial correlation in the model because the estimator takes the first difference to eliminate the individual specific effects (η_i). However, I reject second order serial correlation (m_2) in the residual because it indicates a problem in the model. I present the results of the AB test in tables 6.5, 6.6 and 6.7, which confirm that no second order serial correlations exist in the model.

Finally, I use the Wald test (z_1) to check for the joint significance of the reported coefficients in the model. If I reject the null hypothesis that states no relationship between the dependent and explanatory variables, I make sure that the model is jointly significant. I present the results of the Wald test in tables 6.5, 6.6 and 6.7. They all support the joint significance of the reported coefficients.

6.5 Results

6.5.1 Managerial Ability and Management Compensation

I start by examining the effect of managerial ability on future management compensation. The results appear in the first row of Table 6.5 and show a significant positive coefficient of managerial ability variable (+0.076***); which supports

hypothesis *H1* of this chapter. The result suggests that high quality managers receive higher compensation in the future.

Table 6.5 The effect of managerial ability on management compensation

Variables	Total management compensation
$MgrlAbility_{it}$	0.076***
$FirmSize_{it}$	0.073***
$SalesVolatility_{i,t-4,t}$	-0.026***
$CashFlowVolatility_{i,t-4,t}$	0.229***
$OperCycle_{i,t-4,t}$	0.005***
$Losses_{i,t-4,t}$	0.006***
$NationalAuditor_{it}$	-0.009**
$LitigationInd_{it}$	-0.025***
MB_{it}	-0.000***
$SalesGrowth_{rkit}$	0.011***
$LnNumAnalyst_{it}$	0.030***
IndRev%	0.111***
$Momentum_{it}$	0.057***
$Segments_{it}$	0.004***
$Foreign_{it}$	0.077***
$ExecDir_{it}$	0.069***
$Tenure_{it}$	-0.013***
$BoardMtgs_{it}$	-0.000
Hansen	482.630
m_1	-1.490
m_2	-1.520
z_1	10,640.780

Notes: This table presents the results from the system generalized method of moments regressions for the effect of managerial ability measured by the model of Demerjian et al. (2012) on total management compensation measured as the natural logarithm of the sum of salaries, bonuses, option awards, stock awards, and long term incentive plans (LTIPs) averaged over the next three years. The sample includes 6,974 firm-year observations obtained from Compustat from 1992 to 2006. Each coefficient represents the change in management compensation based on a one unit change in the determinant. Variables are defined in the (Variable Definitions) section above. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Firms always try to resolve the conflict of interests arising from the separation of ownership from control and thus create a balance between risk bearing and decision making between shareholders and managers. They can achieve this target by introducing a suitable pay-performance structure into their contracts with managers to encourage them to share some risk under the condition of paying higher rewards for the better performance. As high quality managers possess the abilities to take more risk and

improve performance, firms compete in attracting them to join or stay by rewarding their superior efforts. Such rewards tend to increase over time as firms gradually realize the consequences of their sophisticated decisions.

6.5.2 Accrual Earnings Management and Management Compensation

The results appear in the first line of the first column of Table 6.6 and represent the average effect of accrual earnings management on management compensation. They show a significant positive coefficient of accrual earnings management variable (+0.004***); which suggests that accrual earnings management results in higher management compensation in the future. The finding supports hypothesis *H2a* of this chapter.

Accrual earnings management contributes to improving the measures used in evaluating management performance. However, it does not influence future cash flows as it reverses in the subsequent period. Therefore, accruals' manipulation is perceived as a harmless activity to the firms and thus managers use accrual earnings management as a tool to signal better performance and extract more rewards in the future. In this sense, it can be considered as a less costly activity from the managers' point of view.

The results contribute to the previous literature by specifically explaining the relation between accrual earnings management and management future compensation. I support the argument of Gao and Shrieves (2002) who document that accruals' manipulation merely gives managers a timing option to maximize their compensation. I agree with Dutta and Fan (2014) who document that firms generally pay higher compensation when they do not expect management to extract high benefits from earnings manipulation. I also agree with Sun (2014) who documents that firms highly reward their managers whenever there is a potential of earnings management. However, while Adut et al. (2013) document that shareholders generally punish their managers for low earnings quality, I find that they do not particularly penalize for accrual earnings management because it is not perceived as costly to their firms.

Table 6.6 The effect of earnings management on management compensation

Variables	(1) Total management compensation	(2) Total management compensation
$AccrualEarningsManagement_{it}$	0.004***	-
$RealEarningsManagement_{it}$	-	-0.005***
$FirmSize_{it}$	0.074***	0.067***
$SalesVolatility_{i,t-4,t}$	-0.043***	-0.047***
$CashFlowVolatility_{i,t-4,t}$	0.269***	0.194***
$OperCycle_{i,t-4,t}$	0.007***	0.009***
$Losses_{i,t-4,t}$	-0.007**	-0.020***
$NationalAuditor_{it}$	-0.023***	-0.044***
$LitigationInd_{it}$	-0.014***	-0.024***
MB_{it}	0.000***	-0.000***
$SalesGrowth_{rk_{it}}$	0.021***	0.028***
$LnNumAnalyst_{it}$	0.027***	0.035***
IndRev%	0.136***	0.141***
$Momentum_{it}$	0.060***	0.069***
$Segments_{it}$	0.011***	0.002***
$Foreign_{it}$	0.076***	0.064***
$ExecDir_{it}$	0.070***	0.088***
$Tenure_{it}$	-0.012***	-0.006***
$BoardMtgs_{it}$	0.001***	0.001***
Hansen	469.660	478.940
m_1	-1.500	-1.440
m_2	-1.440	-1.380
z_1	14,716.530	7,718.130

Notes: This table presents the results from the system generalized method of moments regressions for the effect of earnings management (in the following order: (1) accrual earnings management measured by Stubben's Model (2010), and (2) real earnings management measured by Gunny's Model (2010)) on total management compensation measured as the natural logarithm of the sum of salaries, bonuses, option awards, stock awards, and long term incentive plans (LTIPs) averaged over the next three years. The sample includes 6,974 firm-year observations obtained from Compustat from 1992 to 2006. Each coefficient represents the change in total management compensation based on a one unit change in the determinant. Variables are defined in the (*Variable Definitions*) section above. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

6.5.3 Real Earnings Management and Management Compensation

The results appear in the first line of the second column of Table 6.6 and represent the average effect of real earnings management on management compensation. They show a significant negative coefficient of real earnings management variable (-0.005***); which suggests that real earnings management results in a lower management compensation in the future. The finding supports hypothesis *H2b* of this chapter.

Although real earnings management can be used by managers as a tool to send signals that reflect better current performance, it seriously affects firm future performance as it involves economic actions that may result in sacrificing future projects and losing cash flows. Therefore, real earnings management is perceived as a harmful activity and firms punish their managers for using it. In this sense, shareholders screen real earnings management as a sign of bad performance and poor earnings quality and pay less rewards to managers in the future; hence it can be considered as a more costly activity from management perspective.

Taking the previous studies into consideration, the results agree with those of Adut et al. (2013) in terms of punishing managers for manipulating earnings. However, I document that the penalty occurs when real earnings management specifically takes place as it is a costly activity from the firm's perspective. This part of the results also supports the argument of Dutta and Fan (2014) that firms generally pay lower rewards when they believe that management is already extracting high benefits from earnings management. Finally, the generalization in the study of Sun (2014) regarding how expected earnings management behaviour drives firms to make higher compensation payments does not apply on detrimental activities like real earnings management.

6.5.4 Managerial Ability, Accrual Earnings Management and Management Compensation

The results appear in the second line of the first column of Table 6.7. They show a significant negative coefficient of the interaction term; which suggests that managerial ability significantly influences the relation between accrual earnings management and management compensation in the future. The finding supports hypothesis *H3a* of this chapter. The coefficient of accrual earnings management that drives superior managers'

compensation in the future ($\propto_1+\beta_1$ =0.006-0.003=0.003) is less than that for other managers ($\propto_1$=0.006). In addition, the *t* value of the linear restriction test (LRT) in Table 6.7 shows that the combined effect of managerial ability and accrual earnings management on future management compensation is significantly different from zero. Similar results are obtained by using the Modified Jones' Model (1995) as shown in Appendix A Table I and the OLS estimator as shown in Appendix A Table II.

Shareholders tend to believe in superior managers because of their high skills and thus expect them to demonstrate better performance without the need of high monitoring efforts. However, superior managers keep sending signals to show their distinctive efforts in improving the business under the fear that the less sophisticated shareholders will not be able to directly realize their sophisticated skills compared to those of other managers in the market. Therefore, high quality managers are also inclined to manage earnings. Because accrual earnings management does not require high skills to detect and understand, it can be easily screened by the shareholders; and thus firms tend to punish high quality managers for such activity more severely than other managers. However, the overall effect of accrual earnings management on future compensation is still positive which justifies why superior managers continue to use more accrual earnings management. Therefore, although accrual earnings management is generally considered less costly than real earnings management from managers' perspective, it is relatively more costly to superior managers than to other managers.

The results contribute to the previous literature by showing how accrual earnings management behaviour particularly influences the future compensation of high quality managers. The results are still in line with those of Dutta and Fan (2014) as firms continue to pay higher compensation to superior managers when they do not expect them to achieve high benefits from their opportunistic behaviour. Similarly, I continue to support the results of Sun (2014) as firms still reward the high quality managers when they expect a chance of earnings manipulation. Finally, the results here extend the work of Adut et al. (2013) by demonstrating how shareholders punish superior managers for low earnings quality compared to other managers.

Table 6.7 The effect of earnings management and managerial ability on management compensation

Variables	(1) Total management compensation	(2) Total management compensation
$AccrualEarningsManagement_{it}$	0.006***	-
$MgrlAbility_{it}$*$Accrual\ EarningsManagement_{it}$	-0.003***	-
$RealEarningsManagement_{it}$	-	-0.003***
$MgrlAbility_{it}$*$Real\ EarningsManagement_{it}$	-	0.001***
$MgrlAbility_{it}$	0.013***	0.017***
$FirmSize_{it}$	0.079***	0.070***
$SalesVolatility_{i,t-4,t}$	-0.055***	-0.054***
$CashFlowVolatility_{i,t-4,t}$	0.320***	0.281***
$OperCycle_{i,t-4,t}$	0.006***	0.002**
$Losses_{i,t-4,t}$	0.002	-0.019***
$NationalAuditor_{it}$	-0.013**	-0.043***
$LitigationInd_{it}$	-0.017***	-0.024***
MB_{it}	0.000***	-0.000***
$SalesGrowth_{rk\,it}$	0.010***	0.013***
$LnNumAnalyst_{it}$	0.034***	0.034***
IndRev%	0.135***	0.134***
$Momentum_{it}$	0.066***	0.067***
$Segments_{it}$	0.016***	0.004***
$Foreign_{it}$	0.083***	0.064***
$ExecDir_{it}$	0.077***	0.089***
$Tenure_{it}$	-0.013***	-0.010***
$BoardMtgs_{it}$	0.001***	0.000***
t	-23.577	19.229
Hansen	467.370	464.170
m_1	-1.570	-1.460
m_2	-1.420	-1.430
z_1	6,902.840	3,350.260

Notes: This table presents the results from the system generalized method of moments regressions for the effect of managerial ability measured by the model of Demerjian et al. (2012) and earnings management (in the following order: (1) accrual earnings management measured by Stubben's Model (2010), and (2) real earnings management measured by Gunny's Model (2010)) on total management compensation measured as the natural logarithm of the sum of salaries, bonuses, option awards, stock awards, and long term incentive plans (LTIPs) averaged over the next three years. The sample includes 6,974 firm-year observations obtained from Compustat from 1992 to 2006. Each coefficient represents the change in total management compensation based on a one unit change in the determinant. Variables are defined in the (*Variable Definitions*) section above. The t values of the linear restriction tests (LRT) reflect the joint significance of the explanatory and moderating variables. The test is performed under the null hypothesis $H_o: \propto_1 + \beta_1 = 0$. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

6.5.5 Managerial Ability, Real Earnings Management and Management Compensation

The results appear in the second line of the second column of Table 6.7. They show a significant positive coefficient of the interaction term; which suggests that managerial ability significantly influences the relation between real earnings management and management compensation in the future. The finding supports hypothesis *H3b* of this chapter. The coefficient of real earnings management that drives superior managers' compensation in the future ($\propto_2+\beta_1$=-0.003+0.001=-0.002) is higher than that for other managers ($\propto_2$=-0.003). The *t* value of the linear restriction test (LRT) in Table 6.7 shows that the combined effect of managerial ability and real earnings management on future management compensation is significantly different from zero. Similar results are obtained by using the Roychowdhury's Model (2006) as shown in Appendix A Table I and the OLS estimator as shown in Appendix A Table II.

High quality managers are also inclined to send signals through real earnings management. However, real earnings management is more complicated for shareholders to detect or understand compared to accrual earnings management; and thus it cannot be easily screened. Therefore, firms tend to reward superior managers for their sophisticated behaviour that demonstrates their high skills and specialized knowledge. Nevertheless, the overall effect of real earnings management on future compensation is still negative which again justifies why superior managers continue to avoid real earnings management. In this sense, although real earnings management is generally considered more costly than accrual earnings management from managers' perspective, it is not as costly to superior managers as to other managers.

The results build on those of Adut et al. (2013) by showing that firms ultimately punish superior managers for real earnings management behaviour which is still considered as a costly activity to the firm. I also confirm the work of Dutta and Fan (2014) and demonstrate that firms pay overall lower rewards when they realize that high quality managers can extract benefits from real earnings management. Finally, I extend the work of Sun (2014) and show how expected earnings management behaviour relatively drives firms to make higher compensation payments but only to superior managers when using real earnings management.

6.6 Additional Analysis: Managerial Ability, Earnings Management and Operating Performance

To further explain the influence of earnings management on management future compensation, I try to examine how earnings management influences firm future performance that will subsequently determine management compensation. I particularly focus on earnings management behaviour of high quality managers and its impact on operating performance (*OpPerformance*) measured as the average return on assets (ROA) over the next three-year-period. Therefore, I develop the following model that identifies operating performance as the dependent variable ($OpPerformance_{i,t+1,t+3}$), earnings management ($EarningsManagement_{it}$) and managerial ability($MgrlAbility_{it}$) as explanatory variables, in addition to the interaction term between them. [25] I add the control variables and an error term that is split into (η_i)[26] to control for the impact of the unobserved effects, (d_t)[27] to control for the macroeconomic variables, and (v_{it}) as a random disturbance.

$$\begin{aligned} OpPerformance_{I,t+1,t+3} = {} & \propto_0 + \propto_1 EarningsManagement_{it} + \propto_2 MgrlAbility_{it} \\ & + \beta_1 MgrlAbility_{it} * EarningsManagement_{it} \\ & + \propto_3 FirmSize_{it} + \propto_4 SalesVolatility_{i,t-4,t} \\ & + \propto_5 CashFlowVolatility_{i,t-4,t} + \propto_6 OperCycle_{i,t-4,t} \\ & + \propto_7 Losses_{i,t-4,t} + \propto_8 NationalAuditor_{it} \\ & + \propto_9 SalesGrowth_{rk_{it}} + \propto_{10} MB_{it} + \propto_{11} LnNumAnalyst_{it} \\ & + \propto_{12} IndRev\% + \propto_{13} Momentum_{it} + \propto_{14} Segments_{it} \\ & + \propto_{15} ExecDir_{it} + \propto_{16} Tenure_{it} + \propto_{17} BoardMtgs_{it} \\ & + \eta_i + d_t + v_{it} \end{aligned} \quad (6.7)$$

The model suffers from the previously explained problem of unobservable individual heterogeneity that may result in managers with specific abilities and behaviours to end up in firms at certain levels of performance (Pindado and Requejo, 2014). However, no

[25] $MgrlAbilityDum_{it}$ is a dummy variable that equals 1 if the ability of a manager in an industry is high (greater than the median) and zero otherwise. Therefore, $\propto_1$ is the coefficient of ($EarningsManagement_{it}$) when managerial ability is low; ($\propto_1+\beta_1$) is the coefficient when managerial ability is high.

[26] η_i controls for both firm specific effects and manager specific effects.

[27] I do not tabulate the coefficients of time periods later in the results.

endogeneity can be claimed in this case because it is difficult to predict firm future performance at the moment due to different factors that might interfere in determining such variable. As a result, I use a fixed-effects (FE) estimator to solve the model.

Table 6.8 The effect of earnings management and managerial ability on future operating performance

Variables	(1) Operating performance	(2) Operating performance
$AccrualEarningsManagement_{it}$	0.001	-
$MgrlAbility_{it}$*$Accrual\ EarningsManagement_{it}$	0.001	-
$RealEarningsManagement_{it}$	-	-0.010*
$MgrlAbility_{it}$*$Real\ EarningsManagement_{it}$	-	0.008*
$MgrlAbility_{it}$	0.004	0.005
$FirmSize_{it}$	-0.057***	-0.031***
$SalesVolatility_{i,t-4,t}$	0.025	0.050
$CashFlowVolatility_{i,t-4,t}$	-0.164***	0.697***
$OperCycle_{i,t-4,t}$	-0.032***	-0.017
$Losses_{i,t-4,t}$	0.016	0.085***
$NationalAuditor_{it}$	0.014	0.003
MB_{it}	-0.000	-0.001*
$SalesGrowth_{rk_{it}}$	0.012	-0.000
$LnNumAnalyst_{it}$	-0.001	-0.004
IndRev%	0.017	0.004
$Momentum_{it}$	-0.042***	-0.040**
$Segments_{it}$	0.010	0.019*
$ExecDir_{it}$	-0.008	-0.007
$Tenure_{it}$	-0.008***	-0.007*
$BoardMtgs_{it}$	-0.003***	-0.002**
R^2	0.208	0.177
F-statistic	9.520	7.820
Prob (F-statistic)	0.000	0.000

Notes: This table presents the results from the fixed effect regressions for the influence of managerial ability measured by the model of Demerjian et al. (2012) and earnings management (in the following order: (1) accrual earnings management measured by Stubben's Model (2010) and (2) real earnings management measured by Gunny's Model (2010)) on future operating performance measured as the average return on assets (ROA) over the next three-year-period. The sample includes 6,974 firm-year observations obtained from Compustat from 1992 to 2006. Each coefficient represents the change in future operating performance based on a one unit change in the determinant. Variables are defined in the (*Variable Definitions*) section above. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

The results appear in Table 6.8 and show that managerial ability does not play any significant role in the relationship between accrual earnings management and firm future performance. On the other hand, and as expected, real earnings managed by high quality managers negatively influence firm future operating performance as the

coefficient of real earnings management that drives lower operating performance in the future is still negative when high quality managers are involved in such behaviour ($\propto_1+\beta_1$ =-0.010+0.008=-0.002). The results strongly support the argument that real earnings management is more costly to superior managers than accrual earnings management because it results in a deteriorated firm future performance and subsequently a decrease in management future compensation.

6.7 Conclusions

In this chapter I provide an explanation of the earnings management behaviour of high quality managers that has shown a tendency towards more accrual and less real earnings management according to the previous literature. To do so, I examine the cost and benefit of each of these activities by particularly focusing on their effects on future compensation as a major rent that superior managers might partially lose when manipulating earnings. In other words, I examine the individual and joint effects of managerial ability and earnings management on future compensation.

First, I document that firms reward their managers for their high abilities as the outcomes of their sophisticated decisions are realized in the future. High quality managers contribute towards a better performance over time; which results in higher payments in order to keep the current managers motivated to perform at a high-quality level or attract new ones to move to these firms. The findings suggest that contracts have to take the quality of managers into consideration to establish the optimal pay-performance that keeps a balance between optimal effort and optimal incentives.

Second, I document that firms do not punish their managers for accrual earnings management as much as they do for real earnings management through decreasing their compensation in the future. The findings suggest that firms expect accrual earnings management to reverse in the next accounting period but consider real earnings management as a harmful activity because it severely influences future cash flows. In this sense, I extend the previous literature by documenting that real earnings management is more costly not only from the firm's perspective but also from the management's point of view.

When examining the earnings management behaviour of high quality managers in particular, I find that they extract less rents from accrual earnings management but more from real earnings management compared to other managers. However, real earnings management continues to be more costly from the perspective of high quality managers as they are overall punished for real earnings management compared to accrual earnings management that accounts for the main source of their manipulation.

The results show that managerial ability contributes to strong governance by enhancing better performance in the future. While accrual earnings management is not seen as harmful to the firm, real earnings management seems detrimental whether viewed by firms, managers, or even high quality managers. This overall consent should make any regulation that attempts to mitigate real earnings management easier to implement but the challenge will remain in detecting such sophisticated activities and communicating them to the public.

Appendix A

Appendix A Table I The effect of earnings management and managerial ability on management compensation

Variables	(1) Total management compensation	(2) Total management compensation
$AccrualEarningsManagement_{it}$	0.002***	-
$MgrlAbility_{it}$*$Accrual\ EarningsManagement_{it}$	-0.001***	-
$RealEarningsManagement_{it}$	-	-0.016***
$MgrlAbility_{it}$*$Real\ EarningsManagement_{it}$	-	0.008***
$MgrlAbility_{it}$	0.016***	0.017***
$FirmSize_{it}$	0.084***	0.078***
$SalesVolatility_{i,t-4,t}$	-0.033***	-0.018***
$CashFlowVolatility_{i,t-4,t}$	0.253***	0.221***
$OperCycle_{i,t-4,t}$	-0.001	0.006***
$Losses_{i,t-4,t}$	-0.010***	-0.028***
$NationalAuditor_{it}$	0.014	-0.011*
$LitigationInd_{it}$	-0.026***	0.000
MB_{it}	-0.000***	-0.000***
$SalesGrowth_{rk_{it}}$	0.010***	0.010***
$LnNumAnalyst_{it}$	0.034***	0.029***
IndRev%	0.105***	0.046***
$Momentum_{it}$	0.056***	0.054***
$Segments_{it}$	0.003**	0.010***
$Foreign_{it}$	0.047***	0.073***
$ExecDir_{it}$	0.081***	0.075***
$Tenure_{it}$	-0.015***	-0.011***
$BoardMtgs_{it}$	0.000**	0.000
t	-22.944	5.021
Hansen	477.850	477.880
m_1	-1.450	-1.460
m_2	-1.480	-1.430
z_1	8,780.850	11,487.290

Notes: This table presents the results from the system generalized method of moments regressions for the effect of managerial ability measured by the model of Demerjian et al. (2012) and earnings management (in the following order: (1) accrual earnings management measured by Modified Jones' Model (1995), and (2) real earnings management measured by Roychowdhury's Model (2006)) on total management compensation measured as the natural logarithm of the sum of salaries, bonuses, option awards, stock awards, and long term incentive plans (LTIPs) averaged over the next three years. The sample includes 6,974 firm-year observations obtained from Compustat from 1992 to 2006. Each coefficient represents the change in total management compensation based on a one unit change in the determinant. Variables are defined in the (*Variable Definitions*) section above. The t values of the linear restriction tests (LRT) reflect the joint significance of the explanatory and moderating variables. The test is performed under the null hypothesis $H_o: \propto_1 + \beta_1 = 0$. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Appendix A Table II The effect of earnings management and managerial ability on management compensation

Variables	(1) Total management compensation	(2) Total management compensation
$AccrualEarningsManagement_{it}$	0.004*	-
$MgrlAbility_{it}$*$Accrual\ EarningsManagement_{it}$	-8.71e-05*	-
$RealEarningsManagement_{it}$	-	-0.014*
$MgrlAbility_{it}$*$Real\ EarningsManagement_{it}$	-	0.009*
$MgrlAbility_{it}$	0.022**	0.019**
$FirmSize_{it}$	0.092***	0.092***
$SalesVolatility_{i,t-4,t}$	0.003	0.008
$CashFlowVolatility_{i,t-4,t}$	0.379***	0.362***
$OperCycle_{i,t-4,t}$	-0.003	-0.002
$Losses_{i,t-4,t}$	-0.016	-0.023
$NationalAuditor_{it}$	-0.009	-0.005
$LitigationInd_{it}$	-0.013	-0.015
MB_{it}	0.001	-9.95e-05
$SalesGrowth_{rk_{it}}$	-0.002	0.010
$LnNumAnalyst_{it}$	0.051***	0.055***
IndRev%	0.089***	0.089***
$Momentum_{it}$	0.038	0.042*
$Segments_{it}$	0.008	0.004
$Foreign_{it}$	0.064***	0.064***
$ExecDir_{it}$	0.087*	0.087*
$Tenure_{it}$	0.002	0.001
$BoardMtgs_{it}$	-0.001	-0.001
t	-3.248	4.009
R^2	0.379	0.380
F-statistic	40.900	42.150
Prob (F-statistic)	0.000	0.000

Notes: This table presents the results from the ordinary least square regressions for the effect of managerial ability measured by the model of Demerjian et al. (2012) and earnings management (in the following order: (1) accrual earnings management measured by Stubben's Model (2010), and (2) real earnings management measured by Gunny's Model (2010)) on total management compensation measured as the natural logarithm of the sum of salaries, bonuses, option awards, stock awards, and long term incentive plans (LTIPs) averaged over the next three years. The sample includes 6,974 firm-year observations obtained from Compustat from 1992 to 2006. Each coefficient represents the change in total management compensation based on a one unit change in the determinant. Variables are defined in the (*Variable Definitions*) section above. The t values of the linear restriction tests (LRT) reflect the joint significance of the explanatory and moderating variables. The test is performed under the null hypothesis $H_o: \propto_1 + \beta_1 = 0$. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Chapter 7
Market Concentration and Earnings Management: A Non-Linear Relationship

7.1 Intoduction

While the previous chapter has examined the relationship between some of the contractual motives and earnings management, this chapter focuses on market concentration as one of the external drivers of earnings management. Market concentration plays a divergent role in shaping management behaviour. While it makes monitoring more difficult because of the higher information asymmetry according to the agency theory, it renders communicating information less costly due to the lower pressure from the few existing competitors based on the revelation principle (Strong and Walker, 1987; Milgrom and Roberts, 1992; Walker, 2013). The earnings management literature has emphasized the previous roles and found market concentration stimulates earnings management and brings discipline at the same time. While some studies document a positive effect of market concentration on earnings management based on an intensified agency problem (Dalia and Park, 2009; Markarian and Santalo, 2010; Karuna et al., 2012), others evidence a negative relation due to the lower competitive incentives in concentrated markets (Datta et al., 2013). The different points of view and findings in the previous studies suggest that a non-linear relationship can better explain the effect of market concentration on earnings management than a linear approach.

