Real and Accrual Earnings Management, Regulatory Environments, Audit Quality and IPO Failure Risk

by

Mohammad Muflih Salem Alhadab

Submitted in accordance with the requirements for the degree of
Doctor of Philosophy

The University of Leeds
Leeds University Business School
Accounting and Finance Division
Centre for Advanced Studies in Finance

September, 2012

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

I dedicate this thesis to the memory of my grandmother who passed away during my studies, and to my beloved parents, my grandfather, my brothers, my sisters, my uncles, my aunts and everyone who have shared this dream with.

Acknowledgements

First of all, all praise and gratitude are due to Almighty ALLAH, the most Gracious, the most Merciful, for giving me good health and strength to complete this thesis.

I would to like to express my deep appreciation to my primary supervisor Professor Kevin Keasey for believing in me and being a great source of inspiration, motivation, and enthusiasm throughout the research project. His experience, encouragement, and support certainly contributed to the completion and quality of this thesis. Also, I would like to thank my secondary supervisor Dr. Iain Clacher for his invaluable feedback and constructive comments on my work. I was very fortune to be one of them.

I am also grateful to the members of my PhD's examination panel: Professor Martin Walker (University of Manchester), Professor Igor Filatotchev (City University London) and Professor Steve Toms (University of Leeds) for their helpful comments and suggestions.

Special thanks go to Ms. Michelle Dickson for her invaluable support during my studies. Also, I would like to express my thanks to all my friends and colleagues at the Centre for Advanced Studies in Finance (CASIF) and Leeds University Business School, especially Dr. Shima Amini, for their support. Also, I am grateful to all staff and members of Accounting and Finance Division and the Research Office for their help and support.

The financial support from Al al-Bayt University to pursue my doctoral studies is gratefully acknowledged. I am looking forward to sharing my experience and knowledge with them.

I am grateful to an anonymous referee of the Journal of Accounting and Economic for his constructive feedback and suggestions on chapter five that I submitted to the Journal. I would like also to thank the participants at the European Accounting Association-Annual Conference (2012); the International Accounting and Finance Doctoral Symposium (2011); the British Accounting and Finance Association-Northern Area Conference, (2011); and my presentations at the University of Leeds (2011 &2012).

Finally, I would like to express my deep appreciation to my beloved parents, Muflih and Faddea, for their prayers, well wishes and for being the unlimited source of love, support, and encouragement over the years. I am also grateful to my brothers, my sisters, my grandfather, my uncles, my aunts, and my friends who have all given me wonderful love, support and encouragement during the course of this thesis.

Abstract

This thesis builds on information asymmetry, agency conflicts and litigation-risk backgrounds to examine real and accrual earnings management activities around Initial Public Offerings (IPOs), mitigating factors (regulators and auditors), and consequences for future performance (stock return and IPO survivability). The IPO event is associated with higher levels of information asymmetry and agency conflicts between insiders and outsiders that are found to provide managers with strong incentives and more flexibility to engage in earnings management activities to maximise their wealth instead of shareholders. Due to the existence of information asymmetry around IPOs, IPO firms hire high quality auditors during the IPO to send positive signals about the offer to outside investors (Titman and Trueman, 1986).

The first empirical study (chapter five) of this thesis examines whether different regulatory environments impact the use of real and accrual earnings management around IPOs via an analysis of the heavily regulated Main market of the London Stock Exchange and the more lightly regulated Alternative Investment Market (AIM), and whether these different regulatory burdens (restrictive vs. lighter) have different mechanisms/capabilities to correct stock prices that were inflated by earnings management during the IPO. The results of this study show that IPO firms in the UK manage earnings upward utilizing both real and accrual earnings management around IPOs, and that IPO firms on the lightly regulated AIM market exhibit higher levels of sales-based and accrual-based and a lower level of discretionary expenses-based earnings management than IPO firms on the heavily regulated Main market. Further, the results show that real and accrual earnings management, which take place during the IPO year, have severe negative consequences for post-IPO stock return performance, and that the heavily regulated Main market of the London Stock Exchange has better mechanisms-capabilities to correct stock prices that were inflated by earnings management during the IPO year than the lighter regulated AIM market.

The second empirical study (chapter six) investigates whether enhanced audit quality impacts real earnings management activities that occur during the IPO, whether enhanced audit quality impacts managers' tendency to choose between real and accrual earnings management, and whether enhanced audit quality affects the association between real and accrual earnings management and post-IPO stock return performance. The results show that high quality auditors mitigate real earnings management activities that occur through discretionary expenses-based manipulation during the IPO year, and that IPO firms audited by high quality auditors (big N audit firms) undertake a higher level of sales-based manipulation to avoid the monitoring of discretionary expenses-based and accrual-based manipulations. Further, IPO firms audited by high quality auditors are found to experience a severe decline in post-IPO stock return performance due to the extensive use of sales-based manipulation at the IPO year. Thus, this evidence confirms that high quality auditors impact the relationship between real and accrual earnings management and post-IPO stock return performance.

Finally, the third empirical study (chapter seven) explores whether real and accrual earnings management that occur during the IPO year are associated with post-IPO failure and survivability in the subsequent periods. The results show that IPO firms with high levels of real and accrual earnings management during the IPO year have a higher probability of failure in the subsequent period. Further, IPO firms that engage in high levels of real and accrual earnings management during the IPO year have lower survival rates in the post-IPO period.

In summary, the main findings of this thesis suggest that real and accrual earnings management activities are utilized by IPO firms, that the level of utilizing these activities is dependent on the regulatory environment and audit quality, and that these activities are negatively associated with future stock performance and post-IPO survivorship. Regulators and audit firms should consider the fact that managers switch between real and accrual earnings management to avoid external monitoring. Further, the greater restriction on discretionary expenses-based and accrual-based manipulation seems to lead managers to engage extensively in sales-based manipulation.

Table of Contents

List of Tables

List of Figures

List of Appendices

List of Abbreviations

ABNCFO	Abnormal Cash Flows from Operations
ABNDEXP	Abnormal Discretionary Expenses
AIM	Alternative Investment Market
CEOs	Chief Executives Officers
CFOs	Chief Financial Officers
COX	COX Proportional Hazard Model
GAAP	Generally Accepted Accounting Principals
IFRS	International Financial Reporting Standards
IPOs	Initial Public Offerings
Main	Official List Market
OLS	Ordinary Least Square
REM_Index	Aggregate Measure of Real Earnings Management
R&D	Research and Development Expenses
SEC	Securities Exchange Committee
SEOs	Seasoned Equity Offerings
SG&A	Selling, General, and Administrative Expenses
SIC	Standard Industrial Classification
SOX	Sarbanes-Oxley Act
UKLA	UK Listing Authority
VCs	Venture Capitalists

Chapter 1
Introduction

1.1 Introduction

An Initial Public Offering is a significant driver of earnings management due to the existence of high levels of information asymmetry between insiders and outside investors (e.g., Aharony et al., 1993; Teoh et al., 1998a), notably that information asymmetry leads to two types of agency conflicts; adverse selection and moral hazard (Ritter and Welch, 2002; Bruton et al., 2009). Moral hazard implies that managers may not perform their duties efficiently in line with the interest of shareholders due to the information asymmetry between managers and shareholder (Nygaard and Myrtveith, 2000), while adverse selection implies that managers have better information about the firm and therefore, they may not reveal all they know about the firm to outsiders e.g. shareholders (e.g. Bruton et al., 2009). These agency conflicts that may raise between insiders and outsiders can lead managers to engage in certain activities (e.g. earnings management) to obtain a private gain (Jensen and Meckling, 1976). Teoh et al. (1998a) indicate that managers of IPO firms have strong incentives to manage earnings upward at the end of the IPO year to obtain private gains e.g. to maintain high stock prices given the lock-up restriction on managerial shares selling post-IPO, avoiding a potential litigation risk especially when post-IPO earnings decline compared with the pre-IPO period, meeting earnings forecasts in the prospectuses to avoid any reputation damage, and meeting performance-based compensation targets.

Consistent with this view about information asymmetry, prior literature has presented evidence that IPO firms utilize real and accrual earnings management activities to manage earnings upward around IPOs (e.g., Friedlan, 1994; Teoh et al., 1998c; DuCharme et al., 2001; Gramlich and Sorensen, 2004; Darrough and Rangan, 2005; Morsfield and Tan, 2006; Singer and Fedyk, 2011; Wongsunwai, 2012) and

experience lower post-IPO stock returns and operating performance due to earnings management taking place at the IPO (e.g. Teoh et al. 1998a; Fan, 2007; Chang et al., 2010). This literature also has shown that real and accrual earnings management activities are extensively utilized around Seasoned Equity Offerings (SEOs) to manipulate reported earnings upward and that these activities have negative consequences for future stock returns and operating performance (e.g., Cohen and Zarowin, 2010; Kothari et al., 2012).

Therefore, and given the fact that disclosure systems and financial reporting quality in the capital markets are associated with the level of information asymmetry and agency conflicts (Heal and Palepu, 2001), it is expected that the regulatory environments of the stock exchanges will play a significant role to either mitigate or motivate the use of earnings management activities around IPOs. On the one hand, a restrictive regulatory environment that has higher quality disclosure systems and financial reporting is expected to reduce the level of information asymmetry and agency conflicts and, therefore, managers have less flexibility to manage earnings upward around IPOs to obtain private gains. On the other hand, a lighter regulatory environment that has lower quality disclosure systems and financial reporting can lead to a higher level of information asymmetry and agency conflicts and, therefore managers have more flexibility to manage earnings upward around IPOs to obtain private gains. Despite this clear association between the regulatory environments and the use of earnings management, no research to date has examined whether different regulatory burdens (restrictive vs. lighter) that have different disclosure system and financial reporting quality would lead to different impacts on the level of information asymmetry and agency conflicts around IPOs and, therefore, the use of earnings management.

Further, and due to the fact that the IPO event is associated with a higher level of information asymmetry, hiring high quality audit firms during IPOs would help IPO firms to send a positive signal about the offer to outside investors (Titman and Trueman, 1986; Brau and Fawcett, 2006). This is due to the fact that high quality auditors consider the potential litigation risks that are associated with the IPO event and, therefore, they are expected to provide high quality audits that overall help to reduce information asymmetry and IPO underpricing (Balvers et al.

1988; Beatty 1989; Datar et al. 1991; Hogan, 1997). Consistent with this, prior research finds high quality auditors mitigate the use of accrual earnings management to increase reported earnings upwards during the IPO (e.g. Elder and Zhou, 2002; Chen et al., 2005). On the other hand, and in contrast with accruals accounting, real earnings management activities represent managerial decisions that deviate from normal business practices such as the unexpected reduction of research and development expenses (Roychowdhury, 2006) and, therefore, these activities are less subject to the scrutiny of audit firms (e.g. Graham et al. 2005). Also, real earnings management activities are found to lead to severe negative consequences for future stock return and operating performance (e.g. Cohen and Zarowin, 2010; Kothari et al. 2012) and are associated with a higher future litigation risk (Sohn 2011)[1]. Thus, it still unclear how high quality auditors would response to their IPO clients who engage in a higher level of real earnings management activities during the IPO[2]. Indeed, whether high quality auditors will ignore the potential litigation risks that are associated with earnings manipulation and just turn a blind eye to opportunistic real activities by their IPO clients during the IPO is still an open question.[3]

Moreover, the IPO is a significant event in a firm's life cycle that has consequences for the firm and its shareholders. If earnings management can lead to a future decline in stock returns and operating performance, then these consequences are likely to affect the economy as a whole (e.g. insiders, investors, lenders, financial institutions, and the unemployment rate), especially when earnings management leads to an IPO failure. Thus, exploring real and accrual earnings

[1] Sohn (2011) conducted a survey with high quality auditors (Big 4) and found that more than 30% of the respondents admitted that real earning management activities are associated with a higher probability of future litigation penalties.

[2] It is worth noting that recent literature has examined this relationship based on a SEO setting and found that high quality auditors play no monitoring role on real activities, but rather they lead their SEO clients to engage in a higher level of real activities to avoid the monitoring of accruals manipulation (e.g. Cohen and Zarowin, 2010; Chi et al. 2011). A SEO event is also associated with a higher level of information asymmetry during the offer year, but to a lesser degree than the IPO event. This is due to the fact that SEO firms are public firms and, therefore, the market participants already know a lot of information about these firms, while an IPO firm is a private firm with limited information that is available to the public.

[3] The focus on high quality auditors is due to the fact that a potential litigation risk would lead to severe negative consequences for the reputation of high quality auditors (big N audit firms) compared with lower quality auditors (non-big N audit firms) (Hogan, 1997).

management around IPOs is relevant to the economy as a whole as well to extending knowledge in the core areas of accounting and finance. This thesis therefore aims to explore and investigate real and accrual earnings management activities around IPOs in the UK, the relationships between these activities, mitigating factors (regulators and audit firms), and the consequences of these activities for future performance (post-IPO stock returns and IPO failure). Specifically, this thesis examines how multiple agency conflicts in IPO firms, which are caused by information asymmetry between insiders and outsiders, can lead to an extensive use of real and accrual earnings management to manage earnings upward around IPOs under different regulatory environments. Further, this thesis examines how a litigation-risk hypothesis (potential litigation risks) would impact high quality auditors' response to the use of real earnings management activities during the IPO, even though these activities are considered outside the audit targets. Finally, this thesis explores how these real and accrual earnings management activities (which represent deviation from normal business and accounting practices) can impact IPO firms' future performance through analyzing post-IPO stock return and IPO survivability.

The remainder of this chapter proceeds as follows. Section two discusses the association between regulatory environments and real and accrual earnings management. Section three presents an overview on the expected impact of enhanced audit quality on real and accrual earnings management at the IPO. Section four explores consequences of real and accrual earnings management for IPO failure and survivability. Section five presents the research questions. Section six outlines the significance of the research. Section seven presents the contribution of the research. Section eight provides the structure of the thesis.

1.2 Regulatory Environments

The first empirical chapter (chapter five) of this thesis examines whether IPO firms engage in real and accrual earnings management around IPOs, via analysis of a six-year window starting from two years before the IPO year, and up to three years after the IPO year, under different regulatory environments. This chapter also analyzes the impact of different regulatory environments (restricted vs. flexible) on the association between real and accrual earnings management and post-IPO stock

return performance. The IPO presents a unique setting in which to examine real and accrual earnings management, notably that IPO firms exhibit a higher level of information asymmetry that may lead to higher agency conflicts and, therefore, strong incentives and more flexibility to manage reported earnings upwards around the offer year. Further, the UK stock market provides a unique setting to address the impact of the regulatory environment on earnings management as all firms are governed by the same legal regime, accounting standards and general economic environment, but are subject to differing disclosure systems, listing requirements and monitoring.

The increased interest in earnings management research has led to an examination of the association between managers' tendency to choose between real and accrual earnings management and regulation. Graham et al. (2005) for example present evidence that executives prefer to manage earnings by utilizing real activities manipulation over accrual accounting to avoid the scrutiny of regulators. Real activities represent managerial decisions that deviate from normal business practices and, therefore, are less subject to the scrutiny of regulators and auditors (Graham et al., 2005; Roychowdhury, 2006). Consistent with this, Cohen et al. (2008) examine the impact of the passage of Sarbanes-Oxley Act on managers' tendency to manage earnings utilizing real and accrual earnings management. The Sarbanes-Oxley Act (SOX) was issued in the US after the big accounting scandals in 2002 in order to remedy corporate governance failures and to mitigate earnings management. Consistent with Graham et al. (2005), Cohen et al. (2008) find evidence that managers resort to manage real earnings management after the passage of SOX. Specifically, Cohen et al. (2008) indicate that SOX has constrained the use of accrual earnings management and, therefore, managers have switched to use real activities after the passage of SOX.

Despite this recent increased interest in research that examines the impact of regulatory environments on real and accrual earnings management, no research to date has examined whether different regulatory environments impact managers' tendency to manage earnings and to choose between real and accrual earnings management around IPOs. The IPO represents an event where managers have a very strong incentive to manage earnings upward around the offer year.

In the UK, the heavily regulated Main market of the London Stock Exchange and the more lightly regulated Alternative Investment Market (AIM) provide a unique setting to assess the impact of different sets of regulation (flexible vs. restricted) on managers' tendency to manage earnings upward and to choose between real and accrual earnings management. Specifically, the AIM and Main markets have very different regulatory environments, listing requirements, and corporate governance structure and disclosure systems. However, firms listed on these markets are governed by the same legal regime, accounting standards and general economic conditions. In addition, the Main market is considered to be one of the most developed markets in the world that attracts the attention of analysts and sophisticated investors (Arcot et al., 2007), who in turn help to re-evaluate stock prices that were inflated by earnings manipulation around IPOs. Thus, this thesis enhances the literature by providing evidence on the relation between the regulatory environment and managers' tendency to manage earnings and to choose between real and accrual earnings management activities around IPOs, and whether different regulatory environments may have different mechanisms/capabilities to correct the stock prices that were inflated by earnings management during the IPO.

1.3 Enhanced Audit Quality

The second empirical chapter (chapter six) of this thesis examines whether enhanced audit quality is associated with real and accrual earnings management at the IPO. While prior literature finds evidence that enhanced audit quality constrains accrual-based manipulation to avoid potential litigation risks (e.g. Becker et al., 1998), recent literature presents evidence that the monitoring of accruals manipulation by high quality auditors leads to more extensive use of real activities. For example, Chi et al. (2011) examine whether high quality auditors affect managers' tendency to choose between real and accrual earnings management. By examining firms with strong incentives to manage earnings upward (e.g. firms that have issued a Seasoned Equity Offering [SEO] and firms who just meet or beat earnings benchmarks), Chi et al. (2011) find evidence that firms audited by high quality auditors resort to high levels of real earnings management to avoid the monitoring of accrual based-manipulation. In addition, Cohen and Zarowin (2010) examine SEO firms and find evidence that the presence of high quality auditors is associated with higher levels of

real earnings management. Although recent increased interest in real and accrual earnings management research has led to an examination of the association between enhanced audit quality and managers' tendency to choose between real activities-based and accrual-based manipulation around SEOs, no research to date has examined this association around IPOs. Based on the litigation-risk hypothesis, it is expected that high quality auditors to detect real earnings management activities that are associated with potential litigation risks, even though these activities are considered outside the audit targets.

Further, real and accrual earnings management are found to have severe negative consequences for subsequent stock returns and operating performance. For example, prior research has found IPO and SEO firms that manage accruals upward around the offer year experience a decline in stock returns and operating performance in the following periods (Rangan, 1998; Teoh et al. 1998a, 1998c; Fan, 2007). Prior research also has examined the impact of both real and accrual earnings management for post-SEO returns and operating performance and found evidence that real earnings management has more severe negative consequences for future performance (Cohen and Zarowin, 2010; Kothari et al. 2012).

Therefore, and based on the above evidence, it is expected that the impact of high quality auditors on real and accrual earnings management will extend for subsequent performance. On the one hand, accrual-based manipulation is found to be negatively associated with future stock returns and operating performance (Rangan, 1998; Teoh et al. 1998a; Fan, 2007) and, therefore, reducing accruals manipulation by high quality auditors would mitigate the negative consequences of accruals manipulation for subsequent returns and operating performance. On the other hand, the monitoring of accruals manipulation by high quality auditors is found to lead managers to engage more in real activities manipulation (Cohen and Zarowin, 2010; Chi et al., 2011) and, therefore, this extensive use of real activities-based will have more severe negative consequences for subsequent stock return and operating performance (even greater than the impact of accrual-based manipulation e.g. Cohen and Zarowin, 2010; Kothari et al. 2012).

Thus, this thesis is the first empirical research (based on the IPO context or any other context e.g. SEO) that examines the impact of enhanced audit quality on

the relation between real and accrual earnings management and subsequent stock return performance. Specifically, if enhanced audit quality has an impact on real and accrual earnings management at the IPO, then it is predicted that this will feed through into post-IPO stock return performance.

1.4 IPO Failure Risks

The third and final empirical chapter (chapter seven) of this thesis explores the impact of real and accrual earnings management on the probability of IPO failure and survivability in the subsequent period. Fama and French (2004) document that the survival rates of IPO firms have sharply declined over the past several decades due to the new characteristics of IPO firms, which are lower profitability and the higher growth that are both driven by the lower cost of equity in the market. Given the importance of IPO failure and survivability and its impact for the economy as a whole (e.g. investors, lenders, financial institutions, unemployment rate, etc), recent research has focused on examining several factors that may be associated with IPO failure. For example, Jain and Kini (2000) examine the association between the presence of venture capitalists and IPO survivability. Schultz (1993) examines whether IPO firms with more reputable underwriters have higher survival rates. Willenborg and McKeown (2001), Weber and Willenborg (2003) and Jain and Martin (2005) investigate whether enhanced audit quality is associated with IPO survivability. Hensler et al. (1997) examine whether IPO survivability is associated with IPO firms characteristics such as underpricing, size and firm age.

Despite this extensive research on IPO failure and survivability, little research has examined whether IPO failure and survivability are associated with real and accrual earnings management (e.g. Li and Zhou, 2006; Demers and Joos, 2007). Prior literature has shown evidence that real and accrual earnings management activities are utilized to manipulate reported earnings around IPOs (e.g., Friedlan, 1994; Teoh et al. 1998a; DuCharme et al., 2001; Gramlich and Sorensen, 2004; Darrough and Rangan, 2005; Morsfield and Tan, 2006; Chang et al., 2010; Singer and Fedyk, 2011; Wongsunwai, 2012) and that these activities have severe negative consequences for subsequent returns and operating performance (Teoh et al. 1998a; Teoh et al., 1998b; Fan, 2007; Cohen and Zarowin, 2010; Kothari et al., 2012).

Thus, IPO firms that engage in higher levels of real and accrual earnings management during the IPO are expected to have a higher probability of failure and lower survival rates in the subsequent period.

Consistent with the negative impact of earnings manipulation, a recent paper by Li and Zhou (2006) finds evidence that IPO firms with high levels of accruals manipulation during the IPO year have a higher probability of failure and lower survival rates in the subsequent period. Further, Demers and Joos (2007) find IPO firms that have lower spending on research and development (R&D) and selling, general, and administrative (SG& A) expenses during the year pre the IPO have a higher probability of failure in the following periods.[4]

In summary, this thesis examines whether real and accrual-based earnings management that take place during the IPO year are associated with IPO failure risk and survivability in the subsequent period. It is predicted that IPO firms with high levels of real activities-based and accrual-based manipulations during the IPO year will have a higher probability of failure and lower survival rates in subsequent periods.

1.5 Research Questions

Based on the previous discussion, the objectives of this thesis are to examine the following research questions.

1. It examines whether IPO firms manage earnings upward around Initial Public Offerings (IPOs) utilizing real and accrual earnings management under different regulatory via an analysis of the heavily regulated Main market of the London Stock Exchange and the more lightly regulated Alternative Investment Market (AIM).

[4] It is worth noting that while recent accounting research employs empirical models to estimate discretionary expenses-based manipulation (e.g. the abnormal reduction of R&D and SG&A expenses), Demers and Joos (2007) examine the annual level of discretionary expenses during the year pre the IPO.

2. It investigates whether regulatory environments have different mechanisms/capabilities to correct stock prices that were inflated by earnings management during the IPO year.
3. It examines whether enhanced audit quality affects real earnings management activities during the IPO and whether enhanced audit quality has an impact on managers' tendency to choose between real and accrual earnings management.
4. It investigates whether enhanced audit quality has an impact on the relationships between real and accrual earnings management and post-IPO stock return performance.
5. It explores the consequences of real and accrual earnings management at the IPO through assessing the probability of IPO failure and survivability in the subsequent periods.

1.6 Significance of the Thesis

This study attempts to explore whether UK IPO firms manipulate reported earnings using real earnings management and accrual accounting around the offer year. By examining real earnings management activities, this study provides new evidence on earnings manipulation around IPOs. Prior research has examined accrual earnings management hypothesis in an IPO context; however, the evidence is inconclusive whether IPO firms engage in accrual earnings management. A substantial number of studies find evidence that IPO firms manage earnings upward using accrual accounting (e.g., Aharony et al., 1993; Friedlan, 1994; Teoh et al., 1998a; DuCharme et al., 2001). However, other studies find no evidence of accruals manipulation around IPOs and indicate that the previous findings of high levels of accruals manipulation around IPOs are attributed to the bias in the estimation of discretionary accruals (e.g. Ball and Shivakumar, 2008; Armstrong et al., 2009). While prior research focuses extensively on accrual-based manipulation around IPOs, recent research shows that IPO firms utilize both real activities and accrual accounting to manipulate reported earnings upward around the offer year (e.g., Darrough and Rangan, 2005; Wongsunwai, 2012).

Given the mixed evidence on accrual manipulation around IPOs, and given the increased interest on real activities-based earnings management, this study

enhances the literature by examining real and accrual earnings management around IPOs in the UK. This study is therefore significant for the following reasons:

First, it provides new evidence whether IPO firms engage in real earnings management activities to manipulate reported earnings around the offer year. In addition, given the previous mixed evidence on accruals manipulation during IPOs, this study examines whether IPO firms manage accrual accounting upward around IPOs by taking account of comments in recent research that questions the evidence of accruals manipulation around IPOs (e.g. Ball and Shivakumar, 2008; Armstrong et al., 2009). Second, this study presents evidence whether the regulatory environment has an impact on managers' tendency to choose between real and accrual earnings management. Prior literature shows that more restrictive regulations constrain accrual-based manipulation, but at the expense of more use of real activities manipulation. Graham et al. (2005) and Cohen et al. (2008) show that managers prefer to manipulate real activities over accrual-based manipulation to avoid the scrutiny of regulators. Thus, this thesis illustrates how managers can response to more restrictive regulations and how managers choose between real and accrual earnings management under different regulatory environments, namely flexible vs. restricted.

Third, there is a growing body of literature has examined the association between enhanced audit quality and real activities-based manipulation. Real activities manipulation represent managerial decisions (e.g. R&D and SG&A expenses) that are less subject to the scrutiny of auditors (Graham et al., 2005; Roychowdhury, 2006), in line with this Chi et al. (2011) find evidence that the presence of high quality auditors is associated with high levels of real activities. This recent research examines firms with strong incentives to manage earnings upward (e.g. SEO firms) and finds firms audited by high quality auditors engage in more real activities-based manipulation to avoid the monitoring which occurs when accrual-based manipulation occurs (Cohen and Zarowin, 2010; Chi et al., 2011). Therefore, the findings of this thesis provide evidence on the importance of considering real activities by audit firms, even though these activities are less subject to the scrutiny of auditors. The effective monitoring of accrual manipulation

by audit firms without considering real activities therefore leads to more negative consequences for future performance.

Finally, the failure of an IPO is a significant event that has negative consequences for the firm and its shareholders (investors, lenders, financial institutions, etc). Thus, this thesis enhances the literature by providing evidence whether real and accrual earnings management are associated with IPO failure and survivability. Real and accrual earnings management are negatively associated with future performance, and therefore, constraining these activities will reduce the risk of IPO failure and improve the survivability.

1.7 Contribution of the Thesis

This thesis contributes to the knowledge in the following theoretical aspects. First, this is the first study to examine how the level of information asymmetry and agency conflicts may differ under different regulatory environments and how this impacts the use of real and accrual earnings management activities during the IPO. The findings of this thesis show that IPO firms on the lighter regulatory environment of the AIM market of the London Stock exchange exhibit higher levels of information asymmetry and agency conflicts that, in turn, leads to more flexibility to manage real and accrual earnings management to inflate reported earnings upward around IPOs. While IPO firms on the more restrictive regulatory environment of the Main market of the London Stock Exchange are found to exhibit lower levels of information asymmetry and agency conflicts that, in turn, leads to less flexibility to manage earnings upward.[5]

Second, this is the first study to examine whether a litigation-risk hypothesis (the risk of potential litigation penalties) can impact high quality auditors' response to real activities that are utilized by their IPO clients during the IPO year to manage

[5] In addition to the use of the level of earnings management as a proxy for the presence of information asymmetry and agency conflicts, the results of Table 5.9 show that the coefficient of *ZeroReturn* is positive and statistically significant, suggesting AIM IPOs exhibit a higher level of information asymmetry during the IPO year than Main IPOs. The variable *ZeroReturn* is included into Model 5.9 to control for information asymmetry problems as IPO firms with high levels of information asymmetry their stock are less likely to be traded. *ZeroReturn* is defined as the number of zero-return trading days divided by the total number of trading days since the IPO date and up to one year later.

earnings upward. Prior research shows that high quality auditors mitigate the use of accrual earnings management during the IPO to avoid any potential litigation risks (e.g. Elder and Zhou, 2002), while no research to date has examined whether high quality auditors may mitigate the use of real activities during the IPO. This limited research is due to the fact that real activities represent managerial decisions that are less subject to the scrutiny of audit firms (Graham et al., 2005) and, therefore, researchers would not expect to find any relationship between audit firms and real activities. In contrast with this view, the findings of this thesis provide the first evidence that a litigation-risk hypothesis impacts the monitoring role of high quality auditors on real earnings management activities during the IPO. Specifically, high quality auditors are found to mitigate the use of real activities that occur via discretionary expenses-based manipulation. These discretionary activities are associated with future litigation risks especially when the IPO firms manage earnings upward utilizing both sales and discretionary expenses.[6]

Further, this thesis contributes to the knowledge in the following empirical aspects. First, this study provides the first empirical evidence to the literature on the impact of the regulatory environment on managers' tendency to engage in earnings management and to choose between real and accrual earnings management activities around IPOs. The findings of chapter five show that IPO firms on the lighter regulatory environment of the AIM market exhibit a higher level of information asymmetry and agency conflicts that, in turn, leads to higher levels of real activities (sales-based) and accrual earnings management during the IPO. Further, the findings of chapter five show that IPO firms on the lighter regulatory environment of the AIM market have more flexibility to choose between real and accrual earnings management activities based on the costs and benefits of utilizing each of them.

Second, this study provides the first empirical evidence to the literature that different regulatory environments (restrictive vs. lighter) are found to have different mechanisms/capabilities to correct stock prices that were inflated by earnings management during the IPO year. It is already documented in the literature that

[6] A higher level of sales is expected to be combined with a higher spending on discretionary expenses e.g. selling and advertising expenses. Thus, and as sales-based manipulation is hard to detect, it seems that high quality auditors mitigate any abnormal reduction of discretionary expenses especially when the IPO firms experience high growth in sales.

earnings management during the IPO year predicts post-IPO poor stock return and operating performance. However, no research to date has examined how this relationship may differ under different regulatory environments. For example, a more developed stock market with a more restrictive regulatory environment can attract the attention of sophisticated investors and analysts who help to correct stock prices that were inflated by earnings management. Consistent with this, the findings of chapter five show that the more heavily regulated environment of the Main market of the London Stock Exchange has better mechanisms/capabilities than the lighter regulated environment of the AIM market to correct stock prices that were inflated by earnings management during the IPO year.

Third, this study is the first empirical test to examine the impact of audit quality on real earnings management activities during the IPO, and whether audit quality impacts managers' tendency to choose between real and accrual earnings management activities during the IPO. Prior literature focuses on the relationship between audit quality and accrual earnings management around IPO, while no research to date has examined the relationship between audit quality and real earnings management activities during the IPO. The findings of chapter six show that high quality auditors mitigate real earnings management that occurs via discretionary expenses-based manipulation. Further, the findings of chapter six show that the monitoring of discretionary expenses-based and accrual-based manipulations by high quality auditors lead their IPO clients to engage in a higher level of sales-based manipulation to manage earnings upward during the IPO year.