Under both of the previous points of view, earnings management in concentrated markets tends to be determined by information asymmetry between management and shareholders (Dalia and Park, 2009). The quantity of information decreases in concentrated markets because of the lower analysts' coverage that allows firms to obfuscate information; and thus aggravates adverse selection problem (Harris and Raviv, 1979; Healy and Palepu, 2001; Ali et al., 2014; Elbadry et al., 2013; Walker, 2013; Salop, 2015). However, the less competitive environment motivates analysts' discretion

over their forecasts and, therefore, may influence the quality of information up or down (Strong and Walker, 1987; Walker, 2013).

Based on the previous contrasting effects of market concentration on earnings management, I examine a non-linear relation between market concentration and accrual and real earnings management activities. As the previous relations is based on the asymmetry of information, I explain them according to the changes in information quantity and quality in concentrated markets.

For measuring market concentration, I use the Hall Tideman Index (Dalia and Park, 2009; Markarian and Santalo, 2010; Karuna et al., 2012; Datta et al., 2013). For measuring information asymmetry I use three measures that include earnings forecast error, earnings forecast dispersion, and analysts' coverage (Ali et al., 2014; Dalia and Park, 2009). Finally, for measuring earnings management variables, I implement four different models which include Stubben's model and the Modified Jones' model for measuring accruals' manipulation and Gunny's model and Roychowdhury's model for measuring real earnings management.

This chapter shows a significant non-linear effect of market concentration on earnings management. The decrease in information quantity in concentrated markets allows firms to manage accruals until the quality of information starts to decline and thus enables managers to use more of the sophisticated real earnings management. Nevertheless, I find evidence of an optimal level of market concentration with a mutual decrease in accrual and real earnings management at concentration levels between 55% and 60%. The results extend the work of Guo et al. (2015) who examine a non-linear relation between market competition and earnings quality, but this chapter focuses on the effect of market concentration on accrual and real earnings management.

The remainder of the chapter proceeds as follows. In the next section, I review the related studies from the literature and build the hypotheses of the chapter. In section 7.3, I explain the process of data collection, variable definitions, and the descriptive statistics. In section 7.4, I explain the methodology I use in this chapter. In section 7.5, I present and discuss the results. In section 7.6, I add some empirical analysis. Finally, in section 7.7, I conclude the chapter.

7.2 Literature and Hypotheses Development

7.2.1 Market Concentration and Earnings Management

According to the revelation principle, privately informed managers achieve more benefits from revealing the truth as it allows them to avoid any subsequent penalties of misreporting firm results (Ronen and Yaari, 2008). At the same time, shareholders can make better decisions and thus maximize their expected utilities (Milgrom and Roberts, 1992). In this sense, the revelation principle helps in solving the conflict between principals and agents and emphasizes truth telling equilibrium where the truthful revelation of private information leads to maximizing the utility functions of all players in the game.

However, Walker (2013) identifies four conditions of the revelation principle that need to be violated for earnings management to occur. The first condition is violated when contracting costs are high and hence renders contracts between shareholders and management imperfect and difficult to enforce. Second, earnings management may occur because of shareholders' imperfect rationalities, especially under conditions of market uncertainty, which makes them unable to take wealth maximizing decisions all the time. The third condition of the revelation principle is violated when there is no common knowledge between management and shareholders to enable the later to understand managers' actions. Finally, managers may manipulate earnings when they find that communicating with shareholders is costly due to the presence of third parties like regulators, competitors, and tax authorities. Any of the previous violations is sufficient to give managers the chance to manage earnings (Walker, 2013).

Based on the previous conditions, the effect of market concentration on earnings management can be viewed from two different perspectives of the revelation principle. In more concentrated markets, communicating with shareholders is less costly due to the lower pressure resulting from weak competition that creates fewer chances for comparisons between firms (Strong and Walker, 1987). Therefore, managers feel less need to take risk in order to keep pace with the behaviour of other aggressive competitors and adopt profit maximizing actions to improve their firms' efficiencies (Milgrom and Roberts, 1992). In this sense, I perceive a disciplinary influence of

market concentration on management behaviour, and according to the fourth condition of the revelation principle mentioned above I expect that earnings management is less likely to occur in concentrated markets. In contrast, concentrated markets are less informative causing the lack of common knowledge between management and shareholders. The high information asymmetry does not allow for monitoring management behaviour and thus results in poor follow-up by outsiders; which allows managers to take more non-value-maximizing actions (Milgrom and Roberts, 1992). In this sense, market concentration scatters the interests of principals and agents and, thus, aggravates the agency problem. Consequently, managers may manage earnings as the shareholders are unable to understand their decisions under the uncertainty discussed in the third condition of the revelation principle mentioned earlier.

The literature supports the previous points of view in the theory regarding the effect of market concentration on earnings management and documents contrasting results. Starting with accruals' manipulation, Datta et al. (2013) find that market concentration leads to less accrual earnings management as it plays a disciplinary role and, therefore, mitigates the agency problem between managers and shareholders. On the other hand, Karuna et al. (2012) find that managers in concentrated markets use more accrual earnings management due to the fewer restrictions in such markets. Similarly, Dalia and Park (2009) find that firms in concentrated industries in the manufacturing sector in the United States engage in a higher level of discretionary accruals. They also document that market concentration changes the disciplining function of the market by aggravating the agency problem. Markarian and Santalo (2010) also confirm that the separation of ownership from control does not work efficiently in more concentrated markets.

To the best of my knowledge, the study of Karuna et al. (2012) is the only one that examines the effect of market concentration on real earnings management. It finds that market concentration results in more real earnings management because managers have better opportunities to make benefit of such activities, especially that they can easily understand other managers' incentives to manipulate earnings in such markets (Kallunki and Martikainen, 1999; Bagnoli and Watts, 2000).

Although the previous studies only emphasize the linear relation between market concentration and earnings management, other studies show a non-linear effect of the

market structure on firm behaviour. Hermalin (1992) documents that the effect of competition on the agency problem and thus on firm efficiency and management behaviour depends on four different factors. First, the income effect as firms' profitability is expected to decrease under higher competition and thus managers receive lower income. Second, the risk attitude effect as the willingness of managers to take risk changes under competition. Third, the information effect that is related to the influence of competition on information in the market. Finally, actions' value effect because the outcome of different managerial actions may change under the effect of competition. The previous effects do not necessarily have similar signs and thus suggest a non-linear relationship between market competition and management behaviour.

Schmidt (1997) documents a non-linear relationship between market competition and managerial incentives due to the two-sided effects of competition. On the one hand, market competition increases the pressure on management to improve performance in order to stay in the market and thus creates an incentive for more managerial efforts. On the other hand, competition results in lower profitability that is reflected in lower managerial rewards which may demotivate managerial efforts. The overall effect of market competition on managerial incentives is quadratic with managerial incentives increasing at lower levels of market competition and decreasing at higher levels of market competition.

Scherer (1967) documents a non-linear relationship between market concentration and management innovative efforts because of the endogeneity between the two factors. To further explain the results, Aghion et al. (2005) find a non-linear quadratic relationship between market competition and innovation as innovation is endogenous in competitive markets. Therefore, competition may encourage or discourage innovation depending on the level of innovation in the market. At lower levels of competition, firms tend to be more equal in their technologies and thus exert more innovative efforts to escape the competition as the incremental benefits from innovation are increasing. However, at higher levels of market competition where there are big technological gaps between firms in the industry, innovative efforts tend to decrease as firms have already reached to an equilibrium position where the incremental benefit from innovation is decreasing.

To my knowledge, the only study that examines a non-linear effect of market competition on earnings quality is that of Guo et al. (2015). Specifically, Guo et al. (2015) document a non-linear relationship between market competition and earnings quality that takes a quadratic shape. They find that earnings quality increases at lower levels of market competition but decreases at higher levels of market competition. They explain their results through the marginal benefit of earnings quality that increases at lower levels of market competition and decreases at higher levels as competitors can make advantage of the high quality information disclosed by a firm. The study uses different proxies for market competition including the Herfindahl-Hirschman index (*HHI*) that measures market concentration.

Given the two contrasting views in the agency theory and the revelation principle in addition to the different findings in the previous studies, I expect managers to use different levels of earnings management under different degrees of market concentration. Therefore, I expect a non-linear relationship between market concentration and earnings management. For this purpose, I examine the influence of market concentration (MC_{it}) at two different levels and expect its relationship with earnings management (EM_{it}) to take one of the two shapes that appear in Figure 7.1 and Figure 7.2 below.

Figure 7.1 First assumption for the effect of market concentration on earnings management

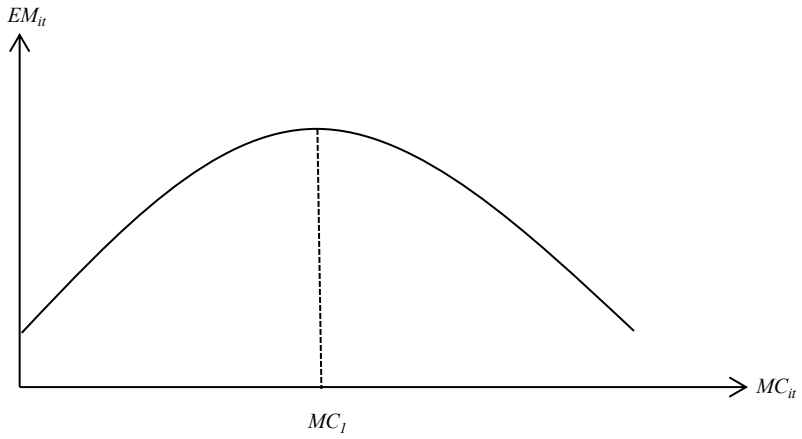
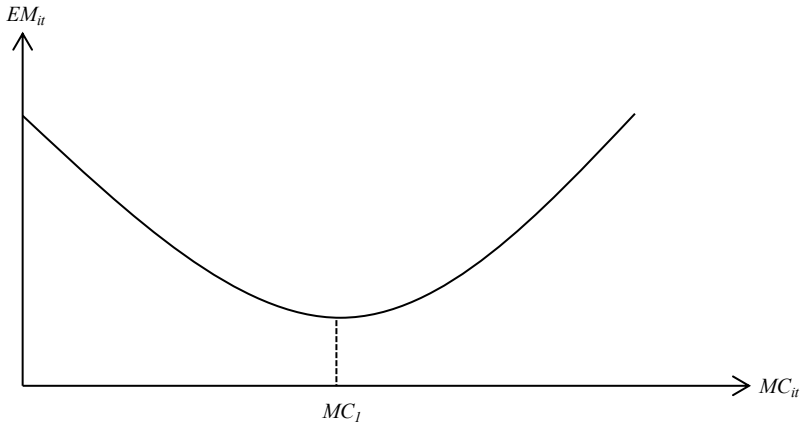


Figure 7.2 Second assumption for the effect of market concentration on earnings management



Both of the previous assumptions suppose that low and high levels of market concentration have different effects on earnings management. Whether I accept the assumption in Figure 7.1 or that in Figure 7.2, the hypothesis predicts a quadratic relationship between market concentration and earnings management. As I cannot decide which one prevails for now, I develop the following hypothesis.

H1: The effect of market concentration on earnings management is different at low and high levels of market concentration.

7.2.2 Market Concentration and Information Asymmetry

To explain the previous double-edged effect of market concentration on earnings management, information asymmetry has to be considered as it represents the main problem between the principal and the agent. Concentrated markets are inefficient as managers may obfuscate information in order to protect their competitive advantages (Ali et al., 2014). Taken with the decreased coverage by analysts, a condition of imperfect information can be generally assumed in concentrated markets where information is not absent but still incomplete. The result will be a situation of information asymmetry between shareholders and management that can take one of the two forms: moral hazard and adverse selection (Milgrom and Roberts, 1992; Boujelbene and Besbes, 2012). Moral hazard happens because shareholders do not possess information to monitor management and assess whether it works for maximizing the firms' values; resulting in different attitudes and motivations for each

party. On the other hand, adverse selection happens because managers have access to private information that allows them to make decisions for their own benefits and ignore shareholders' value (Walker, 2013). The resulting uncertainty changes the costs and benefits of information for decision makers and gives rise to a problem of coordination in making decisions regarding what information is reported, how it is communicated, and who makes the decision (Harris and Raviv, 1979; Healy and Palepu, 2001; Elbadry et al., 2013; Walker, 2013; Salop, 2015). Overall, the decrease in information influences the agency problem by driving contracting costs like observing and monitoring (Hart, 1995; Arroyo, 2007).

From another perspective, firms have a chance to signal information under the lower competitive pressure in concentrated markets (Strong and Walker, 1987). Although management discretion over financial reporting may involve signaling low quality information, the signals may convey information about future performance and ultimately contribute to improving the quality of the reported information (Gunny, 2010; Walker, 2013). Similarly, the less competitive environment drives analysts' judgements and further contributes to the variation in the quality of their forecasts.

The literature provides evidence on the interaction between market competition and information asymmetry to determine the response of the market. Balakrishnan et al. (2012) examine the effect of market competition on the relation between information asymmetry and the cost of capital. They document that investors discount firms' prices according to the level of information asymmetry and competition in the market. This implies a higher cost of capital and lower future returns to the firms under more intense competition and higher levels of information asymmetry. In this sense, both market competition and information asymmetry contribute to adverse selection problem.

More specifically, other studies show the effect of market concentration on information asymmetry. Information asymmetry is likely to occur in markets where a specific group possesses information without allowing the others to access it (Boujelbene and Besbes, 2012). Dalia and Park (2009) find higher levels of analyst forecasts' errors and dispersions at higher levels of market concentration and, therefore, lower financial reporting quality in more concentrated markets. On the other hand, they find less information asymmetry in competitive markets even when firms suffer from low profitability that is expected to create higher incentives to manage earnings.

Markarian and Santalo (2010) document that when shareholders do not have access to information about real firms' outputs and market prices, it becomes easier for managers to justify the manipulation and, therefore, the cost of earnings management to the firms gets lower. Ali et al. (2014) find lower analysts' coverage, higher forecasts' errors and dispersions, and bigger bid-ask spreads in more concentrated markets that reflect a more serious adverse selection problem. They use market concentration as a proxy for firm disclosures because they expect firms in more concentrated markets to be less likely to disclose information to avoid losing their competitive advantages. However, the study uses the industry concentration measures available from the US Census Bureau, rather than the HHI, and for the manufacturing sector only. Finally, Bhattacharya et al. (2013) find a non-linear quadratic relationship between earnings quality and information asymmetry and document that information can be considered as a measure of the quality of disclosure (Bhattacharya et al., 2013).

Although I can expect less information due to the lower analysts' coverage in more concentrated markets according to the obfuscation hypothesis, the contrasting theoretical points of view in the signalling hypothesis and the different literature findings explained earlier suggest a changing information quality at different levels of market concentration. Accordingly, I develop the following two hypotheses.

H2a: There is a negative effect of market concentration on the quantity of information in the market.

H2b: The effect of market concentration on information quality is different at low and high levels of market concentration.

7.3 Data, Variable Definitions and Descriptive Statistics

7.3.1 Data

I include all firms in the United States from the Annual Compustat, Quarterly Compustat, Historical Segments Compustat, and IBES databases, for the period from 1989 to 2011. I also make use of the dataset made available by Demerjian et al. (2012) for managerial ability control variable during the same time period. I start with all firms that have the required data for calculating the measures of earnings management,

market concentration, and information asymmetry after excluding firm-years that experienced accounting changes, merger and acquisition activities, or discontinued operations.[28]

Following Cheng et al. (2011), I exclude regulated industries that contain banks, credit institutions, brokers, insurance, real estate, holding companies, and investment firms because they have their unique accounting and financial practices and are subject to distinct regulations. Therefore, managers in these industries have different motivations to manipulate earnings than those of managers in other industry sectors.[29]

Following prior literature, I exclude any industry with fewer than six observations for each SIC code in a specific year to ensure sufficient data exists to calculate earnings management measures and make sure that OLS assumption regarding the normality of the error term holds (e.g., Rosner, 2003; García Lara et al., 2005; Kothari et al., 2005; Athanasakou et al., 2009; Iqbal et al., 2009). For that purpose, I follow the SIC classification of Fama-French (1997).

As the model is dynamic, I make sure that information is available for at least five consecutive years for each firm over the study period (Miguel et al., 2004). When combining between the cross-sectional and time-series dimensions of the data, I obtain total observations of 25,119 in an unbalanced panel dataset. I do not use balanced panels to avoid survivorship bias problem.

7.3.2 Earnings Management Measures

Based on the discussion in Chapter 5, I use Stubben's Model (2010) for measuring accrual earnings management because it focuses on discretionary revenues which represent the largest component of earnings in most firms (Stubben, 2010). I also use Gunny's Model (2010) for real earnings management because it covers more types of this activity compared to other models (Gunny, 2010). In addition, I use two other widespread models as corroborating measures that include the Modified Jones' Model

[28] According to McNichols (2002), I specifically exclude firm quarters or years with non-blank values for accounting changes cumulative effects (ACCCHGQ_FN), or merger and acquisition activities (ACQMETH_FN), or discontinued operations (DOQ_FN) in the Compustat database.
[29] I exclude firms with the following SIC codes: $4000 \leq SIC \geq 4900$ and $6000 \leq SIC \geq 6300$.

(1995) for measuring accrual earnings management and Roychowdhury's Model (2006) for measuring real earnings management. Again, for each of these measures I use a cross sectional model in the calculations for each year and each industry classified by its four-digit SIC code with at least 6 observations. I also take the decile ranks for better comparability and to avoid the effect of the outliers. For the purpose of calculating an overall measure of real earnings management using Gunny's Model (2010) and Roychowdhury's Model (2006), a principal component analysis with varimax rotation is performed to avoid the inclusion of highly correlated variables in the overall measure (Demerjian et al., 2013b).[30]

7.3.3 Market Concentration Measures

To measure market concentration, I use the Hall Tideman Index (*HTI*) because it takes into consideration the rank of each firm based on its market share in the industry. In this sense, the *HTI* accounts for the absolute number of firms which reflects the entry barriers to the industry, in addition to emphasizing the relative sizes of those firms (Hall and Tideman, 1967). Finally, I decile rank the measure for better comparability and to mitigate for outliers. I present the calculation of the previous measure in Table 7.1.

7.3.4 Information Asymmetry Measures

As there is no "best" measure of information asymmetry (Elbadry et al., 2013), I use several proxies to calculate this variable. Analysts' coverage is negatively associated with information asymmetry and, thus, used as a measure of this variable in many studies (Houston at al., 2008). Therefore, I particularly focus on analysts-related measures because financial analysts act as information intermediaries who generate information through their forecasts (Healy and Palepu, 2001). Information asymmetry is associated with a decrease in analysts' coverage and an increase in the dispersion and error of their earnings forecasts (Ali et al., 2014). Thus, I identify earnings forecast error, earnings forecast dispersion, and analysts' coverage as the proxies of information

[30] The principal component analysis step turns the set of correlated variables to be linearly uncorrelated according to the weights of their variances, thus reducing the number of variables to their principal components.

asymmetry (Dalia and Park, 2009). The calculation of each of these measures is presented in table 7.1.

7.3.5 Control Variables

Following Dechow and Dichev (2002), the first set of controls consider firm specific determinants and account for firm size (*FirmSize*), sales volatility (*SalesVolatility*), cash flow volatility (*CashFlowVolatility*), operating cycle (*OperCycle*), and historical losses (*Losses*). Larger firms have operations that are more predictable and more diversified businesses and thus earnings should be of higher quality and better communicated to the stakeholders (Dechow and Dichev, 2002). Managers in these firms, however, have more opportunities to manipulate earnings because of the large number of transactions they undertake and their complicated operations (Demerjian et al., 2013b). Sales volatility reflects uncertainty in operations and, therefore, implies a higher likelihood of earnings management (Dechow and Dichev, 2002). Cash flow volatility also reflects increased volatility in the operations of the firm creating more opportunities for earnings management. Similarly, longer operating cycles increase uncertainty and therefore, the potential for earnings management (Dechow and Dichev, 2002). However, the higher uncertainty may draw the attention of the analysts to such firms. Prior losses are likely to result in more earnings management to meet investors' expectations in making profit and thus more information asymmetry (Dechow and Dichev, 2002). Equally, they may drive managers to avoid earnings management as they will be facing more scrutiny by the market.

I also control for managerial ability (*MgrlAbility*) that drives more accrual but less real earnings management (Demerjian et al., 2013b). While superior managers make sophisticated decisions that contribute to more information asymmetry, they possess the skills to communicate information to the stakeholders. I use a national auditor indicator (*NationalAuditor*) to control for any auditor effects as firms audited by national auditors use more earnings management, particularly real activities, than those audited by international audit firms (Becker et al., 1998). Therefore, the overall result on information asymmetry can be positive or negative. I add another indicator variable to control for litigious industries (*LitigationInd*) following Francis et al. (1994) because

firms in such industries are more likely to be involved in earnings management. However, the opposite effect may appear because of the probable regulatory intervention.