Fourth, this study also provides the first empirical test to examine the impact of enhanced audit quality on the association between real and accrual earnings management and subsequent stock return performance. As enhanced audit quality is expected to impact managers' tendency to choose between real and accrual earnings management, and as both real and accrual earnings management lead to negative impacts for future stock return performance (Kothari et al., 2012), then it is expected that the impact of enhanced audit quality on earnings management during the IPO will feed through into post-IPO stock return performance. The findings of chapter six provide the first evidence to the literature that IPO firms audited by high quality auditors during the IPO experience more severe poor stock return performance in the

following periods due to the extensive use of sales-based manipulation during the IPO year.

Finally, this study represents the first evidence to the literature on the association between real earnings management activities and IPO failure risks.[7] Prior research has examined the relationship between accrual earnings management during the IPO and IPO failure risks (e.g. Li and Zhou, 2006), but no research to date has examined whether real earnings management activities during the IPO are associated with the probability of IPO failure.[8] The findings of chapter seven show that IPO firms who exhibit higher levels of real and accrual earnings management during the IPO year experience a higher probability of IPO failure and lower survival rates in the subsequent periods, confirming that earnings management activities lead to severe negative consequences for future performance.

1.8 Structure of the Thesis

This thesis consists of eight chapters. The first chapter provides a summary on the motivations to conduct this research and the expected contribution to the literature. In addition, it shows the significance of this study concerning the expected implications to the IPO market, and presents the research questions and the structure of this thesis.

Chapter two aims to provide an overview on the development of earnings management, its activities, and the empirical models employed to measure these activities. Starting with definitions, earlier research will be discussed in order to present the most commonly accepted definitions of earnings management and to distinguish between earnings management and accounting fraud. Further, this chapter shows the difference between real and accrual earnings management

[7] It is worth noting that this study is most closely related to Demers and Joos (2007), which examines whether the annual level of SG&A, R&D, and sales during the year pre the IPO is associated with the probability of IPO failure. However, while Demers and Joos (2007) just examine the annual level of these items pre the IPO, this thesis uses empirical models developed by Roychowdhury (2006) to estimate real activities manipulation during the IPO year.

[8] It is also worth noting that this thesis is the first study to examine real earnings management activities during the IPO in the UK. Thus, this thesis provides new avenues for future research in the UK, notably the differences in the IPO process between the UK and the other part of this world e.g. the US.

concerning the timing of each method and the consequences for subsequent performance. Finally, chapter two provides a summary of the most commonly used empirical models to estimate real and accrual earnings management, discussing the advantages and disadvantages of these empirical models.

Chapter three reviews the motivations, mitigating factors and theories of earnings management. In particular, it reviews prior research that presents evidence on various targets to manipulate reported earnings such as executive compensation, avoidance of debt covenant violation, and meet earnings benchmarks. In addition, this chapter provides a review and discussion of the literature on factors that mitigate earnings management (such as corporate governance, institutional investors, auditors, and accounting standards setters). Further, the most related theories of earnings management will be reviewed e.g. the agency theory, the litigation-risk hypothesis.

Chapter four presents an overview on the data used in the empirical analysis, data sources, sample construction, definition of variables, and descriptive statistics of key variables. Further, this chapter describes and presents statistics for the samples that are used in the three empirical chapters. The control sample (all non-IPO UK firms) and the process of measuring real and accrual earnings management measures are also presented here.

Chapter five is devoted to the first empirical chapter that examines whether UK IPO firms engage in real and accrual earnings management around IPOs and whether the regulatory environment is associated with earnings management. In addition, the effect of earnings management on post-IPO stock return performance is also examined under different regulatory environments. Sample selection, data description, and the empirical methodology will be presented in this chapter.

Chapter six presents the second empirical chapter. This research question examines the effect of audit quality on real and accrual earnings management during the IPO. Whether audit quality has an impact on managers' tendency to manage real activities and to choose between real and accrual earnings management during the IPO is an unanswered question and, therefore, this chapter investigates this. In addition, this chapter investigates the effect of audit quality on the association

between real and accrual earnings management and post-IPO stock return performance.

Chapter seven investigates whether real and accrual earnings management during the IPO are associated with IPO failure risk and survivability. This chapter defines IPO failure as firms that are delisted from the stock exchange for negative reasons within five years of the IPO date. Both Logit regression and survival analysis are employed to examine IPO failure risk and survivability. This chapter also is the first study to examine the impact of real earnings management on IPO failure risks. Chapter eight provides the conclusions.

Chapter 2
Definitions, Activities, and Measurement of Earnings Management

2.1 Introduction

Chapter one provides a summary for the structure of this thesis, which examines real and accrual earnings management activities by UK IPO firms. Chapter two presents the definition of earnings management, earnings management activities, and empirical models that are employed to measure earnings management. In addition, the difference between earnings management and accounting fraud is presented in this chapter. Prior literature shows evidence that managers engage in several activities of earnings management to manipulate reported earnings, some of these activities violate the Generally Accepted Accounting Principle (GAAP) and other activities occur within the bounds of GAAP (e.g. DeFond and Jiambalvo, 1994; Sweeney, 1994; Balsam, 1998; Beneish, 1999)

However, later research has taken a slightly different approach, distinguishing earnings management activities from accounting fraud that violates GAAP (e.g. Dechow and Skinner, 2000). Given the importance of earnings manipulation, this chapter reviews the most related studies that focus on the difference between earnings management and accounting fraud. Further, as the purpose of this thesis is to examine real and accrual earnings management activities around IPOs, this chapter presents the differences between the two activities concerning the motivations and consequences for utilizing each of them. Prior research presents evidence that managers manipulate earnings utilizing real and accrual earnings management either as complementary or substitute techniques (Cohen and Zarowin, 2010; Zang, 2012).

The remainder of this chapter is organised as follows. Section two presents the definitions of real and accrual earnings management and shows the differences between earnings management and accounting fraud. Section three discusses the most commonly utilized activities of earnings manipulation. Section four presents

differences between real and accrual earnings management. Section five presents empirical models that are employed to measure real earnings management. Section six focuses on accrual earnings management and the models used to estimate discretionary accruals. Finally section seven concludes.

2.2 Earnings Management Definition

Earnings management as a widespread phenomenon that aims to manipulate reported earnings upward or downward to meet various targets such as meeting earnings benchmarks (Degeorge et al., 1999; Dechow and Dichev, 2002; Osma, 2008), increasing share prices (Schipper, 1989), etc. Prior literature has extensively researched the motivations and consequences of earnings management activities (e.g., Dechow and Sloan, 1991; Jones, 1991). However, prior literature has not indicated a specific definition of earnings management that can cover all the various activities of earnings manipulation. One of the most commonly definition of earnings management is presented by Healy (1985, p. 368) whereby,

> "*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"*

Consistent with Healy's (1985) definition, later research finds evidence that managers manipulate earnings upward to influence contractual outcomes. For example, prior literature finds evidence that managers manipulate reported earnings upward to meet performance based compensation (e.g., Balsam, 1998; Cheng and Warfield, 2005; Bergstresser and Philippon, 2006) and to avoid debt covenant violations (e.g., DeFond and Jiambalvo, 1994; Sweeney, 1994; Jaggi and Picheng, 2002). Further, Schipper (1989) presents another definition of earnings management, focusing on private gain as the main motivation to manipulate reported earnings. Schipper (1989, p. 92) defines earnings management as:

> *"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)".*

Other studies have focused on the question of whether earnings management activities violate or occur within the bounds of GAAP. For example, Beneish (1999) focuses on earnings management activities that violate GAAP, and in particular, earnings overstatement. He finds firms that overstate their annual earnings have a higher level of insider trading compared with firms without overstatement. Moreover, Beneish (1999) finds evidence on earnings manipulation that violates GAAP and is consistent with previous definitions of earning management by Healy (1985) and Schipper (1989).

Thus, and in the light of above-mentioned studies, one might ask whether earnings management activities violate GAAP and whether there is a difference between earnings management and accounting fraud. Dechow and Skinner (2000) explain this misclassification and provide Figure 2.1 which differentiates between earnings management activities and accounting fraud. Specifically, Figure 2.1 shows that earnings management activities occur without violating GAAP and are classified under two categories; accounting choices and real cash flow choices. While accounting choices (accrual-based earnings management) occur within the bounds of GAAP and at the end of the fiscal year, real cash flow choices (real activities-based earnings management) occur throughout the fiscal year and have direct consequences for current and future cash flows (Roychowdhury, 2006).

Consistent with Dechow and Skinner (2000), Roychowdhury (2006) focuses on examining a set of real cash flow choices (real activities-based earnings management). Roychowdhury (2006) defines real earnings management as managerial decisions that aim to increase current earnings on the expense of future earnings such as the unexpected reduction of research and development expenses, the timing of asset sales, and providing more price discounts or/and more lenient the credit terms. Roychowdhury (2006, p. 336) defines real earnings management as follows,

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

Roychowdhury (2006) finds evidence that managers manipulate earnings upward utilizing real earnings management activities to avoid reporting annual losses. Consistent with the above definition of real earnings management, a large body of research, theoretical and empirical, has found evidence that managers engage extensively in real earnings management activities to meet various targets (e.g. Ewert and Wagenhofer; Cohen et al., 2008; Gunny, 2010; Cohen and Zarowin, 2010; Zang, 2012).

The central premise underlying the previous line of research is that earnings management activities can be implemented without violating GAAP, utilizing either accounting choices or real cash flow choices (Dechow and Skinner, 2000).

Figure 2.1 Differences between accounting fraud and earnings management

	Accounting Choices	**Real Cash Flows Choices**
	Within GAPP	
	-Overly aggressive recognition of provision or reserves.	-Delaying sales.
"Conservative" accounting	-Overvaulting of acquired in-process R&D in purchases acquisitions.	-Accelerating R&D or advertising expenditures.
	-Overstatement of restructuring charges and asset write-offs.	
"Neutral" Accounting	-Earnings that result from a neutral operation of the process.	
	-Understatement of the provision for bad debts.	-Postponing R&D or advertising expenditures.
"Aggressive" Accounting	-Drawing down provisions or reserves in an overly aggressive manner.	-Accelerating sales.
	Violate GAAP	
	-Recording Sales before they are "realisable".	
"Fraudulent" Accounting	-Recording fictitious sales.	
	-Backdating sales invoices.	
	-Overstating inventory be recording fictitious inventory.	

Source; (Dechow and Skinner, 2000 P. 239)

2.3 Earnings Management Activities

Given the importance of understanding earnings management, a vast body of research has focused largely on accrual earnings management activities and little research on real activities manipulation, which are considered as the most commonly utilized techniques to manipulate reported earnings without violating GAAP (e.g., Dechow and Sloan, 1991; Friedlan, 1994; Rangan, 1998; Teoh et al., 1998a; 1998b; 1998c; DuCharme et al., 2001; Gramlich and Sorensen, 2004; Cheng and Warfield, 2005; Morsfield and Tan, 2006; Roychowdhury, 2006; Fan, 2007; Cohen et al., 2008; Chang et al., 2010; Cohen and Zarowin, 2010; Gunny, 2010; Kothari et al., 2012; Zang, 2012).

However, recent research finds evidence of another activity of earnings management, classification shifting, and this occurs within the bounds of GAAP, but it is not considered as real or accrual earnings management (e.g., McVay, 2006; Athanasakou et al., 2009; Yun et al., 2010). Specifically, while real and accrual earnings management change the reported earnings (the bottom-line GAAP net income), classification shifting manipulates core earnings without having any impact on GAAP net income (McVay, 2006; Yun et al., 2010).[9] McVay (2006) indicates that investors and analysts pay more attention to core earnings and, therefore, managers manipulate core earnings upward through shifting core expenses (e.g. cost of goods sold and selling, general, and administrative expenses) to special items. Athanasakou et al. (2009) find evidence for a sub-sample of UK larger firms that classification shifting is utilized to manage earnings upward to meet analysts' forecasts.

Other studies have presented another classification of earnings management activities. For example, Scott (1997) classifies earnings management activities following five groups: (1) big bath, (2) smooth income, (3) increase income, and (4) decrease income. Further, and similar to Scott (1997), Levitt (1998) provides five categories of earnings management activities, namely (1)" big bath" charges, (2) creative acquisition accounting, (3) miscellaneous "cookie jar reserves", (4) "materiality", and (5) revenue recognition. Based on these classifications, a big bath

[9] McVay (2006) defines core earnings as (sales) – (cost of goods sold + selling, general, and administrative expenses, excluding depreciation and amortization).

for example occurs when the firms expect to miss earnings targets and the gap between actual earnings and earnings targets is greater than what can be adjusted by utilizing earnings management. In this case, managers may manage earnings downward to make reserves that help to report a profit in the subsequent periods.

In summary, a substantial body of research shows that earnings management can be implemented by utilizing main three activities; accrual accounting, real activities, and classification shifting. While classification shifting affects core earnings, real and accrual earnings management are utilized to manipulate reported earnings (net income). Thus, the decision to choose between these activities is associated with many other factors such as analysts' forecast, the occurrence of special events (e.g. restructure, merger, and acquisition), corporate governance, institutional investors, audit quality, regulatory environment, executive compensation, accounting standards, industry, etc (e.g., Roychowdhury, 2006; Cohen and Zarowin, 2010; Chi et al., 2011; Zang, 2012).

2.4 The Difference between Real and Accrual Earnings Management

Although real and accrual earnings management occur without violating the bounds of GAAP, prior literature shows that these activities have many differences e.g. when the manipulation occurs, the consequences for current and future cash flows, the scrutiny of regulator and auditors (Cheng and Warfield, 2005; Roychowdhury, 2006; Cohen et al., 2008). For example, accrual earnings management represents accounting choices that occur at the end of the fiscal year and before the issuance of the financial statements (Dechow and Skinner, 2000). Specifically, at the end of the fiscal year managers are likely to know whether earnings will meet or miss the desired threshold and, therefore, reported earnings are adjusted utilizing accrual accounting to meet the desired threshold (Roychowdhury, 2006; Gunny, 2010). Further, accrual earnings management has no direct impact on operating cash flows, but it does reverse over time (e.g. Healy, 1996; Givoly and Hayn, 2000; Ahmed et al., 2002). Thus, there are two situations where accrual accounting can be utilized to manipulate reported earnings. First, when expected earnings fall short the desired threshold, income-increasing accrual accounting might be utilized to ensure meeting the desired threshold. Second, if the difference between expected earnings and the

desired threshold is greater than what can be adjusted by accrual accounting. In the later situation, managers may engage in income-decreasing accrual accounting to make a reserve for the future (see e.g. Scott, 1997; Levitt, 1998; Barton and Simko, 2002).

On the other hand, and in contrast with accrual earnings management, real earnings management provides managers with more flexibility as its activities can be manipulated throughout the fiscal year (Roychowdhury, 2006; Gunny, 2010). Real earnings management represents managerial decisions that deviate from normal business practices, such as the unexpected reduction of research and development (R&D) and selling, general, and administrative (SG& A) expenses (Roychowdhury, 2006). Thus, managers decide the time and the volume of these activities with less interference and scrutiny (compared with accruals) from auditors, regulators, etc (Graham et al., 2005; Cohen and Zarowin, 2010). Further, managers prefer to utilize real earnings management over accrual earnings management when accounting standard setters and regulators restrict the regulations to mitigate accruals manipulation (Ewert and Wagenhofer, 2005; Graham et al., 2005). For example, Cohen et al. (2008) find that managers switch from utilizing accrual accounting pre Sarbanes-Oxley Act 2002 (SOX) to real earnings management post-SOX.[10] Cohen et al. (2008) indicate that managers switch to real earnings management after SOX because of the restriction on accrual accounting manipulations.

In addition, Graham et al. (2005) find evidence that executives prefer real earnings management over accrual earnings management to avoid the scrutiny of auditors and regulators. Consistent with the evidence of Graham et al. (2005), Chi et al. (2011) find SEO firms that are audited by big N audit firms engage intensively in real earnings management activities to avoid the monitoring of accrual earnings management. Similar evidence is presented by Cohen and Zarowin (2010) that the probability of SEO firms to utilize real earnings management during the SEO year increases when they are audited by big N audit firms. Although managers prefer real earnings management over accrual earnings management, recent studies find evidence that real earnings management activities have severe negative

[10] Sarbanes-Oxley Act was issued on 30th July 2002 by the Securities Exchange Committee after the big accounting scandals in the US in an attempt to remedy corporate governance failures that had allowed to scandal to occur.

consequences for subsequent operating and stock return performance, and are even greater than the consequences of accrual earnings management (Cohen and Zarowin, 2010; Kothari et al., 2012).

2.4.1 Evidence on Real Earnings Management Activities

Prior literature has extensively investigated accrual earnings management and presented evidence on the pervasiveness of accruals manipulation (e.g., Jones, 1991; Dechow and Sloan, 1991; Dechow et al., 1995; Becker et al., 1998; Rangan, 1998; Teoh et al., 1998a, 1998b, 1998c; Richardson, 2000; Klein, 2002; Balsam et al., 2003; Krishnan, 2003; Roosenboom et al., 2003; Cheng and Warfield 2005; Peasnell et al., 2005; Bergstresser and Philippon, 2006; Fan, 2007; Lee and Masulis, 2011; and Wongsunwai, 2012). However, recent research finds that real earnings management activities also are utilized to manipulate reported earnings upward (e.g., Roychowdhury, 2006; Cohen et al., 2008; Zang, 2012).

One of the most common activities of real earnings management is discretionary expenses manipulation (the unexpected reduction of R&D, SG&A, and advertising expenses). The abnormal reduction of R&D expenses has received considerable attention by previous studies (Baber et al., 1991; Cheng, 2004; Osma, 2008). For example, Bushee (1998) finds that US managers cut R&D expenses to increase annual earnings. Zarowin and Oswald (2005) and Osma (2008) find that UK listed firms manipulate reported earnings by cutting R&D expenses to meet earnings benchmarks. Cheng (2004) finds a significant positive association between the change in R&D spending and the change in CEO annual compensation for firms with CEOs approaching the retirement and firms reporting small losses or small decreases.

In addition to R&D manipulation, timing of asset sales is also considered as real earnings management activity. Specifically, managers take advantage of the flexibility of timing asset sales to opportunistically increase reported earnings to meet the desired threshold. Bartov (1993) finds evidence that managers time the sales of long-lived assets in order to manipulate reported earnings. Specifically, he finds managers increase reported earnings utilizing asset sales to smooth reported earnings and to avoid debt covenant violations. Herrmann et al. (2003) examine whether Japanese firms adjust operating income by utilizing asset sales to reduce the

errors of management earnings forecasts. Herrmann et al. (2003) find evidence that Japanese firms manage earnings upward (downward) utilizing asset sales when the operating income below (above) management earnings forecasts. Generally, asset sales-manipulation occurs during the fourth quarter (Bartov, 1993) as managers at this time are likely to know whether earnings will meet or miss the desired threshold and, therefore, they decide the volume and the time of these sales.

Moreover, other activities of real earnings management can be implemented through overproduction (conducted through increasing the number of produced units which reduces the cost per unit sold) and sales-based manipulations (conducted through increasing sales by providing more price discounts and/or more lenient credit terms) (see for more details Roychowdhury, 2006). Confirming the existence of real activities-based manipulation, Roychowdhury (2006) finds evidence that US firms engage simultaneously in several activities of real earnings management to avoid reporting annual losses. He finds evidence on sales-based, overproduction, and discretionary expenses manipulations. Similar evidence is reported by Cohen and Zarowin (2010) and Chi et al. (2011) who find SEO firms exhibit evidence of higher levels of real earnings management during the SEO year. Specifically, and in addition to accruals manipulation, they find SEO firms exhibit higher levels of abnormal cash flows from operations (sales-based manipulation), abnormal discretionary expenses (discretionary expenses-based manipulation), and abnormal production cost (overproduction cost-based manipulation). Recently, a survey conducted by Graham et al. (2005) supports the previous empirical evidence on real earnings management activities.[11] The survey shows that Chief Financial Officers (CFOs) prefer to engage in real earnings management activities over accrual accounting to meet annual earnings targets and analysts' forecasts.

2.4.2 The Consequences of Real Earnings Management Activities

Managers engage in real earnings management activities by adopting suboptimal decisions to manipulate reported earnings such as the unexpected reduction of R&D expenses to increase reported earnings (Roychowdhury, 2006). By focusing on these

[11] Graham et al. (2005) conducted a survey with more than 400 financial officers in the US and found evidence that more than 50% of executives expressed a willingness to engage in real earnings management activities as long as the impact on economic value was not too large.

suboptimal decisions, previous literature presents evidence on the negative consequences of real earnings management for subsequent performance (Cohen and Zarowin, 2010, Kothari et al., 2012). For example, Cohen and Zarowin (2010) find SEO firms engage in real earnings management activities during the offer year and that these activities have severe negative consequences for subsequent operating performance. Kothari et al. (2012) find similar evidence to Cohen and Zarowin (2010) that SEO firms manage earnings upward utilizing real earnings management activities during the offer year. Kothari et al. (2012) also find evidence that real earnings management activities have negative consequences for long-run stock return performance. Most importantly, Cohen and Zarowin (2010) and Kothari et al. (2012) find evidence that real earnings management activities have more severe negative consequences for subsequent operating and stock return performance than accrual earnings management. This recent evidence by Cohen and Zarowin (2010) and Kothari et al. (2012) sheds lights on the importance of examining real earnings management activities. Prior literature has extensively examined accrual earnings management without considering real activities (e.g., Jones, 1991; Dechow and Sloan, 1991; Becker et al., 1998; Teoh et al., 1998a, Klein, 2002; Fan, 2007, Lee and Masulis, 2011).

Further, Leggett et al. (2009) examine whether real earnings management is utilized to manipulate reported earnings upward and whether it is associated with subsequent performance. Leggett et al. (2009) find evidence that firms manage real earnings management activities to meet earnings benchmarks. In addition, they find evidence those firms with high levels of real earnings management activities experience inferior operating performance and a lower level of operating cash flows in the subsequent periods. Zhang (2008) finds evidence that firms manage real earnings management activities upward to meet analysts' cash flow forecasts. Further, Zhang (2008) finds similar evidence to Leggett et al. (2009), Cohen and Zarowin (2010), and Kothari et al. (2012) that firms with high levels of real activities-based manipulation experience deterioration in future operating performance.

Although the majority of recent research finds evidence that real earnings management activities have negative consequences for future performance, Gunny (2010) finds evidence that real earnings management leads to better subsequent

operating performance. Specifically, Gunny (2010) finds firms that utilize real earnings management activities to just meet earnings benchmarks experience better subsequent operating performance than firms who just meet or miss earnings benchmarks without utilizing real earnings management activities. Gunny (2010) examines a sample of 23,308 firm-year observations over the period 1988-2002 and finds evidence that US firms manage earnings upward utilizing real activities (sales-based, discretionary expenses-based, and overproduction cost-based manipulations) to just meet earnings benchmarks. Gunny (2010) focuses on two earnings benchmarks (last year earnings and zero earnings benchmarks) and explains this positive association between real earnings management and subsequent performance as follows: (1) real earnings management help managers to attain benefits that leads to better future performance, and (2) real earnings management can send a positive signal about the future firms value.

In summary, although limited research questions the negative consequences of real earnings management (Gunny, 2010), the majority of prior studies find evidence that real earnings management has severe negative consequences for subsequent operating and stock return performance (Zhang, 2008; Leggett et al., 2009), with even greater than the consequences of accrual earnings management (Cohen and Zarowin, 2010; Kothari et al., 2012). Table 2.1 presents some examples on research that examines real earnings management activities.

Table 2.1 Evidence on real earnings management activities

Year	Journal and authors	Sample	Research question	Results
2003	**Journal of Accounting Research** Don Herrmann Inoue Tatsuo Thomas Wayne	Japanese sample of 3,068 firms-year observations over the period 1993-1997	**The Sale of Assets to Manage Earnings in Japan**	-Japanese firms manipulate earnings by using timing of asset sales to meet management earnings forecasts. -Utilizing the asset sales is associated with firms' inability to meet management earnings forecasts through normal business practices.
2004	**Accounting Review** Shijun Cheng	US sample of 160 firms over the period 1984-1997	**R&D Expenditures and CEO Compensation**	-A significant positive association between the change in R&D spending and the change in CEO annual compensation for firms with CEOs approaching the retirement and firms reporting small losses or small decreases.
2006	**Journal of Accounting and Economics** Sugata Roychowdhury	US sample of 17,338 firms-year observations over the period 1987-2001	**Earnings Management through Real Activities Manipulation**	-Firms engage in real activities manipulation to avoid annual losses or to meet analysts' forecasts. -These activities such as price discounts to boost sales, over production to lower the cost of good sales, and reduce the discretionary expenses to lower the expenses.
2008	**Corporate Governance: An International Review** Beatriz Garcia Osma	UK sample of 3,438 firm-year observations over the period 1989-2002	**Board Independence and Real Earnings Management: The Case of R&D Expenditure**	-The reduction of R&D as a response to short-term pressure is constrained by independent directors. -Independent directors prevent firms that reduce R&D expenditures as a response for previous failures or to meet current earnings target. -The percentage of insider directors on the board is positively associated with short-term managerial decisions.

(The table is continued on the next page)

Table 2.1 (continued)

Year	Journal and authors	Sample	Research question	Results
2008	**Accounting Review** Daniel Cohen Aiyesha Dey Thomas Z. Lys	US sample of 87,217 firm-year observations over the period 1987-2005	**Real and Accrual- Based Earnings Management in the Pre- and post-Sarbanes Oxley Periods**	-They find evidence that firms switch from accrual earnings management pre-SOX to real activities manipulation post-SOX. -They find evidence that firms just meet earnings benchmarks exhibit higher levels of real activities-based manipulation than accrual-based manipulation. - They find evidence that accrual-based manipulation is extensively utilized pre-SOX.
2010	**Journal of Accounting and Economic** Daniel Cohen Paul Zarowin	US sample of 1,511 US offer over the period 1987-2006	**Accrual-based and Real Earnings Management Activities around Seasoned Equity Offerings**	-They find SEO firms manipulate earnings upward utilizing real and accrual earnings management during the SEO year. -They find evidence that real earnings management has more negative consequences than accrual earnings management for subsequent operating performance.
2011	**Accounting Horizons** Wuchun Chi Ling Lei Lisic Mikhail Pevzner	US sample of 925 firm-year observations over the period 2001-2008	**Is Enhanced Audit Quality Associated with Greater Real Earnings Management?**	-They find evidence that firms audited by high quality auditors resort to high levels of real earnings management to avoid the monitoring of accrual based-manipulation. -They examine firms with strong incentive to manage earnings upward, namely firms issue Seasoned Equity and firms meet or beat earnings benchmarks.
2012	**Accounting Review** Amy Zang	US sample of firms that just beat or meet earnings benchmarks over the period 1987-2008	**Evidence on the Trade-Off between Real Activities Manipulation and Accrual-Based Earnings Management**	-She finds evidence that managers engage real activities-based throughout the fiscal year and then accrual-based earnings management is adjusted at the end of fiscal year by the unrealized amount of real activities to meet the desired threshold.

Table 2.1 provides examples on research that examines real activities-based and accrual-based earnings management.

2.5 Measurement of Real Earnings Management Activities

Prior literature has employed several models to measure real earnings management activities, namely discretionary expenses-based, sales-based, production cost-based, and timing of asset sales (see section 2.4.1 for more details).

2.5.1 Discretionary Expenses Manipulation

Discretionary expenses represent the sum of R&D, SG&A, and advertising expenses. Prior studies follow two approaches to estimate discretionary expenses-based manipulation. The first approach focuses on estimating the abnormal level for each single activity of discretionary expenses separately (e.g. the abnormal reduction of R&D expenses, Berger, 1993; Bushee, 1998; Osma, 2008; Osma and Young, 2009; Gunny, 2010), while the second approach estimates the abnormal level for the sum of R&D, SG&A, and advertising expenses (e.g. Roychowdhury, 2006; Cohen et al., 2008; Cohen and Zarowin, 2010; Chi et al., 2011; Zang, 2012). Managers typically attempt to decrease these expenses to increase reported earnings.

One of the first models to measure R&D manipulation is presented by Perry and Grinaker (1994) who examine the association between the reduction of R&D expenses and earnings expectations for a small sample of 99 firms. Perry and Grinaker (1994) designed their expectations model to estimate the normal level of R&D expenditures based on a model developed by Berger (1993). First, Perry and Grinaker (1994) estimate the normal level of R&D expenditures for the period 1972-1983. Second, the estimated coefficients are taken to estimate the normal level of R&D expenditures for the sample-firms during the period 1984-1990. Perry and Grinaker (1994) present their model as follows,

$$R\&D_{it} = \alpha_0 + \beta_1 R\&D_{it-1} + \beta_2 FUNDS_{it} + \beta_3 CAP_{it} + \beta_4 IR\&D_{it} + \beta_5 ICAP_{it} + \beta_6 GNP_{it} + \varepsilon_{it} \quad (2.1)$$

Where

$R\&D_{i,t}$: R&D expenses divided by sales.

FUNDS $_{i,t}$: (income before extraordinary items + R&D + depreciation) divided by sales.

CAP $_{i,t}$: capital expenditures divided by sales.

IR&D $_{i,t}$: R&D expenditures divided by sales for all firms in one industry, 4-digit Standard Industrial Classification (SIC) code.

ICAP $_{i,t}$: capital expenditures divided by sales for all firms in one industry, 4-digit SIC cod.

GNP $_{i,t}$: real gross national product divided by sales.

$\varepsilon_{i,t}$: the error term.

Consistent with this approach, which focuses on a single activity of discretionary expenses, Gunny (2010) presents another model to estimate the normal level of R&D expenses by developing the previous expectations model as suggested by Berger (1993). Gunny (2010) estimates the normal level of R&D expenses as follows,

$$\frac{RD_{it}}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_{it} + \beta_2 Q_{it} + \beta_3 \frac{INT_{it}}{A_{t-1}} + \beta_4 \frac{RD_{it-1}}{A_{t-1}} + \varepsilon_{it} \qquad (2.2)$$

Where:

RD $_{i,t}$: research and development expenses.

A $_{i,t-1}$: total assets at the end of the prior year.

MV $_{i,t}$: natural log of market value of equity.

Q $_{i,t}$: Tobin's Q defined as firms' market value divided by replacement cost of its assets.

INT $_{i,t}$: internal funds, a proxy for reduced funds available for investment.

Further, Gunny (2010) estimates the normal level of selling, general and administrative (SG&A) expenses based on a model developed by Anderson et al. (2003). Gunny's (2010) model is presented as follows,

$$\frac{SGA_{it}}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_{it} + \beta_2 Q_{it} + \beta_3 \frac{INT_{it}}{A_{t-1}} + \beta_4 \frac{\Delta S_{it}}{A_{t-1}} + \beta_5 \frac{\Delta S_{it}}{A_{t-1}} * DD + \varepsilon_{it} \quad (2.3)$$

Where:

$SGA_{i,t}$: selling, general and administrative expenses at year $_t$.

$S_{i,t}$: sales at year $_t$.

DD: a dummy variable equalling to 1 when there is a decrease of sales revenue between current year and previous year and zero otherwise. All other variables are previously defined.