The market to book ratio (*MB*), the one year sales growth (*SalesGrowth*), and returns momentum (*Momentum*) are added as they have been found to influence earnings management (Hribar and Nichols, 2007; Dechow et al., 2011). As firms with higher market to book ratios have more growth prospects, they may be involved in more earnings management to meet market expectations (Hribar and Nichols, 2007). Firms with growing sales and high returns momentum also have high growth prospects but the increase in sales and returns reduces the pressure on management to manipulate earnings (Dechow et al., 2011). Therefore, the influence of the previous three factors can take two different directions.

In addition, this chapter controls for analyst coverage (*NumAnalyst*). The presence of more analysts increases the burden on management to present better earnings and, therefore, may lead to more earnings management (Dechow et al., 2011; Zang, 2012). I also include an industry revenue leadership variable (*IndRev%*) (Dechow et al., 2011; Zang, 2012). As Zang (2012) could not specify the influence of industry revenue leadership, I expect it to be bi-directional due to the simultaneous high power of the industry leaders and the more scrutiny they face in the market.

The number of segments (*Segments*) and the frequency of foreign transactions (*Foreign*) are used to control for businesses complexity (Karuna et al., 2012). With more complex transactions managers use more real earnings management because they are less likely to be detected than discretionary revenue manipulation. Meanwhile, business complexity may drive more scrutiny to such firms (Karuna et al., 2012). As a result, it may have a double-edged effect on earnings management and information asymmetry.

Finally, I use dummies for the global financial crisis (*GFC*) (Badertscher et al., 2014; Kanagaretnam et al., 2014; Magnan et al., 2015), the dot-com bubble (*DotCom*) (Lieberman and Asaba, 2006), and the post-Sarbanes Oxley period (SOX) (Cohen et al., 2008) to control for some macro-economic events over the study period. I present the

detailed calculations for each of the previous variables in Table 7.1 and summarize the expected and actual signs of all control variables in Table 7.2.

Table 7.1 Calculation of the variables

Variable	Calculation
$AccrualEM$	The residual from using Stubben's Model (2010) as explained in the 'Variable Definitions' section above.
$RealEM$	The first component generated by using Gunny's Model (2010) that represents the discretionary reduction in SG&A expenses and the overproduction to cut prices or to decrease the cost of goods sold as explained in the 'Variable Definitions' section above.
$Concentration$	Market concentration measured by the Hall Tideman index; calculated as $HTI=1/[(2\sum_{i=1}^{N}(k*s))-1]$ where s represents market share, N is the number of firms per year-industry, and k represents firm rank according to market share.
$ForecastError$	The log of 1 + the difference between the median next-year forecast earnings per share (EPS) and the realized EPS normalized by the median EPS forecast.
$ForecastDispersion$	The log of 1 + the standard deviation of EPS forecasts for the next year normalized by the absolute value of the median EPS forecast.
$InvAnalystsCoverage$	The log of 1 + the number of analysts covering the firm in year t, multiplied by -1 to reflect information asymmetry.
$FirmSize$	The natural log of the firm's assets as of the end of year *t*.
$SalesVolatility$	The standard deviation of (sales / average assets) over at least three of the last five years (*t*–4, *t*).
$CashFlowVolatility$	The standard deviation of (cash from operations / average assets) over at least three of the last five years (*t*–4, *t*).
$OperCycle$	The operating cycle is the natural log of average sales turnover plus days in inventory over at least three of the last five years (*t*–4, *t*).
$Losses$	Loss history is the percentage of years reporting losses in net income before extraordinary items over at least three of the last five years (*t*–4, *t*).
$MgrlAbility$	This measure represents how efficiently managers generate revenues from the available firm resources according to the approach of Demerjian et al. (2012). The variable was directly obtained from *https://community.bus.emory.edu/personal/PDEMERJ/Pages/Home.aspx*.
$NationalAuditor$	An indicator variable equals one for firms audited by national audit firms in year *t*; zero otherwise.
$LitigationInd$	Litigious industry indicator that equals one for firms in industries with SIC Codes: 2833-2836 (biotechnology), 3570-3577 and 7370-7374 (computers), 3600-3674 (electronics), and 52(X)-5961 (retailing).

(The table is continued on the next page)

Table 7.1 (continued)

Variable	Calculation
MB	The market to book ratio that equals the firm's market capitalization divided by book value for year t.
$SalesGrowth$	Current year's sales less prior year's sales less the increase in receivables all scalded by prior year's sales and decile ranked by industry and year.
$Momentum$	Returns momentum calculated by the decile rank (by industry and year) of asset returns during the two years preceding the start of year t.
$NumAnalyst$	The log of 1+ the number of analysts covering the firm in year t.
$IndRev\%$	Industry revenue leadership measured by the firm's sales in year t-1 divided by the total sales for the firm's industry in year t-1.
$Segments$	The natural log of 1+ the number of firm's business segments in year t.
$Foreign$	The frequency with which the firm has a non-zero foreign currency transactions during the sample period.
GFC	An indicator variable equals one for the years of the global financial crisis (2007-2009); zero otherwise.
$Dot-Com$	An indicator variable equals one for the years of the Dot-Com bubble (1997-2000); zero otherwise.
SOX	An indicator variable equals one for the years after the release of the Sarbanes Oxley act (2002-2005); zero otherwise.

Notes: This table presents the detailed calculations for each of the control variables identified in the model as discussed in the (Variable Definitions) section above.

Table 7.2 Panel A Expected and actual signs of the control variables - The effect on earnings management

Variables	*AccrualEM*		*RealEM*	
	Predicted sign	Actual sign	Predicted sign	Actual sign
$FirmSize_{it}$	+/-	+	+/-	+
$SalesVolatility_{i,t-4,t}$	+	+	+	+
$CashFlowVolatility_{i,t-4,t}$	+	+	+	+
$OperCycle_{i,t-4,t}$	+	+	+	+
$Losses_{i,t-4,t}$	+/-	+	+/-	-
$MgrlAbility_{it}$	+	+	-	-
$NationalAuditor_{it}$	+/-	-	+	+
$LitigationInd_{it}$	+/-	+	+/-	+
MB_{it}	+/-	+	+/-	+
$SalesGrowth_{rk_{it}}$	+/-	-	+/-	+
$Momentum_{it}$	+/-	+	+/-	-
$LnNumAnalyst_{it}$	+	+	+	+
IndRev%	+/-	-	+/-	+
$Segments_{it}$	+/-	-	+/-	-
$Foreign_{it}$	+/-	-	+/-	+
GFC_{it}	+/-	+	+/-	+
$Dot\text{-}Com_{it}$	+/-	-	+/-	+
SOX_{it}	+/-	-	+/-	+

Panel B Expected and actual signs of the control variables - The effect on information asymmetry

Variables	$InfoAssymetry_{it}$	
	Predicted sign	Actual sign
$FirmSize_{it}$	+/-	-
$SalesVolatility_{i,t-4,t}$	+/-	+/-
$CashFlowVolatility_{i,t-4,t}$	+/-	-
$OperCycle_{i,t-4,t}$	+/-	+/-
$Losses_{i,t-4,t}$	+/-	+/-
$MgrlAbility_{it}$	+/-	-
$NationalAuditor_{it}$	+/-	+
$LitigationInd_{it}$	+/-	+/-
MB_{it}	+/-	+/-
$SalesGrowth_{rk_{it}}$	+/-	-
$Momentum_{it}$	+/-	-
IndRev%	+/-	+/-
$Segments_{it}$	+/-	+
$Foreign_{it}$	+/-	+

Notes: This table presents the signs I expect and actually get for all control variables identified in the models and discussed in the (Variable Definitions) section above.

7.3.6 Descriptive Statistics

I present the descriptive statistics in Table 7.3. Consistent with Demerjian et al. (2013b), both accrual and real earnings management measures have means and medians of zero because they are calculated as the residuals from the models selected above. Meanwhile, the measures of market concentration and information asymmetry are comparable to those of Karuna et al. (2012) and Dalia and Park (2009), taking into consideration the difference of the sample from those of the previous studies.

Table 7.3 Descriptive statistics

Variables	Mean	Median	Std Dev	P25	P75
AccrualEM	0.00	0.00	0.05	-0.01	0.01
RealEM	0.00	-0.00	1.00	-0.72	0.70
Concentration	0.22	0.17	0.16	0.10	0.29
ForecastError	0.28	0.10	0.83	0.03	0.26
ForecastDispersion	0.15	0.05	0.71	0.02	0.13
AnalystsCoverage	1.22	1.09	0.41	0.69	1.60
TotalAssets	2,622.85	147.34	14,666.88	30.75	789.46
SalesVolatility	0.26	0.15	0.40	0.08	0.29
CashFlowVolatility	0.12	0.06	0.34	0.04	0.12
OperCycle	133.22	119.26	81.27	76.72	172.87
Losses	0.37	0.25	0.36	0.00	0.67
MgrlAbility	0.00	-0.01	0.15	-0.10	0.08
NationalAuditor	0.22	0.00	0.41	0.00	0.00
LitigationInd	0.09	0.00	0.28	0.00	0.00
MB	3.15	1.89	50.61	1.04	3.46
SalesGrowth	0.90	0.08	66.38	-0.03	0.22
Momentum	-0.17	0.06	2.09	-0.13	0.15
NumAnalyst	3.05	3.00	1.71	2.00	4.00
IndRev%	0.07	0.01	0.15	0.00	0.06
Segments	2.04	1.00	1.72	1.00	3.00
Foreign	0.21	0.00	0.34	0.00	0.33
GFC	0.13	0.00	0.34	0.00	0.00
Dot-Com	0.24	0.00	0.43	0.00	0.00
SOX	0.20	0.00	0.40	0.00	0.00

Notes: The table presents the descriptive statistics of all the variables identified in the model for 25,119 firm-year observations obtained from Compustat from 1989 to 2011. Variables are defined in the (Variable Definitions) section above. I present the untransformed variables for ease of interpretation.

The control variables are also comparable to Karuna et al. (2012) and Demerjian et al. (2013b) with some differences appearing because of the variations between the samples. Cash flow volatility is lower than sales volatility and thus implies that firms consider it more costly as it is negatively valued by the market (Allayannis and Weston, 2007). A huge portion of the firms show losses during the recent years which ultimately resulted in negative returns momentum. Because of presenting the untransformed variables, firm size and operating cycle are associated with high standard deviations.

Table 7.4 represents the correlation matrix between the major variables in the chapter: earnings management, market concentration, and information asymmetry. The correlations between the control variables have not been displayed here for easier demonstration. There is a negative correlation between accrual and real earnings management which suggests that they might be used as substitutes consistent with the subsequent findings in the results section. I also observe a strong correlation between the proxy of market concentration and both accrual and real earnings management, suggesting a potential impact of market concentration on earnings management. While for the proxies of information asymmetry, Table 7.4 shows a positive correlation between the three measures of information asymmetry, which implies that they all represent strong measures of the same variable. Further, I evidence a strong correlation between information asymmetry measures and market concentration measures that also shows a potential impact of market concentration on information asymmetry. Finally, I check the VIF between the previous variables and make sure that all VIF factors are less than 10 in order to control for multicollinearity.

Table 7.4 Correlation table

	Accrual EM	*Real EM*	*Concentration*	*Forecast Error*	*Forecast Dispersion*	*Analysts Coverage*
Accrual EM						
Real EM	-0.01**					
Concentration	0.04***	0.03***				
Forecast Error	-0.01*	0.00	-0.04***			
Forecast Dispersion	-0.01*	-0.01**	-0.04***	0.92***		
Analysts Coverage	-0.01	-0.02***	0.05***	0.04***	0.02***	

Notes: This table presents the correlation matrix for 25,119 firm-year observations obtained from Compustat from 1989 to 2011 between the measures of accrual earnings management measured by Stubben's Model (2010), real earnings management measured by Gunny's Model (2010), market concentration measured by the Hall Tideman Index (*HTI*), and information asymmetry measured by analysts' coverage, and the dispersion and error of their earnings forecasts. Variables are defined in the (Variable Definitions) section above. Pearson correlation coefficients are presented. To control for the multicollinearity between the different variables I make sure that all VIF factors are less than 10. VIF factors, however, are not tabulated. *, **, *** denotes a statistical coefficient at the 10, 5 and 1 percent alpha level, respectively.

7.4 Methodology

To test the first hypothesis (*H1*), I present a quadratic relationship in the model that identifies earnings management ($EarningsManagement_t$) as the dependent variable (Y_{it}) with its two proxies of real *(RealEM*) and accrual (*AccrualEM*) earnings management.[31] I introduce market concentration ($Concentration_{it}$) and its square ($Concentration^2_{it}$) as the explanatory variables (X_{it}) and (X^2_{it}) respectively. Meanwhile, I take the dynamic effect of earnings management into the model. Earnings performance in the past years determines earnings management behaviour during the current year (Kim et al., 2003). In addition, earnings management levels are associated with meeting prior earnings' benchmarks (Graham et al., 2005; Cohen et al., 2008; Gunny, 2010). Consequently, managers look back at the previously manipulated earnings when contemplating to manage earnings of the current year. Based on this argument, I use the lagged values ($Y_{i,t-1}$) of earnings management measures ($EarningsManagement_{i,t-1}$) to explain its current levels. To complete the model, I add the previously identified control variables ($Controls_{it}$) and an error term (ε_{it}).

The model suffers from the problem of unobservable individual heterogeneity attributed to time-invariant industry effects. The industry culture (e.g., the nature of relations and knowledge sharing between competitors in the same sector) may contribute to the information asymmetry in the market; hence using higher levels of earnings management activities by firms in specific industries compared to other sectors. Consequently, the sample is expected to be heterogeneous (Graham et al., 2012).

In addition, the model suffers from an endogeneity problem because of the mutual causality between the dependent and explanatory variables. While market concentration influences information asymmetry and thus the levels of earnings management, earnings management and information asymmetry are determinants of market concentration as they contribute to misleading investors and ultimately driving some firms to exit the market. This effect would be captured in the error term and

[31] The dependent variables have been tested for normality using the Jarque and Bera test which follows a chi-square distribution. The test statistic is calculated as $[\frac{n-k}{6}\ (S^2+\frac{(K-3)^2}{4})]$; where *n* is the number of observations, *k* is the number of regressors, *S* represents skewness and *K* represents kurtosis. The results provide statistics of 2.37 and 2.66 for accrual and real earnings management respectively leading to accepting the null hypotheses of normality with 95% confidence.

ultimately results in a correlation between the explanatory variable and the error term (Pindado and Requejo, 2014).

Therefore, the OLS estimator will not be able to solve the model as it ignores the impact of the unobservable individual heterogeneity or endogeneity problems. Furthermore, while the fixed effects estimator tackles the unobservable heterogeneity by demeaning the variables in the model it does not solve for the endogeneity problem as it assumes strict exogeneity. Therefore, I solve the model using a system generalized method of moments (GMM) estimator that demeans the variables in the model to solve for the heterogeneity and introduces instrumental variables to solve for the endogeneity problem as explained earlier in the methodology section of Chapter 5.[32] In addition, I present the results of the OLS regression as a robustness test in Appendix B Table II.

To avoid the consequent bias in the error term (ε_{it}) I split it into three components. First, I introduce (η_i) to control for the impact of the unobserved effects in the model.[33] Second, I add a time specific effect (d_t) to control for the macroeconomic variables that also interfere with the results over the time period of the study.[34] Finally, I consider the remaining part of the error term (ε_{it}) a random disturbance (v_{it}). Consequently, I express the model in general terms in equation (7.1) and in more specific terms in equation (7.2).

$$Y_{it} = \alpha_0 + \alpha_1 Y_{i,t-1} + \alpha_2 X_{it} + \alpha_3 X^2_{it} + \alpha_{4\text{-}21} Controls_{it} + \varepsilon_{it} \quad (7.1)$$

[32] Solving for these two problems using a system GMM estimator allows us to obtain less biased and more significant results compared to the previous studies.

[33] η_i controls for industry specific effects.

[34] I do not tabulate the coefficients of time periods later in the results.

$$\begin{aligned} EarningsManagement_{it} = {} & \alpha_0 + \alpha_1 EarningsManagement_{i,t-1} \\ & + \alpha_2 Concentration_{it} + \alpha_3 Concentration^2{}_{it} \\ & + \alpha_4 FirmSize_{it} + \alpha_5 SalesVolatility_{i,t-4,t} \\ & + \alpha_6 CashFlowVolatility_{i,t-4,t} \\ & + \alpha_7 OperCycle_{i,t-4,t} + \alpha_8 Losses_{i,t-4,t} \\ & + \alpha_9 MgrlAbility_{it} + \alpha_{10} NationalAuditor_{it} \\ & + \alpha_{11} LitigationInd_{it} + \alpha_{12} MB_{it} \\ & + \alpha_{13} SalesGrowth_{rk_{it}} + \alpha_{14} Momentum_{it} \\ & + \alpha_{15} LnNumAnalyst_{it} + \alpha_{16} IndRev\% \\ & + \alpha_{17} Segments_{it} + \alpha_{18} Foreign_{it} + \alpha_{19} GFC_{it} \\ & + \alpha_{20} Dot\text{-}Com_{it} + \alpha_{21} SOX_{it} + \eta_i + d_t + v_{it} \end{aligned} \quad (7.2)$$

After examining the relation between market concentration and earnings management, I find the breakpoints of the regression. As I study a quadratic relation, I calculate one breakpoint (MC_1) derived from differentiating value with respect to market concentration which equal – ($\alpha_2/2\alpha_3$). According to the hypothesis, I expect α_2 and α_3 to have opposite signs. Accordingly, if I accept the assumption in Figure 7.1, MC_1 will be a maximum but the opposite applies if I accept the assumption in Figure 7.2.

Similarly, to test the second hypothesis (*H2*), I present a quadratic relationship in a model that identifies information asymmetry ($InfoAssymetry_{it}$) as the dependent variable (Z_{it}), where ($InfoAssymetry_{it}$) is the proxy of (*ForecastError*), (*ForecastDispersion*), and (*InvAnalystsCoverage*). I again introduce market concentration ($Concentration_{it}$) and its square ($Concentration^2{}_{it}$) as the explanatory variables (X_{it}) and ($X^2{}_{it}$) respectively. To complete the model, I add the previously identified control variables ($Controls_{it}$) and an error term (ε_{it}). This model also suffers from the problems of unobservable individual heterogeneity and endogeneity as explained above (Pindado and Requejo, 2014), and, therefore, I solve it using a system generalized method of moments (GMM) estimator and split the error term (ε_{it}) into three components ($\eta_i, d_t,$ and v_{it}). However, I also present the results of the OLS regression as a robustness test in Appendix B Table III. I express the model in general terms in equation (7.3) and in more specific terms in equation (7.4).

$$Z_{it} = \alpha_0 + \alpha_1 X_{it} + \alpha_2 X^2{}_{it} + \alpha_{3\text{-}20} Controls_{it} + \varepsilon_{it} \quad (7.3)$$

$$\begin{aligned} InfoAssymetry_{it} = {} & \alpha_0 + \alpha_1 Concentration_{it} + \alpha_2 Concentration^2{}_{it} \\ & + \alpha_3 FirmSize_{it} + \alpha_4 SalesVolatility_{i,t-4,t} \\ & + \alpha_5 CashFlowVolatility_{i,t-4,t} \\ & + \alpha_6 OperCycle_{i,t-4,t} + \alpha_7 Losses_{i,t-4,t} \\ & + \alpha_8 MgrlAbility_{it} + \alpha_9 NationalAuditor_{it} \\ & + \alpha_{10} LitigationInd_{it} + \alpha_{11} MB_{it} \\ & + \alpha_{12} SalesGrowth_{rk_{it}} + \alpha_{13} Momentum_{it} \\ & + \alpha_{14} IndRev\% + \alpha_{15} Segments_{it} + \alpha_{16} Foreign_{it} \\ & + \eta_i + d_t + v_{it} \end{aligned} \quad (7.4)$$

After the completion of the empirical work, I ensure that the assumptions of the estimator hold and that the model is valid. I initially test whether the GMM estimator properly addresses the problem of endogeneity. For this purpose, I use the Hansen test for over-identifying restrictions. It takes a χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The model uses multiple lags of the right-hand side variables as instruments, which make it over-identified. Consequently, if I accept Hansen's null hypothesis that the instrumental variables (IV_{it}) and the error term (ε_{it}) are uncorrelated, I guarantee that the instruments are valid and the estimator is appropriate. I present the results of Hansen test in tables 7.5 and 7.6, which show that the instruments are valid.

Additionally, I implement Arellano and Bond (1991) to check for the validity of the model. It takes the shape of a normal distribution with N(0,1). It mainly examines the serial correlation in the first difference residual (v_{it}) over different periods (s) by using the (m_j) statistic [$E(v_{it}\, v_{is})=0$, while $t \neq s$]. I accept first order serial correlation in the model because the estimator takes the first difference to eliminate the individual specific effects (η_i). However, I reject second order serial correlation (m_2) in the residual because it indicates a problem in the model. I present the results of the AB test in tables 7.5 and 7.6, which confirm that no second order serial correlations exist in the model.

Finally, I use the Wald test (z_1) to check for the joint significance of the reported coefficients in the model. If I reject the null hypothesis that states no relationship between the dependent and explanatory variables, I make sure that the model is jointly

significant. I present the results of the Wald test in tables 7.5 and 7.6. They all support the joint significance of the reported coefficients.

7.5 Results

7.5.1 Market Concentration and Earnings Management

I start by examining the effect of market concentration, represented by the Hall Tideman index (*HTI*), on accrual earnings management. Column (1) of Table 7.5 presents the results of the system GMM estimation of the model. The results show that $\propto_1$ is significantly positive while $\propto_2$ is significantly negative; which support hypothesis *H1* and confirm the quadratic relationship between market concentration and accrual earnings management according to Figure 7.1. By calculating the breakpoint (MC_1), I find that accrual earnings management increases at market concentration levels between 0 and 55% but starts decreasing after that level. Similar results are obtained by using the Modified Jones' Model (1995) as shown in Appendix B Table I and the OLS estimator as shown in Appendix B Table II.

I also show the results of the system GMM estimation for the effect of market concentration on real earnings management in column (2) of Table 7.5. They show that $\propto_1$ is significantly negative while $\propto_2$ is significantly positive; which also support hypothesis *H1* and confirm the quadratic relationship presented in Figure 7.2. By calculating the breakpoint, I find that real earnings management decreases at market concentration levels between 0 and 60% but starts increasing afterwards. Similar results are obtained by using the Roychowdhury's Model (2006) as shown in Appendix B Table I and the OLS estimator as shown in Appendix B Table II.

Table 7.5 The effect of market concentration on earnings management

	(1)	(2)
Variables	$AccrualEM_{it}$	$RealEM_{it}$
$Concentration_{it}$	0.306***	-0.827***
$Concentration^2_{it}$	-0.276***	0.694***
$AccrualEM_{i,t-1}$	-0.092***	-
$RealEM_{i,t-1}$	-	0.323***
$FirmSize_{it}$	0.070***	0.038***
$SalesVolatility_{i,t-4,t}$	0.295***	0.346***
$CashFlowVolatility_{i,t-4,t}$	0.093***	0.034***
$OperCycle_{i,t-4,t}$	0.035***	0.016***
$Losses_{i,t-4,t}$	0.073***	-0.032***
$MgrlAbility_{it}$	0.930***	-0.084***
$NationalAuditor_{it}$	-0.081***	0.222***
$LitigationInd_{it}$	0.109***	0.072***
MB_{it}	0.000***	0.000***
$SalesGrowth_{rk_{it}}$	-0.721***	0.040***
$Momentum_{it}$	0.472***	-0.150***
$LnNumAnalyst_{it}$	0.065***	0.016***
IndRev%	-0.484***	0.080***
$Segments_{it}$	-0.100***	-0.056***
$Foreign_{it}$	-0.049***	0.165***
GFC_{it}	0.021***	0.142***
$Dot\text{-}Com_{it}$	-0.083***	0.120***
SOX_{it}	-0.025***	0.124***
Hansen	1,774.690	1,782.030
m_1	-19.450	-9.560
m_2	-1.110	1.600
z_1	31,069.380	2.3e+05

Notes: This table presents the results from the system generalized method of moments regressions for the effect of market concentration on earnings management. The sample includes 25,119 firm-year observations obtained from Compustat from 1989 to 2011. Market concentration *(Concentration)* is measured using the Hall Tideman Index (*HTI*) and each column represents the estimate from examining its effect on earnings management activities in the following order: (1) accrual earnings management measured by Stubben's Model (2010), and (2) real earnings management measured by Gunny's Model (2010). Each coefficient represents the change in earnings management based on a one unit change in the determinant. Variables are defined in the (Variable Definitions) section above. $Concentration$ is the Hall Tideman Index and $Concentration^2$ is its square. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (v_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. The table also displays evidence about the dynamic behaviour of earnings management in the third and fourth rows. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

The previous results emphasize the double-edged effect of market concentration on earnings management through decreasing the costs of communication while increasing the asymmetry of information between management and shareholders. Therefore, while Dalia and Park (2009), Markarian and Santalo (2010), Karuna et al. (2012), and Datta et al. (2013) find linear relations, I document a non-linear effect of market concentration on both accrual and real earnings management. On the other hand, the results support those of Scherer (1967), Hermalin (1992), Schmidt (1997), and Aghion et al. (2005) that document a non-linear effect of the market structure on firm behaviour. Particularly, I am in line with Guo et al. (2015) who find a non-linear relationship between market competition and earnings quality. However, I explain the double-edged effect of market concentration on earnings management based on information asymmetry theory in the next section.

7.5.2 Market Concentration and Information Asymmetry

I start by examining the effect of market concentration, represented by the Hall Tideman index (*HTI*), on information asymmetry measured by the inverse of analysts' coverage.[35] Column (1) of Table 7.6 presents the results of the system GMM estimation of the related model. I find that $\propto_1$ is significantly positive; which supports hypothesis *H2a* and shows that there is more information asymmetry at higher levels of market concentration due to the lower analysts' coverage.[36] In this sense, the previous result shows a decline in the quantity of information with the increase in market concentration. Similar results are obtained by using the OLS estimator as shown in Appendix B Table III.

[35] The analysts' coverage variable is multiplied by -1 to reflect information asymmetry as explained in Table 7.1.

[36] As I am already expecting a linear relationship in hypothesis *H2a*, I do not test for the quadratic effect of market concentration on the inverse of analysts' coverage; and thus I leave a blank value for $Concentration^2{}_{it}$ in table 7.6.

Table 7.6 The effect of market concentration on information asymmetry

Variables	(1) $InvAnalystsCoverage_{it}$	(2) $ForecastError_{it}$	(3) $ForecastDispersion_{it}$
$Concentration_{it}$	0.222***	-0.395***	-0.418***
$Concentration^2_{it}$	-	0.339***	0.393***
$FirmSize_{it}$	-0.134***	-0.039***	-0.019***
$SalesVolatility_{i,t-4,t}$	-0.102***	0.097***	0.054***
$CashFlowVolatility_{i,t-4,t}$	-0.156***	-0.161***	-0.191***
$OperCycle_{i,t-4,t}$	0.028***	0.006***	-0.002*
$Losses_{i,t-4,t}$	-0.032***	0.290***	0.213***
$MgrlAbility_{it}$	0.028***	-0.113***	-0.065***
$NationalAuditor_{it}$	0.043***	0.182***	0.077***
$LitigationInd_{it}$	0.032**	-0.003	-0.078***
MB_{it}	-0.000***	6.81e-05***	3.14e-05***
$SalesGrowth_{rk_{it}}$	-0.020***	-0.164***	-0.074***
$Momentum_{it}$	-0.102***	-0.169***	-0.116***
IndRev%	0.441***	-0.264***	-0.207***
$Segments_{it}$	0.126***	0.026***	0.006***
$Foreign_{it}$	0.032**	0.137***	0.069***
Hansen	1,790.650	1,823.270	1,879.210
m_1	-21.440	-10.550	-8.510
m_2	-2.170	-0.950	-1.360
z_1	990.610	3,791.370	11,269.540

Notes: This table presents the results from the system generalized method of moments regressions for the effect of market concentration on information asymmetry. The sample includes 25,119 firm-year observations obtained from Compustat from 1989 to 2011. Market concentration is measured using the Hall Tideman Index (*HTI*) and each column represents an estimate from examining its effect on information asymmetry measures in the following order: (1) The inverse of analysts' coverage, (2) earnings forecast error, and (3) earnings forecast dispersion. Each coefficient represents the change in information asymmetry based on a one unit change in the determinant. Variables are defined in the (Variable Definitions) section above. $Concentration$ is the Hall Tideman Index and $Concentration^2$ is its square. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (v_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

I then examine the effect of market concentration, represented by the Hall Tideman index (HTI), on information asymmetry measured by earnings forecast error and earnings forecast dispersion. Column (2) and (3) of Table 7.6 present the results of the system GMM estimation of the related model. The results show that $\propto_1$ is significantly

negative while α_2 is significantly positive; which support hypothesis *H2b* and confirm the quadratic relationship between market concentration and earnings forecast error and dispersion. By calculating the breakpoints, I find that earnings forecast error and dispersion decrease up to market concentration levels of 58% and 53% respectively but start increasing afterwards. Similar results are obtained by using the OLS estimator as shown in Appendix B Table III. In this sense, I evidence an increase in the quality of information provided by analysts at lower levels of market concentration because of the lower errors and dispersion in their forecasts, followed by a decrease in that quality at higher levels of market concentration. These results suggest that with the increase in market concentration, analysts are able to produce better forecasts based on firms' higher motivation to signal quality information under the lower probability of competitors to threaten their competitive advantages. However, after a certain point, the few remaining competitors are more likely to collude and ultimately provide low quality information and, therefore, make it more difficult for the analysts to compare the performance between the few existing firms.

The results provide another piece of evidence on the effect of market concentration on information asymmetry. While Ali et al. (2014) and Dalia and Park (2009) emphasize a linear positive effect, I document a non-linear relationship. However, the results are more supportive to those of Bhattacharya et al. (2013) who document a non-linear relationship between earnings quality and information asymmetry.

7.6 Additional Analysis: Governance Controls

Many studies have documented that corporate governance influences earnings management (García Lara et al., 2007; Duh et al., 2009; Feng et al., 2009; Jaggi et al., 2009; Prencipe and Bar-Yosef, 2011; Demerjian et al., 2013a). Better governance quality contributes in aligning information between management and shareholders and, therefore, mitigates the information asymmetry and contributes to decreasing the uncertainty in the market (Elbadry et al., 2013). As a result, I perform all the previous regressions once more using additional controls for corporate governance. I add three

control variables which I obtain form Execuocomp database.[37] I use a dummy for executives who serve as directors (*ExecDir*) which equals 1 if the executive served as director during the year. I also use the executive tenure (*Tenure*) calculated as the log of the executive tenure measured in days. Finally, I add the number of board meeting (*BoardMtgs*) held during the year (Adut et al., 2013). The previous variables, however, are only available from 1992 to 2006 and, therefore, I cover only this period in the additional analysis. As a result, I end up with 18,505 observations. The results emphasize the previous findings related to the relationship between market concentration, information asymmetry and earnings management. The results, however, are not tabulated here.

7.7 Conclusion

In this chapter, I examine the effect of market concentration on earnings management that has been widely debated in the literature. For this purpose, I explain the relationship based on the asymmetry of information in concentrated markets and provide some new insights. First, while the previous studies have examined the linear effect of market concentration on earnings management, I document a significant non-linear effect where accrual earnings management increases up to a certain level of market concentration then real earnings management starts to dominate.

Second, I explain the previous trend of earnings management based on the quantity and quality of information in the market. As the quantity of information decreases in concentrated markets, managers get motivated to use discretionary accruals due to the weak monitoring. However, when the quality of information starts to decline, managers tend to use more of the sophisticated real earnings management as it is more difficult to detect and understand.

Third, the results emphasize the substitutability of earnings management activities based on their relative costs to the firms. While, firms consider accrual earnings management less costly at lower levels of market concentration, they find real earnings management a better choice at higher levels of market concentration. However,

[37] Data generously provided by Francesco Vallascas and Paula Castro.

an optimal level of market concentration exists between the levels of 55% and 60% where both accrual and real earnings management are falling and, therefore, regulatory intervention is required to emphasize that level. For future research, I recommend examining the non-linear relationship between the other measures of market competition and earnings management as it may provide a new understanding of this area of research.

Appendix B

Appendix B Table I The effect of market concentration on earnings management

Variables	(1) $AccrualEM_{it}$	(2) $RealEM_{it}$
$Concentration_{it}$	0.270***	-0.039***
$Concentration^2_{it}$	-0.240***	0.032***
$AccrualEM_{i,t-1}$	0.055***	-
$RealEM_{i,t-1}$	-	0.597***
$FirmSize_{it}$	-0.015***	0.163***
$SalesVolatility_{i,t-4,t}$	0.044***	0.318***
$CashFlowVolatility_{i,t-4,t}$	0.061***	0.104***
$OperCycle_{i,t-4,t}$	0.086***	0.091***
$Losses_{i,t-4,t}$	-0.269***	0.195***
$MgrlAbility_{it}$	0.935***	-0.235***
$NationalAuditor_{it}$	-0.010***	0.014***
$LitigationInd_{it}$	0.299***	0.040***
MB_{it}	0.000***	0.000***
$SalesGrowth_{rk_{it}}$	-0.336***	0.217***
$Momentum_{it}$	0.191***	0.327***
$LnNumAnalyst_{it}$	0.030***	0.053***
IndRev%	-0.158***	-0.902***
$Segments_{it}$	-0.033***	-0.104***
$Foreign_{it}$	-0.056***	-0.148***
GFC_{it}	0.073***	-0.422***
$Dot\text{-}Com_{it}$	0.065***	-0.354***
SOX_{it}	0.078***	-0.387***
Hansen	1,788.330	1,757.050
m_1	-17.000	-6.760
m_2	0.190	1.220
z_1	20,035.810	4.5e+05

Notes: This table presents the results from the system generalized method of moments regressions for the effect of market concentration on earnings management. The sample includes 25,119 firm-year observations obtained from Compustat from 1989 to 2011. Market concentration *(Concentration)* is measured using the Hall Tideman Index (*HTI*) and each column represents the estimate from examining its effect on earnings management activities in the following order: (1) accrual earnings management measured by Modified Jones' Model (1995), and (2) real earnings management measured by Roychowdhury's Model (2006). Each coefficient represents the change in earnings management based on a one unit change in the determinant. Variables are defined in the (Variable Definitions) section above. $Concentration$ is the Hall Tideman Index and $Concentration^2$ is its square. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. The table also displays evidence about the dynamic behaviour of earnings management in the third and fourth rows. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Appendix B Table II The effect of market concentration on earnings management

Variables	(1) $AccrualEM_{it}$	(2) $RealEM_{it}$
$Concentration_{it}$	0.255*	-0.286***
$Concentration^2_{it}$	-0.229*	0.242**
$AccrualEM_{i,t-1}$	-0.104**	-
$RealEM_{i,t-1}$	-	0.652***
$FirmSize_{it}$	0.011	0.005
$SalesVolatility_{i,t-4,t}$	0.011	0.076**
$CashFlowVolatility_{i,t-4,t}$	0.026	-0.029
$OperCycle_{i,t-4,t}$	0.015	0.008
$Losses_{i,t-4,t}$	-0.003	-0.000
$MgrlAbility_{it}$	0.385***	-0.102***
$NationalAuditor_{it}$	0.000	0.062***
$LitigationInd_{it}$	0.041	0.092***
MB_{it}	0.000	5.77e-05
$SalesGrowth_{rk_{it}}$	-0.730***	0.047*
$Momentum_{it}$	0.129**	-0.013
$LnNumAnalyst_{it}$	0.055**	-0.004
IndRev%	-0.223***	0.042
$Segments_{it}$	0.003	-0.005
$Foreign_{it}$	0.046	0.032
GFC_{it}	0.012	0.066
$Dot\text{-}Com_{it}$	0.000	0.121
SOX_{it}	-0.011	0.166
R^2	0.255	0.452
F-statistic	15.300	22.580
Prob (F-statistic)	0.000	0.000

Notes: This table presents the results from the ordinary least square regressions for the effect of market concentration on earnings management. The sample includes 25,119 firm-year observations obtained from Compustat from 1989 to 2011. Market concentration *(Concentration)* is measured using the Hall Tideman Index (*HTI*) and each column represents the estimate from examining its effect on earnings management activities in the following order: (1) accrual earnings management measured by Stubben's Model (2010), and (2) real earnings management measured by Gunny's Model (2010). Each coefficient represents the change in earnings management based on a one unit change in the determinant. Variables are defined in the (Variable Definitions) section above. $Concentration$ is the Hall Tideman Index and $Concentration^2$ is its square. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Appendix B Table III The effect of market concentration on information asymmetry

Variables	(1) $InvAnalystsCoverage_{it}$	(2) $ForecastError_{it}$	(3) $ForecastDispersion_{it}$
$Concentration_{it}$	0.156***	-0.181*	-0.056
$Concentration^2_{it}$	-	0.169*	0.045
$FirmSize_{it}$	-0.108***	-0.019***	-0.003
$SalesVolatility_{i,t-4,t}$	-0.017	0.161***	0.078***
$CashFlowVolatility_{i,t-4,t}$	-0.166***	-0.009	0.011
$OperCycle_{i,t-4,t}$	0.007*	0.010	-0.005
$Losses_{i,t-4,t}$	-0.110***	0.196***	0.156***
$MgrlAbility_{it}$	-0.002	-0.075***	-0.046**
$NationalAuditor_{it}$	0.093***	0.046**	0.006
$LitigationInd_{it}$	-0.034***	0.038*	-0.006
MB_{it}	-0.000**	-3.50e-05	-1.60e-05
$SalesGrowth_{rk_{it}}$	-0.083***	-0.087***	-0.058***
$Momentum_{it}$	-0.155***	-0.183***	-0.104***
IndRev%	0.041	-0.175***	-0.111***
$Segments_{it}$	0.092***	0.078***	0.042***
$Foreign_{it}$	0.052***	0.027	0.017
R^2	0.254	0.137	0.122
F-statistic	137.540	14.80	8.49
Prob (F-statistic)	0.000	0.000	0.000

Notes: This table presents the results from the ordinary least square regressions for the effect of market concentration on information asymmetry. The sample includes 25,119 firm-year observations obtained from Compustat from 1989 to 2011. Market concentration is measured using the Hall Tideman Index (*HTI*) and each column represents an estimate from examining its effect on information asymmetry measures in the following order: (1) The inverse of analysts' coverage, (2) earnings forecast error, and (3) earnings forecast dispersion. Each coefficient represents the change in information asymmetry based on a one unit change in the determinant. Variables are defined in the (Variable Definitions) section above. $Concentration$ is the Hall Tideman Index and $Concentration^2$ is its square. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Chapter 8
Earnings Management, Managerial Ability and the Role of Competition

8.1 Introduction

While chapter 6 and 7 have focused on examining factors from the contractual or third-party motives of earnings management individually, this chapter examines how both groups interact in determining earnings management behaviour. High quality managers possess the abilities to manage earnings and achieve private benefits, but they may avoid earnings management because they are aware of its unfavourable consequences on their firms (Francis et al., 2008; Demerjian et al., 2013b). Meanwhile, the behaviour of superior managers is unlikely to be independent of the external factors that influence the firm. Some managers with high levels of ability, for example, will operate in business environments that are highly competitive, while others will operate in environments with significantly lower levels of competition.[38] Therefore, in this chapter I examine whether the influence of a third-party like competitors disciplines more able managers or drives their opportunistic behaviour.

Earnings management behaviour within a firm is determined by different sets of motives that can be related to contracting, capital market structure, or other external factors (Walker, 2013). Some of the contractual drivers of earnings management are the abilities and competencies of the managers of the firm, which affect the cost of managerial contracts with shareholders (Francis et al., 2008; Demerjian et al., 2013b). In the presence of high quality managers, shareholders may have to continuously consider, write, negotiate, and renegotiate the employment contracts of skilled managerial labour (Hart, 1983; Walker, 2013). Therefore, contracts with highly skilled managers may be insufficient to monitor their performance effectively, thereby giving them more space to manage earnings. Conversely, superior managers possess the requisite skills to manage their firms successfully. As such, highly skilled managers

[38] The converse is also true in the case of managers with lower levels of ability.

may be more able to realize the long-term gains associated with creating sustainable value, both through current and future remuneration and via increased labour market capital. In this situation, shareholders are more likely to trust the signals produced by these managers (e.g. earnings); and these managers' incentives are better aligned with shareholders who consequently feel less need to monitor their behaviour (Hart, 1983; Walker, 2013).

A key external driver of earnings management that has been widely examined in the literature is the level of market competition present in an industry (Dalia and Park, 2009; Markarian and Santalo, 2010; Karuna et al., 2012; Datta et al., 2013). Competition increases the level of transparency in an industry, and as a result, it decreases the information asymmetry between managers and shareholders (Dalia and Park, 2009). However, while the presence of increased information in highly competitive environments allows shareholders to more effectively compare firm performance, it may motivate managers to undertake increased levels of earnings management.

Based on the previous arguments concerning managerial ability and market competition, and the expectation that these two factors interact in explaining earnings management, I examine the influence of managerial ability on the earnings management behaviour in the presence of differential levels of market competition. In measuring managerial ability, I follow the model developed by Demerjian et al. (2012) that measures ability as the capacity of management to generate revenues from firm resources. For market competition I use three of the most commonly used measures, namely, market concentration, product substitutability, and market pricing power (Dalia and Park, 2009; Markarian and Santalo, 2010; Karuna et al., 2012; Datta et al., 2013). Finally, for the measures of earnings management I apply the Stubben (2010) and the Modified Jones (1995) models to measure accrual earnings management, and the Gunny (2010) and Roychowdhury (2006) models to measure real earnings management.

I find that high quality managers respond to market competition by using more discretionary accruals while avoiding real earnings management. The results extend the work of Karuna et al. (2012) who document an overall positive effect of market competition on both accrual and real earnings management. However, I particularly

show that superior managers are not likely to use the later activity because of its higher subsequent costs to their firms.

The remainder of the chapter proceeds as follows. In the next section I review the related studies from the literature and build the hypotheses of the chapter. In section 8.3 I explain the process of data collection, variable definitions, and the descriptive statistics. In section 8.4 I explain the methodology I use in this chapter. In section 8.5 I present and explain the results. In section 8.6 I add some empirical analysis. Finally, in section 8.7 I offer conclusions.

8.2 Literature and Hypotheses Development

8.2.1 Earnings Management Behaviour

According to the theory of the firm, the separation of ownership from control in public companies creates an agency problem (Ronen and Yaari, 2008). In this conflict of interest, shareholders and managers act rationally to maximize their own welfare. However, earnings serve as a performance measure that enables shareholders to monitor managers and hence alleviate the previous tension. That is, earnings have potential value to the shareholders in making their decisions – namely providing them with relevant information to establish or adjust their contracts with the management (Walker, 2013).

However, earnings need not always deliver their expected value as management prepares the financial statements that shareholders rely on. The information asymmetry gives management the opportunity to obfuscate its failures or signal specific messages to outsiders. Under such uncertainty, shareholders will not be able to completely understand management actions (Merkl-Davies and Brennan, 2007). In response to this weak form of market efficiency, managers may take advantage of the imperfect contracts with shareholders and use their judgement to alter the financial statements and report earnings in a different way from what is already known to them (Ronen and Yaari, 2008).

In light of the previous discussion, the motives of earnings management behaviour can be explained using the revelation principle and the conditions identified

by Walker (2013). According to Walker (2013), at least one of the following four conditions needs to be satisfied for earnings management to occur. First, there are high contracting costs, especially under the impossibility of establishing perfect contracts to cover all potential terms required to co-ordinate between management and the large number of shareholders. Second, shareholders are 'imperfect rational' and are unable to make wealth maximizing decisions all of the time. Third, there is a lack of common shared knowledge (in the form of a management information systems), which precludes shareholders from fully understanding management actions. Finally, there are high relative communication costs due to the presence of third parties such as regulators, competitors, and tax authorities – essentially, the performance of a firm that is relevant to shareholders is conditioned by the performance of immediate competitors, how far the regulatory environment affects the specific behaviour of the firm and how able the firm is to manage the tax regime. However, as Walker (2013) has not distinguished between accrual and real earnings management, I incorporate the costs of both activities into the previous model when explaining the selected motives of earnings management, as discussed in the next sections.

8.2.2 Managerial Ability, Market Competition and Accrual Earnings Management

To the extent that perfect contracts do not exist in terms of accommodating all current and potential terms, more simplified general formats are likely to be used. Within this context, more able managers are more likely to emphasize aspects of their firms' performance that allow them to achieve better personal benefits. This conjecture is in line with the rent extraction hypothesis and leads to aggravating moral hazard problem between shareholders and superior managers. Consistent with the previous argument, Francis et al. (2008) provide evidence that superior managers do not necessarily produce better quality disclosures. They point out that managerial ability leads to a decrease in earnings quality because better managers are more able to manage earnings to obtain higher stock compensation, etc. Likewise, Demerjian et al. (2013b) examine the effect of managerial ability on accrual earnings management and document a positive relationship.

At a more macro-level, I expect earnings management behaviour to depend on market competition. To the extent that third parties like competitors influence managerial communication with shareholders, the effect of market competition can be best explained by violating the fourth condition of the revelation principle mentioned above and hence changing the motivation of managers to manage earnings (Walker, 2013). Communicating more information in competitive markets allows shareholders and managers to make more comparisons between firms in the same industry which potentially drives managers to imitate the aggressive activities of other managers (Lieberman and Asaba, 2006). Put differently, market competition drives more adverse selection by triggering management herding behaviour in order to meet market expectations. Consistent with this argument, Milgrom and Roberts (1992) analyse a case study in the savings and loans industry in the United States in the 1980s where conservative managers imitated the aggressive behaviour in the industry by offering high interest rates to depositors in order to collect more money for their projects and stay in the business. Other studies particularly study the effect of market competition on accrual earnings management. Karuna et al. (2012) and Datta et al. (2013) find a positive impact because of the comparisons that create pressure to meet competitors' performance. Moreover, the herding behaviour is very likely in this setting because managers can easily understand each other's incentives in the same industry (Kallunki and Martikainen, 1999; Bagnoli and Watts, 2000). In contrast, Dalia and Park (2009) provide evidence that competition discourages discretionary accruals in the manufacturing sector in the United States because information spreads more easily and hence the stock market promptly punishes earnings management behaviour. Following a similar line of argument, Markarian and Santalo (2010) document that when shareholders have access to more information about the firm and its competitors, earnings management activities become more costly as they are difficult to be justified by management.