The second approach has adopted a slightly different view by estimating the sum of discretionary expenses (R&D, SG&A, and advertising expenses e.g. Roychowdhury, 2006; Cohen et al., 2008; Cohen and Zarowin, 2010). Specifically, this approach follows Roychowdhury (2006) who builds his model based on a model developed by Dechow et al. (1998). Roychowdhury (2006) estimates the normal level of the sum of discretionary expenses as a linear function of contemporaneous sales as follows,

$$\frac{DISEXP_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{A_{it-1}}\right) + \beta \left(\frac{S_{it}}{A_{it-1}}\right) + \varepsilon_{it} \quad (2.4)$$

However, Roychowdhury (2006) and Cohen et al. (2008) point out that estimating the normal level of discretionary expenses as specified in regression (2.4) will create a problem if firms manage sales upwards to increase reported earnings during any year. This problem will result unusually low residuals from running the regression as specified in (2.4). To overcome this problem, discretionary expenses are estimated as a function of lagged sales. Therefore, the normal level of discretionary expenses are estimated using a cross-sectional regression for each year and industry as follows,

$$\frac{DISEXP_{it}}{A_{it-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{it-1}}\right) + \beta\left(\frac{S_{it-1}}{A_{it-1}}\right) + \varepsilon_{it} \quad (2.5)$$

Abnormal level of discretionary expenses is actual discretionary expenses for the firms minus the normal level of discretionary expenses calculated using the estimated coefficients from regression (2.5).

Where

DISEXP $_{i,t}$: the sum of R&D, SG&A; and advertising expenses for firms *i* at period *t*. All other variables are previously defined.

2.5.2 Sales Manipulation

Prior literature finds evidence that firms manage sales upward by increasing price discounts or/and providing more lenient credit terms (Roychowdhury, 2006; Cohen et al. 2008). Despite the fact that sales-based manipulation will increase current reported earnings, reversal consequences will lead to a lower level of operating cash flows in current year (Roychowdhury, 2006). In order to estimate sales-based manipulation, Roychowdhury (2006) builds on Dechow et al. (1998) and estimates the normal level of cash flows from operations as a linear function of sales and change in sales at the same year. Specifically, Roychowdhury (2006) estimates the normal level of cash flows from operations using the following cross-sectional regression for each year and industry.

$$\frac{CFO_{it}}{A_{it-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{it-1}}\right) + \beta_1\left(\frac{S_{it}}{A_{it-1}}\right) + \beta_2\left(\frac{\Delta S_{it}}{A_{it-1}}\right) + \varepsilon_{it} \quad (2.6)$$

Abnormal CFO for the firms is actual CFO minus the normal level of CFO calculated using the estimated coefficients from regression (2.6).

Where:

CFO $_{i,t}$: cash flows from operations for firm *i* at period *t*. All other variables are previously defined.

2.5.3 Production Cost Manipulation

Production manipulation aims to enhance current earnings by producing more units in order to lower the total cost of goods sold, which leads to increase the profit margin. More specifically, firms attempt to decrease the fixed overhead cost per unit sold by increasing the number of produced units, as this increase is not reflected by any increase in the marginal cost per unit (Roychowdhury, 2006; Cohen et al., 2008). Roychowdhury (2006) develops a model based on Dechow et al. (1998) to estimate the normal level of production cost, and defines the production cost as the sum of cost of goods sold (COGS) and change in inventory (INV) throughout the year. Roychowdhury (2006) estimates the normal level of COGS as linear function of contemporaneous sales using the following cross-sectional regression.

$$\frac{COGS_{it}}{A_{it-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{it-1}}\right) + \beta\left(\frac{S_{it}}{A_{it-1}}\right) + \varepsilon_{it} \qquad (2.7)$$

Where:

COGS $_{i,t}$: costs of goods sold for firms i at period t.

The normal level of inventory growth is estimated as follows,

$$\frac{\Delta INV_{it}}{A_{it-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{it-1}}\right) + \beta_1\left(\frac{\Delta S_{it}}{A_{it-1}}\right) + \beta_2\left(\frac{\Delta S_{it-1}}{A_{it-1}}\right) + \varepsilon_{it} \qquad (2.8)$$

Where

Δ INV $_{i,t}$: change in inventory at the end of period t.

Following Roychowdhury (2006), production cost is defined as PROD $_{i,t}$ = COGS $_{i,t}$ + ΔINV $_{i,t}$. Using (2.7) and (2.8), normal level of production cost is estimated as follows,

$$\frac{PROD_{it}}{A_{it-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{it-1}}\right) + \beta_1\left(\frac{S_{it}}{A_{it-1}}\right) + \beta_2\left(\frac{\Delta S_{it}}{A_{it-1}}\right) + \beta_3\left(\frac{\Delta S_{it-1}}{A_{it-1}}\right) + \varepsilon_{it} \qquad (2.9)$$

2.5.4 Timing of Asset Sales Manipulation

Timing of asset sales provides the managers with a flexible technique to enhance reported earnings when normal business practices are expected to fall short the desired threshold. Gunny (2010) develops a model based on Bartov (1993) and Herrmann et al. (2003) in order to measure the manipulation of asset sales. She runs a cross-sectional regression for each year and industry and indicates that a significant high residual from the regression is consistent with asset sales manipulation. Gunny (2010) estimate the normal level of gain on asset sales as follows,

$$\frac{GainA_{it}}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_{it} + \beta_2 Q_{it} + \beta_3 \frac{INT_{it}}{A_{t-1}} + \beta_4 \frac{ASales_{it}}{A_{t-1}} + \beta_5 \frac{ISales_{it}}{A_{t-1}} + \varepsilon_{it} \quad (2.10)$$

Where

GainA $_{i,t}$: income from asset sales deflated by stock price at the beginning of the year.Dat199]

ASales $_{i,t}$: long-lived asset sales.

ISales $_{i,t}$: long-lived investment sales.

2.6 Measurement of Accrual-Based Manipulation

Prior research follows two approaches to measure discretionary accruals; specific accruals approach (e.g. McNichols and Wilson, 1988) and the aggregated accruals approach (e.g. Jones, 1991; Dechow et al., 1995). The specific accruals approach focuses on accrual earnings management based on a specific accrual such as the bad debt provision, while the aggregated accruals approach focuses on total accruals for the firm. The majority of accounting research follows the total accruals approach to examine accrual earnings management because it provides a powerful and comprehensive test for discretionary accruals (e.g., Dechow et al., 1995). In the next sub-sections, the specific and total accrual approaches are reviewed and discussed.

2.6.1 Specific Accruals Approach

Following this approach, prior research has examined several specific accruals such as bad debt provision (McNichols and Wilson, 1988), deferred tax assets (Miller and Skinner, 1998), claim loss reserve of insurance (Beaver and McNichols, 2001), the allowance for uncollectable accounts and bad debt expenses (Cecchini et al., 2012). For example, McNichols and Wilson (1988) hypothesize that bad debt provision consists of discretionary and non-discretionary accruals and find evidence that firms with unusually high earnings or unusually low earnings engage in both discretionary and non-discretionary accruals to decrease reported earnings. Cecchini et al. (2012) provide evidence that IPO firms manipulate reported earnings downward using more decreasing allowances. However, the specific accrual approach does not control for the assumption that managers can use several accruals simultaneously to manipulate reported earnings. For example, if no evidence is found that a firm manages bad debt provision, then it seems premature to suggest that there is no evidence on accrual-based manipulation because this firm might manage other specific accruals.

2.6.2 Aggregate Accruals Approach

Consistent with the aggregate accruals approach, several models have been employed to estimate discretionary accruals over time. These models follow two streams of research: total accruals and discretionary accruals. The first stream of research is to measure the change in total accruals as a proxy for the change in discretionary accruals (DeAngelo, 1986). The second stream of research, which is found to be more efficient, is to decompose total accruals into discretionary and non-discretionary accruals using a cross-sectional regression (e.g., Healy, 1985). Consistent with the second stream, most of recent research in earnings management employs the Jones (1991) model or the modified Jones (1991) model (Dechow et al., 1995) to estimate discretionary accruals. The most important models following the aggregate approach will be discussed in the following sections to illustrate the measurement of discretionary accruals.

2.6.2.1 The Healy Model

Healy (1985) investigates whether managers manipulate accrual accounting and accounting procedures to meet earnings bonus schemes. Based on a sample of 94

firms from the Fortune 250 in the US over the period 1930-1980, Healy (1985) finds evidence that managers manipulate accrual accounting to increase reported earnings in order to meet performance-based compensation targets. Following Healy (1985), accruals are calculated as reported earnings minus operating cash flows and then are decomposed into discretionary and non-discretionary accruals. Healy (1985) model is presented as follows,

$$NDA_{it} = 1/n \sum_{\tau} (TA_{it}/TA_{it-1}) \quad (2.11)$$

Where:

NDA $_{i,t}$: estimated non-discretionary accruals for firm *i* in year *t*.

TA $_{i,t}$: total accruals.

$A_{i,t-1}$: lagged total asset.

n: number of years in the estimation period.

τ :a year subscript as an indicator for a year in the estimation period.

t: event year.

2.6.2.2 The DeAngelo Model

DeAngelo (1986) focuses on whether firms manage earnings downward utilizing accrual accounting. By examining a sample of 64 firms from New York and American Stock Exchanges, DeAngelo (1986) finds no evidence that managers manipulate earnings downward pre-management buyout utilizing accrual accounting. DeAngelo (1986) assumes that non-discretionary accruals do not change over time (approximately the change is very close to zero). Thus, the difference in total accruals between current year and previous year is attributed to discretionary accruals. However, later research points out that the assumption of DeAngelo (1986) (that non-discretionary accruals do not change over time) seems to be premature (Dechow et al., 1995). DeAngelo (1986) presents the model to estimate discretionary accruals as follows,

$$NDA_{it} = TA_{t-1} / A_{it-2} \quad (2.12)$$

Where:

NDA $_{i,t}$: non-discretionary accruals in year *t* scaled by lagged total assets.

$TA_{i,t-1}$: total accruals.

$A_{i,t-2}$: total assets.

2.6.2.3 The Jones (1991) Model

Jones (1991) examines whether US firms, which would benefit from import relief (e.g. tariff increases, quota reduction, marketing agreement and federal adjustment assistance), may attempt to manage reported earnings downward by using income-decreasing accrual accounting. Specifically, Jones (1991) focuses on periods with relief investigation by the US International Trade Commission (ITC) where the import relief decisions are decided based on many factors such as the profitability of the industry. By examining a sample of 23 US firms, Jones (1991) finds evidence that US firms engage in income-decreasing accrual accounting to benefit from import relief. Further, and in contrast with Healy (1985) and DeAngelo (1986) who build their models based on the assumption that the level of non-discretionary accrual does not change over time, the Jones (1991) model controls for the change in the economic circumstances that cause the difference of non-discretionary accruals. Jones (1991) estimates non-discretionary accruals as follows,

$$NDA_{it} = \hat{\alpha}_1(1/A_{it-1}) + \hat{\alpha}_2(\Delta REV_{it}/A_{it-1}) + \hat{\alpha}_3(PPE_{it}/A_{it-1}) \quad (2.13)$$

Where:

$NDA_{i,t}$: non-discretionary accruals in a year t

$A_{i,t-1}$: total assets for firms *i* in year *t-1*

$\Delta REV_{i,t-1}$: is revenue in year *t* less revenue in year *t-1* scaled by total assets in year *t*.

$PPE_{i,t}$: gross property, plant, and equipment.

$\hat{\alpha}_1$, $\hat{\alpha}_2$, and $\hat{\alpha}_3$ firm specific parameters.

The following model is used to estimate firm specific parameters, $\hat{\alpha}_1$, $\hat{\alpha}_2$, and $\hat{\alpha}_3$ during the estimation period:

$$TA_{it}/A_{it-1} = \alpha_1(1/A_{it-1}) + \alpha_2(\Delta REV_{it}/A_{it-1}) + \alpha_3(PPE_{it}/A_{it-1}) + \varepsilon_{it} \quad (2.14)$$

Where α_1, α_2, and α_3 denote the ordinary least squares estimates

$\varepsilon_{i,t}$: error term in year *t*, which represents discretionary accruals as a proportion of total accrual for firm *i* in year *t* .

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

Dechow et al. (1995) point out that Jones (1991) model eliminates part of the managed earnings from the proxy of discretionary accruals when earnings are managed through discretionary revenue. To overcome this problem, Dechow et al. (1995) designed the modified version of Jones (1991) model. In addition, Dechow et al. (1995) present evidence on the importance of controlling for firms' financial performance (a problem that can bias accruals estimation and was not considered by previous models). Dechow et al. (1995) estimate the modified version of Jones (1991) model to estimate non-discretionary accruals as follows,

$$NDA_{it} = \alpha_1(1/A_{it-1}) + \alpha_2(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}) + \alpha_3(PPE_{it}/A_{it-1}) \quad (2.15)$$

Where:

ΔREC: is net receivable in year *t* less than net receivable in year *t-1*, and all other variables are previously defined.

2.6.2.5 The Industry Model

The industry model is used by Dechow and Sloan (1991) under the assumption that the level of non-discretionary accruals is constant over time, in particular, the variation of non-discretionary accruals is similar for firms in the same industry. Later research points out that such an assumption will lead to measurement errors in estimating non-discretionary accrual because it does not control for the change in firm's economic circumstances (e.g., Dechow et al., 1995). The industry model estimates non-discretionary accruals as follows,

$$NDA_{it} - \beta_1 + \beta_2 \, median_i \, (TA_{it}/A_{it-1}) \quad (2.16)$$

Where:

median i (TA $_t$): is the median of total accruals in year t scaled by lagged total assets for all non-sample firms in the same industry (two digit-SIC code) and year.

β_1 and β_2 : firms specific parameters are estimated by using ordinary least square (OLS) on the observations in the estimation period.

2.6.2.6 The K S Model (Sok-Hyon and Sivaramakrishnan, 1995)

Sok-Hyon and Sivaramakrishnan (1995) build their model to measure earnings management based on McNichols and Wilson (1988) approach. They argue that previous models do not provide a plausible solution to overcome common problems that might affect the estimation of accrual earnings management e.g. the omitted variables problem. To overcome these problems Sok-Hyon and Sivaramakrishnan (1995) provide a number of suggestions based on their empirical results. First, they find evidence that increasing the number of regressors in the model mitigates the omitted variables problem. They include into the model all major components of income such as cost of goods sold. Second, Sok-Hyon and Sivaramakrishnan (1995) provide evidence that using the instrumental variables (IV) approach will mitigate the simultaneity and the error in variables problem. Finally, they indicate that using generalised method of moments (GMM) provides greatest power and robustness. Sok-Hyon and Sivaramakrishnan (1995) demonstrate their model as follows,

$$\begin{aligned} AB_{it} &= AB^*_{it} + DA_{it} = AR^*_{it} + APB^*_{it} + DEP^*_{it} + DA_{it} \\ &= \phi_0 + \phi_1[\delta_1 REV^*_{it}] + \phi_2[\delta_2 EXP^*_{it}]_t \\ &\quad + \phi_3[\delta_3 GPPE^*_{it}] + \beta\, PART_{it} + \upsilon_t \end{aligned} \tag{2.17}$$

Where $\upsilon_t = \varphi_t + \varpi_t + \xi_t + \varepsilon_t$,

$$\delta_1 = \frac{AR^*_{it-1}}{REV^*_{it-1}}, \delta_2 = \frac{APB^*_{it-1}}{EXP^*_{it-1}}, \delta_3 = \frac{DEP^*_{it-1}}{GPPE^*_{it-1}}$$

AB $_{i,t}$: total accruals balance.

DA $_{i,t}$: total managed accruals during period t.

AR $_{i,t}$: account receivable, excluding tax refund.

APB $_{i,t}$: account balance related to the expense, for example inventory and account payable.

$DEP_{i,t}$: depreciation and amortization.

$REV_{i,t}$: net sales revenues.

$EXP_{i,t}$: operating expenses, including the cost of goods sold and selling and administrative expenses before depreciation.

$GPPE_{i,t}$: gross property, plant, and equipment.

$PART_{i,t}$ partitioning variable that captures factors that allegedly motivate earnings management.

2.6.2.7 The Performance Matched Discretionary Accruals Model

Kothari et al. (2005) present the performance-matched approach to measure discretionary accruals. This approach controls for the operating performance of the firm and avoids the misspecification of applying the Jones (1991) model and the modified Jones (1991) model (Dechow et al., 1995) for a stratified random sample of firms. As suggested by Kothari et al. (2005), the performance-matched approach can be employed either by adding return on assets (ROA) as a regressor into the model or by adjusting firm's discretionary accruals to a matched firm. Following this approach, ROA for the past year and industry membership are used as benchmarks for creating the matched-sample. Specifically, each treatment firm is matched with a control firm (out-of-sample) based on industry (SIC-code) and the closest operating performance (ROA). Kothari et al. (2005) indicate that using ROA as a proxy for the performance is consistent with Dechow et al. (1998) and Barber and Lyon (1996) who find that ROA is a powerful variable to control for operating performance and to create a matched sample. Kothari et al. (2005) estimate the performance-matched discretionary accruals model as follows,

$$TA_{it} = \alpha_0 + \alpha_1(1/A_{it-1}) + \alpha_2(\Delta SALES_{it}/A_{it-1}) + \alpha_3(PPE_{it}/A_{it-1}) + \alpha_4(ROA_{it\ (or\ t-1)}) + \varepsilon_{it} \quad (2.18)$$

Where:

$ROA_{i,t}$: return on asset.

$\Delta SALES_{i,t}$: change in sales.

$PPE_{i,t}$: gross property, plant, and equipment.

2.6.2.8 Other approaches

Other research has focused on the difference between signed and unsigned models to estimate discretionary accruals. Hribar and Nichols (2007), for example, mention for two streams of research that examine discretionary accruals. The first stream of research has examined signed discretionary accruals, namely income-increasing vs. income-decreasing discretionary accruals (e.g., Healy, 1985). The second stream of research has examined unsigned discretionary accruals which is represented by the absolute value of discretionary accruals (e.g., Dechow and Dichev, 2002; Klein, 2002). Hribar and Nichols (2007) analytically show the difference between signed and unsigned discretionary accruals concerning the mean and standard deviation and find the models which estimate unsigned discretionary accruals are highly correlated with firms' characteristics, in particular, the volatility of both sales and cash flows.

2.7 Conclusions

This chapter presents the literature on the definitions, activities, and empirical models of earnings management. Real and accrual earnings management activities are the most commonly utilized techniques to manipulate reported earnings. While accrual earnings management represents accounting choices that occur within the bounds of GAAP, real earnings management activities represent managerial decisions that deviate from normal business practices such as the unexpected reduction of R&D and SG&A expenses and have direct impact on current and future cash flows (Roychowdhury, 2006). Prior literature provides evidence that managers choose between real activities and accounting choices based on the costs and benefits of utilizing each of them e.g. managers prefer real activities over accrual accounting to avoid the scrutiny of regulators and auditors (Graham et al., 2005; Chi et al., 2011).

Further, while the recent empirical models to measure real activities are relatively new and still under development (e.g., Roychowdhury, 2006; Gunny, 2010), measuring accrual earnings management has received more attention and development in prior accounting research (e.g. Jones, 1991; Dechow et al., 1995). Overall, and based on the previous accounting literature, it seems there is no specific model that can measure discretionary accruals with great precision; however, the

majority of prior studies have used the modified Jones (1991) model (Dechow et al., 1995) and the performance matched approach (Kothari et al., 2005) to measure accrual-based manipulation around IPOs. Regarding measuring real earnings management, the majority of studies have employed models developed by Dechow et al. (1995) and as implemented by Roychowdhury (2006) to measure real activities-based manipulation around IPOs (e.g. Wongsunwai, 2012).

In the next chapter, the literature is reviewed and discussed to provide an overview on motivations, mitigating factors, and theories that are associated with earnings management.

Chapter 3
The Motivations, Mitigating Factors, and Theories of Earnings Management

3.1 Introduction

Consistent with the purpose of this thesis, the previous chapter provides an overview on the definitions, activities, and empirical models of earnings management. Since the focus of this thesis is to examine IPOs as the main motive to manage reported earnings, this chapter presents an in-depth discussion of the motivations, mitigating factors, and theories of earnings management. Prior research has examined the association between earnings management and several motivations that may explain managers' tendency to engage in earnings management e.g. performance-based compensation targets (e.g., Dechow and Sloan, 1991; Cheng, 2004). In addition, prior research has shown that earnings management activities are constrained by several mitigating factors such as corporate governance (Klein, 2002), accounting standards setters (Ewert and Wagenhofer, 2005), institutional investors (Bushee, 1998), audit firms (Becker et al., 1998), etc. Hence, this chapter reviews the most relevant studies that have examined the association between earnings management activities and these motivating and mitigating factors, as well as related theories to provide a comprehensive overview of earnings management.

The remainder of this chapter is presented as follows. Section two reviews the literature on earnings management motivations. Section three provides a discussion for the mitigating factors that constrain earnings management. Section four presents the related theories. Section five concludes.

3.2 Earnings Management Motivations

Previous literature provides evidence on the association between earnings management and different motivations such as increasing share prices (Schipper, 1989), meeting performance-based compensation targets (Bergstresser and Philippon, 2006), avoiding debt covenant violations (DeFond and Jiambalvo, 1994) and manipulating earnings around equity offerings e.g. IPO and SEO (Rangan, 1998; Teoh et al., 1998a, 1998c). However, there is no conclusive evidence on the best activities of earnings management to meet a particular goal over others. In the next-sub sections, these motivations are reviewed and discussed.

3.2.1 Earnings Benchmarks

Earnings benchmarks are considered as important reference points that have been used by many users of the financial information to evaluate the firm's performance and its financial position. Typically, managers attempt to meet earnings benchmarks through normal business practices, but when expected earnings fall short of the desired threshold, managers resort to utilizing earnings management. Consistent with this, prior literature finds evidence that managers engage in earnings management to meet three earnings benchmarks: (1) avoid reporting losses (Osma, 2008); (2) avoid reporting earnings decreases (Burgstahler and Dichev, 1997); and (3) meeting analysts' forecasts (Degeorge et al., 1999; Dechow and Dichev, 2002).

Focusing on two of these important benchmarks in the capital market, Burgstahler and Dichev (1997) find evidence that firms manage reported earnings upward utilizing accrual accounting and cash flows from operations to avoid reporting losses and earnings decreases. Specifically, they find an unexpectedly small number of firms reporting small losses or small decreases and a high number of firms reporting positive earnings or small earnings increases. Roychowdhury (2006) presents similar evidence on cash flow manipulation to meet earnings benchmarks. Based on a sample of 17,338 firm-year observations during the period 1987-2001, Roychowdhury (2006) finds firms engage in real earnings management activities to meet two earnings benchmarks: avoid reporting losses and meeting analysts' forecasts.

Moreover, Osma and Young (2009) investigate the association between the change in R&D expenses and two earnings benchmarks: positive earnings and earnings growth. By examining a sample of 3,866 firm-year observations during the period 1989-2002, Osma and Young (2009) find evidence that previous failures to meet earnings benchmark increases the probability of reducing current R&D spending in order to avoid repeating this failure. They also find evidence that firms cut current R&D investment to meet current earnings benchmarks.

3.2.2 Timing Equity Offerings

Generally, a firm resort to equity offerings by going public (IPOs) or issuing Seasoned Equity (SEOs), to expand its shareholders, raise more capital and extend its operation activities in the capital markets. A large body of research has presented evidence that managers engage in earnings management activities to enhance reported earnings around the time of equity offerings (e.g., Rangan, 1998; Teoh et al., 1998a, 1998b, 1998c). This literature has found that IPO and SEO firms manage reported earnings upward; (1) pre the offer year to enhance the offer price and, thus, the offer proceeds (Friedlan, 1994; DuCharme et al., 2001); (2) during the offer year to maintain high shares prices as most insiders and VCs are restricted by the lock-up period from selling their shares directly after the IPO (Aharony et al. 1993; Teoh et al., 1998a); and (3) post the offer year to avoid disappointing the market about their performance, and to limit future litigation risk (Roosenboom et al., 2003). A recent survey conducted by Brau and Fawcett (2006) confirms this view and finds evidence that managers consider historical reported earnings as a very important factor in sending a positive signal about the offer to outsiders.

Further, prior studies present evidence that earnings management which takes place during the offer year is negatively associated with post SEO and IPO operating and stock return performance. For example, Teoh et al. (1998a) find IPO firms that manage earnings upward (utilizing accruals earnings management) during the offer year experience a decline in stock return performance for three years after the IPO date. Rangan (1998) finds SEO firms with a high level of accrual earnings management during the offer year experience inferior operating and stock return performance in subsequent periods. DuCharme et al. (2004) examine IPO firms and find evidence that accrual earnings management during the IPO year is negatively

associated with post-IPO stock return performance. Roosenboom et al. (2003) find evidence that IPO firms with high levels of accrual-based manipulation during the first year after the IPO experience worse stock performance for three years after the IPO date.

While prior literature has focused on accrual-based manipulation (e.g. Teoh et al., 1998a), recent studies by Cohen and Zarowin (2010) and Kothari et al. (2012) have examined both real and accrual earnings management. Specifically, Cohen and Zarowin (2010) and Kothari et al. (2012) have presented new evidence that both real activities-based and accrual-based manipulations are utilized by SEO firms and that real activities have severe negative consequences for subsequent operating and stock return performance, with even greater than the consequences of accrual manipulation.

Despite the extensive evidence on earnings management around equity offerings (IPO and SEO), little research has questioned this evidence (e.g., Ball and Shivakumar, 2008; Armstrong et al., 2009; Cecchini et al., 2012). For example, Ball and Shivakumar (2008) examined earnings quality pre-IPO and presented evidence based on a UK sample that IPO firms report more conservatively prior to the offer year. Armstrong et al. (2009) also examined accrual earnings management around IPOs and found no evidence on accruals manipulation. Armstrong et al. (2009) found that the negative relation between accrual earnings management, which takes place during the IPO year, and post-IPO stock return performance is attributed to cash flow mispricing. More recently, Cecchini et al. (2012) focused on examining a specific accrual (the allowance for uncollectible accounts) instead of total accruals around IPOs and found evidence that IPO firms utilize more decreasing allowances to manage reported earnings downward. Further, Cecchini et al. (2012) has found evidence that IPO firms record larger debt expenses compared with matched non-IPO firms, suggesting that IPO firms report more conservatively.

In summary, although limited research has questioned accrual manipulation around equity offerings (e.g., Ball and Shivakumar, 2008; Armstrong et al., 2009), the majority of prior research has presented evidence on both real activities-based and accrual-based manipulation around IPO and SEO (e.g. Aharony et al., 1993; Friedlan, 1994; Rangan, 1998; Teoh et al., 1998a, 1998b, 1998c; DuCharme et al.,

2001; Chen et al., 2005; Morsfield and Tan, 2006; Fan, 2007; Chang et al., 2010; Cohen and Zarowin, 2010; Lee and Masulis, 2011; Chahine et al., 2012; Kothari et al., 2012; Wongsunwai, 2012).

3.2.3 Merger, Acquisitions and New Listings

Managing reported earnings prior to events such as mergers, acquisitions and new listings is a widespread phenomenon in the capital market. For example, Erickson and Wang (1999) find evidence that acquiring firms manipulate reported earnings pre-merger in order to decrease the total cost of the merger. By examining a sample of 55 stock-for-stock mergers during the period 1985-1990, Erickson and Wang (1999) find evidence that acquiring firms engage in earnings management pre stock-for-stock merger to increase their stock prices and, therefore, decrease the cost of acquiring the target firms. They also find the merger size is positively associated with level of income-increasing discretionary accruals. Louis (2004) examines whether the acquiring firms engage in earnings management activities and whether these activities are associated with subsequent performance. Specifically, Louis (2004) examines a sample of 373 mergers during the period 1992-2000 and finds evidence that firms engage in earnings management pre-merger. Louis (2004) also finds the acquiring firms with high levels of accrual earnings management, which takes place pre-merger, experience post-merger stock return underperformance.

Further, other research has examined whether firms manage earnings before they switch between stock exchanges. For example, Lin (2003) focuses on firms that switch from the NASDAQ and AMEX to the NYSE stock exchange over the period 1990-1997. Consistent with earnings management hypothesis, Lin (2003) finds evidence that firms manage earnings upward utilizing accrual earnings management prior to listing on a new stock exchange. Further, Lin (2003) finds evidence that accrual earnings management, which takes place prior to the new listing, is negatively associated with post-listing operating and stock return performance.

Lang et al. (2006) took a slightly different approach, focusing on whether foreign firms (cross-listed non-US firms) mange earnings when they reconcile their

net income to be consistent with the US GAAP.[12] By comparing reported earnings for US firms with the reconciled earnings for cross-listed non-US firms, Lang et al. (2006) find evidence that such firms are more likely to manipulate earnings toward earnings targets and less likely to be conservative in loss recognition. They also find that these firms exhibit evidence of earnings smoothing and that the highest level of earnings management is found for firms from countries with weak investors protection.

3.2.4 Executive Compensation

As suggested by the agency theory, the role of executive compensation is considered as one of the best solutions to mitigate the conflict between managers and shareholders (Jensen and Meckling, 1976). However, Jensen and Meckling (1976) clearly state that managers could engage in certain transactions that aim to maximise their wealth instead of shareholders. Consistent with this view, prior research finds evidence that performance-based compensation motivates managers to engage in higher levels of earnings management activities (e.g. Balsam, 1998; Cheng and Warfield, 2005), which are found to have negative impact for shareholders' wealth (e.g. Fan, 2007; Cohen and Zarowin, 2010; Kothari et al., 2012).

Focusing on the compensation of Chief Executives Officers (CEOs), prior literature has found evidence that CEOs manipulate reported earnings upward to meet performance-based compensation targets utilizing earnings management activities such as accrual-based (e.g. Healy, 1985; Balsam, 1998; Cheng and Warfield, 2005; Bergstresser and Philippon, 2006; Ronen et al., 2006; Kuang, 2008; Laux and Laux, 2009) and real activities-based earnings management (e.g., Dechow and Sloan, 1991; Cheng, 2004; Cazier, 2009; Cao and Laksmana, 2010). For example, Cheng and Warfield (2005) examine the association between CEOs' equity incentive and earnings management based on a US sample over the period

[12] Lang et al. (2006) focus on foreign firms that are required to reconcile their financial statement consistent with the US GAAP according to form 20-F. They mention that the form 20-F requires all foreign firms that want to be listed on the American stock exchanges to present a reconciliation of any significant variation between the method and the principle that have been used to prepare their financial statement and the US GAAP. This form can be found at the following website: http://www.sec.gov/about/forms/form20-f.pdf.

1993-2000. They find evidence that CEOs with high equity incentives manage earnings upward utilizing accrual earnings management to meet or beat analysts' forecasts. Dechow and Sloan (1991) examine the association between the abnormal reduction of R&D expenses and CEOs' performance-based compensation. They find evidence that CEOs who approaching the retirement reduce R&D expenses to increase reported earnings.

While prior literature has focused on the association between CEO compensation and earnings management (e.g., Healy, 1985; Balsam, 1998), recent research has examined whether Chief Financial Officers (CFOs) and their equity incentives are associated with earnings management. For example, Jiang et al. (2010) argue that CFOs are more involved in the financial reporting processes compared to the CEOs and, therefore, CFO equity incentives are expected to be a significant driver of earnings management and beating analysts' forecasts. Consistent with this, Jiang et al. (2010) find evidence that CFO equity incentives are positively associated with accrual earnings management and beating analysts' forecasts, with even greater impact than CEO equity incentives.

However, a recent paper by Feng et al. (2011) shows contradictory evidence on the association between CFOs' equtiy incentives and accounting manipulation. Specifically, Feng et al. (2011) examine reasons that can explain why CFOs are involved in material accounting manipulation. They compare executives' (CEOs and CFOs) equity incentives and power between firms engaged in material accounting manipulation and non-manipulating firms. Feng et al. (2011) find CFOs of manipulating firms have the same level of equity incentives as CFOs of non-manipulating firms, but that CEOs of manipulating firms have higher levels of equity incentives and power than CEOs of non-manipulating firms. Thus, Feng et al. (2011) explain that CFOs engage in material accounting manipulation as a response to a pressure from their powerful CEOs.