Given the abilities of superior managers to trade-off between the short and long horizons after evaluating the costs of earnings management activities as explained earlier, I expect them to react carefully to the pressure of market competition. To the extent that the high communication costs can drive managers to act more aggressively in order to survive in the market, high quality managers are more likely to use the less

costly accrual earnings management to achieve this target. Consistent with this argument, I develop the following hypothesis:

H1a: The positive relationship between managerial ability and accrual earnings management will be enhanced with the extent of market competition in the industry where the firm operates.

8.2.3 Managerial Ability, Market Competition and Real Earnings Management

In contrast to the previous argument, more able managers provide higher quality performance and are obviously aware of the consequences of their behaviour on their reputations and future benefits. Therefore, shareholders expect superior managers to emphasize the long horizons of their firms. The assumption is in line with the efficient contracting hypothesis and implies a decrease in moral hazard problem between more able managers and shareholders in the long-run. The above idea has some foundation in the prior research that examines the effect of managerial ability on earnings management. Demerjian et al. (2013b) find that superior managers are less inclined to use earnings management by particularly avoiding real earnings management activities because of the negative consequences for their firms. To the extent that real earnings management involves activities like delaying expenses, asset sales, increasing production, sales discounts, or R&D cuts, it results in giving up positive net present value (NPV) projects and burning cash flows and, therefore, achieving short-term earnings' targets at the expense of firm value. Because superior managers can anticipate the negative long-term consequences of real earning management, they are less likely to use such costly activities.

At the same time, superior managers are not independent of the external motives and thus market competition may also influence their real earnings management behaviour. Some studies provide evidence on the disciplinary function of market competition. Holmstrom (1982) finds that the performance evaluation of a manager relative to others in the same industry results in more information about the common uncertainties in the market and, thus, helps to mitigate the conflict of interest between management and shareholders. Similarly, Hart (1983) provides evidence that there is less space for discretionary behaviour under competition as firms within the same

industry share a business environment that allows performance comparisons and ultimately rules out any supernormal profits. Furthermore, Chhaochharia et al. (2012) specifically find that market competition is associated with better operational efficiency that makes it a potential substitute for internal governance mechanisms. In contrast, Karuna et al. (2012) examines the effect of market competition on real earnings management. Their results show managers use more real earnings management under the intensive comparisons between firms and the tendency to imitate the opportunistic behaviour of other managers in the same industry. Because superior managers possess the abilities to extract private benefits without sacrificing long-term gains (Demerjian et al., 2013b), I expect them to pursue improving shareholder value even under the pressure of the high communication costs and adverse selection driven by market competition. Top managers are therefore more likely to avoid real earnings management because of the associated costs. Drawing on the previous discussion I develop the following hypothesis:

H1b: The negative relationship between managerial ability and real earnings management will be enhanced with the extent of market competition in the industry where the firm operates.

8.3 Data, Variable Definitions, and Descriptive Statistics

8.3.1 Data

To undertake the analysis, I include all firms in the United States from the Annual Compustat, Quarterly Compustat, Historical Segments Compustat, and IBES databases. I start with all firms that have the required data for calculating the measures of earnings management, competition, and managerial ability.[39] Following Cheng et al. (2011), I exclude regulated industries such as banks, credit institutions, brokers, insurance, real estate, holding companies, and investment firms. These industries have their unique accounting and financial practices and are subject to distinct regulations. Therefore, managers in these industries have different motivations to manipulate earnings than

[39] For estimates of managerial ability, I use the dataset of Demerjian et al. (2012) which is available at https://community.bus.emory.edu/personal/PDEMERJ/Pages/Home.aspx

those of managers in other industry sectors.[40] In addition, I exclude firm-years where accounting changes, merger and acquisition activities, or discontinued operations occur.[41]

Following prior literature, I exclude any industry with fewer than six observations for each SIC code in a specific year to ensure sufficient data exists to calculate earnings management measures and make sure that OLS assumption regarding the normality of the error term holds (e.g., Rosner, 2003; García Lara et al., 2005; Kothari et al., 2005; Athanasakou et al., 2009; Iqbal et al., 2009). For that purpose, I follow the SIC classification of Fama-French (1997). As the model is dynamic, I ensure that information is available for at least five consecutive years for each firm over the study period (Miguel et al., 2004). When I combine the cross-sectional and time-series dimensions of the data, I obtain 66,695 observations in an unbalanced panel.[42]

8.3.2 Earnings Management Measures

Based on the discussion in Chapter 5, I use Stubben's Model (2010) for measuring accrual earnings management because it focuses on discretionary revenues which represent the largest component of earnings in most firms (Stubben, 2010). I also use Gunny's Model (2010) for real earnings management because it covers more types of this activity compared to other models (Gunny, 2010). In addition, I use two other widespread models as corroborating measures that include the Modified Jones' Model (1995) for measuring accrual earnings management and Roychowdhury's Model (2006) for measuring real earnings management. Again, for each of these measures I use a cross sectional model in the calculations for each year and each industry classified by its four-digit SIC code with at least 6 observations. I also take the decile ranks for better comparability and to avoid the effect of the outliers. For the purpose of calculating an overall measure of real earnings management using Gunny's Model (2010) and Roychowdhury's Model (2006), a principal component analysis with varimax rotation is

[40] I exclude firms with the following SIC codes: $4000 \leq SIC \geq 4900$ and $6000 \leq SIC \geq 6300$.
[41] According to McNichols (2002), I specifically exclude firm quarters or years with non-blank values for accounting changes cumulative effects (ACCCHGQ_FN), or merger and acquisition activities (ACQMETH_FN), or discontinued operations (DOQ_FN) in the Compustat database.
[42] By having an unbalanced panel I avoid any issues regarding survivorship bias.

performed to avoid the inclusion of highly correlated variables in the overall measure (Demerjian et al., 2013b).[43]

8.3.3 Managerial Ability Measure

To calculate the managerial ability variable, I adopt the approach of Demerjian et al. (2012) as discussed in section 4.3.3. The measure represents managerial potential of generating revenues from the available firm resources. It uses Data Envelopment Analysis (DEA) to calculate firm efficiency then excludes some firm specific characteristics that may influence the performance of managers. The remaining residual (ε_i) is the ultimate measure of managerial ability (*MgrlAbility*). Finally, I take the decile ranks of these measures by industry-year to obtain better comparability and to avoid the effects of outliers.

8.3.4 Competition Measures

As market competition has various dimensions, I use three of the most commonly used measures in the literature for this variable. These measures include market concentration, product substitutability, and market pricing power. The Herfindahl-Hirschman index (*HHI*) is the most commonly expressed measure in the literature to proxy for market concentration. I calculate it using the following equation:

$$HHI = \sum_{i=1}^{N} \omega_i^2 \tag{8.1}$$

In equation (8.1), ω is market share; and N is the number of firms per year-industry. Following Karuna et al. (2012) I use product substitutability (*ProdSubstitutability*) to represent the gross margin in the industry; and I measure it by the average operating profit divided by the sales in the industry. Finally, I measure firm-specific product market pricing power (*PricPower*) by the industry adjusted Lerner Index (*LI*). As in

[43] The principal component analysis step turns the set of correlated variables to be linearly uncorrelated according to the weights of their variances, thus reducing the number of variables to their principal components.

Datta et al. (2013) I adjust the Lerner Index by excluding industry specific characteristics that interfere with market pricing power as follows:

$$LI_i = \frac{Sales\text{-}COGS\text{-}SG\&A}{Sales} \tag{8.2}$$

$$PricPower = LI_i - \sum_{i=1}^{N} \omega_i LI_i \tag{8.3}$$

In equations (8.2) and (8.3), LI_i is the Lerner index for firm i, also referred to as the price cost margin (PCM); and ω_i is market share for firm i measured by its sales divided by total industry sales.

8.3.5 Control Variables

Following Dechow and Dichev (2002), the first set of controls consider firm specific determinants and account for firm size (*TotalAssets*), sales volatility (*SalesVolatility*), cash flow volatility (*CashFlowVolatility*), operating cycle (*OperCycle*), and historical losses (*Losses*). Larger firms have operations that are more predictable and more diversified businesses and thus earnings should be of higher quality. Managers in these firms, however, have more opportunities to manipulate earnings because of the large number of transactions they undertake and their complicated operations (Demerjian et al., 2013b). Sales volatility reflects uncertainty in operations and, therefore, implies a higher likelihood of earnings management. Cash flow volatility also reflects increased volatility in the operations of the firm creating more opportunities for earnings management. Similarly, longer operating cycles increase uncertainty and therefore, the potential for earnings management. Prior losses are likely to result in more earnings management to meet investors' expectations in making profit but equally, they may drive managers to avoid earnings management as they will be facing more scrutiny by the market.

I use a national auditor indicator (*NationalAuditor*) to control for any auditor effects as firms audited by national auditors use more earnings management than those audited by international audit firms (Becker et al., 1998). I add another indicator variable to control for litigious industries (*LitigationInd*) following Francis et al. (1994).

Firms in such industries are expected to use more real activities as accrual earnings management is more likely to be detected. However, the opposite may occur as real earnings management has serious economic consequences to the firm. I also add the market to book ratio (*MB*), the one year sales growth (*SalesGrowth*), and returns momentum (*Momentum*) as they have been found to influence earnings management (Hribar and Nichols, 2007). As firms with higher market to book ratios have more growth prospects, they may be involved in more earnings management to meet market expectations (Hribar and Nichols, 2007). Firms with growing sales and high returns momentum also have high growth prospects but the increase in sales and returns reduces the pressure on management to manipulate earnings (Dechow et al., 2011).

I also control for analyst coverage (*NumAnalyst*). Although the presence of more analysts may discipline managers, it can increase the burden to present better earnings and, therefore, may lead to more of the sophisticated earnings management activities. I also include an industry revenue leadership variable (*IndRev%*) (Dechow et al., 2011; Zang, 2012). Although Zang (2012) could not specify the influence of industry revenue leadership, I expect a negative effect because industry leaders are under more scrutiny from investors and the SEC. I use the number of segments (*Segments*) and the frequency of foreign transactions (*Foreign*) to control for businesses complexity (Karuna et al., 2012). With more complex transactions managers use more real earnings management because they are less likely to be detected than discretionary revenue manipulation (Karuna et al., 2012).

Finally, I use dummies for the global financial crisis (*GFC*) (Badertscher et al., 2014; Kanagaretnam et al., 2014; Magnan et al., 2015), the dot-com bubble (*DotCom*) (Lieberman and Asaba, 2006), and the post-Sarbanes Oxley period (*SOX*) (Cohen et al., 2008) to control for some macro-economic events over the study period. The possibility of trade-off between accrual and real earnings management has to be always taken into consideration when examining the previous factors. I present the detailed calculations for each of the previous variables in Table 8.1 and summarize the expected and actual signs of all control variables in Table 8.2.

Table 8.1 Calculation of control variables

Variable	Calculation
FirmSize	The natural log of the firm's assets as of the end of year *t*.
SalesVolatility	The standard deviation of (sales / average assets) over at least three of the last five years (*t*–4, *t*).
CashFlowVolatility	The standard deviation of (cash from operations / average assets) over at least three of the last five years (*t*–4, *t*).
OperCycle	The operating cycle is the natural log of average sales turnover plus days in inventory over at least three of the last five years (*t*–4, *t*).
Losses	Loss history is the percentage of years reporting losses in net income before extraordinary items over at least three of the last five years (*t*–4, *t*).
NationalAuditor	An indicator variable equals one for firms audited by national audit firms in year *t*; zero otherwise.
LitigationInd	Litigious industry indicator that equals one for firms in industries with SIC Codes: 2833-2836 (biotechnology), 3570-3577 and 7370-7374 (computers), 3600-3674 (electronics), and 52(X)-5961 (retailing).
MB	The market to book ratio that equals the firm's market capitalization divided by book value for year t.
SalesGrowth	Current year's sales less prior year's sales less the increase in receivables all scaled by prior year's sales and decile ranked by industry and year.
NumAnalyst	The log of 1+ the number of analysts covering the firm in year t.
IndRev%	Industry revenue leadership measured by the firm's sales in year t-1 divided by the total sales for the firm's industry in year t-1.
Momentum	Returns momentum calculated by the decile rank (by industry and year) of asset returns during the two years preceding the start of year t.
Segments	The natural log of 1+ the number of firm's business segments in year t.
Foreign	The frequency with which the firm has a non-zero foreign currency transactions during the sample period.
GFC	An indicator variable equals one for the years of the global financial crisis (2007-2009); zero otherwise.
Dot-Com	An indicator variable equals one for the years of the Dot-Com bubble (1997-2000); zero otherwise.
SOX	An indicator variable equals one for the years after the release of the Sarbanes Oxley act (2002-2005); zero otherwise.

Notes: This table presents the detailed calculations for each of the control variables identified in the model as discussed in the (Variable Definitions) section above.

Table 8.2 Expected and actual signs of the control variables

Variables	*AccrualEM*		*RealEM*	
	Predicted sign	Actual sign	Predicted sign	Actual sign
FirmSize	+/-	+	+/-	+
SalesVolatility	+	+	+	+
CashFlowVolatility	+	+	+	+
OperCycle	+	+	+	+
Losses	+/-	+	+/-	-
NationalAuditor	+	+	+	+
LitigationInd	+/-	-	+/-	+
MB	+	+	+	+
SalesGrowth	+/-	-	+/-	+
NumAnalyst	+/-	+	+/-	+
IndRev%	-	-	-	-
Momentum	+/-	+	+/-	-
Segments	+/-	-	+/-	-
Foreign	+/-	-	+/-	+
GFC	+/-	-	+/-	-
Dot-Com	+/-	-	+/-	-
SOX	+/-	-	+/-	-

Notes: This table presents the signs I expect and actually get for all control variables identified in the model and discussed in the (Variable Definitions) section above.

8.3.6 Descriptive Statistics

I present the descriptive statistics in Table 8.3. Consistent with Demerjian et al. (2013b), accrual earnings management and real earnings management have means and medians of zero as these variables are taken from the residuals of the models selected above. The measures of market competition are comparable to those calculated by prior studies (e.g., Karuna et al., 2012; Datta et al., 2013). Similarly, managerial ability measure is consistent with Demerjian et al. (2013b) and has a mean and median close to zero because it is measured as the residual from the firm efficiency equation.

Table 8.3 Descriptive statistics

Variables	Mean	Median	Std Dev	P25	P75
AccrualEM	0.00	0.00	0.06	-0.02	0.02
RealEM	0.00	0.00	1.00	-0.72	0.71
HHI	0.28	0.22	0.18	0.14	0.37
ProdSubstitutability	0.17	0.15	0.10	0.10	0.23
PricPower	-3.60	-0.05	73.04	-0.22	0.02
MgrlAbility	0.00	-0.01	0.15	-0.10	0.08
TotalAssets	1,759.47	86.79	10,847.54	18.43	446.71
SalesVolatility	0.29	0.17	0.46	0.09	0.34
CashFlowVolatility	0.14	0.07	0.41	0.04	0.14
OperCycle	134.37	120.05	81.96	76.79	176.29
Losses	0.40	0.25	0.37	0.00	0.75
NationalAuditor	0.24	0.00	0.43	0.00	0.00
LitigationInd	0.08	0.00	0.27	0.00	0.00
MB	3.50	1.98	58.04	1.05	3.70
SalesGrowth	1.20	0.08	83.94	-0.04	0.25
NumAnalyst	2.94	3.00	1.65	2.00	4.00
IndRev%	0.06	0.01	0.13	0.00	0.04
Momentum	-0.27	0.05	2.79	-0.22	0.16
Segments	1.74	1.00	1.45	1.00	2.00
Foreign	0.20	0.00	0.33	0.00	0.31
GFC	0.10	0.00	0.30	0.00	0.00
Dot-Com	0.24	0.00	0.42	0.00	0.00
SOX	0.17	0.00	0.38	0.00	0.00

Notes: The table presents the descriptive statistics of all the variables identified in the model for 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Variables are defined in the (Variable Definitions) section above. I present the untransformed variables for ease of interpretation.

The control variables are comparable to Karuna et al. (2012) and Demerjian et al. (2013b) with some differences appearing because of the variations in the samples. Cash flow volatility is lower than sales volatility and thus implies that firms consider it more costly as it is negatively valued by the market (Allayannis and Weston, 2007). 40% of the firms in the sample reported a history of losses in the last five years which has contributed to an overall negative returns momentum. The high standard deviations associated with firm size and operating cycle are due to presenting the untransformed variables.

Table 8.4 presents the correlation matrix between the measures of earnings management, managerial ability, and competition. From the table it can be seen that managerial ability is positively correlated with accrual earnings management and negatively correlated with real earnings management, which suggests that high quality managers are more inclined to use accrual rather than real earnings management. However, there is no consistent direction for the measures of market competition and earnings management. As well as examining the correlation between the variables of interest, I also check the VIF between all the variables in the model and confirm they are less than 10.

Table 8.4 Correlation table

	Accrual EM	*Real EM*	*HHI*	*Prod Substitutability*	*Pric Power*	*Mgrl Ability*
Accrual EM						
Real EM	0.00					
HHI	0.01**	0.02***				
Prod Substitutability	-0.01*	-0.03***	-0.21***			
Pric Power	0.00	0.02***	0.01***	-0.03***		
Mgrl Ability	0.06***	-0.06***	0.01**	-0.01*	0.05***	

Notes: This table presents the correlation matrix for 66,695 firm-year observations obtained from Compustat from 1989 to 2011 between the measures of accrual earnings management measured by Stubben's Model (2010), real earnings management measured by Gunny's Model (2010), managerial ability measured by the model of Demerjian et al. (2012), market concentration measured by the Herfindahl-Hirschman index (*HHI*), product substitutability measured by the gross margin in the industry, and pricing power measured by the industry adjusted Lerner Index (*LI*). Variables are defined in detail in the (Variable Definitions) section above. Pearson correlation coefficients are presented. To control for the multicollinearity between the different variables I make sure that all VIF factors are less than 10. VIF factors, however, are not tabulated. *, **, *** denotes a statistical coefficient at the 10, 5 and 1 percent alpha level, respectively.

I next perform univariate analysis where I examine earnings management, competition and managerial ability simultaneously. I first identify in Panel A of Table 8.5 earnings management observations under high competition i.e. less than the median of the three measures of market competition calculated by industry and year. Among the resulting observations, I create a group for the most able managers (highest quintile of managerial ability variable by industry and year) and another group for the least able managers (lowest quintile of managerial ability variable by industry and year). Next, I identify in Panel B of Table 8.5 earnings management observations under low competition i.e. more than the median of the three measures of market competition calculated by industry and year, and again I divide the results into a high managerial ability group and a low managerial ability group.

When considering accrual earnings management, I find that under low and high levels of market concentration the means[44] of accrual earnings managed by high quality managers (0.006 and 0.005 successively) are higher than those evidenced by low quality managers (-0.007 and -0.004 successively). Similar results are achieved for the measures of product substitutability and pricing power. In contrast, when considering real earnings management I find that under low and high levels of market concentration the means of real earnings managed by high quality managers (-0.086 and -0.084 successively) are lower than those evidenced by low quality managers (0.081 and 0.104 successively). Again, similar results are achieved for the measures of product substitutability and pricing power. Overall, the results imply that high quality managers always use more accrual and less real earnings management compared to low quality managers.

[44] The same applies when the median is used for comparisons.

Table 8.5 Earnings management variables partitioned by competition and managerial ability

Panel A: High Market Competition

Market Competition below median *HHI*

	Lowest Quintile of Managerial Ability		Highest Quintile of Managerial Ability		Significance of difference test	
Variable	Mean	Median	Mean	Median	Mean	Median
AccrualEM	-0.007	-0.003	0.006	0.001	***	***
RealEM	0.081	0.088	-0.086	-0.086	***	***

Market Competition below median *ProdSubstitutability*

	Lowest Quintile of Managerial Ability		Highest Quintile of Managerial Ability		Significance of difference test	
Variable	Mean	Median	Mean	Median	Mean	Median
AccrualEM	-0.006	-0.002	0.005	0.001	***	***
RealEM	0.046	0.056	-0.097	-0.089	***	***

Market Competition below median *PricPower*

	Lowest Quintile of Managerial Ability		Highest Quintile of Managerial Ability		Significance of difference test	
Variable	Mean	Median	Mean	Median	Mean	Median
AccrualEM	-0.006	-0.002	0.002	0.002	***	***
RealEM	0.103	0.096	-0.149	-0.159	***	***

Panel B: Low Market Competition

Market Competition above median *HHI*

	Lowest Quintile of Managerial Ability		Highest Quintile of Managerial Ability		Significance of difference test	
Variable	Mean	Median	Mean	Median	Mean	Median
AccrualEM	-0.004	-0.001	0.005	0.001	***	***
RealEM	0.104	0.101	-0.084	-0.069	***	***

Market Competition above median *ProdSubstitutability*

	Lowest Quintile of Managerial Ability		Highest Quintile of Managerial Ability		Significance of difference test	
Variable	Mean	Median	Mean	Median	Mean	Median
AccrualEM	-0.005	-0.002	0.004	0.001	***	***
RealEM	0.132	0.123	-0.071	-0.055	***	***

Market Competition above median *PricPower*

	Lowest Quintile of Managerial Ability		Highest Quintile of Managerial Ability		Significance of difference test	
Variable	Mean	Median	Mean	Median	Mean	Median
AccrualEM	-0.003	-0.001	0.001	0.001	***	***
RealEM	0.107	0.096	-0.113	-0.112	***	***

Notes: This table presents the univariate analysis of earnings management by competition and managerial ability for 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Accrual earnings management is measured by Stubben's Model (2010), real earnings management is measured by Gunny's Model (2010), managerial ability is measured by the model of Demerjian et al. (2012), market concentration is measured by the Herfindahl-Hirschman index (*HHI*), product substitutability is measured by the gross margin in the industry, and pricing power is measured by the industry adjusted Lerner Index (*LI*). Variables are defined in detail in the (Variable Definitions) section above. Panel A and panel B use the three measures I identified for market competition. I present the untransformed variables for ease of interpretation. The significances of the two-tailed t-test for the differences between means and medians are displayed. *, **, *** denotes a statistical coefficient at the 10, 5 and 1 percent alpha level, respectively.

However, the intensity of such behaviour changes at different levels of market competition. When considering accrual earnings management, I find that under lower levels of market concentration (higher competition) the mean[45] of accrual earnings managed by high quality managers (0.006) is higher than that observed under higher levels of market concentration (0.005). Similar results are achieved for the measures of product substitutability and pricing power. When shifting the attention to real earnings management, I find that under lower levels of market concentration the mean of real earnings managed by high quality managers (-0.086) is lower than that observed under higher levels of market concentration (-0.084). Similar results are achieved for the measures of product substitutability and pricing power. Overall, the results suggest that high quality managers use more accrual and less real earnings management under higher levels of market competition.

8.4 Methodology

I derive a model that identifies earnings management as the dependent variable (Y_{it}). I also use the lagged values ($Y_{i,t-1}$) of earnings management ($EarningsManagement_{i,t-1}$) to explain its current levels. I control for the dynamic effect of earnings management because earnings performance in the past year will influence earnings management behaviour during the current year (Kim et al., 2003). In addition, earnings management levels are associated with meeting prior earnings' benchmarks (Graham et al., 2005; Cohen et al., 2008; Gunny, 2010). As a result, managers have to be aware of the prior year's earnings management levels when managing earnings in the current period.

[45] The same applies when the median is used for comparisons.