3.2.5 Debt Contracts

Prior research has presented evidence that firms engage in accrual earnings management to avoid debt covenant violations (e.g., DeFond and Jiambalvo, 1994; Sweeney, 1994). This research has primarily investigated accrual-based earnings

management and found evidence that firms manipulate reported earnings upward (downward) to avoid debt covenant violations (to restructure debt covenants) (e.g., Jaggi and Picheng, 2002). One of the earliest studies of debt covenant violations was conducted by Sweeney (1994) who finds evidence that firms use income-increasing accounting changes to reduce the default cost imposed by lenders. She examines a sample of 130 firms that reported a debt covenant violation in their annual reports over the period 1980-1989. Specifically, Sweeney (1994) finds that manager's tendency to use income-increasing accounting changes is reflected by the accounting flexibility and the imposed cost by lenders. These results have been confirmed by DeFond and Jiambalvo (1994) who examine the association between accrual accounting and debt covenant violations. Specifically, they investigate a sample of 94 listed firms that show a debt covenant violation in their annual reports over the period 1985-1988. DeFond and Jiambalvo (1994) find a significant level of positive total accruals and working capital accruals in the year prior to the violation. Further, after controlling for the audit going-concern qualification and the change in firm management, DeFond and Jiambalvo (1994) find evidence on positive abnormal working capital accruals in the violation year.

Jaggi and Picheng (2002) extend this line of research by investigating the association between earnings management and debt restructuring. By examining a sample of 135 firms that have a technical default over the period 1989-1996, Jaggi and Picheng (2002) find violating firms use income-decreasing discretionary accruals when their waiver requests for debt covenant violations are denied and the firms will start a new negotiation to restructure their debt contracts. In addition, Jaggi and Picheng (2002) indicate that distressed firms use income-increasing discretionary accruals when their waiver requests for debt covenant violations are accepted. More recently, Rodríguez-Pérez and Hemmen (2010) investigate whether the level of diversification has an impact on the association between earnings management and the level of debt. By examining a Spanish sample of 1,853 firm-year observations during the period 1992-2002, Rodríguez-Pérez and Hemmen (2010) find evidence for firms with a lower level of diversification, that the level of debt is negatively associated with discretionary accruals, suggesting that debt-holders play an effective role in mitigating earnings manipulation.

Despite the extensive research on accrual earnings management, there has been limited research examining whether firms engage in real earnings management activities to avoid debt covenant violations. Bartov (1993) for example finds evidence that firms increase reported earnings through timing the sales of long-lived assets to smooth reported earnings and to avoid debt covenant violations. Recently, Kim et al. (2011) find firms utilize real earnings management activities to avoid debt covenant violations. They also find firms with less flexibility to re-negotiate a debt-covenant technical default exhibit a higher probability to manage real activities in order to avoid debt covenant violations.

3.2.6 Import Relief and Political Cost

Jones (1991) examines whether firms that would benefit from import relief (e.g. tariff increases, quota reduction, marketing agreement and federal adjustment assistance) may engage in income-decreasing accrual accounting. Jones (1991) focuses on periods with relief investigation by the US International Trade Commission (ITC), where the profitability of industry was considered by ITC as one of the main factors to decide the import relief decisions. By examining a sample of 23 US firms from five industries, Jones (1991) finds evidence that firms manage earnings downward utilizing accrual manipulation to benefit from import relief. She also presents one of the most commonly used models to estimate discretionary accruals, the Jones (1991) model.

Further, prior literature found evidence that firms manage earnings to avoid political cost. Key (1997) for example examines whether US firms manage earnings downward utilizing accrual earnings management to avoid the congressional scrutiny and lower the chance of new regulations, being imposed on firms that report excessive profits. By examining a period of intense congressional scrutiny (1989-1991), Key (1997) finds firms in the cable television industry engage in income-decreasing earnings management to mitigate the effect of congressional scrutiny and new regulations.

Han and Wang (1998) examine earnings management during periods of unusual increases in the product prices. Specifically, they focus on the excessive increases in oil prices during the 1990 Persian Gulf crisis. Han and Wang (1998)

hypothesize that oil firms during this period are expected to engage in income-decreasing accrual accounting to avoid political cost that will be imposed on firms reporting high profits. By examining a sample of 76 oil and gas firms during 1990, Han and Wang (1998) find evidence firms use income-decreasing accrual accounting to decrease reported earnings during the third and fourth quarters of the fiscal year. They indicate that these results are consistent with the view that firms avoid reporting profits due to the expected political cost.

3.3 Mitigating Factors on Earnings Management

3.3.1 The Role of Corporate Governance

The role of corporate governance in mitigating earnings management activities is well-known and extensively researched. In line with importance of corporate governance in constraining earnings management, Keasey et al. (2005) indicate that the reform of corporate governance in the UK, which is started since the establishment of Cadbury Committee in the early 1990s, was as a response to three main issues; earnings management (creative accounting), corporate failures, and the excessive executive compensation. However, a large body of research indicates that the mitigating role of corporate governance is contingent upon the existence of many factors such as the proportion of outside directors on the board, the separation of CEO and Chairman, the independence of the audit committee, long-term vs. short-term institutional investors (e.g., Hsu and Ping-Sheng, 2005; Osma, 2008). Consistent with this view, two mechanisms of corporate governance have been found to be the most effective in constraining earnings management, namely board structure and institutional investors. Hence, the role of the board and institutional investors are discussed in the following sub-sections.

3.3.1 .1 The Role of the Board of Directors and the Audit Committee

Previous research has focused on examining whether the board of directors and its committees constrain accrual earnings management (e.g., Klein, 2002; Yang and Krishnan, 2005; Cornett et al., 2008; Laux and Laux, 2009), and limited research has investigated other earnings management activities such as real earnings management (e.g., Osma, 2008; Visvanathan, 2008). Focusing on accrual accounting, Klein

(2002) investigates the effect of the board of directors and audit committee on accrual earnings management. By examining a sample of 692 US firms, Klein (2002) finds evidence that the presence of outside directors on the audit committee and board of directors is negatively associated with accruals manipulation. He also indicates that the level of discretionary accruals increases steadily as a result of the decline in the proportion of outside directors. Klein (2002) finds that the board of directors and audit committee are less affected by the CEO when there is a high proportion of outside directors. Overall, Klein (2002) mentions that increasing the proportion of outside directors leads to a lower level of earnings management and a powerful monitoring role of the accounting processes in the firms.

Other studies have taken an approach similar to Klein (2002) examining whether corporate governance plays the same monitoring role on real earnings management activities. For example, Visvanathan (2008) examines the effect of the board of directors and audit committee on real earnings management activities. Specifically, he examines whether the characteristics of directors that are found to constrain accrual earnings management play the same role in constraining real earnings management activities. By using a US sample of 9,567 firm-year observations pre- SOX 2002, Visvanathan (2008) finds evidence that outside directors play an effective role in constraining real earnings management activities.

Consistent with Visvanathan (2008), Osma (2008) presents additional evidence on the role of board independence in mitigating real activities manipulation. Specifically, Osma (2008) examines the moderating effect of board independence on the association between R&D manipulation and the capital market pressure to meet earnings benchmarks. By examining a UK sample of 3,438 firm-year observations over the period 1989-2002, Osma (2008) finds evidence that outside directors reduce R&D manipulation. She indicates that firms reduce R&D expenses as a response to short-term pressure or to a previous failure to meet an earnings target. In addition, Osma (2008) finds that a high proportion of inside directors on the board increases the tendency toward short-term managerial decisions such as a reduction in R&D expenses.

Despite the fact that research has investigated the role of board structure and the audit committee on earnings manipulation, few studies have examined whether

directors' accounting and financial expertise mitigate earnings management (e.g. Carcello et al., 2006; Krishnan and Visvanathan, 2008). For example, Carcello et al. (2006) investigate the association between real and accrual earning management and the accounting and financial expertise of the audit committee by examining a sample of 283 US firms during 2003. For firms with weak corporate governance, Carcello et al. (2006) find evidence that an audit committee with accounting expertise and some types of financial expertise play an effective role in constraining accrual earnings management, notably when all the members of the audit committee are independent. However, Carcello et al. (2006) find the accounting and financial expertise of the audit committee has no impact on real earnings management via overproduction manipulation, and it is positively associated with real earnings management via discretionary expenses manipulation.

In contrast with Carcello et al. (2006), Krishnan and Visvanathan (2008) examine a sample of 1,176 firm-year observations over the period 2000-2002 and find evidence that the accounting and financial expertise of the audit committee is negatively associated with real earnings management activities. Further, Krishnan and Visvanathan (2008) find evidence that the accounting and financial expertise of the audit committee is positively associated with accounting conservatism, confirming the monitoring explanation for appointing expertise on the audit committee (DeFond et al. 2005).

3.3.1.2 The Role of Institutional Ownership

Recent changes in the field of corporate governance have led to a renewed interest in examining whether the presence of institutional investors reduces earnings manipulation (e.g., Bushee, 1998; Chung et al., 2002; Hsu and Ping-Sheng, 2005). Bushee (1998) for example investigates the association between institutional investors and the unexpected reduction of R&D spending to meet earnings targets. By focusing on prior year earnings targets for a sample of US firms over the period 1983-1994, he finds evidence that the presence of sophisticated institutional investors prevents managers from cutting R&D spending to meet the previous year's earnings target. However, Bushee (1998) finds evidence that the presence of institutional investors with a high portfolio turnover and a momentum trading strategy is positively associated with R&D manipulation to increase annual earnings.

Consistent with Bushee (1998), Chung et al. (2002) provide evidence that the presence of institutional investors is negatively associated with earnings management activities. Specifically, Chung et al. (2002) find evidence that the presence of large institutional investors constrains managers' flexibility to manage earnings either upward or downward utilizing accrual earnings management.

Other research has examined whether the monitoring role of institutional investors is associated with long-term vs. short-term investment. Hsu and Ping-Sheng (2005) find evidence that long-term institutional investors constrain earnings management, while the presence of short-term institutional investors is positively associated with high levels of income-increasing accrual earnings management. Yu (2008) investigates the effect of institutional investors on real and accrual earnings management. By conducting experimental research, Yu (2008) examines whether institutional ownership impacts managers' decision to choose between real and accrual earnings management when the accounting standards are restricted. Yu (2008) finds evidence that the restriction of accounting standards leads managers to engage in real earnings management activities instead of accrual accounting, but this switch between earnings management activities is contingent upon the presence of institutional investors who focus on short-term earnings. Concerning the long-term institutional investors, Yu (2008) finds similar evidence to Hsu and Ping-Sheng (2005) that long-term institutional investors limit earnings management activities. Overall, institutional investors are found to play an efficient role in mitigating earnings manipulation.

3.3.2 The Role of Audit Quality

The association between audit quality and earnings management is well-established and it has been extensively researched in the accounting literature. This literature has investigated the effect of several proxies of audit quality on accrual earnings management e.g. big 6 audit firms (Becker et al., 1998), audit and non-audit fees (Frankel et al., 2002; Antle et al., 2006), auditor industry expertise (Krishnan, 2003), audit effort (Caramanis and Lennox, 2008), audit report (Francis and Krishnan, 1999), etc. Prior research has focused on accruals manipulation and found evidence that enhanced audit quality mitigates accrual earnings management. For example, one of the earliest studies on audit quality by DeAngelo (1981) indicated that the

size of audit firms is considered as a good proxy of audit quality. Consistent with this, Becker et al. (1998) examined the association between accruals manipulation and audit quality proxied by the presence of big 6 audit firms.[13] Becker et al. (1998) find evidence firms audited by big 6 auditors exhibit a lower level of accruals manipulation (discretionary accruals) than firms audited by non-big 6 auditors.

Frankel et al. (2002) focus on the association between earnings management and audit and non-audit fees. By examining a sample of 3,074 US firms, Frankel et al. (2002) find evidence that audit fees are negatively associated with discretionary accruals, suggesting that the higher audit fees imply higher audit quality and, this in turn, leads to a lower level of accrual-based manipulation. They also find non-audit fees are positively associated with discretionary accruals and small earnings surprises, suggesting that non-audit fees might compromise auditor independence.

Moreover, prior literature has examined the association between auditor opinion and earnings management. Francis and Krishnan (1999) for example find evidence that audit firms are likely to issue a modified audit opinion when their clients have a higher level of accruals manipulation. Further, Francis and Krishnan (1999) indicate that audit firms resort to lower their threshold (the requirements) to issue the modified audit opinion because their clients exhibit higher levels of accruals manipulation, which can lead to future litigation risks. Caramanis and Lennox (2008) have focused on the association between audit effort and earnings management. They have examined whether audit hours are associated with the levels of earnings management. Confirming the hypothesis that the greater the audit effort the less earnings manipulation that occurs, Caramanis and Lennox (2008) find firms with less audit hours exhibit evidence of higher levels of income-increasing accrual accounting, abnormal accruals, and positive abnormal accruals.

While prior literature has examined the role of enhanced audit quality on accrual earnings management (Becker et al., 1998; Frankel et al., 2002), there has been limited research examined whether audit quality is associated with real earnings management activities. Real earnings management represents managerial

[13] The classification for audit firms as big8, big 6, big 5, and big4 is changed over time after series of merger to become now as big 4 audit firms.

decisions deviate from normal business practices and are subject to lower scrutiny by auditors e.g. the unexpected reduction in R&D and SG&A expenses (Graham et al., 2005; Roychowdhury, 2006).

However, a recent paper by Cohen and Zarowin (2010) finds evidence that enhanced audit quality is associated with higher real earnings management. Specifically, Cohen and Zarowin (2010) find evidence that the probability of SEO firms to engage in real earnings management activities during the SEO year increases when they are audited by high quality auditors (big N audit firms). Chi et al. (2011) find similar evidence to Cohen and Zarowin (2010) on the positive association between enhanced audit quality and real earnings management. Focusing on firms with strong incentives to manage earnings upward i.e. SEO firms and firms just meet or beat earnings benchmarks, Chi et al. (2011) find evidence that firms audited by high quality auditors resort to manage earnings upward utilizing real activities-based manipulation to avoid the monitoring of accrual-based manipulation. Further, Sohn (2011) examines the association between audit fees and real earnings management and finds evidence that audit fees are positively associated with real activities-based manipulation, confirming recent evidence (Cohen and Zarowin, 2010; Chi et al, 2011) on the positive association between enhanced audit quality and real earnings management activities.

In summary, high quality auditors constrain accrual-based manipulation and this leads their clients, especially when they have a strong incentive to manage earnings upward, to resort to higher levels of real activities-based manipulation, which has more severe negative consequences for future performance (Cohen and Zarowin, 2010; Kothari et al. 2012).

3.3.3 The Role of Accounting Regulation.

Given the evidence on the pervasiveness of earnings management and its negative impact for future performance (e.g., Rangan, 1998; Teoh et al. 1998a) and given the recent accounting scandals in the US, there has been a renewed interest on examining whether accounting regulations are associated with earnings manipulation. The most common view, according to accounting literature, is that tightening accounting standards will constrain accrual earnings management (e.g.,

Ewert and Wagenhofer, 2005; Jeanjean and Stolowy, 2008). Consistent with this, a growing body of literature has focused on examining the impact of the adoption of International Financial Reporting Standards (IFRS) on earnings management (e.g., Van Tendeloo and Vanstraelen, 2005; Jeanjean and Stolowy, 2008).[14] Barth et al. (2008) for example examine whether accounting quality is affected by the voluntary adoption of IFRS. By examining a sample of international firms from 21 countries that voluntarily adopted the IFRS, Barth et al. (2008) find evidence that firms that adopted IFRS exhibit more timely loss recognition, more value relevance, and a lower level of earnings management.

In contrast with Barth et al. (2008), Callao and Jarne (2010) find evidence that the IFRS adoption leads to a higher level of accrual earnings management. By examining a sample of 1,408 non-financial firms from 11 European Union member states, Callao and Jarne (2010) find evidence that the level of accrual earnings management has increased after the IFRS adoption. They explain this result as being due to the differences between the IFRS and local accounting standards. Further, Ahmed et al. (2012) find firms that are mandatory adopters of IFRS in 2005 exhibit more income smoothing, more accruals manipulation, and less timely loss recognition. Ahmed et al. (2012) examine a sample of 3,262 firms from 20 countries that are mandatory adopters of IFRS in 2005 relative to a benchmark sample of firms from countries with no IFRS adoption.

Other studies have adopted a different approach by examining whether the restriction of accounting standards and corporate governance regulation is associated with managers' tendency to choose between earnings management activities (accruals vs. real activities). Ewert and Wagenhofer (2005) for example adopt a rational expectations equilibrium model to examine whether earnings management is affected by tightening accounting standards. They find that the level of real earnings management has increased after tightening accounting standards. Consistent with Ewert and Wagenhofer (2005), Ipino and Parbonetti (2011) examine whether the mandatory adoption of IFRS is associated with managers' tendency to

[14] The term IFRS indicates for International Financial Reporting Standards and International Accounting Standards (IAS).

engage in real and accrual earnings management for a sample of 53,853 firm-year observations from 37 countries over the period 2000-2008. For countries with strict enforcement regimes, Ipino and Parbonetti (2011) find evidence that after the IFRS adoption firms switch from accrual-based manipulation to real activities-based manipulation. Further, Ipino and Parbonetti (2011) find firms that switch from accrual-based manipulation pre-IFRS to real activities-based manipulation post-IFRS experience a greater decline in operating performance.

3.3.4 The Role of Regulatory Environment

Recent research has presented evidence that managers' tendency to choose between real and accrual earnings management is associated with the regulatory environments. Graham et al. (2005) conducted a survey with Chief Financial Officers (CFOs) and found evidence that CFOs prefer to manage earnings utilizing real activities over accrual accounting to avoid the scrutiny of auditors and regulators. Specifically, 80% of executives surveyed admitted to utilizing real activities such as reducing R&D and advertising expenses to meet earnings targets. Over 50% of CFOs also expressed a willingness to postpone starting a new project as long as the impact on economic value was not too large. Recently, Cohen et al. (2008) investigated whether the passage of Sarbanes-Oxley Act 2002 (SOX) is associated with less earnings management. The Sarbanes-Oxley Act was issued on 30th July 2002 by the Securities Exchange Committee (SEC) after the big accounting scandals in the US in order to remedy the regulatory and corporate governance failures. Cohen et al. (2008) find evidence that US firms switch from using accrual-based manipulation pre-SOX to real activities-based post-SOX. This evidence is consistent with Graham et al. (2005), that managers under more restricted regulatory environment prefer real activities manipulation over accrual-based manipulation. Also, this evidence is consistent with Ewert and Wagenhofer (2005), that, more stringent accounting regulation mitigates accrual earnings management, but leads to the more extensive use of real earnings management.

More recently, Gerakos et al. (2011) examine whether the regulatory environment is associated with the characteristics of IPO firms. Specifically, they compare the characteristics of IPO firms listed on the lightly regulated AIM market vs. IPO firms listed on the more heavily regulated Main market of the London Stock

Exchange and other US developed markets. Gerakos et al. (2011) find evidence that firms listed on the AIM market have higher levels of information asymmetry, failure rates, post-listing underperformance as well as lower liquidity than firms listed on the Main market and US markets. These results suggest that there is a higher likelihood of earnings management occurring. For example, Trueman and Titman (1988), Schipper (1989) and Dechow and Skinner (2000) indicate that one of the strong incentives to manage earnings is the presence of high levels of information asymmetry between insiders and outsiders. Richardson (2000) examines the impact of information asymmetry on earnings management and finds evidence that firms with higher levels of information asymmetry exhibit higher levels of accrual earnings management.

Moreover, it is well-known that a lightly regulatory environment imposes lower listing and corporate governance requirements and, this in turn, may lead to more flexibility to utilize earnings management. For example, the AIM market (the lightly regulated environment) in the UK requires the listing firms to have an appropriate corporate governance mechanism, while the Main market (the restrictive regulatory environment) requires the firms to comply with the UK Corporate Governance Code. Prior research shows that corporate governance plays an effective role in mitigating real and accrual earnings management (e.g., Yang and Krishnan, 2005; Cornett et al., 2008; Laux and Laux, 2009). In addition, Mendoza (2008) indicates that firms listed on the AIM market have liquidity problems and recent research finds evidence that firms with lower levels of liquidity have higher levels of earnings management (Chung et al., 2009).

In summary, firms listed on a lightly regulatory environment are expected to have more flexibility to engage in real and accrual earnings management than firms listed on a more restrictive regulatory environment.

3.4 Theories of Earnings Management and Monitoring

3.4.1 Agency Theory

The agency theory indicates that the conflict between managers and shareholders arises as managers may engage in certain activities to obtain a private gain (Jensen

and Meckling, 1976) and that these activities may decrease the shareholders' wealth. Prior research for example finds that information asymmetry during the IPO leads to two types of agency conflicts; adverse selection and moral hazard (Ritter and Welch, 2002; Bruton et al., 2009). Thus, and given the impact of this conflict between managers and shareholders, executive compensation is considered by the agency theory as one of the best solutions to align the interests of managers and shareholders (Jensen and Meckling, 1976; Watts and Zimmerman, 1986). However, Jensen and Meckling (1976) indicate that executive compensation may motivate managers to engage in certain transactions that aim to maximise their wealth instead of shareholders. Confirming this view, prior literature has shown that managers manipulate reported earnings upward utilizing earnings management activities to meet performance-based compensation targets (Healy, 1985; Dechow and Sloan, 1991; Balsam, 1998; Cheng, 2004; Cheng and Warfield, 2005; Bergstresser and Philippon, 2006; Ronen et al., 2006; Kuang, 2008; Cazier, 2009; Laux and Laux, 2009; Cao and Laksmana, 2010). This literature also has presented evidence that earnings management activities are negatively associated with subsequent operating and stock return performance, which in turn leads to a reduction in shareholders' wealth (DuCharme et al., 2001; Fan, 2007; Chang et al., 2010; Cohen and Zarowin, 2010; Kothari et al., 2012).

A recent paper by Jiraporn et al. (2008) examines two competing views that explain the relation between earnings management and the agency theory, namely the beneficial use vs. the opportunistic use of earnings management. The first view is that earnings management can be used by managers to communicate private information to the shareholders and the public to improve the information value of earnings (e.g., Watts and Zimmerman, 1986; Holthausen, 1990; Healy and Palepu, 1993; Guay et al., 1996; Subramanyam, 1996; Demski, 1998; Arya et al., 2003). Hence, Jiraporn et al. (2008) expect, if firms suffer high levels of agency costs, then managers will engage in a lower level of earnings management because managers will not use earnings management opportunistically (managers just use earnings management to communicate private information).

The second view is that earnings management can be used opportunistically by managers to obtain a private gain, and this leads to negative consequences for

shareholders' wealth (e.g., Rangan, 1998; Teoh et al., 1998a; Kothari et al., 2012). Consistent with the second scenario, Jiraporn et al. (2008) expect, if firms suffer high levels of agency costs, then managers will engage opportunistically in a higher level of earnings management. By examining these two competing views on the relation between the agency costs and earnings management, Jiraporn et al. (2008) find evidence that firms which suffer high levels of agency costs exhibit evidence of a lower level of earnings management, confirming the first view on the beneficial use of earnings management. In other words, Jiraporn et al. (2008) find managers use earning management to communicate private information to shareholders and public and, this in turn, leads to enhance the value of earnings. Consistent with Jiraporn et al. (2008), Gunny (2010) finds evidence on the beneficial use of earnings management that leads to better future performance.

In summary, while the agency theory has presented theoretical explanation why managers engage in earnings management, the recent literature has found that earnings management can be utilized either opportunistically and this leads to a negative impact for shareholders' wealth (Teoh et al., 1998a; Fan, 2007, amongst other) or beneficially (through enhancing the value of earnings) and this leads to a positive impact for shareholders' wealth (Jiraporn et al. 2008; Gunny, 2010).

3.4.2 Monitoring Role and Moral Hazard Hypotheses

Monitoring role and moral hazard hypotheses provide an explanation for the role of Venture Capitalists (VCs) during the IPO and whether these VCs will motivate or mitigate the use of earnings management by IPO firms. VCs are financial intermediaries, with a limited liability partnership, that raise funds from investors in order to invest in the financial events such as IPOs and SEOs. Generally, VCs go through three main stages: fundraising, investing funds, and exiting the investment (e.g. Gompers and Lerner, 1999; Gompers and Lerner, 2001). The monitoring role and moral hazard hypotheses have different views about whether the presence of VCs during the IPO will lead to safeguard or expropriate the shareholders' wealth.

The monitoring hypothesis implies that VCs may play a monitoring role on their investments during IPOs to protect their reputation and to avoid any expected litigation risk in the future. Thus, a monitoring role by VCs will lead to safeguard

the interests of other shareholders by monitoring the managers (e.g. Morsfield and Tan, 2006). On the other hand, the moral hazard hypothesis implies that VCs may turn a blind eye to opportunistic earnings management to ensure high offer prices and better stock return performance later, which in turn will increase the gains from IPOs (e.g. Agrawal and Cooper, 2009).

A growing body of literature finds evidence consistent with monitoring role of VCs on earnings management. For example, Morsfield and Tan (2006) investigate the effect of VCs on earnings management during IPOs. By examining a sample of 2,630 IPO firms during the period 1983-2001, they find evidence that the presence of VCs is associated with less accrual earnings management during the IPO year. Further, Morsfield and Tan (2006) find no evidence that supports the view that the presence of VCs is associated with earnings inflation during internet bubble and the huge number of IPOs that occurred during this period. Lee and Masulis (2011) find similar evidence that more reputable VCs play a monitoring role during IPOs in mitigating earnings management. However, after controlling for underwriters' reputation Lee and Masulis (2011) find the presence of VC is not associated with earnings management.

Moreover, Agrawal and Cooper (2009) find evidence that VCs mitigate earnings management during IPOs, notably if VCs are mature and more reputable. Agrawal and Cooper (2009) also find the reputation of VCs is negatively associated with the probability that IPO firms restate their financial accounts during the subsequent periods. Wongsunwai (2012) meanwhile examines the role of VCs in constraining real and accrual earnings management around IPOs and finds evidence that IPO backed by more reputable VCs exhibit lower levels of real and accrual earnings management and a lower level of financial restatement.

Despite the evidence on the monitoring role of VCs, little research has presented evidence that the presence of VCs during the IPO is negatively associated with future performance. For example, Chahine et al. (2012) investigate the association between the diversity of a VC syndicate and accrual earnings management around IPOs. By examining a sample of 274 IPOs that are backed by venture capitalists from both the US and the UK, they find evidence the diversity of a VC syndicate is associated with higher levels of accrual-based manipulation pre-

IPO. They also find evidence that IPO firms with higher levels of accrual manipulation and VC diversity experience higher levels of underpricing and post-IPO stock return underperformance.

Coakley et al. (2007) and Coakley et al. (2009) find evidence that the presence of VCs during the IPO has a negative impact for offer prices and operating performance during the dot-com bubble. By examining a sample of 316 UK IPOs that were backed by VCs and 274 IPOs that were not backed by VCs over the period 1985–2003, Coakley et al. (2007) find evidence that the presence of VC representatives on the board of directors is negatively associated with subsequent operating performance. In addition, Coakley et al. (2009) examines the effect of VCs on IPOs' underpricing in the UK. Coakley et al. (2009) examine a sample of 591 UK IPOs over the period 1985-2003 and find evidence that the presence of VCs and prestigious underwriters during the dot-com bubble is associated with a decline in offers prices. However, for periods other than the internet bubble Coakley et al. (2009) find evidence consistent with the certification role of VCs and underwriters during the IPO.

3.4.3 Certification Hypothesis.

Based on the certification hypothesis, financial institutions (e.g. VCs and underwriters) are expected to perform due-diligence investigations by picking and monitoring their IPO firms carefully to protect their reputation and to avoid any litigation risk (e.g. Megginson and Weiss, 1991). Focusing on underwriters, prior literature shows that underwriters play a significant role in equity offerings by purchasing, marketing, and distributing these offers to outside investors (e.g., Beatty and Ritter, 1986; Carter and Manaster, 1990; Chemmanur and Fulghieri, 1994).

IPO and SEO firms typically attempt to appoint more prestigious underwriters to send a positive signal about the offer to outside investors. For example, Booth and Smith (1986) find evidence that supports the view that the presence of underwriters during the IPO leads to reduce the information asymmetry between insiders and outsiders (prospective shareholders). Brau and Fawcett (2006) conducted a survey with 336 CFOs to compare between the theory and practice of IPOs and found evidence that historical earnings and prestigious underwriters,

respectively, are considered by CFOs as the most important factors that send positive signals about IPOs to outside investors. Moreover, Yung and Zender (2010) find evidence that IPO firms with more prestigious underwriters experience a lower level of information asymmetry.

Thus, and based on the certification hypothesis, prior literature has investigated whether prestigious underwriters reduce accrual earnings management around equity offerings. For example, Jo et al. (2007) find evidence that the presence of more reputable underwriters is negatively associated with accrual earnings management during a SEO. They indicate that underwriters constrain earnings manipulation to avoid any future litigation risk and to protect their reputation. Chang et al. (2010) find evidence that IPO firms with less reputable underwriters exhibit a higher level of accrual earnings management. Lee and Masulis (2011) find similar evidence that the presence of more reputable underwriters is associated with less accrual earnings management. Further, it is worth noting that the role of underwriters in constraining earnings manipulation is found to be more efficient when the IPO firms are backed by VCs and audited by high-quality auditors (e.g. Lee and Masulis, 2011).

3.4.4 Litigation Risk Hypothesis

Prior research shows that IPO firms have strong incentives to hire high quality auditors to send positive signals about the offer to outsiders (Titman and Trueman, 1986; Brau and Fawcett, 2006). This is due to the fact that high quality auditors (big N) are expected to provide high-quality audits to avoid any future litigation risks and to protect their reputation in the capital market (DeAngelo, 1981; Francis and Krishnan, 1999). Khurana and Raman (2004) examined the association between litigation risk, reputation damage, and enhanced audit quality. Their results showed that avoiding litigation risk is the primary driver for providing high quality audits by more reputable audit firms.

Consistent with this, an extensive body of research has found evidence that high quality auditors play a significant role in constraining accrual-based earnings management (Becker et al., 1998; Balsam et al., 2003; Krishnan, 2003; Reichelt and Wang, 2010). For example, Becker et al. (1998) find evidence that firms audited by

high quality auditors exhibit a lower level of accrual-based earnings management. Elder and Zhou (2002) find high quality auditors constrain accrual earnings management during the IPO year. Chen et al. (2005) find similar evidence that the presence of high quality auditors is associated with a lower level of accrual earnings management during the IPO year. Further, Balsam et al. (2003), Krishnan (2003), and Reichelt and Wang (2010) find evidence that the presence of auditor industry specialism is associated with less accrual earnings management. Thus, prior research supports the view that high quality auditors constrain accrual earnings management to limit future litigation risk.

However, recent research has presented evidence that high quality auditors affect managers' tendency to choose between real and accrual earnings management activities (e.g. Cohen and Zarowin, 2010; Chi et al., 2011). While constraining accrual earnings management is one of the main responsibility of audit firms, real earnings management represents managerial decisions that deviate from normal business practices (Roychowdhury, 2006) and, therefore, are less subject to the scrutiny of audit firms (Graham et al., 2005). Consistent with this view, Chi et al. (2011) find evidence that firms audited by high quality auditors switch to more real activities-based earnings management to avoid the monitoring of accrual-based earnings management. Chi et al. (2011) focus on firms with strong incentives to manage reported earnings upward such as SEO firms and public firms that just meet or beat earnings benchmarks. Further, and in line with Chi et al. (2011), Cohen and Zarowin (2010) find evidence that SEO audited by big N exhibit higher levels of real earnings management activities.