I introduce managerial ability ($MgrlAbility_{it}$) and a dummy for market competition dummy ($Competition_{it}$) as an the explanatory variables (X_{it}) and ($Z_{i,t}$). I also use competition dummy as a moderating variable.[46] To complete the model, I add the previously identified control variables ($Controls_{it}$) and an error term (ε_{it}). I express the model in general terms in equation (8.4) and in more specific terms in equation (8.5).

$$Y_{it} = \propto_0 + \propto_1 X_{i,t} + \propto_2 Z_{i,t} + \beta_1 Z_{it} X_{it} + \propto_4 Y_{i,t-1} + \propto_{5\text{-}21} Controls_{it} + \varepsilon_{it} \quad (8.4)$$

$$\begin{aligned} EarningsManagement_t = {} & \propto_0 + \propto_1 MgrlAbility_{it} + \propto_2 Competition_{it} \\ & + \beta_1 Competition_{it} * MgrlAbility_{it} \\ & + \propto_4 \text{EarningsManagement}_{\text{i,t-1}} + \propto_5 \text{FirmSize}_{\text{it}} \\ & + \propto_6 SalesVolatility_{i,t-4,t} + \propto_7 CashFlowVolatility_{i,t-4,t} \\ & + \propto_8 OperCycle_{i,t-4,t} + \propto_9 Losses_{i,t-4,t} + \propto_{10} NationalAuditor_{it} \\ & + \propto_{11} SalesGrowth_{rk_{it}} + \propto_{12} MB_{it} + \propto_{13} LitigationInd_{it} \\ & + \propto_{14} LnNumAnalyst_{it} + \propto_{15} IndRev\% + \propto_{16} Momentum_{it} \\ & + \propto_{17} Segments_{it} + \propto_{18} Foreign_{it} + \propto_{19} GFC_{it} \\ & + \propto_{20} Dot\text{-}Com_{it} + \propto_{21} SOX_{it} + \varepsilon_{it} \end{aligned} \quad (8.5)$$

The model suffers from the problem of unobservable individual heterogeneity attributed to time-invariant firm and managerial effects. Firm strategies and corporate cultures may result in firms with specific levels of earnings quality selecting managers with specific abilities. Similarly, managers' characteristics e.g., inborn capabilities, personalities, or tendencies to take risk, may drive them to target firms with specific levels of earnings quality. Consequently, the sample is expected to be heterogeneous, as some companies are more predisposed to earnings management than others (Graham et al., 2012; Demerjian et al., 2013b).

In addition, the model suffers from an endogeneity problem because of the mutual causality between managerial ability and earnings management. While more

[46] The dummy takes a value of one when competition is high in the market and zero otherwise. Therefore, $\propto_1$ is the coefficient of ($MgrlAbility_{it}$) when competition is low; ($\propto_1 + \beta_1$) is the coefficient when competition is high. I introduce a dummy for each of the three measures of market competition I identified earlier. *HHI* is a dummy variable that equals 1 if the firm is in an industry where market concentration is lower than the median and zero otherwise. ProdSubstitutability is a dummy variable that equals 1 if the firm is in an industry where product substitutability is lower than the median and zero otherwise. Finally, PricPower is a dummy variable that equals 1 if the firm has lower pricing power than the median and zero otherwise.

able managers are expected to be more selective in using the different earnings management activities, higher levels of earnings management may require hiring managers with specific abilities to successfully run the business. This effect would be captured in the error term and ultimately results in a correlation between the explanatory variable and the error term (Pindado and Requejo, 2014).

Therefore, the OLS estimator will not be able to solve the model as it ignores the impact of the unobservable individual heterogeneity or endogeneity problems. Furthermore, while the fixed effects estimator tackles the unobservable heterogeneity by demeaning the variables in the model it does not solve for the endogeneity problem as it assumes strict exogeneity. Therefore, I solve the model using a system generalized method of moments (GMM) estimator that demeans the variables in the model to solve for the heterogeneity and introduces instrumental variables to solve for the endogeneity problem as explained earlier in the methodology section of Chapter 5.[47] In addition, I present the results of the OLS regressions as a robustness test in Appendix C Table III and IV.

Therefore, I split the error term (ε_{it}) into three components. First, I introduce (η_i) to control for the impact of the unobserved effects in the model.[48] Second, I add a time specific effect (d_t) to control for the macroeconomic variables that may interfere with the results over the period of the study. Finally, I consider the remaining part of the error term (ε_{it}) to be a random disturbance (v_{it}).

$$\begin{aligned} EarningsManagement_t = {} & \alpha_0 + \alpha_1 MgrlAbility_{it} + \alpha_2 Competition_{it} \\ & + \beta_1 Competition_{it} * MgrlAbility_{it} \\ & + \alpha_4 EarningsManagement_{i,t-1} + \alpha_5 FirmSize_{it} \\ & + \alpha_6 SalesVolatility_{i,t-4,t} + \alpha_7 CashFlowVolatility_{i,t-4,t} \\ & + \alpha_8 OperCycle_{i,t-4,t} + \alpha_9 Losses_{i,t-4,t} + \alpha_{10} NationalAuditor_{it} \\ & + \alpha_{11} SalesGrowth_{rk_{it}} + \alpha_{12} MB_{it} + \alpha_{13} LitigationInd_{it} \\ & + \alpha_{14} LnNumAnalyst_{it} + \alpha_{15} IndRev\% + \alpha_{16} Momentum_{it} \\ & + \alpha_{17} Segments_{it} + \alpha_{18} Foreign_{it} + \alpha_{19} GFC_{it} \\ & + \alpha_{20} Dot\text{-}Com_{it} + \alpha_{21} SOX_{it} + \eta_i + d_t + v_{it} \end{aligned} \quad (8.6)$$

[47] Solving for these two problems using a system GMM estimator allows us to obtain less biased and more significant results compared to the previous studies.

[48] η_i controls for both firm specific effects and manager specific effects.

After examining the individual effect of the moderating variable ($Competition_{it}$) and the independent variable ($MgrlAbility_{it}$), I test for their combined influence. For this purpose, I use a linear restriction test (LRT) that examines the significance of ($\alpha_1+\beta_1$). I use the different measures identified earlier for market competition ($Competition_{it}$) as moderating factors. Therefore, I repeat the test for each measure separately as shown in the next section.

After the completion of the empirical work, I ensure that the assumptions of the estimator hold and that the model is valid. I initially test whether the GMM estimator properly addresses the problem of endogeneity. For this purpose, I use the Hansen test for over-identifying restrictions. It takes a χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The model uses multiple lags of the right-hand side variables as instruments, which make it over-identified. Consequently, if I accept Hansen's null hypothesis that the instrumental variables (IV_{it}) and the error term (ε_{it}) are uncorrelated, I guarantee that the instruments are valid and the estimator is appropriate. I present the results of Hansen test in tables 8.6 and 8.7, which show that the instruments are valid.

Additionally, I implement Arellano and Bond (1991) to check for the validity of the model. It takes the shape of a normal distribution with N(0,1). It mainly examines the serial correlation in the first difference residual (v_{it}) over different periods (s) by using the (m_j) statistic [$E(v_{it}\ v_{is})=0$, while $t\neq s$]. I accept first order serial correlation in the model because the estimator takes the first difference to eliminate the individual specific effects (η_i). However, I reject second order serial correlation (m_2) in the residual because it indicates a problem in the model. I present the results of the AB test in tables 8.6 and 8.7, which confirm that no second order serial correlations exist in the model.

Finally, I use the Wald test (z_1) to check for the joint significance of the reported coefficients in the model. If I reject the null hypothesis that states no relationship between the dependent and explanatory variables, I make sure that the model is jointly significant. I present the results of the Wald test in tables 8.6 and 8.7. They all support the joint significance of the reported coefficients.

8.5 Results

8.5.1 Managerial Ability, Market Competition and Accrual Earnings Management

The results show that increased competition has a positive effect on the relation between managerial ability and accrual earnings management - higher levels of competition drive more able managers to use more discretionary accruals. From Table 8.6, column (1) shows that the coefficient of superior managers who use accrual earnings management in less concentrated markets ($\propto_1+\beta_1$=1.474+0.103=1.577) is higher than that in more concentrated markets ($\propto_1$=1.474). Column (2) shows that the same coefficient in industries with higher product substitutability ($\propto_1+\beta_1$=1.507+0.202=1.709) is more than that in industries with fewer substitutes ($\propto_1$=1.507). Column (3) shows that the coefficient in firms with less pricing power ($\propto_1+\beta_1$=1.223+0.646=1.869) is higher than that in other firms ($\propto_1$=1.223). Finally, the *t* values of the linear restriction test (LRT) in Table 8.6 show that the combined effects of market competition and managerial ability on accrual earnings management are significantly different from zero. These results support hypothesis *H1a* of this chapter. Similar results are obtained by using the Modified Jones' Model (1995) as shown in Appendix C Table I and the OLS estimator as shown in Appendix C Table III.

The individual average effects of managerial ability and market competition on accrual earnings management appear in Appendix C Table V and VII as Table 8.6 presents the conditional effects only. The results in Appendix C Table V confirm that high quality managers manage earnings by exploiting their incomplete contracts with the shareholders. The high costs of writing, negotiating, and renegotiating contracts with high quality managers allow them to exercise more discretion in financial reporting. In this case, they use accrual earnings management to improve the perception about their abilities and earn high imminent rewards without influencing the long-term performance of their firms (Narayanan, 1985; Milgrom and Roberts, 1992; Graham et al., 2005; Cohen et al., 2008; Ronen and Yaari, 2008; Demerjian et al., 2013b). Meanwhile, the results in Appendix C Table VII show that market competition plays a role in changing the behaviour of managers in utilising earnings management as evidenced in the coefficients of its three proxies. Information-driven comparisons

Table 8.6 The moderating role of market competition in the relation between managerial ability and accrual earnings management (AccrualEM)

Variables	(1)	(2)	(3)
	Accrual earnings management		
$MgrlAbility_{it}$	1.474***	1.507***	1.223***
HHI_{it}	-0.041***	-	-
$ProdSubstitutability_{it}$	-	0.069***	-
$PricPower_{it}$	-	-	-0.134***
$EarningsManagement_{i,t-1}$	-0.111***	-0.111***	-0.108***
$FirmSize_{it}$	0.105***	0.094***	0.089***
$SalesVolatility_{i,t-4,t}$	0.225***	0.256***	0.230***
$CashFlowVolatility_{i,t-4,t}$	0.090***	0.084***	0.058***
$OperCycle_{i,t-4,t}$	0.039***	0.012**	0.020***
$Losses_{i,t-4,t}$	0.093***	0.055***	0.153***
$NationalAuditor_{it}$	0.056***	0.071***	0.071***
$LitigationInd_{it}$	-0.169***	-0.094***	-0.095***
MB_{it}	2.65e-05***	5.88e-05***	5.26e-05***
$SalesGrowthrk_{it}$	-0.610***	-0.621***	-0.672***
$LnNumAnalyst_{it}$	0.047***	0.057***	0.089***
IndRev%	-0.390***	-0.484***	-0.504***
$Momentum_{it}$	0.409***	0.396***	0.331***
$Segments_{it}$	-0.107***	-0.085***	-0.093***
$Foreign_{it}$	-0.213***	-0.065***	-0.020
GFC_{it}	-0.272***	-0.270***	-0.564***
$Dot\text{-}Com_{it}$	-0.108***	-0.172***	-0.420***
SOX_{it}	-0.153***	-0.061**	-0.460***
$(HHI_{it})MgrlAbility_{it}$	0.103***	-	-
$(ProdSubstitutability_{it})MgrlAbility_{it}$	-	0.202***	-
$(PricPower_{it})MgrlAbility_{it}$	-	-	0.646***
t	52.426	51.892	49.607
Hansen	1,696.560	1,672.400	1,698.560
m_1	-17.840	-18.040	-17.850
m_2	-1.200	-0.970	-1.050
z_1	3,417.130	13,936.510	8,792.840

Notes: This table presents the results from the system generalized method of moments regressions for the effect of market competition on the relation between managerial ability and accrual earnings management. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Accrual earnings management is measured by Stubben's Model (2010). Managerial ability is measured by the model of Demerjian et al. (2012). Each column represents the estimates from examining a dummy measure of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*). HHI is a dummy variable that equals 1 if the firm is in an industry where market concentration is lower than the median and zero otherwise. ProdSubstitutability is a dummy variable that equals 1 if the firm is in an industry where product substitutability is lower than the median and zero otherwise. PricPower is a dummy variable that equals 1 if the firm has lower pricing power than the median and zero otherwise. Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in accrual earnings management based on a one unit change in the determinant. The t values of the linear restriction tests (LRT) reflect the joint significance of the explanatory and moderating variables. The test is performed under the null hypothesis $H_o: \propto_1 + \beta_1 = 0$. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (v_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. The table also shows evidence about the dynamic behaviour of accrual earnings management in the fifth row. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

impose higher expectations on managers to beat rivals' earnings and, therefore, make communications more costly between managers and shareholders. In this setting, managers tend to accept more risk to keep pace with the behaviour of other aggressive competitors. The results imply that competition drives adverse selection and encourages opportunistic managerial behaviour.

The fact that superior managers use accrual earnings management in the face of increased competition as presented in Table 8.6 is telling. Accrual earnings management is less costly to shareholders as it does not affect the underlying business and its future cash flows. Moreover, it is less costly for managers as it will allow short-term targets to be met in the current period i.e. bonuses, but also lowers the risk of missing targets in future periods. The results extend the previous work of Dalia and Park (2009), Markarian and Santalo (2010), Karuna et al. (2012), and Datta et al. (2013) by showing that all managers, including high quality ones, tend to manage more accruals under the pressure of competition.

8.5.2 Managerial Ability, Market Competition and Real Earnings Management

The results show that competition plays a moderating role in the relation between managerial ability and real earnings management. Table 8.7, column (1) shows that the coefficient of superior managers who use real earnings management in less concentrated markets ($\propto_1+\beta_1$=-0.123-0.163=-0.286) is lower than that in more concentrated markets ($\propto_1$=-0.123). Column (2) shows that the coefficient in industries with higher product substitutability ($\propto_1+\beta_1$=-0.145-0.308=-0.453) is lower than that in industries with fewer substitutes ($\propto_1$=-0.145). Column (3) shows that the coefficient in firms with less pricing power ($\propto_1+\beta_1$=-0.136-0.167=-0.303) is lower than that in other firms ($\propto_1$=-0.136). Finally, the *t* values of the linear restriction test (LRT) in Table 8.7 show that the combined effects of market competition and managerial ability on real earnings management are significantly different from zero. Once more, the previous results support hypothesis *H1b* of this chapter. Similar results are obtained by using the Roychowdhury's Model (2006) as shown in Appendix C Table II and the OLS estimator as shown in Appendix C Table IV.

Table 8.7 The moderating role of market competition in the relation between managerial ability and real earnings management (RealEM)

Variables	(1)	(2)	(3)
	Real earnings management		
$MgrlAbility_{it}$	-0.123***	-0.145***	-0.136***
HHI_{it}	-0.070***	-	-
$ProdSubstitutability_{it}$	-	-0.031***	-
$PricPower_{it}$	-	-	0.082***
$EarningsManagement_{i,t-1}$	0.295***	0.290***	0.291***
$FirmSize_{it}$	0.064***	0.052***	0.076***
$SalesVolatility_{i,t-4,t}$	0.302***	0.249***	0.257***
$CashFlowVolatility_{i,t-4,t}$	0.036***	0.052***	0.039***
$OperCycle_{i,t-4,t}$	0.011***	0.005**	0.003
$Losses_{i,t-4,t}$	-0.093***	-0.007	-0.077***
$NationalAuditor_{it}$	0.187***	0.181***	0.201***
$LitigationInd_{it}$	0.218***	0.188***	0.175***
MB_{it}	2.97e-05***	1.51e-05***	2.33e-05***
$SalesGrowthrk_{it}$	0.011**	0.029***	0.038***
$LnNumAnalyst_{it}$	0.056***	0.056***	0.041***
IndRev%	-0.127***	-0.124***	-0.026*
$Momentum_{it}$	-0.178***	-0.100***	-0.133***
$Segments_{it}$	-0.027***	-0.018**	-0.028***
$Foreign_{it}$	0.177***	0.228***	0.152***
GFC_{it}	-0.179***	-0.169***	-0.493***
$Dot\text{-}Com_{it}$	-0.117***	-0.076***	-0.370***
SOX_{it}	-0.111***	-0.093***	-0.395***
$(HHI_{it})MgrlAbility_{it}$	-0.163***	-	-
$(ProdSubstitutability_{it})MgrlAbility_{it}$	-	-0.308***	-
$(PricPower_{it})MgrlAbility_{it}$	-	-	-0.167***
t	-12.205	-10.987	-3.139
Hansen	1,723.230	1,736.200	1,731.640
m_1	-14.250	-14.220	-14.300
m_2	1.030	0.990	1.080
z_1	8,414.850	10,021.850	9,691.780

Notes: This table presents the results from the system generalized method of moments regressions for the effect of market competition on the relation between managerial ability and real earnings management. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Real earnings management is measured by Gunny's Model (2010). Managerial ability is measured by the model of Demerjian et al. (2012). Each column represents the estimates from examining a dummy measure of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*). HHI is a dummy variable that equals 1 if the firm is in an industry where market concentration is lower than the median and zero otherwise. ProdSubstitutability is a dummy variable that equals 1 if the firm is in an industry where product substitutability is lower than the median and zero otherwise. PricPower is a dummy variable that equals 1 if the firm has lower pricing power than the median and zero otherwise. Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in real earnings management based on a one unit change in the determinant. The t values of the linear restriction tests (LRT) reflect the joint significance of the explanatory and moderating variables. The test is performed under the null hypothesis $H_o: \propto_1 + \beta_1 = 0$. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. The table also displays evidence about the dynamic behaviour of real earnings management in the fifth row. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

The individual average effect of managerial ability on real earnings management appears in Appendix C Table VI as Table 8.7 presents the conditional effects only. Lower levels of monitoring by shareholders allow managers greater flexibility. However, real earnings management activities, while harder to detect in the short-run, are detrimental to the sustainability and performance of the firm as they have long-run economic consequences for the business (Graham et al., 2005; Merkl-Davies and Brennan, 2007; Cohen et al., 2008). Therefore, managers with higher levels of ability do not undertake such activities, as they are detrimental to their long-term compensation and labour market value. The results show how high quality managers link their own interests and shareholder wealth in the long-run. Similar to Karuna et al. (2012), Appendix C Table VIII confirm the role market competition plays in imposing higher pressure on managers to beat rivals' earnings and driving adverse selection.

Given the influence of competition as appears in Table 8.6 and Table 8.7, the results provide evidence that while high quality managers respond to increased market competition by relying on accrual earnings management, they avoid costly real earnings management. In this sense, they balance the short-term and long-term benefits of their earnings management decisions based on their insight and superior competencies. The results extend those of Karuna et al. (2012) by excluding high quality managers from using real earning management as a response to competition pressure.

8.5.3 Comparison of Competition Measures

To compare the explanatory power of the competition measures I calculate their individual elasticity indices (EI). As Tables 8.6 and 8.7 show, all the competition measures have significant coefficients. This test, however, helps to identify which measure is the most restrictive with regards to earnings management. I present the results in Table 8.8, which are calculated according to the following equation.

$$EI_{Competition} = \frac{h_{MgrlAbility} + h_{Competition}}{\sum h} \tag{8.7}$$

Where, $EI_{Competition}$ is the elasticity index of a specific competition measure, $h_{MgrlAbility}$ is the elasticity of managerial ability variable, $h_{Competition}$ is the elasticity of a specific competition measure, and $\sum h$ is the sum of all explanatory variables' elasticities. I

calculate elasticity (h) as $h_k = b_k \frac{\bar{x}_k}{\hat{b}\bar{x}}$, where k is the variable of interest, b_k is its coefficient, $\bar{x}_k$ is its mean, and $\hat{b}\bar{x}$ is the expected value of the dependent variable obtained by multiplying the coefficient of each explanatory variable by its mean.

The results show that product substitutability has the highest elasticity index for its moderating effect on both accrual and real earnings management. Among the three competition measures I cover, product substitutability is the strongest driver of superior managers in manipulating accruals [Highest index EI= 0.577 in Table 8.8] and has the strongest mitigating effect on real earnings management by more able managers [Highest index EI= 0.395 in Table 8.8].

Table 8.8 Elasticity Indices

Variables	(1)	(2)	(3)
AccrualEM	0.490	0.577	0.426
RealEM	0.215	0.395	0.343

Notes: This table presents the individual elasticity indices (EI) of the competition measures identified in this chapter. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. EI is calculated as the sum of the elasticities of the main explanatory variable (managerial ability) and the moderating variable (market competition) divided by the total elasticities of all the variables identified in the model, as explained in the (Comparison of competition measures) section above. EIs assist in comparing the explanatory power of competition measures. Each column represents the estimates from examining one measure of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*).

8.6 Additional Analysis

8.6.1 Comparing the Effect of Managerial Ability on Earnings Management between High and Low Competition Settings

Although the GMM estimator used earlier in the methodology section solves for the problem of heterogeneity, in this section I control for the correlation between market competition and managerial ability that may influence the results. As more competitive markets are more likely to attract high quality managers and vice versa, I divide the sample into a subsample of high competition and another of low competition. Based on the first proxy of market competition, observations with "HHI" lower than the median

are considered in the high competition subsample, and in the low competition subsample otherwise. Under the second proxy of market competition, observations with "ProdSubstitutability" lower than the median are considered in the high competition subsample, and in the low competition subsample otherwise. Under the third proxy of market competition, observations with "PricPower" lower than the median are considered in the high competition subsample, and in the low competition subsample otherwise.

To generate two comparable subsamples under each of the previous proxies, I exclude the extreme values of managerial ability that exist under the normal distribution of high or low levels of competition by trimming at 1%. To make sure that the subsamples are comparable, I perform the t-test for the differences between means and confirm that the results are not significant. When combining the high and low competition subsamples, the sample size for each of the previous three proxies of competition include 57,040, 56,886, and 59,516 firm-year observations respectively.

Finally, I perform the system generalized method of moments regressions for the effect of managerial ability on accrual earnings management and real earnings management separately in each subsample following this model:

$$\begin{aligned} EarningsManagement_t = {} & \alpha_0 + \alpha_1 MgrlAbility_{it} + \alpha_2 EarningsManagement_{i,t-1} \\ & + \alpha_3 FirmSize_{it} + \alpha_4 SalesVolatility_{i,t-4,t} \\ & + \alpha_5 CashFlowVolatility_{i,t-4,t} + \alpha_6 OperCycle_{i,t-4,t} \\ & + \alpha_7 Losses_{i,t-4,t} + \alpha_8 NationalAuditor_{it} \\ & + \alpha_9 SalesGrowth_{rk_{it}} + \alpha_{10} MB_{it} + \alpha_{11} LitigationInd_{it} \\ & + \alpha_{12} LnNumAnalyst_{it} + \alpha_{13} IndRev\% + \alpha_{14} Momentum_{i} \\ & + \alpha_{15} Segments_{it} + \alpha_{16} Foreign_{it} + \alpha_{17} GFC_{it} \\ & + \alpha_{18} Dot\text{-}Com_{it} + \alpha_{19} SOX_{it} + \eta_i + d_t + v_{it} \end{aligned} \quad (8.8)$$

The results appear in tables 8.9 and 8.10 and confirm the previous findings. Superior managers use more accrual earnings management in more competitive markets as the coefficients of managerial ability variable are higher than those under less competition in table 8.9. The results also show that while high quality managers avoid real earnings management under high levels of competition, they tend to use more of this costly activity in less competitive markets as appears in the coefficients of managerial ability variable in table 8.10. The results again support the two hypotheses of this chapter.