In summary, the role of enhanced audit quality on accrual earnings management has been extensively researched, but little research has examined the relation between enhanced audit quality and real earnings management (e.g. Chi et al. 2011). Hence, whether audit firms will face a litigation risk due to the extensive use of real activities-based manipulation by their clients is still an open question.

3.5 Conclusions

This chapter introduces several motivations and mitigating factors of earnings management as well as related theories that explain the association between these

factors and earnings management. The central premise of this literature is that managers can switch between real and accrual earnings management activities based on the costs and benefits of utilizing each of them (Zang, 2012). For example, if a monitoring body (e.g. auditors) focuses on constraining a specific activity of earnings management (e.g. accrual-based manipulation), then managers are likely to switch to another activity (e.g. real activities-based manipulation), notably when there is a strong incentive to manage earnings upward (Cohen and Zarowin, 2010; Chi et al. 2011). In addition, the decision to choose between real and accrual earnings management is likely to have an impact for firm's subsequent performance. Prior literature shows that both real and accrual earnings management are negatively associated with subsequent stock returns and operating performance (Fan, 2007; Kothari et al., 2012) and, therefore, the extensive use of these activities will lead to more negative consequences for future performance.

Thus, all monitoring e.g. auditors, corporate governance structure, accounting standards setters, regulators, etc (that are expected to constrain earnings manipulation) should consider the fact that managers can switch between earnings management activities, and that these activities are negatively associated with future performance. The next chapter presents data collection, sample construction, descriptive statistics, and the estimation of real and accrual earnings management activities.

Chapter 4
Data and Research Methods

4.1 Introduction

This chapter presents the data used in the empirical analysis, data sources, sample construction, descriptive statistics of the variables, the estimation of real and accrual earnings management, and the control sample (all UK non-IPO firms).[15] This thesis examines British IPO companies that have gone public on the AIM and Main markets of the London Stock Exchange over the period 1998-2008.

This chapter is organized as follows. Section two provides the process of constructing the sample and the databases that were used to download the data. Section three presents descriptive statistics for the pooled IPO sample and for samples that are used in the three empirical chapters of this thesis; namely regulatory environments, audit quality, and IPO failure risk. The processes of measuring real activities-based and accrual-based earnings management and the control sample (all non-IPO UK firms) are presented and discussed in section four. Finally section five concludes.

4.2 Sample Construction

The sample consists of 571 IPO firms that went public on either the Main or AIM markets between January 1998 and December 2008.[16] All financial IPO firms are excluded from the sample due to differences in their financial reporting and disclosure requirements (e.g., Teoh et al., 1998a; 1998c; Chen et al., 2005;

[15] It is worth noting that descriptive statistics of the variables and the estimation of real and accrual earnings management are also discussed in the following empirical chapters (five, six and seven). However, in this chapter a detailed discussion is provided.

[16] The London Stock Exchange provides information about IPOs on the Main market starting from 1998 while information about IPOs on the AIM market starts from 1995. Therefore, and to be consistent, the sample covers the period 1998 - 2008.

Morsfield and Tan, 2006; Fan, 2007; Chang et al., 2010; Lee and Masulis, 2011; Chahine et al., 2012; Wongsunwai, 2012). The sample also is restricted to all IPO firms with available prospectuses and the necessary data to allow estimating of real and accrual earnings management proxies. This restriction results in the sample consisting of larger and more successful firms, and as noted by Cohen et al., (2008) and Cohen and Zarowin (2010), a more conservative test of earnings management.

Data are collected using the following sources: (1) IPO firms are identified using the list of IPOs on the London Stock Exchange website for UK firms that were admitted to the AIM and Main markets during the period 1998-2008. This list provides information about IPOs such as, issue price, the date of an IPO, market capitalization, etc; (2) the ICC Plum and Lexis-Nexis databases were used to obtain information about the company identifier for IPO firms, such as the WorldScope and ISIN codes; (3) financial data for the IPO firms and for the control sample of all UK non-IPO firms were obtained from the WorldScope database; (4); WorldScope however, does not provide all the required financial data for the sample of IPO firms, therefore, IPO prospectuses were downloaded from the Thomson One Banker database and all missing financial data were manually collected from IPO prospectuses; (5) the DataStream database was used to collect the stock prices for the sample of IPOs and their matched firms; (6) the Fame database was used to collect the reasons of delisting from the stock exchange and date of delisting which was cross checked with the delisted dates that were obtained from DataStream. Further, the delisted reasons obtained from Fame are double checked with Companies House.

4.3 Descriptive Statistics

Table 4.1 presents descriptive statistics of key variables for the sample at the IPO. Table 4.1 shows that the average total assets of IPO firms prior to go public is £56.12 million, the median is £4.47 million, the standard deviation is £233.90 million, the minimum amount is £0.07 million, and the maximum amount is £1969.10 million. This large difference in total assets values is due to the fact that the sample comprises very small IPO firms (AIM IPOs sample) and very large firms (Main IPOs sample). The AIM market is designed to fit the needs of small, growing

IPO firms. Consistent with this, Table 4.1 shows that the mean market capitalization for IPO firms is £113.93 million and the median is £25.11 million with a range from £1.44 million to £2,020.68 million. Table 4.1 also shows that the money raised by IPO firms ranges from £0.14 million to £1499.85 million with a mean of £43.41 million and a median of £7.00 million. With regards to the net income of IPO firms, Table 4.1 shows that the operating performance (net income) for IPO firms on average £1.93 million with a standard deviation of £25.38 million and a median of £-0.03 million. The minimum and the maximum amount of net income range from £-124.10 million to approximately £398 million.

Table 4.2 presents the distribution of IPOs and shows that four years (2000, 2004, 2005, and 2006) account for more than 60% of IPOs. Consistent with the internet bubble the highest number of IPOs (103 IPOs) in the sample is in 2000. These statistics are also consistent with the view that IPO firms usually time their offerings to take advantage of the hot market (Ibbotson and Jaffe, 1975; Lowry and Schwert, 2002). While the lowest number of IPOs in the sample is in 2008 due to the recent global financial crisis.

Table 4.3 presents the frequency of IPOs based on the industry standard classification, measured by 2-digit SIC codes. The Business Services industry accounts for approximately 32% of the total sample, while the majority of other industries have similar percentages of IPOs ranging from 1% to 10%.

Table 4.1 Descriptive statistics for pooled IPOs sample during 1998-2008

	Total assets (£ mill.)	**Net income (£ mill.)**	**Market value (£ mill.)**	**Money raised (£ mill.)**
Mean	56.12	1.93	113.93	43.41
Median	4.47	-0.03	25.11	7.00
Std. dev	233.90	25.38	302.19	136.22
Minimum	0.07	-124.10	1.44	0.14
Maximum	1969.10	397.47	2020.68	1499.85

Table 4.1 presents sample descriptive statistics for IPOs sample over the period 1998-2008. Total assets are the beginning of period total assets; net income at the end of the IPO year; market value is the market capitalization for IPO firms immediately after the listing; and money raised is the offer amount of the IPO. Total assets and net income are obtained from the WorldScope database; market value and money raised are obtained from the London Stock Exchange website.

Table 4.2 Time distribution for pooled IPOs sample during 1998-2008

Year	Freq	%
1998	35	6.13
1999	29	5.08
2000	103	18.04
2001	43	7.53
2002	35	6.13
2003	23	4.03
2004	97	16.99
2005	94	16.46
2006	70	12.26
2007	40	7.01
2008	2	0.35
Total	**571**	**100.00**

Table 4.2 presents the frequency of IPO firms by year over the period 1998-2008.

Table 4.3 Industry distribution for pooled IPOs sample during 1998-2008

Industry	SIC 2-digit	Freq	%
Oil & gas extraction	13	26	4.55
Food products	20	11	1.93
Printing and publishing	27	13	2.28
Chemicals and allied products	28	37	6.48
Industrial machinery	35	16	2.80
Electronic equipment	36	36	6.30
Instruments and related products	38	25	4.21
Communications	48	27	4.73
Electric, gas, and sanitation	49	10	1.75
Durable goods	50	11	1.93
Eating and drinking establishments	58	15	2.63
Retail	59	8	1.40
Business services	73	182	31.87
Media and entertainment	78	8	1.40
Amusement and recreation	79	27	4.73
Engineering and management services	87	58	10.16
All others	-	61	10.68
Total		**571**	**100.00**

Table 4.3 presents the frequency of IPO firms by industry over the period 1998-2008.

4.3.1 Regulatory Environment

The first empirical research question of this thesis (chapter five) examines real and accrual earnings management under different regulatory environments. In the UK, the London Stock Exchange comprises two different regulatory environments; that is, the Main market and the AIM market. Data concerning the regulatory environment are collected using a list provided by the London Stock Exchange. This list shows all UK firms that were admitted to the AIM and Main markets and provides information about IPOs such as, issue price, the date of an IPO, market capitalization, etc. Further, the London Stock Exchange provides information about IPOs on the Main market starting from 1998 while information about IPOs on the AIM market starts from 1995. Thus, to be consistent, the sample covers the period 1998 – 2008.

To collect financial and non-financial data for IPO firms on the AIM and the Main markets several databases are used such as WorldScope, DataStream, Fame, and ICC Plum. In addition, when data are missing from the databases they are manually collected from the prospectuses. Following prior research (e.g., Teoh et al., 1998a; Morsfield and Tan, 2006), financial IPO firms are excluded from the sample due to the differences in their financial reporting from other IPO firms. These procedures result in a sample consisting of 433 IPOs on the AIM market and 138 IPOs on the Main market over the period 1998-2008 with available prospectuses and the necessary data to analyze real and accrual earnings management.

Table 4.4 (Panels A and B) present descriptive statistics for IPOs on the AIM and the Main markets. Panel A shows that the market capitalization for IPO firms on the AIM market on average £27.73 million with a standard deviation of £32.67 million and a median of £17.83 million. The minimum and the maximum amounts of market capitalization range from £1.44 million to £183.06 million. While for IPO firms on the Main market, Panel B shows that the average market capitalization is £384.40 million, the median is £151.80 million, the standard deviation is £528.58 million, the minimum amount is £6.11million, and the maximum amount is £2020.68 million. This large difference in market capitalization values between IPOs on the two markets is attributed to the fact that IPO firms on the AIM market are very small firms compared with IPOs on the Main market. However, the range

of market values on the AIM market shows that some IPO firms with large market values have listed on AIM.

Table 4.4 also presents statistics for other figures (e.g. total assets and money raised) and again shows similar evidence that IPO firms on the AIM market are smaller than IPO firms on the Main market. In addition, Table 4.4 shows that IPO firms on the AIM market experience greater losses during the IPO year compared with IPO firms on the Main market. For example, the mean (median) net income for IPO firms on the AIM market is £-0.15 million (£-0.09 million), while the mean (median) net income for IPO firms on the Main market is £8.47 million (£1.75 million).

Table 4.5 reports the distribution of IPOs on the AIM and the Main markets from 1998 to 2008. For IPO firms on the AIM market Table 4.5 shows that more than 60% of IPOs have gone public during 2000, 2004, 2005, and 2006 with the highest number of IPOs (85 IPOs) occurred in 2005. For IPO firms on the Main market Table 4.5 shows that the highest number of IPOs (44 IPOs) is in 2000, consistent with the internet bubble, while the other years have similar percentages of IPOs ranging from 2% to 16%. It is worth noting for both the AIM and the Main market that the lowest number of IPOs is in 2008, due to the recent global financial crisis.

Table 4.6 shows the frequency of IPOs relative to the industry standard classification, measured by 2-digit SIC codes. For IPO firms on the AIM market the maximum number of IPOs in a single industry is 129 in Business Services. The other industries have similar frequencies ranging from 5 IPOs in Retail industry to 49 IPOs in Engineering and Management Services industry. In addition, Table 4.6 presents the frequency of IPOs on the Main market and shows that the Business Services industry accounts for approximately 39% of the total sample, consistent with the frequency of AIM IPOs. Except for the clustering in the Business Services industry, the majority of other industries on the Main market have similar percentages of IPOs ranging from 1% to 7%.

Table 4.4 Descriptive statistics for sample IPO firms during 1998-2008 by market

	Total assets (£ mill.)	Net income (£ mill.)	Market value (£ mill.)	Money raised (£ mill.)
Panel A: AIM sample (n=433)				
Mean	15.99	-0.15	27.73	10.82
Median	2.73	-0.09	17.83	5.00
Std. Dev	102.53	5.30	32.67	26.43
Minimum	0.07	-12.61	1.44	0.14
Maximum	1969.10	74.25	183.06	388.97
Panel B: Main sample (n=138)				
Mean	182.06	8.47	384.40	145.65
Median	29.86	1.75	151.80	53.21
Std. Dev	416.43	50.35	528.58	247.21
Minimum	0.07	-124.1	6.11	0.55
Maximum	1969.10	397.47	2020.68	1499.85

Table 4.4 presents sample descriptive statistics for the AIM and Main Market IPO firms over the period 1998-2008. All variables are previously defined.

Table 4.5 Time distribution of IPOs during 1998-2008 by market

	AIM market		Main Market	
Year	**Freq**	**%**	**Freq**	**%**
1998	14	3.23	21	15.22
1999	16	3.70	13	9.42
2000	59	13.63	44	31.88
2001	39	9.01	4	2.90
2002	24	5.54	11	7.97
2003	19	4.39	4	2.90
2004	84	19.40	13	9.42
2005	85	19.63	9	6.52
2006	61	14.09	9	6.52
2007	30	6.93	10	7.25
2008	2	0.46	-	-
Total	**433**	**100.00**	**138**	**100.00**

Table 4.5 presents the frequency of IPO firms by year over the period 1998-2008.

Table 4.6 Industry distribution of IPOs during 1998-2008 by market

	SIC	AIM market		Main Market	
Industry	**2-digit**	**Freq**	**%**	**Freq**	**%**
Oil & gas extraction	13	20	4.62	6	4.35
Food products	20	8	1.85	3	2.17
Printing and publishing	27	12	2.77	1	0.72
Chemicals and allied products	28	28	6.60	9	6.52
Industrial machinery	35	16	3.50	2	1.45
Electronic equipment	36	28	6.47	8	5.80
Instruments and related products	38	16	3.70	7	5.07
Communications	48	20	4.62	7	5.07
Electric, gas, and sanitation	49	9	2.08	1	0.72
Durable goods	50	7	1.62	4	2.90
Eating and drinking establishments	58	13	3.00	2	1.45
Retail	59	5	1.15	3	2.17
Business services	73	129	29.79	53	38.41
Media and entertainment	78	6	1.39	2	1.45
Amusement and recreation	79	24	5.54	3	2.17
Engineering and management services	87	49	11.32	9	6.52
All others	-	43	9.93	18	13.04
Total		**433**	**100.00**	**138**	**100.00**

Table 4.6 presents the frequency of IPO firms by industry over the period 1998-2008.

4.3.2 Audit Quality

The second empirical research question of this thesis (chapter six) examines the impact of enhanced audit quality on real and accrual earnings management at the IPO. Data concerning audit quality (the name of auditors, audit tenure, and audit fees) for IPO firms are collected from Fame and cross checked with the prospectuses. Financial and non-financial data are collected from several databases such as WorldScope, DataStream, ICC Plum, and Lexis-Nexis. All missing data are manually collected from IPO prospectuses. An audit firm is classified as a big N auditor (high quality auditor) if it is considered as one of the big 4 audit firms.[17] With regards to audit tenure, Fame just provides the name of previous auditors and the period for each one of them. Thus, auditor's tenure is constructed by calculating (accumulating) the number of years that the auditor was auditing the IPO client. Finally, and following Mayhew and Wilkins (2003) and Reichelt and Wang (2010), an auditor is identified as an industry expert if the auditor is the largest provider of audit services in the industry and the difference in market share between the largest provider and second provider is greater than 10 percent in a specific industry and year. The market share for each auditor is calculated based on the total audit fees and just for big N audit firms to avoid a brand name effect (Craswell et al. 1995).

After imposing the restriction to all non-financial IPO firms with available prospectuses and the necessary data to analyze the impact of audit quality on real and accrual earnings management, the final sample consists of 240 IPOs audited by big N and 275 IPOs audited by non-big N audit firms over the period 1998-2008. Table 4.7 (Panel A) presents descriptive statistics for IPO firms audited by big N audit firms. Panel A shows that the market capitalization of IPO firms audited by big N on average £199.59 million with a median of £57.62 million. The minimum market capitalization amount is £2.39 million and the maximum amount is £2,020.68 million. While for IPO firms audited by non-big N Table 4.7 (Panel B) shows that the mean (median) market capitalization is £24.83 million (£15 million) with a minimum amount of £1.44 million and a maximum amount of £147.66 million. This large difference in market values between IPO firms audited by big N

[17] The classification for audit firms as big8, big 6, and big 5 is changed over time after series of mergers to become now as big 4 audit firms.

and IPO firms audited by non-big N is consistent with view that large IPO firms have strong incentives to hire high quality auditors to send a positive signal about IPOs to outsiders (Titman and Trueman, 1986; Brau and Fawcett, 2006). In other words, large IPO firms can afford to pay the high costs of those reputable audit firms which allows them to send positive signals about the offer. Moreover, the other figures of Table 4.7, namely total assets and money raised, show similar evidence that IPO firms audited by big N are larger in size than IPO firms audited by non-big N audit firms.

Table 4.8 (Panel A) reports the distribution of IPOs over the period 1998 to 2008 and shows that for IPO firms audited by big N auditors the years 2000, 2004, and 2005 account for more than 50% of the sample, while the majority of other years have similar percentages of IPOs. For IPO firms audited by non-big N audit firms Table 4.8 (Panel A) shows that more than 50% of IPOs have gone public during 2004, 2005, and 2006 with the highest number of IPOs (57 IPOs) is in 2005. Table 4.8 (Panel B) shows the frequency of IPOs relative to the industry standard classification, measured by 2-digit SIC codes. For both IPO firms audited by big N and non-big N Table 4.8 (Panel B) shows that the Business Services industry accounts for more than 30% of the sample, while the majority of other industries show similar percentages of IPOs ranging from 1% to 13%.

Table 4.7 Descriptive statistics for sample IPO firms during 1998-2008 by audit quality

	Total assets (£ mill.)	**Net income (£ mill.)**	**Market value (£ mill.)**	**Money raised (£ mill.)**
Panel A: IPO clients of big N audit firms sample (n=240)				
Mean	102.78	3.95	199.59	75.44
Median	9.65	0.17	57.62	21.73
Std. dev	319.86	38.21	380.08	169.42
Minimum	0.20	-124.10	2.39	0.28
Maximum	1969.10	397.47	2020.68	1499.85
Panel B: IPO clients of non-big N audit firms sample (n=275)				
Mean	8.97	0.05	24.83	10.97
Median	2.03	-0.07	15.00	3.50
Std. dev	42.33	3.88	29.45	56.62
Minimum	0.07	-11.84	1.44	0.14
Maximum	671.60	37.67	147.66	928.80

Table 4.7 presents sample descriptive statistics for IPO clients of big N auditors and IPO clients of non-big N auditors over the period 1998-2008. All variables are previously defined.

Table 4.8 Time and industry distribution of IPOs during 1998-2008 by audit quality

Panel A: Time distribution

	Big N clients		non- Big N clients	
Year	**Freq**	**%**	**Freq**	**%**
1998	24	10.00	9	3.27
1999	10	4.17	16	5.82
2000	59	24.58	35	12.73
2001	17	7.08	24	8.73
2002	15	6.25	14	5.09
2003	9	3.75	11	4.00
2004	38	15.83	47	17.09
2005	31	12.92	57	20.73
2006	21	8.75	44	16.00
2007	15	6.25	18	6.55
2008	1	0.42	-	-
Total	240	100.00	275	100.00

Panel B: Industry distribution

		Big N clients		non-Big N clients	
Industry	**SIC 2-digit**	**Freq**	**%**	**Freq**	**%**
Oil and gas extraction	13	9	3.75	15	5.45
Food products	20	3	1.25	8	2.91
Printing and publishing	27	5	2.08	6	2.18
Chemicals and allied products	28	19	7.92	16	5.82
Industrial machinery	35	9	3.75	6	2.18
Electronic equipment	36	17	7.08	16	5.82
Instruments and related products	38	10	4.17	12	4.36
Communications	48	15	6.25	12	4.36
Electric, gas, and sanitation	49	2	0.83	6	2.18
Durable goods	50	5	2.08	5	1.82
Eating and drinking establishments	58	5	2.08	9	3.27
Retail	59	3	1.25	5	1.82
Business services	73	87	36.25	86	31.27
Media and entertainment	78	1	0.42	4	1.45
Amusement and recreation	79	7	2.92	19	6.91
Engineering and management services	87	19	7.92	37	13.45
All others	-	24	10.00	13	4.75
Total		**240**	**100.00**	**275**	**100.00**

Table 4.8 reports time and industry distributions for IPO clients of big N auditors and IPO clients of non-big N auditors over the period 1998 -2009.

4.3.3 IPO Failure Risk

The third empirical research question of this thesis (chapter seven) examines the association between IPO failure and real and accrual earnings management. Following prior research (e.g., Li and Zhou, 2006; Demers and Joos, 2007) IPO failure is defined as those IPO firms who delisted from the stock exchanges for negative reasons within five years post the IPO date. The negative reasons (involuntary delisted) are, administration, receivership, liquidation, winding up, and bankruptcy. Delisted reasons and dates of delisting are collected form Fame and

were double checked with delisted dates that are obtained from the DataStream. In addition, the delisted reasons from Fame were cross checked with the delisted reasons obtained from Companies House (ICC Plum).

Out of 571 non-financial IPO firms that went public on either the Main or AIM markets between January 1998 and December 2008 (with available prospectuses and the necessary data to analyze real and accrual earnings management), 317 IPOs are delisted and 253 IPOs survive prior to December 2011. Specifically, 90 IPOs are delisted for negative reasons (administration, receivership, liquidation, winding up, and bankruptcy), 140 IPOs are delisted as a result of being acquired by other firms, 68 IPOs are delisted at the request of the company, and 19 IPOs are delisted for other reasons. After imposing the definition of IPO failure (delisted for negative reasons within 5 years after the IPO date), 60 IPOs out of 90 IPOs are found to be delisted for negative reasons within 5 years after the IPO date. Thus, the final sample consists of 60 IPOs delisted for negative reasons and 253 IPO survivors prior to December 2011.

Table 4.9 presents a breakdown of 317 delisted IPOs by reasons for delisting. Table 4.9 shows that 28.39% (90 IPOs) are delisted for negative reasons out of the total delisted IPOs (317 IPOs), 44.16% are delisted for being acquired (takeover) by other firms, 21.46% are delisted at the request of the company, and 5.99% are delisted for other reasons. While after imposing the five-year restriction Table 4.9 shows that 36.58% (60 IPOs) are delisted for negative reasons out of the total delisted IPOs within five year (164 IPOs).

Table 4.9 Data on reasons for the cancellation (delisting) of 317 IPOs between January 1998 and December 2011

	Since the IPO date and up to December 2011		**Since the IPO date and up to 5 years after the IPO date**	
Delisted reasons	**Number**	**Percentage (%)**	**Number**	**Percentage (%)**
Negative reasons	90	28.39	60	36.58
Takeover (being acquired)	140	44.16	72	43.90
At the request of the company	68	21.46	51	31.09
Other reasons	19	5.99	11	6.71
Total delisted IPOs	**317**	**100.00**	**164**	**100.00**

Table 4.9 reports the distribution and reasons for the cancellation (delisting) of 317 IPOs between January 1998 and December 2011.

Table 4.10 (Panels A and B) present descriptive statistics for IPOs delisted for negative reasons within five years after the IPO date and survivor IPOs. Panel A shows that the mean (median) market capitalization for IPO firms delisted for negative reasons is £33.34 million (£18.26 million), while Panel B shows that the mean (median) market capitalization for IPO survivors is £140.80 million (£26.12 million). This large difference in market values between the two samples suggests that small IPO firms exhibit a higher probability of delisting from the stock exchange in the following periods. In addition, Table 4.10 shows that IPO firms delisted for negative reasons experience operating losses during the IPO year compared with IPO survivors. Specifically, Table 4.10 (Panel A) shows that the average net income of IPO firms delisted for negative reasons at the IPO is £-0.54 million, the median is £-0.32 million, the standard deviation is £3.78 million, the minimum amount is £-11.84 million, and the maximum amount is £16.19 million. While for IPO survivors Table 4.10 (Panel B) shows that the mean (median) net income is £4.51 million (£0.01 million) with a minimum amount of £-124.10 million and a maximum amount of £397.47 million.

Table 4.11 (Panel A) reports the time distribution of IPOs delisted for negative reasons and IPO survivors over the period from 1998 to 2008. For IPOs delisted for negative reasons Table 4.11(Panel A) shows that more than 60% of the sample are delisted during the years 2000, 2004 and 2005, while the majority of other years show similar percentages range from 1% to 11%. Table 4.11 (Panel B) presents the frequency of IPOs relative to the industry standard classification, measured by 2-digit SIC code. For IPO firms delisted for negative reasons Table 4.11 (Panel B) shows that the maximum number (highest percentage) of delisted IPOs in a single industry, 2-digits SIC, is 19 IPOs (31.67%) in Business Services industry, while other industries have similar frequencies of delisted IPOs ranging from 1 IPO (1.67%) to 7 IPOs (11.67%).

Table 4.10 Descriptive statistics for sample IPO firms during 1998-2008 by IPO failure

	Total assets (£ mill.)	Net income (£ mill.)	Market value (£ mill.)	Money raised (£ mill.)
Panel A: IPO delisted for negative reasons (n=60)				
Mean	7.75	-0.54	33.34	10.45
Median	2.58	-0.32	18.26	4.70
Std. dev	13.84	3.78	41.78	13.91
Minimum	0.12	-11.84	1.44	0.25
Maximum	75.18	16.19	193.04	55.00
Panel B: IPO survivors (n=253)				
Mean	78.45	4.51	140.80	60.86
Median	4.11	0.01	26.12	6.64
Std. dev	284.31	33.98	349.29	184.76
Minimum	0.07	-124.10	1.44	0.14
Maximum	1969.10	397.47	2020.68	1499.85

Table 4.10 presents sample descriptive statistics for IPO firms delisted for negative reasons and survivor IPO firms. All variables are previously defined.

Table 4.11 Time and industry distribution of IPOs during 1998-2008 by IPO failure

Panel A: Time distributions

	Delisted for negative reasons within 5 years post IPO		Survivors	
Year	**Freq**	**%**	**Freq**	**%**
1998	4	6.67	8	3.16
1999	3	5.00	6	2.37
2000	13	21.67	29	11.46
2001	2	3.33	19	7.51
2002	1	1.67	19	7.51
2003	3	5.00	8	3.16
2004	12	20.00	47	18.58
2005	15	25.00	42	16.60
2006	7	11.67	42	16.60
2007	-	-	31	12.25
2008	-	-	2	0.79
Total	60	100.00	253	100.00

Panel B: Industry distributions

		Delisted for negative reasons within 5 years post IPO		Survivors	
Industry	**2-digit SIC**	**Freq**	**%**	**Freq**	**%**
Oil and gas extraction	13	2	3.33	17	6.72
Food products	20	1	1.67	4	1.58
Printing and publishing	27	1	1.67	6	2.37
Chemicals and allied products	28	5	8.33	16	6.32
Industrial machinery	35	2	3.33	6	2.37
Electronic equipment	36	6	10.00	19	7.51
Instruments and related products	38	2	3.33	9	3.56
Communications	48	1	1.67	12	4.74
Electric, gas, and sanitation	49	1	1.67	5	1.98
Durable goods	50	-	-	2	0.79
Eating and drinking establishments	58	3	5.00	5	1.98
Retail	59	-	-	3	1.19
Business services	73	19	31.67	76	30.04
Media and entertainment	78	1	1.67	5	1.98
Amusement and recreation	79	7	11.67	8	3.16
Engineering and management services	87	1	1.67	28	11.07
All others	-	8	13.36	32	12.64
Total	-	60	100.00	253	100.00

Table 4.11 reports time and industry distributions for IPOs delisted for negative reasons and survivor IPO firms.

4.4 The Estimation of Real Activities and Discretionary Accruals

4.4.1 Measuring Accrual-Based Earnings Management

Discretionary accruals are calculated as the difference between total accruals and the estimated normal accruals. Following prior research in earnings management, the Dechow et al. (1995) cross-sectional adaptation of the modified Jones (1991) model is used to estimate normal accruals. However, Ball and Shivakumar (2008) point out estimating normal accruals for IPO firms using lagged total assets to scale accrual variables may inflate the measure of accruals in the current year. They argue that lagged total assets are qualitatively smaller than total assets at the end of the IPO year because IPO firms tend to use proceeds to invest in assets. In order to overcome this problem, and following Armstrong et al. (2009), all variables in the model are scaled by average total assets rather than lagged total assets. Further, return on assets (ROA) is added to the model as suggested by Kothari et al. (2005) in order to control for extreme operating performance as this can bias the estimation of normal accruals.

To estimate normal accruals for IPO firms, a cross-sectional regression is used for the control sample for each 2-digit SIC code industry-year group. The control sample comprises all non-IPO UK listed firms (non-financial active and dead firms to avoid the survivorship bias) over the period 1998-2008. This approach, in part, controls for changes in economic conditions that impact on total accruals across different industry groups, but allows for coefficients to vary through time (DeFond and Jiambalvo, 1994, Kasznik, 1999; Cohen and Zarowin, 2010). Further, and following prior research (e.g., Rosner, 2003; Iqbal et al., 2009; Athanasakou et al., 2011), any group of firms with less than 6 observations (for each 2-digit SIC code industry-year group) are excluded from the control sample. This restriction results in 174 portfolios (industry-year groups) with more than 6 observations: 147 out of the 174 had observations over 10. Table 4.12 presents industry-year classification for the control sample (all non-IPO UK active and dead firms) that is used to estimate discretionary accruals, abnormal cash flows from operations, and abnormal discretionary expenses.

Table 4.12 Industry-year group classification for the control sample

SIC (2-digit)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
10	-	-	8	9	11	12	12	13	17	19	-	**101**
13	16	20	17	-	19	-	26	24	27	27	-	**176**
15	-	-	-	28	-	24	24	-	-	-	-	**76**
16	-	-	-	-	-	-	8	-	-	-	-	**8**
20	33	-	-	29	30	31	31	30	-	-	-	**184**
22	-	-	-	-	-	-	-	7	-	-	-	**7**
23	-	-	6	-	7	-	-	-	-	-	-	**13**
25	-	-	-	8	-	-	6	-	-	-	-	**14**
27	-	33	26	29	-	31	30	28	26	25	-	**228**
28	43	-	43	45	44	39	39	42	42	-	-	**337**
32	18	-	-	15	-	13	12	-	-	-	-	**58**
33	-	-	-	-	-	-	-	-	6	-	-	**6**
34	-	-	-	20	-	-	-	16	16	16	-	**68**
35	-	-	32	32	34	34	33	36	38	-	-	**239**
36	42	-	42	44	45	42	42	44	46	46	-	**393**
37	-	-	-	-	18		-	-	-	-	-	**18**
38	-	36	32	32	33	30	31	29	27	-	-	**250**
44	8	-	-	-	-		8	-	-	7	-	**23**
48	-	20	21	27	-	24	18	19	18	18	-	**165**
49	-	-	-	18	18	19	20	21	21	25	-	**142**
50	47	47	40	35	-	35	35	33	32	-	-	**304**
51	-	16	-	-	-	-	15	-	-	13	-	**44**
53	-	-	-	-	-	-	-	-	6	-	-	**6**
55	-	-	-	-	-	-	7	-	-	8	-	**15**
56	19	16	-	-	-	-	-	-	-	-	-	**35**
57	-	9	9	-	7	-	6	-	-	-	6	**31**
58	17	20	21	22	21	-	-	18	16	-	-	**135**
59	13	-	13	14	14	-	13	-	-	11	-	**78**
70	-	-	-	-	13	11	-	-	-	-	-	**24**
73	73	73	73	73	73	73	73	73	73	73	-	**730**
78	-	-	-	-	15	-	15	14	-	18	-	**62**
79	19	28	27	27	32	-	30	26	25	-	-	**214**
80	-	-	7	-	9	-	8	-	9	-	-	**33**
82	-	-	-	-		-	6	6	-	-	-	**12**
87	39	46	44	46	48	53	56	57	52	58	-	**499**
Total	**387**	**364**	**461**	**553**	**491**	**471**	**604**	**536**	**497**	**364**	**6**	**4728**

Table 4.12 presents the classification of industry-year group for the control sample

Thus, in the first stage the normal accruals are estimated for all non-IPO UK firms for each year-industry group using the following model:

$$\frac{TA_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{\Delta SALES_{it}}{AvAssets_{it}} + \beta_3 \frac{PPE_{it}}{AvAssets_{it}} + \beta_4 ROA_{it} + \varepsilon_{it} \qquad (4.1)$$

Where $TA_{i,t}$ is total accruals defined as earnings before extraordinary items minus cash flows from operations; $AvAssets_{i,t}$ is the sum of total assets at the beginning of the year and the total assets at the end of the year divided by 2; $\Delta SALES_{i,t}$ is the

change in sales during a year scaled by average total assets; $PPE_{i,t}$ is the gross value of property, plant and equipment scaled by average total assets; and $ROA_{i,t}$ is return on assets calculated as earnings before extraordinary items scaled by average total assets.

In the second stage, the estimated coefficients α_0, β_1, β_2, β_3 and β_4 from equation (4.1) are used to estimate normal accruals ($NA_{i,t}$) for all IPO firms in each year and industry as follows,

$$NA_{it} = \hat{\alpha}_0 + \hat{\beta}_1 \frac{1}{AvAssets_{it}} + \hat{\beta}_2 \frac{\Delta SALES_{it} - \Delta REC_{it}}{AvAssets_{it}} + \hat{\beta}_3 \frac{PPE_{it}}{AvAssets_{it}} + \hat{\beta}_4 ROA_{it} \qquad (4.2)$$

$\Delta REC_{i,t}$ is the change in receivables during the year scaled by average total assets.

Discretionary accruals ($DA_{i,t}$) are measured as the difference between total accruals and fitted normal accruals where,

$$DA_{it} = \left(\frac{TA_{it}}{AvAssets_{it}} \right) - NA_{it} \qquad (4.3)$$

For robustness the analysis is repeated using the performance-matched discretionary accruals approach following Kothari et al. (2005). First, each IPO firm is matched with a non-IPO firm based on year, 2-digit SIC industry code and the closest return on assets (+/- 0.20 of IPO firms' return on assets). Second, discretionary accruals for IPO firms and the matched firms are estimated as above. Then, discretionary accruals for an IPO firm are adjusted by the discretionary accruals for its matched firms.

4.4.2 Measuring Real Activities-Based Earnings Management

Following prior research real earnings management proxies are estimated based on models of real earnings management developed by Dechow et al. (1998) and applied by Roychowdhury (2006). Later researchers such as Zang, (2012), Cohen and Zarowin, (2010), and Cohen et al., (2008) also apply these models to estimate real earnings management. This thesis focuses on two activities of real earnings

management; sales-based manipulation and reducing discretionary expenses. Production cost manipulation is not considered within the analysis of real earnings management as this is a method that can only be fully utilized by manufacturing companies (Roychowdhury, 2006) and manufacturing companies make up just 26.6% of the total sample (571 IPOs). Similar to the estimation of the measures of accrual earnings management all variables are scaled by average total assets rather than lagged total assets.

Sales-based manipulation leads to lower levels of cash flows from operations, and can be managed through offering more price discounts and/or more lenient credit terms (Roychowdhury, 2006). To measure sales-based manipulation, the abnormal level of cash flows from operations for an IPO firm is estimated using similar steps to the estimation of discretionary accruals. First, the normal level of cash flows from operations is estimated using the following cross-sectional regression for all non-IPO UK firms for each industry and year:

$$\frac{CFO_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it}}{AvAssets_{it}} + \beta_3 \frac{\Delta SALES_{it}}{AvAssets_{it}} + \varepsilon_{it} \quad (4.4)$$

Where $CFO_{i,t}$ is cash flows from operations for firm i at period t. All variables are scaled by average total assets rather than lagged total assets to avoid estimation bias (Ball and Shivakumar, 2008).

Second, the estimated coefficients α_0, β_1, β_2, and β_3 from equation (4.4) are used to estimate the normal level of cash flows from operations $(NCFO_{i,t})$ for all IPO firms in each year and industry as follows,

$$NCFO_{it} = \hat{\alpha}_0 + \hat{\beta}_1 \frac{1}{AvAssets_{it}} + \hat{\beta}_2 \frac{SALES_{it}}{AvAssets_{it}} + \hat{\beta}_3 \frac{\Delta SALES_{it}}{AvAssets_{it}} \quad (4.5)$$

Third, the abnormal level of cash flows from operations ($ABNCFO_{i,t}$) for IPO firms is calculated as actual cash flows from operations minus the normal level of cash flows from operations $(NCFO_{i,t})$ as follows,

$$ABNCFO_{it} = \left(\frac{CFO_{it}}{AvAssets_{it}} \right) - NCFO_{it} \quad (4.6)$$

To measure discretionary-expenses based manipulation (the abnormal reduction of R&D, SG&A, and advertising expenses), the normal level of discretionary expenses is estimated following Roychowdhury (2006) for all non-IPO UK firms for each industry and year as follows,

$$\frac{DISX_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it-1}}{AvAssets_{it}} + \varepsilon_{it} \quad (4.7)$$

$DISX_{i,t}$ is, therefore, calculated as the sum of, SG&A, R&D, and advertising expenses for firm i at period t . $SALES_{i,t-1}$ is sales during the previous year. The abnormal level of discretionary expenses for IPO firms is calculated as actual discretionary expenses minus the normal level of discretionary estimated using the coefficients from regression (4.7).

In order to measure the total effect of real earnings management, and following Cohen et al. (2008) and Zang (2012), the abnormal level of cash flows from operations and the abnormal level of discretionary expenses are combined to compute an aggregate measure of real earnings management. Specifically, abnormal cash flows from operations and abnormal discretionary expenses are multiplied by -1, and then calculated as one aggregate measure. A higher amount of this aggregate measure implies that IPO firms are more likely to be manipulating sales to increase reported earnings and cutting discretionary expenses.

4.5 Conclusions

This chapter presents the process of sample construction that is used in the analysis of this thesis, the data sources that are used to collect financial and non-financial data, and descriptive statistics for the key variables. This chapter also presents statistics for all samples that are used in the three empirical chapters; regulatory environments, audit quality, and IPO failure risks. The control sample (all non-IPO

UK firms) and the process of measuring real and accrual earnings management activities are also presented.

The next chapter is the first empirical chapter in this thesis. It investigates the impact of different regulatory environments on real and accrual earnings management of IPO firms in the UK.

Chapter 5
Real and Accrual Earnings Management around Initial Public Offerings under Different Regulatory Environments

5.1 Introduction

The objectives of this chapter are as follows. First, it examines the effect of different regulatory environments on real and accrual earnings management activities around IPOs via an analysis of the heavily regulated Main market of the London Stock Exchange and the more lightly regulated Alternative Investment Market (AIM). Second, it examines the effect of different regulatory environments on the association between real and accrual earnings management and post-IPO stock returns performance. The UK stock market provides a unique setting to directly test the effect of the regulatory environment on earnings management as all firms are governed by the same legal regime, accounting standards and general economic environment, but are subject to differing listing requirements, disclosure systems and monitoring. Further, IPOs present a unique setting in which to examine the impact of regulatory environments on the real and accrual earnings management activities of firms, notably that managers of IPO firms have very strong incentives to manipulate reported earnings upward at the end of the IPO year to maintain high stock prices.[18]

The findings of this chapter contribute to the literature by showing that IPO firms engage in both real and accrual earnings management around IPOs and more specifically, that the regulatory environment matters. IPO firms on the AIM market engage in higher levels of sales-based and accrual-based, and a lower level of discretionary expenses-based manipulations compared to IPO firms on the Main

[18] Teoh et al. (1998a) indicate that the lock-up restriction on managerial shares selling post-IPO, avoiding future litigation risks due to an abnormal reduction in stock prices post-IPO, executive compensation, and meeting earnings forecast are among the most strong incentives to manage earnings upward at the end of the IPO year.

market.[19] Further, post-IPO stock returns are determined not only by the level of real and accrual earnings management during the IPO, but also by the regulatory environment. The evidence suggests that the Main market has better mechanisms/capabilities than the AIM market to effectively correct the stock prices of IPO firms that manage earnings during the IPO year.

Prior studies have presented evidence that IPO firms manipulate earnings using accrual earnings management around IPOs (e.g., Friedlan, 1994; Teoh et al. 1998a; Gramlich and Sorensen, 2004; Morsfield and Tan, 2006). However, little research has examined real earnings management and IPOs. Analyzing real earnings management is important as manipulating real activities represents managerial decisions (that deviate from normal business practice) such as reducing research and development (R&D) expenses or increasing sales by offering greater price discounts and/or more lenient credit terms (Roychowdhury, 2006). Further, recent research shows that real earnings management activities have severe negative consequences for subsequent return and operating performance, with even greater consequences than accruals manipulation (Cohen and Zarowin, 2010; Kothari et al., 2012).

Moreover, and given the increasing interest in real earnings management, recent research finds evidence that stronger regulation has a direct impact on managers' tendency to choose between real and accrual earnings management. Ewert and Wagenhofer (2005) provide evidence that the level of real earnings management increases after accounting standards are strengthened. In line with the evidence of Ewert and Wagenhofer (2005), Cohen et al. (2008) investigate the effect of Sarbanes-Oxley Act 2002 (SOX) on real and accrual earnings management and find evidence that US firms switch from accrual-based manipulation pre-SOX, to manipulating real activities post-SOX. The evidence of Cohen et al. (2008) suggests

[19] While the AIM market provides IPO firms with strong incentives and more flexibility to manage both real and accrual earnings management, the evidence shows that IPO firms on the AIM market avoid discretionary expenses-based manipulation. This is due to the following reasons. First, a higher level of sales-based manipulation that is combined with a lower level of discretionary expenses is likely to bring the attention of outsiders. Second, a lower level of discretionary expenses is associated with a higher probability of IPO failure (Demers and Joos, 2007) and, therefore, higher potential litigation risks. Third, both high quality auditors and prestigious underwriters are found to mitigate discretionary expenses manipulation for IPO firms on the AIM market (the results are reported in Table I in Appendix A).

that more stringent regulation mitigates accrual-based earnings management leading to the more extensive use of real earnings management. Further, Zang (2012) finds evidence that managers engage in real and accrual earnings management as substitutes to manage reported earnings upward. Graham et al. (2005) meanwhile provide evidence that managers prefer real over accrual earnings management to avoid the scrutiny of regulators. Therefore, and in the light of previous evidence, the levels of real and accrual earnings management are likely to differ depending on the regulatory environment in which a firm operates.

In the UK, the London Stock Exchange comprises two different regulatory environments; that is, the Main market and the AIM market. While IPO firms on the Main market are monitored and regulated by the UK Listing Authority (UKLA), IPO firms on the AIM market have to appoint and retain a Nominated Adviser (Nomad), who undertakes the role of regulator. Nomads are private companies that play the role of adviser and regulator for IPO firms on the AIM market. Compared with the Main market, and other developed markets such as those in the US, the AIM market imposes lower corporate governance requirements, lower levels of disclosure and transparency, and a lighter set of listing requirements. For example, while IPO firms on the Main market are required to comply with the UK Corporate Governance Code[20], the AIM market only requires listing firms to have appropriate corporate governance and, therefore, there is a lower requirement for corporate governance mechanisms as compared to the Main market. However, whether these different regulatory burdens (restrictive vs. lighter) would lead to different impacts on disclosure system and financial reporting quality and, therefore, the level of earnings management by companies listed on these markets is still an open question.

Prior literature indicates that the presence of lower quality disclosure system and lower quality financial reporting in the capital markets is associated with two main problems; the agency conflict and information asymmetry (Heal and Palepu, 2001), and that the presence of agency conflict (Jensen and Meckling, 1976; Watts and Zimmerman, 1986) and high levels of information asymmetry (Trueman and

[20] The UK Corporate Governance Code, formerly known as the Combined Code, is a set of standards and principles of good corporate governance practice concerning the board of directors, remuneration, shareholders, audit, accountability, etc.

Titman, 1988; Schipper, 1989; Dechow and Skinner, 2000) are among the most attractive incentives that lead managers to engage in earnings management. For example, a higher level of information asymmetry around IPOs can lead to two types of agency problems; adverse selection and moral hazard (Ritter and Welch, 2002; Bruton et al., 2009). Adverse selection implies that managers have better information about the firm and therefore, they may not reveal all they know about the firm to outsiders e.g. shareholders (e.g. Bruton et al., 2009), while moral hazard implies that managers may not perform their duties efficiently in line with the interest of shareholders due to the information asymmetry between managers and shareholder (Nygaard and Myrtveith, 2000). Thus, and as indicated by agency theory, this conflict between managers and shareholders may lead managers to engage in certain activities (e.g. earnings management) to obtain a private gain and that these activities may decrease the shareholders' wealth (Jensen and Meckling, 1976).

Recent research examines the effect of the lighter AIM regulation compared to the more restrictive regulations of the Main market and other developed markets and provides evidence on the existence of high levels of information asymmetry in the AIM market. For example, Gerakos et al. (2011) find evidence that firms listed on the AIM market have higher levels of information asymmetry, lower levels of liquidity[21], higher failure rates, and higher levels of post-listing stock return underperformance compared with firms listed on the Main market and other developed US markets. In addition, Campbell and Tabner (2011) and Jenkinson and Ramadorai (2010) find firms that move from the AIM market to the Main market experience positive returns on the announcement day of the move, while negative returns are found for firms that move from the Main market to the AIM market. Further, a recent debate by rival exchanges criticized the high level of flexibility of AIM market regulation, which has helped to attract many national and international IPO firms. Roel Campos, a former SEC Commissioner, described AIM as a 'casino' and pointed out that 30% of IPOs on AIM were 'gone in a year'.[22]

[21] Mendoza (2008) also presents evidence that the AIM market has liquidity problems.

[22] SEC official sparks row over Aim 'casino', Financial Times, March 8th 2007.

Furthermore, it is well-documented that earnings management during the IPO leads to negative impact for future stock returns performance. For example, studies have documented that IPO firms with a high level of accrual earnings management at the IPO experience poor stock returns and operating performance in the years following the IPO (DuCharme et al., 2001; Fan, 2007; Chang et al., 2010). Thus, it is expected that the regulatory environment to play vital role on the association between earnings management and post-IPO stock return performance. On the one hand, a regulatory environment with good disclosure systems, is followed by a large number of analysts, and attracts large sophisticated investors is likely to have good mechanism to uncover any earnings manipulation and, therefore, stock prices are corrected accordingly. On the other hand, a regulatory environment with lower quality disclosure systems that is mainly designed to fit the needs of small, growing firms is less likely to attract the same attention of analysts and large sophisticated investors. Thus, a lighter regulatory environment is less likely to have good mechanisms to correct stock prices that were inflated by earnings management. Thus, and in the light of above discussion, it seems that the Main market of the London Stock Exchange is more likely to have better capabilities and mechanisms than the AIM market to evaluate the stock prices of IPO firms that managed earnings in the IPO year. Notably, that the Main market provides listing firms with a wide pool of capital and institutional investors and also is considered to be one of the most developed markets in the world (Arcot et al., 2007).

Though prior research has extensively examined accrual-based manipulation around IPOs, few studies have extended their scope to examine whether IPO firms engage in the manipulation of real activities.[23] Further, no study to date has examined whether lighter regulation provides IPO firms with greater flexibility to utilize real and accrual earnings management techniques around IPOs, and whether the regulatory environment (restrictive vs. lighter) would lead to different impacts on the association between real and accrual earnings management and post-IPO stock return performance. This study, therefore, progresses the earnings

[23] There are few published papers (e.g. Darrough and Rangan, 2005; Wongsunwai, 2012) that examines real earnings management around IPOs. More recently, a number of working papers have emerged examining real earnings management around IPOs. For example, Singer and Fedyk (2011) examine IPO valuation and real and accrual earnings management.

management literature by examining real and accrual based earnings management around IPOs and post-IPO stock return performance under the different regulatory environments of the AIM and Main markets in the UK.

This chapter contributes to the earnings management literature by showing that IPO firms manage earnings upward by manipulating real activities more extensively than accrual-based activities. Further, IPO firms on the lightly regulated AIM market are found to have higher levels of sales-based and accrual-based earnings management around the IPO than firms listing on the more heavily regulated Main market. Also, the results show that IPO firms on the AIM market exhibit a lower level of discretionary expenses-based earnings management compared to IPO firms on the Main market. This is due to the fact that a higher level of sales-based manipulation, which is combined with a lower level of discretionary expenses, is likely to bring the attention of outsiders e.g. auditors, underwriters and, therefore, is likely to be associated with a higher probability of IPO failure (Demers and Joos, 2007) and higher future litigation risks.[24] Finally, while prior research focuses on accrual-based manipulation and finds evidence that it predicts post-IPO stock return underperformance, this chapter shows evidence that post-IPO stock return underperformance is a function of the level of both real and accrual based earnings manipulation in the IPO year. More importantly, the evidence shows that the regulatory environment matters and that IPO firms on the Main market, which exhibit higher levels of real and accrual earnings management at the end of the IPO year, experience more severe poor stock return performance in the following period. This evidence, in turn, confirms the view that the Main market is very developed market that attracts the attention of analysts and very sophisticated investors (Arcot et al., 2007).

The study proceeds as follows. Section two provides a brief overview of UK stock markets. Section three reviews the related literature and presents the hypotheses development. Section four discusses data and research methods. Section five discusses empirical evidence on the use of real and accrual earnings

[24] For IPO firms on the AIM market Table I in Appendix A provides evidence that both high quality auditors and prestigious underwriters mitigate discretionary expenses-based manipulation during the IPO.

management around IPOs and the relations with the regulatory environment and post-IPO stock performance. Section six presents the additional analysis. Section seven concludes.

5.2 Background of UK Stock Markets and Theories of Earnings Management

5.2.1 Background of UK Stock Markets.

The AIM and Main markets of the London Stock Exchange represent examples of relatively flexible versus restrictive regulatory environments. Jenkinson and Ramadorai (2010) present a detailed review and a discussion of the major differences between the AIM and Main markets. The regulatory environment of the Main market is more restrictive and similar to other developed stock markets, while the AIM market has lighter and more flexible regulation. The purpose of the AIM market is to provide small and medium size firms with greater opportunities to raise capital from the public, and as a result the market has a lighter regulatory environment to reduce compliance and listing costs.

Comparing the listing requirements, IPO firms on the AIM market are not required to have previous financial records before going public or to have a minimum market capitalization.[25] Hence, IPO firms on the AIM market can go public within a short period of commencing trading. In contrast, IPO firms on the Main market should have, at least three years of financial records, at least 25% of their capital should be in public hands prior to going public, a minimum market capitalization, and at least 75 percent of their business should be supported by a revenue earning record. IPO firms on the AIM market have no such requirements.

In addition, prospectuses for IPO firms on the AIM market are not pre-vetted by the UKLA. In contrast, this is a mandatory requirement for IPO firms listing on the Main market, as all IPO firms on the Main market are monitored and regulated by the UKLA. AIM listed firms however, are monitored and regulated by a Nomad.

[25] This restriction does apply for some companies such as those engaged in scientific research, London Stock Exchange at http://www.londonstockexchange.com/home/homepage.htm

The Nomad plays the key role in monitoring and advising firms listed on the AIM market and is also crucial in ensuring the integrity of the AIM market. Further, while the Main market requires all listed firms to comply with the UK Corporate Governance Code, the AIM market only requires listing firms to have appropriate corporate governance. However, while Nomads play an important role in advising AIM firms on appropriate corporate governance practices, in general, such firms are more likely to have less effective corporate governance mechanisms than firms on the Main market. In spite of the recent evidence by Gerakos et al. (2011) that shows the lighter regulation of the AIM market can have negative consequences on firms' future performance, the AIM market has attracted many national and international firms with more than 3,100 IPO firms raising over £67 billion since its launch in 1995.[26] Table 5.1 presents a summary of the main differences between the two markets.

Table 5.1 Differences in admission criteria and continuing obligations for the AIM and Main markets

Aim Market	Main Market
No minimum market capitalization	Minimum market capitalization
No trading record requirement	Normally 3-year trading record required
No prescribed level of shares to be in public hands	Minimum of 25% of shares held publically
No prior shareholder approval for most transactions	Prior shareholder approval required for substantial acquisitions and disposals (premium listings only)
Nominated Adviser required at all times	Sponsors needed for certain transactions (premium listings only)
Admission documents not pre-vetted by the Exchange or by the UKLA in most circumstances. The UKLA will only vet an AIM admission document where it is also a Prospectus under the Prospectus Directive	Pre-vetting of prospectus

Table 5.1 reports differences in admission criteria and continuing obligations for the AIM and Main markets.[27]

[26] A Guide to AIM, page 6, available at: http://www.londonstockexchange.com/home/homepage.htm

[27] Source: London Stock Exchange Website (A Guide to AIM, page 6) Available at: http://www.londonstockexchange.com/home/homepage.htm

5.2.2 Information Asymmetry, Agency Conflict, Earning Management and the Regulatory Environment of the AIM and Main markets in the UK.

The quality of disclosure system and financial reporting is crucial to the success of capital markets and their liquidity level (Levitt, 1997)[28] and to reducing information asymmetry and agency problems that may raise between managers and shareholders (Ball, 2001; Heal and Palepu, 2001). Prior research indicates that the existence of higher levels of information asymmetry and agency problems motivate managers to engage in earnings management to obtain a private gain (Jensen and Meckling, 1976; Watts and Zimmerman, 1986; Trueman and Titman, 1988; Schipper, 1989; Dechow and Skinner, 2000). For example, a regulatory environment with a higher level of information asymmetry implies that managers have better information about the firm's current and future operations than outside investors and, therefore, it will be easier for managers to manipulate reported earnings if they have strong incentives e.g. executive compensation, managerial shares selling, etc.

In the UK, the regulatory environment of the AIM market is very flexible and mainly designed and structured to fit the needs of small, growing IPO firms that are required to appoint and retain a Nominated Adviser (Nomad), who are private companies that play the role of adviser and regulator for firms on the AIM market.[29] This view about AIM lighter set of rules is clearly expressed by the London Stock Exchange as follows,

> *"In recognition of AIM's role as a market for growing companies, the Exchange has made the AIM Rules relatively simple and clear, with entry requirements and continuing obligations which are less prescriptive than those of many other markets. For example, the*

[28] Arthur Levitt, Chairman U.S. Securities and Exchange Commission Remarks to the Inter-American Development Bank: The Importance of High Quality Accounting Standards (September 29, 1997), available at http://www.sec.gov/news/speech/speecharchive/1997/spch176.txt.

[29] A Guide to AIM (2010), available at http://www.londonstockexchange.com/companies-and-advisors/aim/publications/documents/a-guide-to-aim.pdf

> *UK Listing Authority's Listing Rules, which apply to companies seeking to list on the Main Market of the London Stock Exchange, are significantly longer and more prescriptive" (*A Guide to AIM, 2010, p.38).

However, researchers criticize the lighter regulatory environment of the AIM market and its lighter disclosure systems. For example, Mendoza (2008) describes the AIM market, which has lighter set of rules, as principles-based rules that provide listed firms with more flexibility to apply these rules through the comply-or-explain option. One feature of this option is that firms on the AIM market are not required to comply with the UK Corporate Governance Code rather they just need to explain why not to comply.[30] Further, prior research indicates that these sub-optimal disclosures and lighter corporate governance standards in the AIM market can lead to investors being easily manipulated and even defrauded (Dey, 2006, cited in Mendoza, 2008).[31] For example, sub-optimal disclosures system can lead to a higher level of information asymmetry, while lower corporate governance standards can motivate the agency conflict between managers and shareholders.[32] Other research indicates that illiquidity and under-pricing are considered as drawbacks of the AIM market (Litvintsev, 2009).

Furthermore, and by discussing the disclosure system as explained in AIM rules, Gerakos et al. (2011) indicate that firms listed on the AIM market are required to disclose information about the following; price-sensitive non-public information, substantial transactions, related party transactions, reverse takeovers, and assets disposal that could have strong impact on the business. However, both Mendoza (2008) and Gerakos et al. (2011) point out that it is just the Nomads' responsibility to determine the merits of disclosure and which information is considered as price-

---

30 "*Main Market companies, being admitted to the Official List, are required to adhere to the Principles of Good Governance set out in the The UK Corporate Governance Code (formerly the Combined Code), a set of guidelines designed to ensure that each listed company is headed by an effective board acting in the interests of all stakeholders in the company*".
A Guide to AIM, 2010, p.38, available at, http://www.londonstockexchange.com/companies-and-advisors/aim/publications/documents/a-guide-to-aim.pdf

31 Iain Dey, "*you have to go into AIM with your eyes open*", The Telegraph, June 18th 2006.

32 Heal and Palepu (2001) indicate that board of directors plays a significant role to monitor managers and, therefore, mitigate any agency problems that could occur between insiders and outsiders.

sensitive information, and also to make sure that all the previous disclosures are made without any manipulations by their advisee firms.[33] Consistent with this view, Litvintsev (2009) explains the importance of Nomads on AIM market by indicating that the role of a Nomad, based on the Article 14 of the AIM Rules, is to decide whether a company is ready and meets the requirements to be listed on the AIM market, not ready yet to list, or should be delisted from the stock exchange. Litvintsev (2009) also indicates that Nomad's roles on the AIM market are similar to the roles of the SEC in the US and the UKLA in the UK Main market. Mendoza (2008) mentioned that many commentators point out the fact that some of the Nomads on the AIM market are small and speculative as the firms for which they acts as adviser.[34] Therefore, whether a firm listed on the AIM market will exhibit higher levels of disclosure and higher quality financial reporting is something to be decided and evaluated by its Nomad.

Recent research shows evidence confirming the previous view on the negative impact of AIM lighter regulatory environment on disclosure systems and financial reporting quality of firms listed on the AIM market, and on the negative impact of lower reputable Nomads on AIM firms' future performance. For example, Jenkinson and Ramadorai (2010) and Campbell and Tabner (2011) find firms that move from the Main market to the AIM market experience negative returns on the announcement day of the move, suggesting that investors react negatively to this news. Gerakos et al. (2011) find firms listed on the AIM market have higher levels of information asymmetry, higher failure rates, higher post-listing return underperformance, and lower levels of liquidity. Mendoza (2008) indicates that the AIM market has liquidity problems. Espenlaub et al. (2012) investigate whether the future performance of firms listed on the AIM market is affected by the reputation of their Nomads. Espenlaub et al. (2012) find evidence that lower quality Nomads have a negative impact on survivability of AIM firms.

[33] For more details please see AIM Rules For Companies, available at http://www.londonstockexchange.com/companies-and-advisors/aim/advisers/rules/aim-rules-for-companies.pdf

[34] For example, "Business: AIM Changes" BRIEFINGS, Mischon de Reya, (December 2006). http://www.mishcon.com/news/briefings.

Thus, and based on the above discussion, it is more likely that IPO firms on the AIM market will exhibit higher levels of information asymmetry and agency conflict and, therefore, managers of AIM IPO firms will have strong incentives and more flexibility to manage earnings upward at the end of the IPO year utilizing real and accrual earnings management to support high stock prices.

5.3 Literature Review and Hypotheses Development

First, the literature on real and accrual earnings management around IPOs is reviewed. Second, a discussion is presented on how earnings management might differ according to the nature of the regulatory regime. Third, the potential consequences of real and accrual earnings management on post-IPO stock performance and the regulatory environments are reviewed. The existing evidence and research in each of these areas are discussed to build and state the hypotheses.

5.3.1 Real and Accrual Earnings Management around IPOs

In pursuit of analyzing the impact of the regulatory environment on earnings management, this chapter first examines whether IPO firms undertake real and accrual earnings management around IPOs. An IPO is considered to be one of the most important events in a firm's life cycle and, therefore, IPO firms have very strong incentives to manage earnings upward around IPOs (e.g., Aharony et al., 1993; Friedlan, 1994; Roosenboom et al., 2003). For example, IPO firms may engage in earnings management pre the IPO to increase the offer price. Brau and Fawcett (2006) surveyed more than 300 executives about IPOs and found evidence that historical earnings represent the most important positive signal that executives attempt to send to outside investors.

Further, IPO firms have strong incentives to manage earnings upward at the end of the IPO year (at the end of the first year of being public firms) to maintain high stock prices. For example, Teoh et al. (1998a) examine earnings management around IPOs and argue that IPO firms are likely to manage earnings at the end of the IPO year to maintain high stock prices for the following reasons. First, entrepreneurs usually are restricted by the lock-up period from selling their shares immediately post the IPO date and, therefore, any reversal of performance of earnings would lead

to negative impacts on stock prices and eventually the entrepreneurs' investment.[35] Consistent with this, Darrough and Rangan (2005) find evidence that managers reduce R&D expenses at the end of the IPO year to manage earnings upward, and this reduction in R&D expenses was motivated by managerial share selling as managers believe investors place greater emphasis on current earnings. Second, IPO firms face a high litigation risk especially when the firms manage earnings upward pre the IPO and that their reported earnings post-IPO decline compared with the pre-IPO period. This in turn suggests, and as indicated by Teoh et al. (1998a), that IPO firms which manage earnings upward pre-IPO are likely to manage the first reported earnings post the IPO date. Third, IPO firms may provide earnings forecasts in the prospectuses and, therefore, they are under pressure to meet their earnings forecast to maintain good relations with investors, underwriters, analysts, and to avoid any reputation damage or any future litigation risks by shareholders due to a reversal of earnings in the post-IPO period. Gramlich and Sorensen (2004) find evidence that IPO firms engage in accrual manipulation at the end of the IPO year (the first reported earnings after the date of IPO) to meet earnings forecasts. Teoh et al. (1998c) also added that executive compensation is considered as a strong incentive to manage earnings upwards, notably that the time to exercise compensation options is usually after the IPO date with a lot of several months.

Other studies have, however, documented evidence that questions the existence of accrual earnings management during IPOs (e.g., Ball and Shivakumar, 2008; Armstrong et al., 2009; Cecchini et al., 2012). For example, Armstrong et al. (2009) find that the previous negative association between accrual-based manipulation and the subsequent stock return performance is an artifact of the mispricing of operating cash flows. Cecchini et al. (2012) examine the allowance for uncollectable accounts and bad debt expenses and find evidence that IPO firms manage earnings downward using more decreasing allowances. Ball and Shivakumar (2008) examine accrual accounting during the year pre IPO for 171 UK

[35]A commitment to a lock-up period by IPO managers is considered as a positive signal about the IPO firm's quality (Courteau, 1995; Brau et al., 2005).However, a long lock-up period may lead managers to manage earnings upward in the months immediately post the IPO date to maintain high stock prices. For the UK IPO sample that is examined by this thesis, the average lock-up is 14 months post the IPO date. This in turn implies that post-IPO poor stock returns will lead to negative consequences for insiders' wealth.