Table 8.9 The effect of managerial ability on accrual earnings management (AccrualEM) conditional on competition

Variables	(1)		(2)		(3)	
	High Competition	Low Competition	High Competition	Low Competition	High Competition	Low Competition
MgrlAbility$_{it}$	0.870***	0.660***	0.714***	0.654***	0.868***	0.565***
AccrualEM$_{i,t-1}$	-0.170***	-0.142***	-0.140***	-0.162***	-0.191***	-0.094***
FirmSize$_{it}$	0.098***	0.086***	0.068***	0.116***	0.182***	-0.048***
SalesVolatility$_{i,t-4,t}$	0.157***	0.282***	0.161***	0.009***	0.112***	0.103***
CFVolatility$_{i,t-4,t}$	0.096***	0.121***	0.004***	1.522***	1.338***	0.037***
OperCycle$_{i,t-4,t}$	0.035***	0.140***	0.086***	0.008***	0.021***	0.108***
Losses$_{i,t-4,t}$	-0.055***	-0.032***	0.001	-0.113***	0.359***	-0.116***
NationalAuditor$_{it}$	-0.088***	0.167***	-0.005**	0.114***	0.248***	-0.254***
LitigationInd$_{it}$	0.071***	-0.115***	0.113***	-0.159***	-0.014	0.107***
MB$_{it}$	0.000***	0.001***	-0.000***	0.000***	-0.000***	-0.002***
SalesGrowthrk$_{it}$	-0.606***	-0.555***	-0.592***	-0.639***	-0.615***	-0.642***
LnNumAnalyst$_{it}$	0.094***	0.084***	0.080***	0.048***	-0.002**	0.160***
IndRev%	-1.557***	-0.524***	-0.545***	-0.986***	0.170***	-0.624***
Momentum$_{it}$	0.186***	0.445***	0.437***	0.108***	0.496***	0.195***
Segments$_{it}$	-0.099***	-0.084***	-0.094***	-0.183***	-0.136***	0.075***
Foreign$_{it}$	-0.217***	-0.195***	-0.155***	0.045***	-0.011**	-0.192***
GFC$_{it}$	0.052***	0.177***	0.039***	-0.488***	-0.377***	0.042***
Dot-Com$_{it}$	0.190***	0.166***	-0.070***	-0.460***	-0.141***	-0.103***
SOX$_{it}$	0.103***	0.133***	0.017***	-0.406***	-0.266***	-0.021***
Observations	27,538	29,502	28,959	27,927	29,904	29,612
Hansen	1,145.730	1,005.340	958.550	1,099.750	1,026.620	1,118.230
m_1	-12.570	-11.880	-11.960	-11.760	-10.120	-14.200
m_2	-1.690	-0.910	0.210	-1.630	-1.230	-1.140
z_1	2.2e+06	65,008.940	2.1e+05	3.5e+05	1.1e+06	1.1e+06

Notes: This table presents the results from the system generalized method of moments regressions for the effect of managerial ability on accrual earnings management based on the level of different proxies of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*). Under each of the previous three proxies of competition, I divide the sample into a subsample of high competition and another of low competition. Based on the first proxy of market competition, observations with HHI lower than the median are considered in the high competition subsample, and in the low competition subsample otherwise. Under the second proxy of market competition, observations with ProdSubstitutability lower than the median are considered in the high competition subsample, and in the low competition subsample otherwise. Under the third proxy of market competition, observations with PricPower lower than the median are considered in the high competition subsample, and in the low competition subsample otherwise. I trim each subsample at 1% level to exclude the extreme values of managerial ability that might exist under high or low levels of competition. When combining the high and low competition subsamples, the sample size for each of the previous three proxies of competition include 57,040, 56,886, and 59,516 firm-year observations respectively, obtained from Compustat from 1989 to 2011. To make sure that the subsamples are comparable, I perform the t-test for the differences between means and make sure that the results are not significant. Accrual earnings management is measured by Stubben's Model (2010). Managerial ability is measured by the model of Demerjian et al. (2012). Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in accrual earnings management based on a one unit change in the determinant. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (v_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. The table also displays evidence about the dynamic behaviour of accrual earnings management in the second row. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Table 8.10 The effect of managerial ability on real earnings management (RealEM) conditional on competition

Variables	(1)		(2)		(3)	
	High Competition	Low Competition	High Competition	Low Competition	High Competition	Low Competition
MgrlAbility$_{it}$	-0.226***	0.048***	-0.263***	0.123***	-0.312***	0.078***
RealEM$_{i,t-1}$	0.364***	0.160***	0.296***	0.239***	0.304***	0.256***
FirmSize$_{it}$	0.045***	0.058***	0.058***	-0.009***	0.109***	0.009***
SalesVolatility$_{i,t-4,t}$	0.124***	0.134***	0.372***	0.079***	0.203***	0.133***
CFVolatility$_{i,t-4,t}$	0.055***	0.223***	0.074***	0.066***	0.290***	0.033***
OperCycle$_{i,t-4,t}$	-0.005***	0.088***	-0.030***	0.184***	-0.006***	0.074***
Losses$_{i,t-4,t}$	-0.182***	-0.062***	-0.051***	-0.115***	-0.091***	-0.096***
NationalAuditor$_{it}$	0.117***	0.010***	0.224***	0.019***	0.138***	0.072***
LitigationInd$_{it}$	0.096***	0.239***	0.031***	0.265***	0.041**	0.172***
MB$_{it}$	0.000***	0.000***	-0.000***	0.000***	0.000***	0.000***
SalesGrowthrk$_{it}$	0.049***	0.041***	0.071***	0.083***	0.009***	0.118***
LnNumAnalyst$_{it}$	0.049***	0.027***	0.012***	0.142***	-0.095***	0.074***
IndRev%	-0.431***	-0.026***	0.132***	0.139***	-0.526***	0.193***
Momentum$_{it}$	-0.046***	0.024***	0.007***	-0.074***	-0.219***	-0.003***
Segments$_{it}$	-0.010***	0.000	-0.021***	0.021***	0.197***	-0.092***
Foreign$_{it}$	0.194***	-0.049***	0.103***	0.071***	0.098***	0.031***
GFC$_{it}$	-0.011***	-0.084***	0.023***	-0.010***	-0.168***	0.053***
Dot-Com$_{it}$	0.026***	0.007***	0.082***	-0.075***	0.006***	-0.005***
SOX$_{it}$	0.134***	0.025***	0.205***	-0.005***	0.095***	0.049***
Observations	27,538	29,502	28,959	27,927	29,904	29,612
Hansen	1,168.640	1,027.720	1,120.570	976.190	1,074.200	1,168.160
m_1	-12.300	-9.940	-11.570	-10.670	-10.180	-12.210
m_2	1.150	1.540	1.590	0.040	1.220	0.720
z_1	2.9e+06	1.1e+05	1.4e+06	4.8e+05	5.3e+05	2.4e+06

Notes: This table presents the results from the system generalized method of moments regressions for the effect of managerial ability on real earnings management based on the level of different proxies of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*). Under each of the previous three proxies of competition, I divide the sample into a subsample of high competition and another of low competition. Based on the first proxy of market competition, observations with HHI lower than the median are considered in the high competition subsample, and in the low competition subsample otherwise. Under the second proxy of market competition, observations with ProdSubstitutability lower than the median are considered in the high competition subsample, and in the low competition subsample otherwise. Under the third proxy of market competition, observations with PricPower lower than the median are considered in the high competition subsample, and in the low competition subsample otherwise. I trim each subsample at 1% level to exclude the extreme values of managerial ability that might exist under high or low levels of competition. When combining the high and low competition subsamples, the sample size for each of the previous three proxies of competition include 57,040, 56,886, and 59,516 firm-year observations respectively, obtained from Compustat from 1989 to 2011. To make sure that the subsamples are comparable, I perform the t-test for the differences between means and make sure that the results are not significant. Real earnings management is measured by Gunny's Model (2010). Managerial ability is measured by the model of Demerjian et al. (2012). Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in real earnings management based on a one unit change in the determinant. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. The table also displays evidence about the dynamic behaviour of real earnings management in the second row. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

8.6.2 Earnings Smoothing, Managerial Ability, and Market Competition

Earnings smoothing is another way that management may seek to improve the earnings of the firm. I therefore examine the effect of market competition on earnings smoothed by high quality managers. Earnings smoothing may improve the informativeness of earnings when managers try to reduce current high earnings numbers under the expectation of a decrease in future earnings, and vice versa. In this sense, earnings smoothing makes future earnings more predictable to shareholders. Nevertheless, managers may opportunistically smooth earnings in order to hide bad news in the current period, the result of which will be worse earnings numbers in the future when performance does not improve (Dalia and Park, 2009).

Based on Hunt et al. (1997) and Pincus and Rajgopal (2002), I calculate the earnings smoothing ratio as the standard deviation of pre-managed earnings to the standard deviation of reported earnings over at least three of the last five years. Pre-managed earnings are calculated as non-discretionary accruals from the Modified Jones Model (1995) added to the cash flows from operating activities minus extra-ordinary items and discontinued operations.

I start by examining the effect of managerial ability on earnings smoothing under low market competition and find that managerial ability has a significant negative effect on earnings smoothing. The results appear in the first row of Table 8.11 and show managers with higher levels of ability avoid smoothing earnings when competition is low in the market. This is consistent with the lack of earnings management motive in the absence of competition especially that managers with higher abilities are aware of the reputational costs they would incur if the decline in earnings does not reverse in subsequent periods.

Table 8.11 The moderating role of market competition in the relation between managerial ability and earnings smoothing

Variables	(1)	(2)	(3)
	Earnings smoothing		
$MgrlAbility_{it}$	-0. 138***	-0.265***	-0.175***
HHI_{it}	0.057***	-	-
$ProdSubstitutability_{it}$	-	0.566***	-
$PricPower_{it}$	-	-	0.000***
$Smoothing_{i,t-5}$	0.389***	0.391***	0.393***
$FirmSize_{it}$	-0.072***	-0.083***	-0.061***
$SalesVolatility_{i,t-4,t}$	-0.762***	-0.832***	-0.831***
$CashFlowVolatility_{i,t-4,t}$	1.862***	1.924***	1.948***
$OperCycle_{i,t-4,t}$	-0.122***	-0.120***	-0.108***
$Losses_{i,t-4,t}$	-1.223***	-1.266***	-1.233***
$NationalAuditor_{it}$	-0.133***	-0.090***	-0.111***
$LitigationInd_{it}$	0.100***	0.073***	-0.015***
MB_{it}	6.16e-05***	5.48e-05***	2.93e-05***
$SalesGrowthrk_{it}$	0.090***	0.090***	0.102***
$LnNumAnalyst_{it}$	-0.210***	-0.210***	-0.208***
IndRev%	1.413***	1.550***	1.261***
$Momentum_{it}$	-0.100***	-0.114***	-0.136***
$Segments_{it}$	-0.063***	-0.053***	-0.018***
$Foreign_{it}$	-0.187***	-0.218***	-0.300***
GFC_{it}	2.613***	0.234***	0.506***
$Dot\text{-}Com_{it}$	2.414***	0.000	0.047***
SOX_{it}	2.470***	0.114***	0.047***
$(HHI_{it})MgrlAbility_{it}$	0.213***	-	-
$(ProdSubstitutability_{it})MgrlAbility_{it}$	-	0.434***	-
$(PricPower_{it})MgrlAbility_{it}$	-	-	0.380***
t	85.185	111.261	111.638
Hansen	1,705.400	1,701.510	1,716.710
m_1	-4.200	-4.190	-4.200
m_2	0.210	0.200	0.230
z_1	4.0e+07	5.9e+06	6.2e+06

Notes: This table presents the results from the system generalized method of moments regressions for the effect of market competition on the relation between managerial ability and earnings smoothing. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Earnings smoothing is calculated as the standard deviation of pre-managed earnings to the standard deviation of reported earnings over at least three of the last five years, as described in the (Additional analysis) section above. Managerial ability is measured by the model of Demerjian et al. (2012). Each column represents the estimates from examining a dummy measure of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*). HHI is a dummy variable that equals 1 if the firm is in an industry where market concentration is lower than the median and zero otherwise. ProdSubstitutability is a dummy variable that equals 1 if the firm is in an industry where product substitutability is lower than the median and zero otherwise. PricPower is a dummy variable that equals 1 if the firm has lower pricing power than the median and zero otherwise. Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in earnings smoothing ratio based on a one unit change in the determinant. The t values of the linear restriction tests (LRT) reflect the joint significance of the explanatory and moderating variables. The test is performed under the null hypothesis $H_o: \propto_1 + \beta_1 = 0$. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. The table also displays evidence about the dynamic behaviour of earnings smoothing in the fifth row. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Next, I incorporate the effect of high market competition into the relationship between managerial ability and earnings smoothing. The results here show a positive moderating role of market competition on the relation between managerial ability and earnings smoothing. Table 8.11, column (1) shows that the coefficient of superior managers who smooth earnings in less concentrated markets ($\propto_1+\beta_1$=-0.138+0.213=0.075) is higher than that in more concentrated markets ($\propto_1$=-0.138). Column (2) shows that the same coefficient in industries with higher product substitutability ($\propto_1+\beta_1$ =-0.265+0.434=0.169) is more than that in industries with fewer substitutes ($\propto_1$=-0.265). Column (3) shows that the coefficient in firms with less pricing power ($\propto_1+\beta_1$ =-0.175+0.380=0.205) is higher than that in other firms ($\propto_1$=-0.175). Finally, the t values of the linear restriction tests (LRT) in Table 8.11 show that the combined effects of market competition and managerial ability on earnings smoothing are overall significantly different from zero. These results confirm the major finding of this chapter that market competition changes the behaviour of high quality managers when undertaking earnings management by driving earnings smoothing in this case.

8.6.3 Additional Control Variables

As corporate governance influences earnings management (Duh et al., 2009; Feng et al., 2009; Jaggi et al., 2009; Prencipe and Bar-Yosef, 2011; Demerjian et al., 2013a), I perform the previous regressions once more using additional controls for corporate governance. I add three control variables which I obtain form Execuocomp database.[49] I use a dummy for executives who serve as directors ($ExecDir$) which equals 1 if the executive served as director during the year. I also use the executive tenure ($Tenure$) calculated as the log of the executive tenure measured in days. Finally, I add the number of board meeting ($BoardMtgs$) held during the year (Adut et al., 2013). The previous variables, however, are only available from 1992 to 2006 and, therefore, I cover only this period in this additional test. As a result, I end up with 42,183 observations. The results emphasize the previous findings related to the moderating effect of market

[49] Data generously provided by Francesco Vallascas and Paula Castro.

competition on earnings management behaviour of superior managers. The results, however, are not tabulated in this thesis.

8.7 Conclusions

In this chapter, I examine the role of market competition in moderating the relation between managerial ability and earnings management. I build the core question of this chapter based on the expectation that the communication of information in more competitive markets contributes to further discipline the behaviour of high quality managers. Firstly, I find that superior managers use more of the less costly accrual earnings management and less of the more costly real earnings management in facing competition. The results provide another evidence on the substitutability of earnings management activities.

Secondly, although market competition can individually drive both accrual and real earnings management activities, it contributes to mitigating real earnings management behaviour of high quality managers. In other words, high quality managers use their superior competencies to manage earnings more wisely under the pressure of competition. Therefore, high managerial skills and strong market competition may serve together as alternative forms of governance mechanisms by preventing the firms from costly activities in the future.

Finally, this chapter emphasizes the importance of understanding the different motives of earnings management at a time to get a better vision of management decisions in reality. I particularly provide evidence on how industry level factors influence management decisions at the firm level and thus show the interaction between the external and contracting motives of earnings management. For future research, further factors might be selected at different levels to examine how they interact in determining earnings management behaviour.

Appendix C

Appendix C Table I The moderating role of market competition in the relation between managerial ability and accrual earnings management (AccrualEM)

Variables	(1)	(2)	(3)
	Accrual earnings management		
$MgrlAbility_{it}$	1.233***	1.072***	1.005***
HHI_{it}	-0.030***	-	-
$ProdSubstitutability_{it}$	-	0.039***	-
$PricPower_{it}$	-	-	-0.193***
$EarningsManagement_{i,t-1}$	0.035***	0.036***	0.036***
$FirmSize_{it}$	0.026***	0.011***	0.010***
$SalesVolatility_{i,t-4,t}$	0.056***	-0.010	0.057***
$CashFlowVolatility_{i,t-4,t}$	0.097***	0.050***	0.032***
$OperCycle_{i,t-4,t}$	0.001	0.026***	-0.008
$Losses_{i,t-4,t}$	-0.100***	-0.209***	-0.097***
$NationalAuditor_{it}$	0.152***	0.170***	0.173***
$LitigationInd_{it}$	0.069***	-0.010	-0.000
MB_{it}	0.000***	0.000***	0.000***
$SalesGrowthrk_{it}$	-0.242***	-0.256***	-0.297***
$LnNumAnalyst_{it}$	-0.043***	-0.022***	-0.017***
IndRev%	-0.163***	-0.210***	-0.285***
$Momentum_{it}$	0.349***	0.299***	0.274***
$Segments_{it}$	-0.077***	-0.076***	-0.051***
$Foreign_{it}$	-0.014	0.083***	-0.008
GFC_{it}	-0.120***	0.082***	0.060***
$Dot\text{-}Com_{it}$	0.011	0.062***	0.196***
SOX_{it}	-0.087**	0.190***	0.204***
$(HHI_{it})MgrlAbility_{it}$	0.127***	-	-
$(ProdSubstitutability_{it})MgrlAbility_{it}$	-	0.855***	-
$(PricPower_{it})MgrlAbility_{it}$	-	-	0.457***
t	50.428	39.908	37.839
Hansen	1,692.500	1,687.180	1,715.820
m_1	-20.850	-20.830	-20.920
m_2	-0.680	-0.580	-0.540
z_1	1,967.600	3,354.900	4,930.200

Notes: This table presents the results from the system generalized method of moments regressions for the effect of market competition on the relation between managerial ability and accrual earnings management. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Accrual earnings management is measured by Modified Jones' Model (1995). Managerial ability is measured by the model of Demerjian et al. (2012). Each column represents the estimates from examining a dummy measure of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*). HHI is a dummy variable that equals 1 if the firm is in an industry where market concentration is lower than the median and zero otherwise. ProdSubstitutability is a dummy variable that equals 1 if the firm is in an industry where product substitutability is lower than the median and zero otherwise. PricPower is a dummy variable that equals 1 if the firm has lower pricing power than the median and zero otherwise. Variables are defined in detail in the (Variable Definitions) section above. The t values of the linear restriction tests (LRT) reflect the joint significance of the explanatory and moderating variables. The test is performed under the null hypothesis $H_o: \propto_1 + \beta_1 = 0$. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (v_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. The table also displays evidence about the dynamic behaviour of accrual earnings management in the fifth row. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Appendix C Table II The moderating role of market competition in the relation between managerial ability and real earnings management (RealEM)

Variables	(1)	(2)	(3)
	Real earnings management		
$MgrlAbility_{it}$	-0.508***	-0.516***	-0.468***
HHI_{it}	-0.053***	-	-
$ProdSubstitutability_{it}$	-	-0.007***	-
$PricPower_{it}$	-	-	-0.027***
$EarningsManagement_{i,t-1}$	0.567***	0.566***	0.568***
$FirmSize_{it}$	0.178***	0.174***	0.184***
$SalesVolatility_{i,t-4,t}$	0.185***	0.229***	0.167***
$CashFlowVolatility_{i,t-4,t}$	0.104***	0.119***	0.101***
$OperCycle_{i,t-4,t}$	0.046***	0.061***	0.059***
$Losses_{i,t-4,t}$	0.168***	0.148***	0.177***
$NationalAuditor_{it}$	0.079***	0.073***	0.073***
$LitigationInd_{it}$	-0.143***	-0.070***	-0.143***
MB_{it}	0.000***	0.000***	0.000***
$SalesGrowthrk_{it}$	0.195***	0.197***	0.190***
$LnNumAnalyst_{it}$	0.065***	0.056***	0.056***
IndRev%	-0.924***	-0.923***	-0.943***
$Momentum_{it}$	0.275***	0.283***	0.294***
$Segments_{it}$	-0.084***	-0.068***	-0.082***
$Foreign_{it}$	0.029**	0.039***	0.110***
GFC_{it}	0.044***	-1.646***	-0.293***
$Dot\text{-}Com_{it}$	0.170***	-1.604***	-0.230***
SOX_{it}	0.157***	-1.549***	-0.189***
$(HHI_{it})MgrlAbility_{it}$	-0.006	-	-
$(ProdSubstitutability_{it})MgrlAbility_{it}$	-	-0.089***	-
$(PricPower_{it})MgrlAbility_{it}$	-	-	-0.125***
t	-49.469	-36.473	-42.602
Hansen	1,731.660	1,755.180	1,727.840
m_1	-10.360	-10.350	-10.270
m_2	0.690	0.850	0.800
z_1	22,770.440	33,300.670	14,569.600

Notes: This table presents the results from the system generalized method of moments regressions for the effect of market competition on the relation between managerial ability and real earnings management. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Real earnings management is measured by Roychowdhury's Model (2006). Managerial ability is measured by the model of Demerjian et al. (2012). Each column represents the estimates from examining a dummy measure of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*). HHI is a dummy variable that equals 1 if the firm is in an industry where market concentration is lower than the median and zero otherwise. ProdSubstitutability is a dummy variable that equals 1 if the firm is in an industry where product substitutability is lower than the median and zero otherwise. PricPower is a dummy variable that equals 1 if the firm has lower pricing power than the median and zero otherwise. Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in real earnings management based on a one unit change in the determinant. The t values of the linear restriction tests (LRT) reflect the joint significance of the explanatory and moderating variables. The test is performed under the null hypothesis $H_o: \propto_1 + \beta_1 = 0$. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. The table also displays evidence about the dynamic behaviour of real earnings management in the fifth row. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Appendix C Table III The moderating role of market competition in the relation between managerial ability and accrual earnings management (AccrualEM)

Variables	(1)	(2)	(3)
	Accrual earnings management		
$MgrlAbility_{it}$	0.498***	0.387***	0.236***
HHI_{it}	-0.025	-	-
$ProdSubstitutability_{it}$	-	0.044**	-
$PricPower_{it}$	-	-	-0.131***
$EarningsManagement_{i,t-1}$	-0.091***	-0.090***	-0.089***
$FirmSize_{it}$	0.004	0.005	-0.001
$SalesVolatility_{i,t-4,t}$	-0.069	-0.081	-0.064
$CashFlowVolatility_{i,t-4,t}$	0.091	0.093	0.084
$OperCycle_{i,t-4,t}$	0.019	0.019	0.024*
$Losses_{i,t-4,t}$	-0.016	-0.007	0.070*
$NationalAuditor_{it}$	0.041	0.043	0.041
$LitigationInd_{it}$	0.028	0.004	0.009
MB_{it}	2.13e-05	3.83e-05	2.42e-05
$SalesGrowthrk_{it}$	-0.502***	-0.503***	-0.537***
$LnNumAnalyst_{it}$	0.067***	0.069***	0.075***
IndRev%	-0.196**	-0.190**	-0.208**
$Momentum_{it}$	0.178***	0.183***	0.167***
$Segments_{it}$	0.006	0.000	0.003
$Foreign_{it}$	0.026	0.025	0.024
GFC_{it}	-0.017	-0.078	-0.074
$Dot\text{-}Com_{it}$	-0.056	-0.053	-0.051
SOX_{it}	-0.003	-0.079	-0.084
$(HHI_{it})MgrlAbility_{it}$	0.078	-	-
$(ProdSubstitutability_{it})MgrlAbility_{it}$	-	0.222*	-
$(PricPower_{it})MgrlAbility_{it}$	-	-	0.469***
t	4.582	9.788	17.687
R^2	0.131	0.135	0.149
F-statistic	11.060	11.160	12.280
Prob (F-statistic)	0.000	0.000	0.000