IPOs, which have similar information and characteristics in the financial reports and the prospectuses, over the period 1995 -1999. Ball and Shivakumar (2008) present evidence that UK IPO firms provide high quality reporting, tending towards accounting conservatism, rather than accounting manipulation. They argue that IPO firms report conservatively in response to the expected demand for high quality reporting, which is enforced by efficient players in the capital market.

However, Lo (2008) discusses Ball and Shivakumar's (2008) paper and points out the possibility that Ball and Shivakumar (2008) may exclude the IPO firms that managed earnings because their sample is restricted to firms that present similar information and categorization between the financial reports and the prospectuses. In the UK, IPO firms have the right to restate their financial reports for the periods before the IPO year, but they should mention this restatement in their prospectuses. Lo (2008) argues IPO firms that managed earnings are more likely to provide different information and categorisation between the prospectus and the financial reports in order to make it harder for the outside investors to discover and detect any earnings manipulation. In addition, Lo (2008) indicates that IPO firms can manage earnings utilizing real earnings management activities, which are not examined by Ball and Shivakumar (2008).

In summary, although some recent research questions the existence of accrual earnings management around IPOs, the majority of prior studies find evidence that IPO firms engage in accrual-based manipulation around the IPO event. However, this chapter addresses the comments of Ball and Shivakumar (2008) and Armstrong et al. (2009) to avoid any measurement error when discretinary accruals are estimated. For example, and as suggested by Ball and Shivakumar (2008), the cash flow approach is used to estimate discretionary accruals rather than balance sheet approach. Further, Ball and Shivakumar (2008) point out that prior research uses lagged total assets as a deflator in accruals models and this inflates discretionary accruals. They argue that IPO firms use IPO proceeds to invest in their assets and, therefore, using lagged total assets would lead to bias in accruals estimation. Thus, to overcome this problem this chapter follows Armstrong et al. (2009) and scales all variables by average assets rather than lagged total assets. Finally, Armstrong et al. (2009) find the negative association between discretionary

accruals and post-IPO stock return performance is an artifact of cash flow mispricing. Thus, this chapter controls for the absolute value of cash flows from operations when the impact of real and accrual earnings management for subsequent stock return performance is examined.

Despite the extensive research on accrual earnings management, there has been limited research examining whether IPO firms engage in manipulating real activities. Darrough and Rangan (2005) for example show IPO firms reduce R&D expenses during the IPO year to increase reported earnings. They find that the reduction in R&D is motivated by managerial share selling as managers believe investors place greater emphasis on current earnings. Consistent with this view, Graham et al. (2005) provide evidence that executives are more willing to undertake real as opposed to accrual earnings management to manipulate reported earnings. Compared to accrual-based manipulation, real earnings management is harder for auditors, regulators, investors, etc to detect (Graham et al., 2005; Roychowdhury, 2006; Cohen et al., 2008). Further, firms that have engaged extensively in accrual-based manipulation in previous years have limited flexibility to utilize accrual earnings management for the current year because the balance sheet accumulates all the previous changes of accounting methods (Barton and Simko, 2002). Therefore, IPO firms that undertook extensive accrual-based manipulation in previous years are more likely to switch to real earnings management in the current period (Gunny, 2010).

One final factor that must be considered is accrual earnings management is a relatively risky means of meeting earnings targets as it occurs at the end of a fiscal year or quarter (Roychowdhury, 2006). If managers decided to manage earnings using accrual manipulation alone, and the amount being manipulated fell short of the desired threshold, there would be insufficient time to manage real activities at this time of the year to meet the earnings target. A recent paper by Cohen and Zarowin (2010) finds that SEO firms engage simultaneously in real and accrual earnings management during the offer year, while prior literature focused extensively on accrual-based manipulation around the SEO year. Zang (2012) find evidence that managers utilize real activities-based throughout the fiscal year and then accrual-based earnings management is adjusted at the end of fiscal year by the unrealized

amount of real activities to meet the desired threshold. Given the limited research examining real earnings management around IPOs, but based upon the evidence above, this chapter examines whether IPO firms in the UK engage in real and accrual earnings management around the IPO year. The first hypothesis, in alternative form, is therefore as follows:[36]

HYPOTHESIS 1. *IPO firms in the UK exhibit evidence of real and accrual earnings management around the IPO year.*

5.3.2 Real and Accrual Earnings Management around IPOs and the Regulatory Environment

The primary objective of this chapter is to examine the effect of the regulatory environment on real and accrual earnings management. While the Main market in the UK imposes restrictive regulation on IPOs, the AIM market has fewer requirements and imposes lighter regulation. For example, while the Main market requires the firms to comply with the UK Corporate Governance Code, the AIM market requires listing firms to have an appropriate corporate governance mechanism. The Nomad advises IPO firms about their corporate governance to ensure the integrity of the market. Therefore, whether AIM firms meet the requirements of effective corporate governance is something evaluated by the appointed Nominated Advisor.

The role of corporate governance in mitigating the agency conflict between managers and shareholders (Heal and Palepu, 2001) and, therefore, preventing real and accrual earnings management has been extensively researched (e.g., Yang and Krishnan, 2005; Cornett et al., 2008; Laux and Laux, 2009). Specifically, the literature finds evidence that the proportion of outside directors on the board, the separation of CEO and Chairman, and the independence of the audit committee are the most effective monitoring and mitigating factors on real and accrual earnings management (e.g., Klein, 2002; Peasnell et al., 2005; Osma, 2008). More recently,

[36] It is worth noting that Hypothesis 1 is not new to the literature and it has been already addressed by prior research based on IPOs setting e.g. Teoh et al., 1998a; Wongsunwai, 2012. However, it is necessary to examine such hypothesis in the thesis to prove consistency with prior literature.

Gerakos et al. (2011) find evidence that firms on the AIM market have a higher level of information asymmetry than firms on the Main market. By comparing firms listed on the AIM market with firms listed on the Main market and US markets, they find evidence that firms listed on the AIM market have higher levels of information asymmetry, failure rates, post-listing underperformance as well as lower liquidity.

Trueman and Titman (1988), Schipper (1989) and Dechow and Skinner (2000) indicate that the existence of high levels of information asymmetry is one of the motivations for managers to engage in earnings management. Richardson (2000) explores the effect of information asymmetry on accrual earnings management and finds evidence that firms with higher levels of information asymmetry have higher levels of accrual-based manipulation. Moreover, Mendoza (2008) indicates that the AIM market has liquidity problems and recent research finds evidence that firms with lower levels of liquidity have higher levels of earnings management. For example, Chung et al. (2009) present evidence that firms with a high level of earnings management experience a lower level of stock liquidity.

Given the above evidence that the AIM market is likely to exhibit higher levels of agency conflict and information asymmetry, it is expected that IPO firms on the AIM market will have strong incentives and more flexibility to engage in real and accrual earnings management than IPO firms on the Main market. Therefore, the second hypothesis is as follows:

HYPOTHESIS 2. *IPO firms on the AIM market exhibit higher levels of real and accrual earnings management than IPO firms on the Main Market.*

5.3.3 Real and Accrual Earnings Management and Post-IPO Stock Performance under Different Regulatory Environments

To further examine the impact of the regulatory environment on earnings management and post-IPO stock return performance, this chapter analyzes the association between real and accrual earnings management and post-IPO stock returns performance and whether the regulatory environment impacts this association. Prior research examines the association between real and accrual earnings management, which take place around equity offerings (e.g. SEOs and

IPOs), and future operating and stock return performance. For example, Rangan (1998) finds evidence that SEO firms manage earnings upward during the SEO year and experience poor stock returns and operating performance in the subsequent periods. Given the extensive evidence on accruals manipulation, Cohen and Zarowin (2010) extend previous literature by examining whether SEO firms engage in real earnings management activities around the SEO year and whether these activities are associated with future operating performance. They find evidence that real earnings management takes place during the offer year and predicts post-SEO operating underperformance. Further, Kothari et al. (2012) focus on post-SEO stock return performance and find evidence that real earnings management that occur during the SEO year is negatively associated with post-SEO stock return performance. More importantly, both Cohen and Zarowin (2010) and Kothari et al. (2012) find evidence that real earnings management activities have more severe negative consequences for future operating and stock return performance than accrual earnings management.

Focusing on IPOs setting, prior literature also finds IPO firms which manage earnings upward using accrual-based manipulation during IPOs experience poor stock returns in subsequent periods. For example, Teoh et al. (1998a) find IPO firms that have high levels of accrual earnings management during the IPO year experience poor stock returns for up to three years after the IPO year. In addition, by comparing post-IPO stock returns across different levels of accrual earnings management Teoh et al. (1998a) find the decline in stock returns is more severe for those firms that aggressively managed their earnings during the IPO. Further, Teoh et al. (1998c) finds similar evidence that higher accrual earnings management during the IPO year is associated with lower stock returns in the post-IPO period. Roosenboom et al. (2003) also find evidence that IPO firms with high levels of accrual earnings management during the IPO year experience poor stock returns post-IPO. Fan (2007) finds evidence that accruals manipulation that takes place during the IPO year predicts post-IPO operating underperformance, while Chang et al. (2010) examine the moderating role of prestigious underwriters on the association between accrual earnings management and post-IPO stock return performance. For IPO firms with less reputable underwriters, Chang et al. (2010)

find evidence that accrual earnings management during the IPO is associated with poor long-term stock returns performance.

In addition, as the London Stock Exchange compromises two different regulatory environments, the AIM and the Main markets, it is expected that each market will have different mechanisms/capabilities to evaluate the stock prices of IPO firms that managed earnings in the IPO year. The Main market is considered to be one of the most developed markets in the world that gives listing firms a wide pool of capital and institutional investors (Arcot et al., 2007). In contrast, the AIM market imposes a lighter regulatory environment in order to provide small and growing firms with the opportunity to raise capital. As a consequence, it is less likely to attract the same attention of analysts and sophisticated investors as the Main market. Due to the existence of a much larger number of professional investors and much greater coverage by analysts, IPO firms on the Main market that managed earnings upward during the IPO are more likely to be punished in the following period by a re-evaluation of their stock prices relative to those firms that listed on the AIM market. Therefore, it is expected that IPO firms on the main market will experience greater long-run return underperformance due to real and accrual earnings management that take place at the end of the IPO year. Hence, the next hypotheses are as follows:[37]

HYPOTHESIS 3a. *IPO firms that report high levels of real and/or accrual earnings management during the IPO year will experience poor stock return performance in the post-IPO period.*

HYPOTHESIS 3b. *IPO firms on the Main market that report high levels of real and/or accrual earnings management during the IPO year will experience, ceteris paribus, poorer stock return performance in the post-IPO period than those firms that listed on the AIM market.*

[37] Hypothesis 3a is not new to the literature and it has been already addressed by prior research based on IPOs setting e.g. Teoh et al., 1998a. However, it is necessary to examine such hypothesis in the thesis to prove consistency with prior literature.

5.4 Research Methods and Data

5.4.1 Data and Sample Construction

The sample consists of 571 IPO firms that went public on either the Main or AIM markets between January 1998 and December 2008.[38] All financial IPO firms are excluded from the sample due to differences in their financial reporting and disclosure requirements (e.g., Teoh et al., 1998a; 1998c; Chen et al., 2005; Morsfield and Tan, 2006; Fan, 2007; Chang et al., 2010; Lee and Masulis, 2011; Chahine et al., 2012; Wongsunwai, 2012). The sample also is restricted to all IPO firms with available prospectuses and the necessary data to allow analyzing real and accrual earnings management. This restriction results in the sample consisting of larger and more successful firms, and as noted by Cohen et al., (2008) and Cohen and Zarowin (2010), a more conservative test of earnings management. Further, this chapter follows prior research by excluding from the control sample (all UK non-IPO firms) any group of firms with less than 6 observations for each 2-digit SIC code industry-year group. This restriction results in 174 portfolios (industry-year groups) with more than 6 observations: 147 out of the 174 had observations more than 10.[39] The IPO year (0) is defined as the fiscal year during which the IPO occurs.[40]

Data are collected using the following sources: (1) IPO firms are identified using the list of IPOs on the London Stock Exchange website for UK firms that were admitted to the AIM and Main markets during the period 1998-2008. This list provides information about IPOs such as, issue price, the date of an IPO, market capitalization, etc; (2) the ICC Plum and Lexis-Nexis databases were used to obtain information about the company identifier for IPO firms, such as the WorldScope and

[38] The London Stock Exchange provides information about IPOs on the Main market starting from 1998 while information about IPOs on the AIM market starts from 1995. Therefore, and to be consistent, the sample covers the period 1998 - 2008.

[39] Also the analysis is repeated using 10 observations for each industry-year group and the results are qualitatively similar but this restriction leads to a large decrease in the sample size and so this chapter follows Rosner, (2003), Iqbal et al., (2009), and Athanasakou et al., (2011) and uses 6 observations.

[40] To overcome any misspecification of the financial year end, the financial data obtained from WorldScope are cross checked with the financial data in the prospectus and the results are qualitatively similar.

ISIN codes; (3) financial data for the IPO firms and for the control sample of all UK non-IPO firms were obtained from the WorldScope database; (4); WorldScope however, does not provide all the required financial data for the sample of IPO firms, therefore, IPO prospectuses were downloaded from the Thomson One Banker database and all missing financial data were manually collected from IPO prospectuses; (5) the DataStream database was used to collect the stock prices for the sample of IPOs and their matched firms; (6) data concerning audit quality were obtained from the Fame database.

Table 5.2 presents descriptive statistics for the AIM and Main IPO samples. The mean market capitalization for IPO firms on the AIM market is approximately £28 million and for IPO firms on the Main market is approximately £384 million. This large difference in market values between IPO firms on the AIM and Main markets is consistent with the view that the AIM market is dominated by small, growing IPO firms. However, the range of market values shows that some IPO firms with large market values listed on the AIM market.

Table 5.3 reports the distribution of IPOs over the period from 1998 to 2008 and shows that the years 2000, 2004, 2005, and 2006 account for more than 60% of the sample. In addition, one consequence of the recent global financial crisis is that the lowest number of IPOs in the sample is in 2008. Table 5.4 shows the frequency of IPOs relative to the industry standard classification, measured by 2-digit SIC codes. Except for the clustering in the Business Services industry, which accounts for 31% of the total sample, the majority of other industries have similar percentages of IPOs ranging from 1% to 10%.

Table 5.2 Descriptive statistics for sample IPO firms during 1998-2008

	Total assets (£ mill.)	Net income (£ mill.)	Market value (£ mill.)	Money raised (£ mill.)
Panel A: Whole sample (n=571)				
Mean	56.12	1.93	113.93	43.41
Median	4.47	-0.03	25.11	7.00
Std. dev	233.90	25.38	302.19	136.22
Minimum	0.07	-124.10	1.44	0.14
Maximum	1969.10	397.47	2020.68	1499.85
Panel B: AIM sample (n=433)				
Mean	15.99	-0.15	27.73	10.82
Median	2.73	-0.09	17.83	5.00
Std. dev	102.53	5.30	32.67	26.43
Minimum	0.07	-12.61	1.44	0.14
Maximum	1969.10	74.25	183.06	388.97
Panel C: Main sample (n=138)				
Mean	182.06	8.47	384.40	145.65
Median	29.86	1.75	151.80	53.21
Std. dev	416.43	50.35	528.58	247.21
Minimum	0.07	-124.10	6.11	0.55
Maximum	1969.10	397.47	2020.68	1499.85

Table 5.2 presents sample descriptive statistics for the pooled, AIM, and Main Market IPO firms over the period 1998-2008. Total assets are the beginning of period total assets; net income at the end of the IPO year; market value is the market capitalization for IPO firms immediately after the listing; and money raised is the offer amount of the IPO. Total assets and net income are obtained from the WorldScope database; market value and money raised are obtained from the London Stock Exchange website.

Table 5.3 Time distribution of IPOs during 1998-2008

	AIM market		Main Market		Whole Sample	
Year	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
1998	14	3.23	21	15.22	35	6.13
1999	16	3.70	13	9.42	29	5.08
2000	59	13.63	44	31.88	103	18.04
2001	39	9.01	4	2.90	43	7.53
2002	24	5.54	11	7.97	35	6.13
2003	19	4.39	4	2.90	23	4.03
2004	84	19.40	13	9.42	97	16.99
2005	85	19.63	9	6.52	94	16.46
2006	61	14.09	9	6.52	70	12.26
2007	30	6.93	10	7.25	40	7.01
2008	2	0.46	-	-	2	0.35
Total	**433**	**100.00**	**138**	**100.00**	**571**	**100.00**

Table 5.3 presents the frequency of IPO firms by year over the period 1998-2008

Table 5.4 Industry distribution of IPOs during 1998-2008

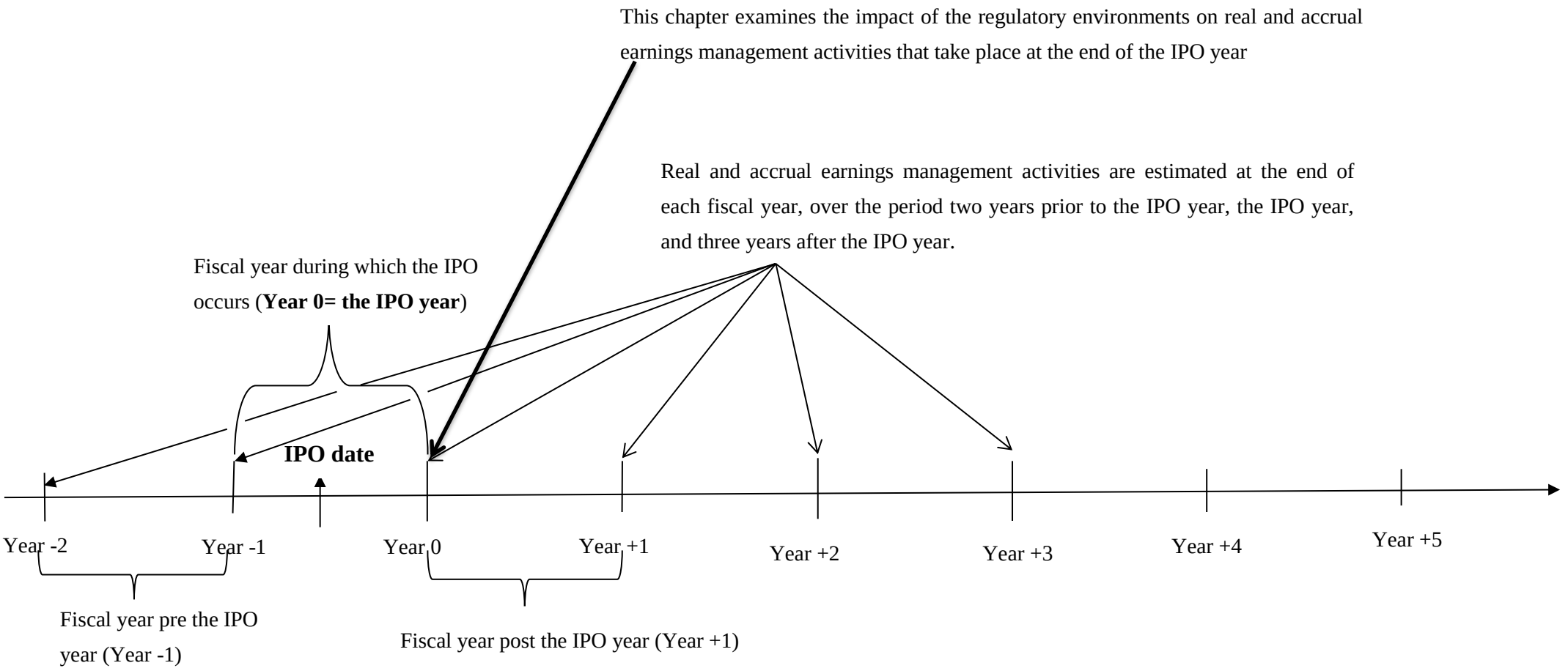
Industry	SIC 2-digit	AIM market Freq	AIM market %	Main Market Freq	Main Market %	Whole Sample Freq	Whole Sample %
Oil & gas extraction	13	20	4.62	6	4.35	26	4.55
Food products	20	8	1.85	3	2.17	11	1.93
Printing and publishing	27	12	2.77	1	0.72	13	2.28
Chemicals and allied products	28	28	6.60	9	6.52	37	6.48
Industrial machinery	35	16	3.50	2	1.45	16	2.80
Electronic equipment	36	28	6.47	8	5.80	36	6.30
Instruments and related products	38	16	3.70	7	5.07	25	4.21
Communications	48	20	4.62	7	5.07	27	4.73
Electric, gas, and sanitation	49	9	2.08	1	0.72	10	1.75
Durable goods	50	7	1.62	4	2.90	11	1.93
Eating and drinking establishments	58	13	3.00	2	1.45	15	2.63
Retail	59	5	1.15	3	2.17	8	1.40
Business services	73	129	29.79	53	38.41	182	31.87
Media and entertainment	78	6	1.39	2	1.45	8	1.40
Amusement and recreation	79	24	5.54	3	2.17	27	4.73
Engineering and management	87	49	11.32	9	6.52	58	10.16
All others	-	43	9.93	18	13.04	61	10.68
Total		**433**	**100.00**	**138**	**100.00**	**571**	**100.00**

Table 5.4 presents the frequency of IPO firms by industry over the period 1998-2008.

5.4.2 Event periods

This thesis focuses on examining real and accrual earnings management that take place at the end of the fiscal year. For example, if the IPO date was 14th July 2005 for firm X and the fiscal year for this firm starts at 1st January and ends at 31st of December, then real and accrual earnings management for firm X are estimated at the end of the fiscal year, which is at the 31st of December 2005. For the years pre and post the IPO year, real and accrual earnings management are also estimated at the end of the fiscal year. This approach of estimating earnings management is consistent with prior research that examines earnings management around IPOs (e.g. Teoh et al. 1998a; Roosenboom et al., 2003; Gramlich and Sorensen, 2004; Morsfield and Tan, 2006) and SEOs (e.g., Rangan, 1998; Cohen and Zarowin, 2010). Figure 5.1 depicts the time periods when real and accrual earnings management are estimated.

Figure 5.1 Time periods analyzed and regulatory environments



5.4.3 Variable Measurement

5.4.3.1 Measuring Accrual-based Earnings Management

This chapter follows prior research (e.g. Gramlich and Sorensen, 2004; Fan, 2007; Cohen and Zarowin; 2010) by using the cash flows approach to estimate accruals measures. Following this approach total accruals are defined as earnings before extraordinary items minus cash flows from operations. The advantage of cash flows approach over other approaches is to examine all accrual manipulations that are conducted using either current accruals (short-term) or non-current accruals (long-term). For example, current accrual manipulation can be conducted through delay the recognition of expenses and accelerate the recognition of revenues, while non-current accrual manipulation can be conducted through e.g. decelerating depreciation policies, reducing deferral tax, and realizing unusual gains (e.g., Teoh et al., 1998a, 1998b; 1998c; Chang et al., 2010; Chahine et al. 2012). Thus, total accruals are decomposed into discretionary accruals (related to manager discretion) and non-discretionary accruals (related to economic circumstances and outside managers' control) (e.g., Teoh et al., 1998a).

To estimate discretionary accruals, and following prior research in earnings management, the Dechow et al. (1995) cross-sectional adaptation of the modified Jones (1991) model is used. Ball and Shivakumar (2008) point out estimating discretionary accruals for IPO firms using lagged total assets to scale accrual variables may inflate the measure of accruals in the current year. They argue that lagged total assets are qualitatively smaller than total assets at the end of the IPO year because IPO firms tend to use proceeds to invest in assets. In order to overcome this problem, this chapter follows Armstrong et al. (2009) and scales all variables by average total assets rather than lagged total assets.[41] A cross-sectional regression is used for each year for all UK non-IPO firms for each 2-digit SIC industry category. This approach, in part, controls for changes in economic conditions that impact on total accruals across different industry groups, but allows for coefficients to vary through time (Cohen and Zarowin, 2010, Kasznik, 1999; DeFond and Jiambalvo,

[41] The analysis is also repeated by scaling all variables by lagged total assets and the results are qualitatively similar to those reported in this chapter.

1994). In addition, return on assets is added to the model as suggested by Kothari et al. (2005) in order to control for extreme operating performance as this can bias the estimation of discretionary accruals. Then, the estimated coefficients are taken to estimate discretionary accruals for the IPO firm. Normal accruals are, therefore, estimated using the following cross-sectional regression for each industry and year for all non-IPO firms:[42]

$$\frac{TA_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{\Delta SALES_{it}}{AvAssets_{it}} + \beta_3 \frac{PPE_{it}}{AvAssets_{it}} + \beta_4 ROA_{it} + \varepsilon_{it} \qquad (5.1)$$

Where $TA_{i,t}$ is total accruals defined as earnings before extraordinary items minus cash flows from operations; $AvAssets_{i,t}$ is the sum of total assets at the beginning of the year and the total assets at the end of the year divided by 2; $\Delta SALES_{i,t}$ is the change in sales during a year scaled by average total assets; $PPE_{i,t}$ is the gross value of property, plant and equipment scaled by average total assets; and $ROA_{i,t}$ is return on assets calculated as earnings before extraordinary items scaled by average total assets.

The coefficient estimates from equation (5.1) are used to estimate normal accruals ($NA_{i,t}$) for all IPO firms in each year and industry as follows,

$$NA_{it} = \hat{\alpha}_0 + \hat{\beta}_1 \frac{1}{AvAssets_{it}} + \hat{\beta}_2 \frac{\Delta SALES_{it} - \Delta REC_{it}}{AvAssets_{it}} + \hat{\beta}_3 \frac{PPE_{it}}{AvAssets_{it}} + \hat{\beta}_4 ROA_{it} \qquad (5.2)$$

$\Delta REC_{i,t}$ is the change in receivables during the year scaled by average total assets.

Discretionary accruals ($DA_{i,t}$) are measured as the difference between total accruals and fitted normal accruals where,

$$DA_{it} = \left(\frac{TA_{it}}{AvAssets_{it}} \right) - NA_{it} \qquad (5.3)$$

For robustness this chapter also repeats this analysis using performance-matched discretionary accruals following Kothari et al. (2005). Therefore, each IPO

[42] To take account of extreme values all variables are Winsorized at the top 1% and bottom 99%.

firm is matched with a non-IPO firm based on year, 2-digit SIC industry code and the closest return on assets (+/- 0.20 of IPO firms' return on assets). The results using the performance-matched discretionary accruals are qualitatively similar to those reported where return on assets is added as a control variable to the model. The imposition of the above restriction, however, reduces the sample by 20% as the appropriate matches are only available for 80% of the IPO sample. As the results are qualitatively similar, the results are reported based on the larger sample size that simply controls for return on assets.

5.4.3.2 Measuring Real Earnings Management

Following prior research real earnings management proxies are estimated based on models of real earnings management developed by Dechow et al. (1998) and applied by Roychowdhury (2006). Later researchers such as Wongsunwai, (2012), Zang, (2012), Cohen and Zarowin, (2010), and Cohen et al., (2008) also apply these models to estimate real earnings management. This chapter examines two real earnings management activities; sales-based manipulation and reducing discretionary expenses.[43] Sales-based manipulation leads to lower levels of cash flows from operations, and can be managed through offering more price discounts and/or more lenient credit terms (see Roychowdhury, 2006). Discretionary expenses meanwhile represent the sum of research and development expenses (R&D), advertising expenses, and selling, general and administrative expenses (SG&A). Reducing discretionary expenses in the current period will boost reported earnings in the current period. In addition, where discretionary expenses are paid for in cash, any reduction in these expenses will increase cash flows in the current period (Cohen and Zarowin, 2010). Similar to the estimation of the measures of accrual earnings management all variables are scaled by average total assets.[44] First, the

[43] Production cost manipulation is not considered within the analysis of real earnings management as this method can only be fully utilized by manufacturing companies (Roychowdhury, 2006) and manufacturing companies make up just 26.6% of the total sample which corresponds to 21.1 % of the AIM market sample and just 5.5% of the Main market sample.

[44] The test is also repeated by scaling all the variables by lagged total assets and the results are qualitatively similar to those reported in this chapter.

normal level of cash flows from operations is estimated using the following cross-sectional regression for each industry and year for all non-IPO firms:[45]

$$\frac{CFO_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it}}{AvAssets_{it}} + \beta_3 \frac{\Delta SALES_{it}}{AvAssets_{it}} + \varepsilon_{it} \quad (5.4)$$

Where $CFO_{i,t}$ is cash flows from operations for firm i at period t. The abnormal CFO for IPO firms is calculated as actual CFO minus the normal level of CFO estimated using the coefficients from regression (5.4).

The normal level of discretionary expenses can be expressed as a linear function of contemporaneous sales as follows:

$$\frac{DISX_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it}}{AvAssets_{it}} + \varepsilon_{it} \quad (5.5)$$

Roychowdhury (2006) and Cohen and Zarowin (2010) point out, however, that estimating a normal level of discretionary expenses as specified in regression (5.5) can lead to poor estimation where firms manage sales upwards to increase reported earnings during any year. If a firm has managed sales upwards, this will result in unusually low residuals from running the regression as specified above. In order to overcome this problem, discretionary expenses are estimated as a function of lagged sales. This chapter, therefore, follows Roychowdhury (2006) and estimates the normal level of discretionary expenses for the IPO firms as follows,

$$\frac{DISX_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it-1}}{AvAssets_{it}} + \varepsilon_{it} \quad (5.6)$$

$DISX_{i,t}$ is, therefore, calculated as the sum of, SG&A, R&D, and advertising expenses for firm i at period t. $SALES_{i,t-1}$ is sales during the previous year. The abnormal level of discretionary expenses for IPO firms is calculated as actual

[45] To take account of extreme values all variables are Winsorized at the top 1% and bottom 99%.

discretionary expenses minus the normal level of discretionary expenses estimated using the coefficients from regression (5.6).

In order to measure the total effect of real earnings management, and following Cohen et al. (2008) and Cohen and Zarowin (2010), the abnormal level of cash flows from operations and the abnormal level of discretionary expenses are combined to compute an aggregate measure of real earnings management. Specifically, abnormal cash flow from operations and abnormal discretionary expenses are multiplied by -1, and then calculated as one aggregate measure. A higher amount of this aggregate measure implies that IPO firms are more likely to be manipulating sales to increase reported earnings and cutting discretionary expenses.

5.4.3.3 Measuring Long-run Stock Price Performance

Measuring long-run stock return performance is not without controversy as most long-term return anomalies change when methodologies change (Fama, 1998). This chapter, therefore, follows previous research and measures abnormal returns using two methods; namely, buy and hold abnormal returns (BHAR) and cumulative abnormal returns (CAR).[46] Both BHAR and CAR are computed as the difference between the return for IPO firms and matched non-IPO firms starting 4 months after the date of the IPO to 3 years after the date of the IPO (e.g., Teoh et al., 1998a; Roosenboom at al., 2003).[47] In addition, a matched sample is created from all UK non-IPO firms following Lyon et al. (1999). A firm is included in the matched sample if its market capitalization is between 70% and 130% of the IPO firms' market value; then it will be matched with the closest book-to-market ratio to the IPO firms.[48] If the IPO firm is delisted prior to the IPO returns' ending date the

[46] The results are consistent using both BHAR and CAR and, therefore, this chapter presents only the BHAR results.

[47] To allow for a reporting lag and following Teoh et al. (1998a), the buy and hold returns are calculated starting from month 4, while matched sample are used to correct for the risk characteristics of IPO firms.