Notes: This table presents the results from the ordinary least square regressions for the effect of market competition on the relation between managerial ability and accrual earnings management. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Accrual earnings management is measured by Stubben's Model (2010). Managerial ability is measured by the model of Demerjian et al. (2012). Each column represents the estimates from examining a dummy measure of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*). HHI is a dummy variable that equals 1 if the firm is in an industry where market concentration is lower than the median and zero otherwise. ProdSubstitutability is a dummy variable that equals 1 if the firm is in an industry where product substitutability is lower than the median and zero otherwise. PricPower is a dummy variable that equals 1 if the firm has lower pricing power than the median and zero otherwise. Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in accrual earnings management based on a one unit change in the determinant. The t values of the linear restriction tests (LRT) reflect the joint significance of the explanatory and moderating variables. The test is performed under the null hypothesis $H_o: \propto_1 + \beta_1 = 0$. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Appendix C Table IV The moderating role of market competition in the relation between managerial ability and real earnings management (RealEM)

Variables	(1)	(2)	(3)
	Real earnings management		
$MgrlAbility_{it}$	-0.310*	-0.305***	-0.172**
HHI_{it}	-0.017	-	-
$ProdSubstitutability_{it}$	-	0.000	-
$PricPower_{it}$	-	-	0.051***
$EarningsManagement_{i,t-1}$	0.536***	0.537***	0.536***
$FirmSize_{it}$	0.010*	0.010*	0.012**
$SalesVolatility_{i,t-4,t}$	0.107**	0.107**	0.107**
$CashFlowVolatility_{i,t-4,t}$	-0.082	-0.084	-0.084
$OperCycle_{i,t-4,t}$	0.011	0.013	0.011
$Losses_{i,t-4,t}$	-0.042	-0.042	-0.080**
$NationalAuditor_{it}$	0.079***	0.080***	0.081***
$LitigationInd_{it}$	0.097***	0.096***	0.104***
MB_{it}	3.00e-05	3.07e-05	2.92e-05
$SalesGrowthrk_{it}$	0.025	0.027	0.043
$LnNumAnalyst_{it}$	0.016	0.014	0.010
IndRev%	-0.001	0.014	0.034
$Momentum_{it}$	-0.039	-0.040	-0.036
$Segments_{it}$	-0.003	-0.004	-0.003
$Foreign_{it}$	0.022	0.020	0.020
GFC_{it}	0.102	0.076	0.069
$Dot\text{-}Com_{it}$	0.063	0.035	0.033
SOX_{it}	0.110*	0.076	0.075
$(HHI_{it})MgrlAbility_{it}$	-0.075*	-	-
$(ProdSubstitutability_{it})MgrlAbility_{it}$	-	-0.106	-
$(PricPower_{it})MgrlAbility_{it}$	-	-	-0.208*
t	-4.914	-3.653	-5.232
R^2	0.312	0.311	0.313
F-statistic	140.250	139.890	140.310
Prob (F-statistic)	0.000	0.000	0.000

Notes: This table presents the results from the ordinary least square regressions for the effect of market competition on the relation between managerial ability and real earnings management. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Real earnings management is measured by Gunny's Model (2010). Managerial ability is measured by the model of Demerjian et al. (2012). Each column represents the estimates from examining a dummy measure of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*). HHI is a dummy variable that equals 1 if the firm is in an industry where market concentration is lower than the median and zero otherwise. ProdSubstitutability is a dummy variable that equals 1 if the firm is in an industry where product substitutability is lower than the median and zero otherwise. PricPower is a dummy variable that equals 1 if the firm has lower pricing power than the median and zero otherwise. Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in real earnings management based on a one unit change in the determinant. The t values of the linear restriction tests (LRT) reflect the joint significance of the explanatory and moderating variables. The test is performed under the null hypothesis $H_o: \propto_1 + \beta_1 = 0$. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Appendix C Table V The individual effect of managerial ability on accrual earnings management (AccrualEM)

Variables	Accrual earnings management
$MgrlAbility_{it}$	0.973***
$EarningsManagement_{i,t-1}$	-0.109***
$FirmSize_{it}$	0.128***
$SalesVolatility_{i,t-4,t}$	0.323***
$CashFlowVolatility_{i,t-4,t}$	0.033***
$OperCycle_{i,t-4,t}$	0.013
$Losses_{i,t-4,t}$	0.024
$NationalAuditor_{it}$	0.082***
$LitigationInd_{it}$	-0.176***
MB_{it}	8.65e-05***
$SalesGrowthrk_{it}$	-0.688***
$LnNumAnalyst_{it}$	0.044***
IndRev%	-0.572***
$Momentum_{it}$	0.298***
$Segments_{it}$	-0.117***
$Foreign_{it}$	-0.091**
GFC_{it}	-1.122***
$Dot\text{-}Com_{it}$	-1.080***
SOX_{it}	-1.009***
Hansen	1,512.910
m_1	-17.950
m_2	-0.760
z_1	627.450

Notes: This table presents the results from the system generalized method of moments regressions for the individual effect of managerial ability on accrual earnings management. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Accrual earnings management is measured by Stubben's Model (2010). Managerial ability is measured by the model of Demerjian et al. (2012). Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in accrual earnings management based on a one unit change in the determinant. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (v_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Appendix C Table VI The individual effect of managerial ability on real earnings management (RealEM)

Variables	Real earnings management
$MgrlAbility_{it}$	-0.133***
$EarningsManagement_{i,t-1}$	0.289***
$FirmSize_{it}$	0.074***
$SalesVolatility_{i,t-4,t}$	0.274***
$CashFlowVolatility_{i,t-4,t}$	0.046***
$OperCycle_{i,t-4,t}$	0.013*
$Losses_{i,t-4,t}$	-0.003
$NationalAuditor_{it}$	0.189***
$LitigationInd_{it}$	0.227***
MB_{it}	5.88e-06
$SalesGrowthrk_{it}$	0.013
$LnNumAnalyst_{it}$	0.043***
IndRev%	-0.112***
$Momentum_{it}$	-0.108***
$Segments_{it}$	0.001
$Foreign_{it}$	0.146***
GFC_{it}	-0.471***
$Dot\text{-}Com_{it}$	-0.373***
SOX_{it}	-0.338***
Hansen	1,536.760
m_1	-14.340
m_2	1.030
z_1	1,022.200

Notes: This table presents the results from the system generalized method of moments regressions for the individual effect of managerial ability on real earnings management. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Real earnings management is measured by Gunny's Model (2010). Managerial ability is measured by the model of Demerjian et al. (2012). Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in real earnings management based on a one unit change in the determinant. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Appendix C Table VII The individual effect of market competition on accrual earnings management (AccrualEM)

Variables	(1)	(2)	(3)
	Accrual earnings management		
HHI_{it}	0.135***	-	-
$ProdSubstitutability_{it}$	-	0.169***	-
$PricPower_{it}$	-	-	0.000***
$EarningsManagement_{i,t-1}$	-0.115***	-0.118***	-0.121***
$FirmSize_{it}$	0.109***	0.129***	0.134***
$SalesVolatility_{i,t-4,t}$	0.339***	0.307***	0.307***
$CashFlowVolatility_{i,t-4,t}$	0.093***	0.124***	0.134***
$OperCycle_{i,t-4,t}$	0.001	0.002	0.005*
$Losses_{i,t-4,t}$	-0.096***	-0.031	-0.076***
$NationalAuditor_{it}$	0.104***	0.098***	0.129***
$LitigationInd_{it}$	-0.210***	-0.167***	-0.285***
MB_{it}	1.57e-05	1.61e-05	5.36e-06
$SalesGrowthrk_{it}$	-0.495***	-0.494***	-0.467***
$LnNumAnalyst_{it}$	0.089***	0.059***	0.075***
IndRev%	-0.342***	-0.416***	-0.418***
$Momentum_{it}$	0.516***	0.581***	0.526***
$Segments_{it}$	-0.080***	-0.097***	-0.105***
$Foreign_{it}$	-0.144***	-0.173***	-0.254***
GFC_{it}	0.056**	-0.238***	-0.925***
$Dot\text{-}Com_{it}$	0.232***	-0.169***	-0.790***
SOX_{it}	0.220***	-0.138***	-0.777***
Hansen	1,515.950	1,502.270	1,509.870
m_1	-17.840	-17.790	-17.770
m_2	-0.830	-1.020	-1.000
z_1	369.110	351.160	1,331.950

Notes: This table presents the results from the system generalized method of moments regressions for the individual effects of market competition on accrual earnings management. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Accrual earnings management is measured by Stubben's Model (2010). Each column represents the estimates from examining a dummy measure of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*). HHI is a dummy variable that equals 1 if the firm is in an industry where market concentration is lower than the median and zero otherwise. ProdSubstitutability is a dummy variable that equals 1 if the firm is in an industry where product substitutability is lower than the median and zero otherwise. PricPower is a dummy variable that equals 1 if the firm has lower pricing power than the median and zero otherwise. Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in accrual earnings management based on a one unit change in the determinant. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (v_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Appendix C Table VIII The individual effect of market competition on real earnings management (RealEM)

Variables	(1)	(2)	(3)
	Real earnings management		
HHI_{it}	0.176***	-	-
$ProdSubstitutability_{it}$	-	0.088**	-
$PricPower_{it}$	-	-	0.000***
$EarningsManagement_{i,t-1}$	0.288***	0.287***	0.290***
$FirmSize_{it}$	0.072***	0.080***	0.070***
$SalesVolatility_{i,t-4,t}$	0.255***	0.290***	0.217***
$CashFlowVolatility_{i,t-4,t}$	0.041***	0.035***	0.037***
$OperCycle_{i,t-4,t}$	0.009	0.002	0.002
$Losses_{i,t-4,t}$	0.024	0.044***	0.036***
$NationalAuditor_{it}$	0.184***	0.198***	0.192***
$LitigationInd_{it}$	0.298***	0.193***	0.252***
MB_{it}	3.24e-05***	2.95e-05***	2.82e-05***
$SalesGrowthrk_{it}$	-0.015*	-0.010	0.004
$LnNumAnalyst_{it}$	0.052***	0.047***	0.050***
IndRev%	-0.126***	-0.070*	-0.074**
$Momentum_{it}$	-0.163***	-0.157***	-0.138***
$Segments_{it}$	-0.010	-0.020	0.007
$Foreign_{it}$	0.216***	0.216***	0.201***
GFC_{it}	-0.230***	0.130***	0.110***
$Dot\text{-}Com_{it}$	-0.121***	0.220***	0.166***
SOX_{it}	-0.137***	0.192***	0.215***
Hansen	1,540.150	1,531.660	1,539.560
m_1	-14.390	-15.530	-14.310
m_2	1.030	1.570	0.97
z_1	1,086.850	879.310	1,932.970

Notes: This table presents the results from the system generalized method of moments regressions for the individual effects of market competition on real earnings management. The sample includes 66,695 firm-year observations obtained from Compustat from 1989 to 2011. Real earnings management is measured by Gunny's Model (2010). Each column represents the estimates from examining a dummy measure of market competition in the following order: (1) market concentration measured by the Herfindahl-Hirschman index (*HHI*), (2) product substitutability measured by the gross margin in the industry, and (3) pricing power measured by the industry adjusted Lerner Index (*LI*). HHI is a dummy variable that equals 1 if the firm is in an industry where market concentration is lower than the median and zero otherwise. ProdSubstitutability is a dummy variable that equals 1 if the firm is in an industry where product substitutability is lower than the median and zero otherwise. PricPower is a dummy variable that equals 1 if the firm has lower pricing power than the median and zero otherwise. Variables are defined in detail in the (Variable Definitions) section above. Each coefficient represents the change in real earnings management based on a one unit change in the determinant. Hansen test for over-identifying restrictions takes the shape of χ^2 distribution and checks for the orthogonality between the instrumental variables (IV_{it}) and the error term (ε_{it}). The AB test (Arellano and Bond, 1991) examines the serial correlation in the first difference residual (υ_{it}) by using the (m_j) statistic and takes the shape of a normal distribution with N(0,1). m_1 values represent the results of the 1st order serial correlation test, while m_2 values represent the results of the 2nd order serial correlation test. The Wald test (z_1) checks for the joint significance of the reported coefficients in the model. Intercept is included, but not tabulated. *, **, *** denotes significance at 0.10, 0.05, and 0.01, respectively.

Chapter 9
Conclusions

9.1 Introduction

Earnings management occurs as a result of the conflict in interests arising from the separation of ownership from control in public companies. Three groups of motives are expected to influence earnings management behaviour including contracting, capital market, and third-party motives. However, these three groups are not completely independent and may overlap in determining earnings management behaviour. In this thesis I have examined the effect of management compensation and managerial ability from the contracting group and market concentration and competition from the third-party group. Finally, I have studied how factors from both groups jointly influence earnings management.

While the prior research has considered management compensation as one of the contracting motives, this thesis views it as an outcome of earnings management behaviour because firms tend to reward/punish managers through their compensation. Accordingly, the information asymmetry and moral hazard drive managers to signal better performance, while shareholders screen these signals to determine management compensation. The thesis contributes to the literature by documenting that while firms reward/punish their managers for accrual/real earnings management because of its lower/higher subsequent adverse consequences, they react less intensively when high quality managers are involved in the manipulation because of the high contracting costs and the big knowledge gap that make their activities less likely to be detected or understood. Nevertheless, superior managers continue to prefer using/avoiding accrual/real earnings management because of the overall positive/negative effect on their future compensation.

At the external motives level, this thesis expects a non-linear effect of market concentration on earnings management based on the role of market concentration in increasing information asymmetry and decreasing communication costs at the same

time. The results show that while firms are more likely to use accrual earnings management as information quantity decreases in concentrated market, they prefer the sophisticated real earnings management as the information quality decreases. The thesis contributes to the literature by identifying an optimal level of market concentration where both accrual and real earnings management are declining at the same time.

Finally, as the different motives of earnings management are unlikely to be independent, market competition at the external level may interact with managerial ability at the contractual level in determining earnings management behaviour. While market competition increases the costs of communicating information in the market and thus may stimulate earnings management, the response of high quality managers is sophisticated as they possess the abilities to provide better performance which is difficult to be monitored due to their high contracting costs with the firms. The thesis contributes to the literature by documenting a different response of more able managers who prefer using accrual earnings management under the pressure of competition compared to other managers who continue using both accrual and real earnings management.

The remainder of this chapter is organized as follows. Section 9.2 provides a summary of the objectives and results of the three empirical chapters of this thesis. Section 9.3 explains the implications of the thesis to the regulators, policy makers, shareholders, investors, gatekeepers, and academics. Finally, section 9.4 presents the research limitations and suggests some recommendations for the future studies to take into consideration based on the results of this thesis.

9.2 Summary of Results

This thesis has focused on management compensation, managerial ability, market concentration and market competition as some of the contractual and external motives of earnings management. Chapter 2 has discussed the definitions, activities, and measurement of earnings management. Chapter 3 has established the theoretical framework of this thesis. Chapter 4 has summarized the three main groups of motives of earnings management. Chapter 5 has explained the data and research methods used in the thesis. Chapter 6 represents the first empirical chapter of this thesis and has

examined the impact of earnings management and managerial ability on management compensation. Chapter 7 is the second empirical chapter and has studied the non-linear relationship between market concentration and earnings management. Finally, chapter 8 is the third empirical chapter and has examined the role of market competition in the relation between managerial ability and earnings management. In this section I summarize the main objectives and findings of the three empirical chapters of this thesis.

9.2.1 Management Compensation: The Impact of Earnings Management and Managerial Ability

Although compensation has been extensively examined as a contractual motive of earnings management, the impact of earnings management on executives' compensation has not been considered in the literature to my knowledge. The objective of this empirical chapter is to examine the previous relation and use it to explain the behaviour of high quality managers in using more accrual and less real earnings management, taking into consideration the different economic consequences of each activity to the firm. To achieve this objective, I first examine the effect of managerial ability on management compensation. Second, I examine the impact of both accrual and real earnings management on management compensation. Finally, I examine whether the previous influence changes at the different levels of managerial ability.

First, I find that firms tend to attract or retain managers with better abilities by rewarding them with higher compensation. Due to the sophisticated nature of their decisions, superior managers receive better compensation as the positive consequences of their decisions are realized over time. The optimal pay-performance structure motivates managers to share risk and thus mitigates the information asymmetry and moral hazard problems arising from the separation of ownership and control.

Second, although accrual and real earnings management can be used by the managers to signal better performance, real earnings management is screened by the shareholders as a more costly activity when detected in the future. Accrual earnings management allows managers to extract better compensation because it enables them to improve their performance measures without influencing firms' future cash flows. In contrast, real earnings management results in a reduction of managers' future

compensation because it has serious economic consequences on the firm's future performance. As a result, while real earnings management is considered more costly than accrual earnings management from the firm's perspective because it severely influences firms' future performance, it is also considered more costly from management's perspective because it drives a reduction in future compensation.

Finally, high quality managers continue to prefer using accrual earnings management because it has an overall positive effect on their future compensation. In contrast, they avoid real earnings management due to its overall negative effect. In this sense, real earnings management is perceived more costly than accrual earnings management not only from the firm and management points of view, but also from the perspective of high quality executives.

9.2.2 Market Concentration and Earnings Management: A Non-Linear Relationship

The objective of this empirical chapter is to examine a non-linear relation between market concentration and earnings management based on two different perspectives in the agency theory and the revelation principle. While it is more difficult to monitor performance in concentrated markets because of the higher information asymmetry between the firms and the stakeholders, the presence of fewer competitors makes communicating information less costly. The literature supports the previous points of view and documents a positive linear effect of market concentration on earnings management in some instances (Dalia and Park, 2009; Markarian and Santalo, 2010; Karuna et al., 2012) and a negative linear effect in others (Datta et al., 2013). Therefore, I initially examine the non-linear effect of market concentration on earnings management. Then, I explain this effect through the asymmetry of information in the market.

First, I find a non-linear effect of market concentration on earnings management that takes an inverted U shape when accrual earnings management is the regressand and U shape in the case of real earnings management. Accrual earnings management increases at market concentration levels between 0 and 55% but starts decreasing after that level, while real earnings management decreases at market concentration levels

between 0 and 60% but starts increasing afterwards. The results are in line with the contrasting effects of market concentration that involve high information asymmetry and low communication costs at the same time.

While the quantity of information decreases steadily in concentrated markets, the quality of information increases up to market concentration levels of 55% - 60% then starts decreasing. The reason is that firms get less threatened to lose their competitive advantages in concentrated markets and thus provide high quality information that allows analysts to make better forecasts. However, at high levels of market concentration, firms collude to hide information and thus make it difficult for the analysts to produce quality forecasts. These findings explain the increase in accrual earnings management at lower levels of market concentration because of the decrease in information quantity in the market, and the use of real earnings management at higher levels of market concentration due to the lack of quality information to monitor firms' sophisticated activities.

9.2.3 Earnings Management, Managerial Ability and the Role of Competition

Managerial ability and market competition are not independent and thus they are likely to interact in determining the levels of earnings management. While managerial ability influences the contracting costs between managers and shareholders, competition changes the costs of communicating information to those shareholders. In this sense, the previously documented behaviour of superior managers using more accrual and less real earnings management may change under the pressure of market competition. Therefore, the objective of this empirical chapter is to examine the influence of market competition on accrual and real earnings managed by high quality managers.

I initially find that market competition has a positive effect on the relation between managerial ability and accrual earnings management. While market competition drives more adverse selection by increasing the cost of communicating information in the market, superior managers become more selective in their behaviour. Therefore, they choose more accrual earnings management because it is perceived less costly from the firm and management perspectives at the same time.

Finally, I find that managers use more real earnings management under the pressure of the high communication costs in competitive markets. However, superior managers select to avoid using real earnings management because they are able to realize its severe consequences to the firm and its management in the future. Therefore, I find that market competition decreases the amount of real earnings managed by high quality managers. The results imply that market competition and managerial ability together contribute to the welfare of the firm in the long run.

9.3 Implications

The previous findings have implications to be considered by regulators, policy makers, shareholders, investors, academics, and some of the gatekeepers e.g., auditors and analysts. First, while real earnings management involves some economic consequences to the firm because it contributes to decreasing future cash flows and sacrificing the long term projects, it results in lower compensation to managers at different levels of abilities. Therefore, real earnings management is considered a costly activity to the firms, managers, and even to the top quality executives. However, more effort should be invested by regulators in communicating the previous consequences of real earnings management to the different stakeholders e.g., shareholders, investors, and managers, in addition to emphasizing the role of the gatekeepers, e.g., auditors, in reporting such activities.

Second, market concentration cannot be considered absolutely good or bad to the economy. An optimal level has been identified in Chapter 7 at intermediate levels of market concentration where both accrual and real earnings management are decreasing. Therefore, while anti-competition laws attempt to mitigate the high levels of market concentration, the previous findings of this thesis suggest that both high and low levels of market concentration increase the likelihood of different types of earnings management activities. Therefore, it is more recommended that such laws emphasize the optimal level of market concentration that allows for optimal information and thus contributes to mitigating the agency conflict and avoiding more concentrated markets in the future. The optimal market concentration assists industry regulators to keep a balance between firms entering and exiting the market. Furthermore, it emphasizes the

role of analysts as gatekeepers that may contribute to enlarging the optimal level of market concentration by providing higher quality forecasts.

Finally, earnings management motives at the firm level cannot be considered independently from those at the industry level when explaining management decisions. Therefore, any regulation that attempts to mitigate one motive at a specific level has to consider it with respect to the other motives at a different level. For example, while market competition drives more real earnings management when examined individually, this thesis documents that it results in less real earnings management when considered together with managerial ability. In this sense, both factors serve as strong governance mechanisms in preventing the costly real earnings management. Explaining the interaction between earnings management motives at different levels assists regulators in identifying firms at higher risk of earnings management and ultimately helps investors and shareholders in making better decisions.

9.4 Limitations and Future Research

While the thesis has examined the costs of accrual and real earnings management from the perspective of managers with different abilities, the previous costs should be also considered at other contracting levels e.g., position in the executive team, tenure in the firm, years remaining to retirement, and the mobility of a manager to other firms. Distinguishing between the costs of earnings management strategies for the different types of managers would assist in further mitigating the costly earnings management activities. In addition, although the time period covered in chapter 6 of this thesis is still long enough to run a panel data methodology (15 years from 1992 to 2006), up to date data from new sources can be obtained to confirm the previous results or perform the suggested new ideas.

Although the literature has focused on market concentration measures when studying competition, the contradicting theoretical points of view regarding the impact of market concentration on earnings management can be also extended when considering the other measures of market competition. In this sense, competition is expected to play a double-edged role because of the increased communication costs and the decrease in information asymmetry at the same time. For future research, I

recommend examining a non-linear impact of the other measures of market competition e.g., product substitutability and market pricing power, on earnings management as it may provide a new understanding of this area of research.

Finally, the contracting motives, capital market motives, and third-party motives of earnings management are unlikely to be independent in reality. While this thesis has examined the interaction of managerial ability as a contracting motive and market competition as a third-party motive, prior studies have almost ignored this area of research. To my knowledge, the study of Bushman et al. (2013) examines the influence of the voting rights as a corporate governance mechanism and market competition as an external motive on the loan loss provision in the banking sector of 46 countries. It documents that the role of weak governance in motivating earnings management can be mitigated by bank competition. Future studies should consider such related factors at different levels to extend research benefits beyond the firm borders.

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