[48] The matching approach is consistent with Kothari et al. (2012) who match on post-issuance characteristics rather than pre-issuance. Kothari et al. (2012) indicate that equity offerings may change the risk characteristics of the firms and, therefore, matching on post-issuance reduces the complications of these changes.

.

returns of the IPO firm and its matched firm are set to zero, while if the matched firm is delisted prior to the ending date it is replaced, on a point-forward basis, with another matched firm to avoid survivorship bias in the matched sample. The mean BHAR is calculated as follows

$$BHAR_T = \frac{1}{N}\sum_{i=1}^{N}\left[\prod_{t=1}^{T}(1+R_{it}) - \prod_{t=1}^{T}(1+R_{benchmark_t})\right] \quad (5.7)$$

Where $R_{i,t}$ is the monthly return for firm i in month t and $R_{benchmark,t}$ is the monthly return for the benchmark in month t.

5.5 Results

5.5.1 Empirical Evidence on Earnings Management around IPOs

Table 5.5 presents time-series profiles of mean and median discretionary accruals, abnormal cash flows from operations (Sales), abnormal discretionary expenses, and aggregate real earnings management for years -2 to +3 relative to the IPO year which is year 0. The results are interpreted on the basis of median values. For discretionary accruals, a significant and positive coefficient indicates income-increasing accrual-based earnings management. As noted above, to allow the measures of real earnings management to have the same interpretation as the measure of accrual-based earnings management, both abnormal cash flows from operations and abnormal discretionary expenses are multiplied by -1. A significant and positive coefficient for abnormal cash flows from operations or abnormal discretionary expenses can therefore be interpreted as being consistent with income-increasing real earnings management. In addition, a significant and positive coefficient on the measure of aggregate real earnings management also indicates income-increasing real earnings management.

Table 5.5 shows that IPO firms in the UK engage extensively in real and accrual-based earnings management during and after the IPO year. Consistent with previous studies (e.g. Friedlan (1994), Teoh et al. (1998a), and Morsfield and Tan (2006)), Table 5.5 presents evidence of significant positive discretionary accruals. IPO firms, therefore, manage earnings upward using accrual-based earnings

management during the IPO year. However, no evidence is found on accruals manipulation during the year pre IPO. This result is consistent with Ball and Shivakumar (2008) that IPO firms in the UK do not manage accrual accounting pre the IPO.[49] The results also show that IPO firms manage earnings upwards in the post-IPO period, and the level of discretionary accruals increases above the IPO year level in the post-IPO year but is lower in years +2 and +3.

In addition, and most importantly, Table 5.5 reports the median abnormal cash flows from operations during the IPO year is significant and positive. This is consistent with income-increasing real earnings management being undertaken. In the post-IPO period the level of real earnings management decreases, as the median abnormal cash flows from operations, despite remaining significant and positive, is closer to zero.

Table 5.5 also shows that IPO firms do not manage earnings upward using discretionary expenses. One possible explanation for this result is that discretionary expenses-based manipulation is associated with higher future litigation risks. Sohn (2011) conducted a survey with big 4 audit firms and found that 34.1% of the respondents admitted that real earning management is associated with a higher future litigation risk. Further, and consistent with the importance of discretionary expenses, Demers and Joos (2007) find evidence that IPO firms with lower levels of R&D and SG&A spending pre-IPO have a lot higher probability of future failure. Therefore, an abnormal reduction of discretionary expenses is likely to attract the attention of underwriters and auditors, especially if the IPO firms exhibit high levels of sales.

[49] The evidence of no earnings management during the year pre the IPO can be attributed to several reasons. For example, it is well-known that IPO firms usually time their offerings to take advantage of the hot market period (e.g., Ibbotson and Jaffe, 1975; Lowry and Schwert, 2002). This in turn does not allow having enough time to plan earnings management ahead. Further, Ball and Shivakumar (2008) indicate that IPO firms report more conservatively during the year pre the IPO year in order to improve the quality of their financial reporting, so IPO firms can meet the market demand of high quality financial reporting during the IPO year. Other reason can be that many of IPO original shares holders are restricted by the lock-up period from selling their shares after the IPO directly. Thus, managing earnings pre the IPO would make it too difficult to manage earnings in the following years where the lock-up period will be terminated. For example, for IPOs sample the average lock-up period is 14 months after the IPO date.

Finally, examining the overall level of manipulation via real earnings management, Table 5.5 shows that the median aggregate measure of real earnings management during the IPO year is positive and statistically significant indicating that in aggregate, IPO firms are manipulating real earnings upwards. The aggregate measure of real earnings management declines in the year after the IPO year but remains significant.

Collectively, the results presented in Table 5.5 support the first hypothesis that IPO firms manage earnings upward utilizing both sales-based and accrual-based earnings management techniques. Accrual-based earnings management results are consistent with Ball and Shivakumar (2008) who find IPO firms in the UK report more conservatively during the year pre the IPO and with prior research that reports evidence on accrual earnings management during and after IPOs (see Teoh et al., 1998a; Roosenboom et al., 2003; Fan, 2007; Chang et al., 2010). Further, the results show that IPO firms also engage in sales-based manipulation during the IPO year, and subsequent to the IPO year. While prior research focuses on accrual manipulations around IPOs, this chapter provides the first evidence to the literature that IPO firms engage in sales-based manipulation around IPOs to manage earnings upward. This evidence also suggests that the first year post-IPO is important as the level of accrual-based earnings management increases and the level of sales-based manipulation remains at around the same level.

Table 5.6 shows the correlations between discretionary accruals, abnormal cash flows from operations, and abnormal discretionary expenses during the IPO year. Similar to prior research, the results show a significant positive correlation between discretionary accruals and abnormal cash flows from operations. This high positive correlation can be explained by IPO firms engaging in accrual-based manipulation and sales-based manipulation at the same time (Roychowdhury, 2006). In addition, the correlation coefficient between abnormal cash flows from operations and abnormal discretionary expenses is negative and statistically significant. This negative correlation is consistent with prior literature where a significant negative correlation between real earnings management activities has been found (e.g., Cohen et al., 2008; Cohen and Zarowin, 2010).

Table 5.5 Time-series profiles of real and accrual earnings management

Year	-2	-1	0	1	2	3
Discretionary accruals						
Median	0.007	0.007	0.018***	0.046***	0.010*	0.015**
Mean	-0.099	-0.051	0.022	0.042***	0.029*	0.031***
Abnormal cash flows from operations						
Median	-0.014	0.009	0.037***	0.036***	0.015***	0.017***
Mean	-0.167	0.065	0.061**	0.080***	0.098***	0.086***
Abnormal discretionary expenses						
Median	-0.011	-0.010	0.023	-0.003	-0.017**	-0.003
Mean	0.125	-0.088	0.031	-0.024	-0.059**	-0.076***
Aggregate real earnings management						
Median	0.035	0.013	0.073***	0.051***	0.045*	0.011
Mean	-0.042	-0.023	0.092***	0.055***	0.038	0.010
N	98	159	571	387	388	323

*, **, *** Denote significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively. Differences in medians are tested using the Wilcoxon Signed Rank test and differences in means are tested using t-tests. Table 5.5 presents the time-series profiles of median and mean discretionary accruals, abnormal cash flows from operations, abnormal discretionary expenses and aggregate real earnings management for the pooled sample over the period two years prior to the IPO year, the IPO year, and three years after the IPO year. The IPO year is year 0. To avoid the influence of outliers all continuous financial data are Winsorized at the top 1% and bottom 99%. Discretionary accruals are the difference between total accruals and normal accruals, which are estimated according to the cash flow approach using the corrected version of the modified Jones (1991) model (Dechow et al., 1995) as follows:

$$\frac{TA_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{\Delta SALES_{it}}{AvAssets_{it}} + \beta_3 \frac{PPE_{it}}{AvAssets_{it}} + \beta_4 \ ROA_{it} + \varepsilon_{it}$$

where $TA_{i,t}$ is total accruals defined as, earnings before extraordinary items minus cash flows from operations, $\Delta SALES_{i,t}$ is the change in sales during a year, $PPE_{i,t}$ is the gross value of property, plant and equipment, all variables are scaled by $AvAssets_{i,t}$ which is the sum of total assets at the beginning of the year and the total assets at the end of the year divided by 2. $ROA_{i,t}$ is return on assets measured as earnings before extraordinary items divided by average total assets. Abnormal cash flows from operations are estimated as the deviations from the predicted values from the following industry-year regressions from a sample of UK non-IPO firms:

$$\frac{CFO_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it}}{AvAssets_{it}} + \beta_3 \frac{\Delta SALES_{it}}{AvAssets_{it}} + \varepsilon_{it}$$

where $CFO_{i,t}$ is the cash flows from operations for firm $_i$ at period $_t$. Abnormal discretionary expenses is the difference between actual discretionary expenses and the normal level of discretionary expenses, estimated as the deviations from the predicted values from the following industry-year regressions from a sample of UK non-IPO firms:

$$\frac{DISX_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{i,t-1}}{AvAssets_{it}} + \varepsilon_{it}$$

where $DISX_{i,t}$ is the sum of selling, general and administrative expenses, research and development expenses, and advertising expenses for firm *i* at period *t*. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation. The aggregate measure of real earnings management is the sum of abnormal cash flows from operations and abnormal discretionary expenses.

Table 5.6 Correlation matrix of earnings management proxies

	Discretionary accruals	Abnormal cash flows from operations	Abnormal discretionary expenses	Aggregate real earnings management
Discretionary accruals	1	0.679***	-0.167***	0.386***
Abnormal cash flows from operations (Sales)	0.681***	1	-0.431***	0.379***
Abnormal discretionary expenses	-0.215***	-0.425***	1	0.670***
Aggregate real earnings management	0.327***	0.313***	0.610***	1

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Table 5.6 presents Pearson (above the diagonal) and Spearman (below the diagonal) correlations between earnings management proxies during the IPO year for the sample of initial public offerings over the period 1998-2008. Discretionary accruals are estimated using corrected version of the modified Jones (1991) model (Dechow et al., 1995). Abnormal cash flows from operations and abnormal discretionary expenses are estimated using models developed by Dechow et al. (1998) and as implemented by Roychowdhury, (2006). Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation. The aggregate measure of real earnings management is the sum of abnormal cash flows from operations and abnormal discretionary expenses.

5.5.2 Empirical Evidence on Earnings Management around IPOs under Different Regulatory Environments

In order to examine the effect of the regulatory environment on real and accrual earnings management, the IPO sample is split by market i.e. AIM and Main. Table 5.7 (Panel A) reports time-series profiles of median and mean real and accrual earnings management activities for IPO firms on the AIM market. The median discretionary accruals during the IPO year is positive and highly significant. In addition, discretionary accruals also increase above the IPO year level in the following year and remain highly significant. In years +2 and +3 the level of discretionary accruals then declines below the IPO year level, but remains significant. Similar evidence is reported for sales-based manipulation where the median abnormal cash flows from operations during the IPO year is positive and highly significant. Again, in the year after the IPO an increased level of sales-based manipulation occurs relative to the IPO year, and this then reduces in years +2 and +3 while remaining statistically significant.

However, there is no evidence of abnormal discretionary expenses manipulation either during the IPO year or the year after the IPO year. This is due to the fact that a higher level of sales is expected to be combined with a higher level of spending on selling and advertising expenses. Thus, IPO firms that simultaneously engage in sales-based and discretionary expenses-based manipulations are likely to bring the attention of outsiders e.g. high quality auditors, prestigious underwriters, etc. Further, a lower level of discretionary expenses around IPOs is found to be associated with a higher probability of IPO failure risks (Demers and Joos, 2007) and, therefore, higher potential litigation risks.

In summary, the results of Table 5.7 (Panel A) show that IPO firms on the AIM market engage extensively in accrual-based earnings management and sales-based manipulation during the IPO year and the year after the IPO. In addition, the levels of real and accrual earnings management during the post-IPO year are greater than the levels observed in the IPO year. This is consistent with the view that, IPO firms who manage earnings upward during the IPO year are likely to continue to do so in the year after the IPO to avoid disappointing the market about their performance (see for example, Jain and Kini, 1994).

Panel B of Table 5.7 reports the results for IPO firms on the Main market. The results of Panel B show that real and accrual earnings management are less prevalent in the Main market compared to the AIM market. The median discretionary accruals during the IPO year can be seen to be statistically insignificant, and despite the level of discretionary accruals increasing in the year after the IPO, it remains insignificant. The median abnormal level of cash flows from operations during the IPO year is also insignificant. Further, the median abnormal discretionary expenses during the IPO year are insignificant. These preliminary results suggest that IPO firms on the Main market, therefore, exhibit little evidence of real and accrual earnings management around IPOs.[50]

It worthwhile to mention that the reported results in Table 5.7 (Panels A and B) cannot be interpreted in the context of differences in the regulatory environments

[50] It is worth noting that Table 5.7 (Panel B) shows that the mean of abnormal cash flows from operations during the IPO year is positive and statistically significant indicating that there is some sales-based manipulation taking place in the Main market.

unless many other covariates (which are found to be associated with real and accrual earnings management) are controlled. In the next section OLS regressions are used to control for the impact of these covariates.

Table 5.7 Time-series profiles of real and accrual earnings management of AIM and Main IPOs

Year	**-2**	**-1**	**0**	**1**	**2**	**3**
Panel A: AIM Market						
Discretionary accruals						
Median	0.017	0.009	0.038***	0.055***	0.015*	0.016**
Mean	-0.130	-0.020	0.034*	0.055***	0.018*	0.029**
Abnormal cash flows from operations						
Median	-0.020	0.009	0.040***	0.042***	0.021***	0.023***
Mean	-0.230	0.035	0.060**	0.110***	0.119***	0.100***
Abnormal discretionary expenses						
Median	0.002	-0.025	0.039	0.004	-0.020**	-0.010
Mean	0.170	-0.028	0.033	-0.041*	-0.080***	-0.090***
Aggregate real earnings management						
Median	0.050	0.004	0.112***	0.074***	0.054	0.002
Mean	-0.052	-0.023	0.125***	0.079***	0.047	0.008
N	**72**	**119**	**433**	**285**	**289**	**241**
Panel B: Main Market						
Discretionary accruals						
Median	-0.008	0.003	-0.009	0.014	0.002	0.006
Mean	-0.010	-0.020	0.020	0.008	0.018	0.031
Abnormal cash flows from operations						
Median	-0.002	0.008	0.032	0.015	0.005	-0.002
Mean	0.005	0.068	0.058**	0.017	0.032	0.045
Abnormal discretionary expenses						
Median	-0.022	-0.005	-0.012	-0.005	-0.012	-0.002
Mean	-0.018	-0.093	-0.062*	-0.031	-0.016	-0.028
Aggregate real earnings management						
Median	-0.011	0.042	0.021	0.030	0.026	0.023
Mean	-0.013	-0.024	-0.007	-0.012	0.015	0.017
N	**26**	**40**	**138**	**102**	**99**	**82**

*, **, *** Denote significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively. Differences in medians are tested using the Wilcoxon Signed Rank test and differences in means are tested using t-tests. Table 5.7 presents the time-series profiles of median and mean real and accrual earnings management activities for the AIM and Main IPO samples over the period two years prior to the IPO year, the IPO year, and three years after the IPO year. All other variables are previously defined.

5.5.3 Earnings Management during IPOs under Different Regulatory Environments

5.5.3.1 Regression of Earnings Management during IPOs under Different Regulatory Environments

This chapter further tests the differences in real and accrual earnings management of IPO firms across the AIM and Main markets using the following OLS regression:

$$EM_{it} = \alpha_0 + \beta_1 AIM + \beta_2 LnSize + \beta_3 Volatility + \beta_4 Lev + \beta_5 BM + \beta_6 Ln(1+age) + \beta_7 CapexGrowth + \beta_8 BigN + \beta_9 AudTenure + \beta_{10} VC + \beta_{11} Underwriter + \beta_{12} ROA + \beta_{13} Loss + \beta_{14} Abs(CFO) + \beta_{15} OutDirectors + \beta_{16} BrdSize + \beta_{17} Chrm/CEO + \beta_{18} RetaiOwnership + IND + Year + \varepsilon_{it} \quad (5.8)$$

Where ($EM_{i,t}$) is the different proxies for real and accrual earnings management during the IPO year and *(AIM)* is a dummy variable equalling 1 if the IPO firms trade on AIM market and zero for firms trading on the Main market. In the above OLS regression abnormal cash flows from operations and abnormal discretionary expenses are multiplied by -1. Thus, all real and accrual earnings management proxies have the same interpretation with respect to the regulatory environment. Further, this chapter follows prior research (e.g. Ball and Shivakumar, 2008; Gerakos et al., 2011) by using the percentile rank of all variables (dependent and independent) in the regression models to avoid an outliers problem.[51]

Based on prior research (e.g., Teoh et al., 1998a; Fan, 2007; Cohen et al., 2008; Chi et al., 2011), a set of control variables is added to the model that are found to be associated with real and accrual earnings management.[52] The possible impact of a size effect is controlled by adding the natural logarithm of market value (*LnSize*) to the model, calculated as the offer price multiplied by the number of outstanding shares on the first day of listing. In addition, returns variability *(Volatility)* is added as a control variable measured as the annualized standard diviation of daily stock returns. Gerakos et al. (2011) find evidence that firms listed

[51] Following Leone et al. (2012), the percentile rank are used for both dependent and independent variables. Leone et al. (2012) point out that Winsorizing just the independent variables without considering the dependent variable leads to estimation bias of the coefficient.

[52] Executives' compensation is also a significant driver of earnings management (Cheng and Warfield 2005). As a robustness test, directors' remuneration is included into the model as a control variable. This reduces the sample size by 50% as this variable (directors' remuneration) is not available for the whole sample. After including directors' remuneration as an explanatory variable, similar evidence is found that IPO firms on the AIM market exhibit higher levels of accrual earnings management than IPO firms on the Main market. Further, the coefficient of directors' remuneration is found to be a positive and statistically significant at 10% level when the *abnormal cash flows from operations* is the dependent variable. This confirms the view that executives' equity compensation is positively associated with earnings manipulation (Cheng and Warfield 2005). Also, a positive coefficient of directors' remuneration is found when the *aggregate measure of real earnings management* and *discretionary accruals* are the dependent variables, but this coefficient is not statistically significant. Thus, directors' remuneration is excluded from the model to avoid the large decrease in the sample size.

on the AIM market have higher levels of post-listing stock return underperformance compared with firms listed on the Main market and other developed US markets. Thus, firms may engage in higher levels of earnings management to avoid disappointing the markets about their operating performance, which is positively associated with the stock prices performance. Further, as DeFond and Jiambalvo (1994) show, firms that have a higher level of debt have higher incentives to manage earnings, therefore, leverage (*Lev*) measured as total $debt_t$/total $assets_{t-1}$ is added as a control variable.

In order to control for growth opportunities the model includes book-to-market (*BM)*; calculated as the book value of equity divided by the market value of equity. IPO firm age [*Ln(1+age)*] measured as the natural logarithm of 1+IPO firm age, where firm age is calculated as the difference between the founding date of the firm and the date of its IPO. Capital expenditure growth (*CapexGrowth*) which is computed as capital expenditure during the IPO year minus the capital expenditure in the previous year scaled by total assets in the year prior to the IPO year *(*e.g., Rangan, 1998; Teoh et al., 1998a; Roosenboom et al., 2003; Cohen and Zarowin, 2010).

Prior research finds evidence that higher quality auditors play a significant monitoring role in detecting and mitigating accrual-based earnings management (e.g., Becker et al., 1998; Balsam et al., 2003; Krishnan, 2003) and that this effective monitoring of accrual-based earnings management leads firms to engage in a higher level of real earnings management (Cohen and Zarowin, 2010; Chi et al., 2011). Therefore, two variables are added to control for auditor quality; *(Big N)* a dummy variable that equals 1 if the IPO firm's auditor is a Big N audit firm and zero otherwise, and *(AudTenure)* a continues variable that measures the cumulative number of years of the auditor-client relationship.[53]

In addition, prior research shows IPO firms that are backed by venture capitalists or have a high profile underwriter have lower levels of real and accrual earnings management (e.g., Morsfield and Tan, 2006; Lee and Masulis, 2011;

[53] The classification for audit firms as big8, big 6, big 5, and big4 is changed over time after series of merger to become now as big 4 audit firms.

Wongsunwai, 2012). Therefore, venture capitalist (*VC*) and underwriter (*Underwriter*) dummy variables are added to control for the monitoring effect that these financial intermediaries may have on the earnings management activities of the firm.[54] In order to control for profitability ROA is included to the model (e.g., Kothari et al., 2005; Gunny, 2010) while a dummy variable for firms that have reported a loss (*Loss*) is added as prior evidence shows that firms that have reported a loss are more likely to manage earnings (e.g., Roychowdhury, 2006). The absolute value of cash flows from operations [*Abs(CFO)]* is added to control for the impact of operating cash flows (Dechow et al., 1995).

Further, prior research finds evidence that effective corporate governance constrains real and accrual earnings management activities (.e.g., Klein, 2002; Xie et al., 2003; Osma, 2008). Thus, the model includes (*OutDirectors)* measured as the percentage of outside directors on the board, *(BrdSize)* is the number of directors on the board, and *(Chrm/CEO)* is a dummy variable equalling 1 if the chairman of the board and the CEO is the same director and zero otherwise. Also, equity retention (*RetaiOwnership)* measured as the percentage of retained ownership by insiders is added to control for the ownership structure. Fan (2007) finds evidence that retained ownership is associated with earnings management during the IPO. Finally (*IND)* and (*Year*) dummies are added to control for industry and time effects, respectively.

Table 5.8 reports the results and shows evidence that IPO firms on the AIM market exhibit higher levels of abnormal cash flows from operations and accrual earnings management and lower levels of abnormal discretionary expenses than IPO firms on the Main market. Specifically, the results show positive coefficients of 0.068 ($P < 0.10$) and 0.093 ($P < 0.05$) on *AIM* in the abnormal cash flows from operations and discretionary accruals regressions, respectively. This evidence also is consistent with the results in Table 5.7 that IPO firms on the AIM market exhibit higher levels of abnormal cash flows from operations and discretionary accruals

[54] Prestigious underwriters are those global investment banks as defined by Derrien and Kecskes (2007), while venture capitalist are those investors who hold more than 3 % of a firm's shares and appear in the list of venture capitalists provided by British Venture Capitalist Association. Specifically, data are collected from the prospectuses about all the shareholders who hold more than 3% of the total shares and then shareholder's name is matched with a list of venture capitalists, which is obtained from the British Venture Capitalist Association.

during the IPO year. Further, Table 5.8 reports a negative coefficient of -0.091 ($p<0.05$) on *AIM* in the abnormal discretionary expenses regression. This evidence suggests that IPO firms on the AIM market exhibit a lower level of discretionary expenses manipulation than IPO firms on the Main market.

For AIM IPO firms, and by comparing between sales-based, discretionary expenses-based and accrual-based manipulations, it seems that an abnormal reduction of discretionary expenses is associated with higher future litigation risks than the other activities for the following reason. IPO firms that simultaneously engage in sales-based and discretionary expenses-based manipulations are likely to bring the attention of auditors, underwriters, analysts, etc. This is due to the fact that a high level of sales is normally expected to be combined with a high level of selling, general, and administrative (SG&A) and advertising expenses. Therefore, IPO firms that intend to manage earnings upward utilizing real activities are likely to choose between either sales-based or discretionary expenses-based manipulations. Thus, and given the fact that sales-based manipulation is hard to be detect by outsiders, notably that IPO firms will be in an upward tragedy in terms of sales growth around IPOs, it is expected IPO firms on the AIM market (which have strong incentives to manage earnings upward) to prefer sales-based over discretionary expenses-based manipulation.

In addition, and to explore cost factors that lead AIM IPO firms to choose between real and accrual earnings management activities, model 5.8 is re-estimated just for the AIM IPOs sample. Table I in Appendix A reports the results and shows both high quality auditors and prestigious underwriters play an effective role in mitigating discretionary expenses manipulation on the AIM market. IPO firms on the AIM market are small, growing IPO firms and riskier (Gerakos et al., 2011) and, therefore, any abnormal reduction in discretionary expenses during the IPO, which is combined with higher levels of sales-based manipulation, is likely to be associated

with a higher probability of IPO failure (Demers and Joos, 2007) and higher future litigation risks (Sohn, 2011). [55]

Further, the results in Table 5.8 show that IPO firms on the Main market exhibit lower levels of earnings manipulation than IPO firms on the AIM market. These results are expected due to the restricted regulatory environment on the Main market that overall restricts managers flexibility to manipulate earnings. In addition, IPO firms on the Main market are very large firms (compared with AIM IPOs) that can afford to pay the high cost and to meet the requirements of more reputable accounting and financial institutions (e.g. big N audit firms, prestigious underwriters, and prestigious venture capitalists) that can help to send positive signals about the IPO to outsiders (e.g., Titman and Trueman, 1986; Brau and Fawcett, 2006). These reputable institutions are found to play an effective role in mitigating real and accrual earnings management activities (e.g., Becker et al., 1998; Morsfield and Tan, 2006; Chi et al., 2011; Lee and Masulis, 2011; Wongsunwai, 2012). [56]

[55] Other observation about the results is why IPO firms on the AIM market would manage real earnings management activities which have severe negative consequences for subsequent operating and stock return performance (e.g., Kothari et al., 2012; Cohen and Zarowin, 2010). For example, someone would ask why young and small IPO firms on the AIM market would start with real activities (sales-based)! Why they do not just manage accrual accounting that is less costly for future performance compared with real activities? This can be explained as accrual earnings management occurs at the end of the fiscal year, while real earnings management occurs throughout the year. Thus, If IPOs' managers on the AIM market decided to manage earnings solely using accrual-based manipulation, and the amount being manipulated fell short of the desired threshold, there may be insufficient time to utilize real earnings management during the rest of the year (Roychowdhury, 2006). Zang (2012) confirms this view and finds evidence that real and accrual earnings management are utilized as substitutes. Specifically, Zang (2012) find managers engage in real earnings management activities throughout the fiscal year and then accruals earnings management is adjusted at the end of fiscal year by the unrealized amount of real activities to meet the desired threshold. Therefore, it seems IPO firms on the AIM market manage sales-based earnings management activities to avoid missing the desired threshold by solely utilizing accrual-based manipulation.

[56] For example, for IPOs sample on the Main market 34% backed by venture capitalists, 33% underwritten by prestigious underwriters, 88% audited by big N audit firms, and 39% reported a loss during the IPO year. While for IPO firms on the AIM market 18% backed by venture capitalist, 16% underwritten by prestigious underwriters, 33% audited by big N audit firms, and 53% reported a loss during the IPO year. Thus, and in addition to the impact of the restricted regulatory environment, firms-specific characteristics might also explain why IPO firms on the Main market do not exhibit evidence of earnings manipulation during the IPO year.

Table 5.8 Regressions of real and accrual earnings management under different regulatory environments

	Aggregate real earnings management	Abnormal cash flows from operations	Abnormal discretionary expenses	Discretionary accruals
AIM	-0.064	0.068	-0.091	0.093
	(-1.432)	(1.737)*	(-2.124)**	(2.001)**
LnSize	-0.057	0.082	-0.061	0.156
	(-0.740)	(1.207)	(-0.853)	(1.920)*
Volatility	0.007	-0.020	0.007	0.000
	(0.146)	(-0.445)	(0.139)	(0.001)
Lev	0.053	0.041	0.028	0.057
	(1.186)	(1.070)	(0.641)	(1.295)
BM	0.136	0.019	0.126	0.147
	(2.931)***	(0.468)	(2.783)***	(3.045)***
Ln(1+age)	-0.058	-0.024	-0.071	-0.027
	(-1.290)	(-0.586)	(-1.599)	(-0.595)
CapexGrowth	-0.039	-0.022	-0.040	-0.026
	(-0.552)	(-0.358)	(-0.582)	(-0.339)
Big N	-0.075	0.001	-0.068	-0.027
	(-2.099)**	(0.033)	(-2.057)**	(-0.769)
AudTenure	-0.063	-0.036	-0.013	-0.028
	(-1.693)*	(-1.109)	(-0.337)	(-0.743)
VC	-0.036	-0.029	-0.019	-0.035
	(-1.090)	(-1.044)	(-0.586)	(-1.092)
Underwriter	-0.032	0.035	-0.064	0.021
	(-0.888)	(1.150)	(-1.883)*	(0.598)
ROA	-0.147	-0.442	0.214	-0.212
	(-1.704)*	(-5.551)***	(2.500)**	(-2.316)**
Loss	0.029	-0.012	0.024	-0.011
	(0.546)	(-0.256)	(0.451)	(-0.205)
Abs(CFO)	0.013	0.204	-0.176	0.048
	(0.210)	(3.430)***	(-2.780)***	(0.750)
OutDirectors	0.024	-0.094	0.088	-0.032
	(0.524)	(-2.342)**	(1.975)**	(-0.696)
BrdSize	-0.022	0.014	-0.015	-0.041
	(-0.480)	(0.342)	(-0.328)	(-0.876)
Chrm/CEO	-0.006	0.034	-0.066	0.018
	(-0.108)	(0.718)	(-1.267)	(0.353)
RetaiOwnership	-0.049	-0.026	-0.006	-0.026
	(-1.081)	(-0.627)	(-0.146)	(-0.560)
Constant	0.828	0.710	0.689	0.494
	(5.413)***	(5.380)***	(4.831)***	(3.307)***
Year and industry dummies	Yes	Yes	Yes	Yes
N	547	547	547	547
Adj.R^2	0.079	0.268	0.143	0.077
F-statistic	2.83	8.72	5.20	3.00
Prob (F-statistic)	0.0000	0.0000	0.0000	0.0000
Mean VIF	1.87	1.87	1.87	1.87
Max VIF	4.71	4.71	4.71	4.71

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Robust *t*-statistics (appear in parentheses) are clustered at the firm level as suggested by Petersen (2009). Table 5.8 reports the results of regressions of real and accrual earnings management proxies on the regulatory environments. The dependent variable is proxies of real and accrual earnings management, while the main independent variable of interest is *(AIM)*, a dummy variable equals 1 if the IPO firms listed on the AIM market and zero if the IPO firms listed on the Main market. VIF is Various Inflation Factor. All other variables are previously defined.

In summary, the results in Table 5.7, Table 5.8, and Table I in Appendix A confirm the hypothesis that IPO firms on the AIM market are expected to exhibit higher levels of real and accrual earnings management during the IPO than IPO firms on the Main market. [57]

5.5.3.2 Sample Selection-bias

One possible observation about the results in Table 5.8 is that they may be affected by a sample selection-bias. Gerakos et al. (2011) find evidence that IPO firms listed on the AIM market have higher levels of information asymmetry, failure rates, post-IPO stock return underperformance, and a lower level of liquidity than IPO firms listed on the Main market and other developed US markets. Thus, there is a possibility that IPO firms which choose to list on the AIM are sharing the same characteristics, which in turn may explain the differences in real and accrual earnings management between IPO firms on the AIM and Main markets.

To rule out that the reported results in Table 5.8 are not driven by the sample selection-bias, this chapter uses a Heckman (1979) two-stage model to control for sample selection-bias where in the first stage a probit regression is used on the probability of listing on the AIM market. Then, the inverse Mills ratio is calculated and included as a control variable in the second stage regression. In the first stage the following model is used to obtain the probability of listing on the AIM market

---

[57] For robustness this chapter also follows the compensation literature (e.g., Smith and Watts, 1992; Core et al., 1999; Murphy, 1999; Core et al., 2008) by undertaking a two-stage analysis. In the first stage, the following OLS regression is used:

$$EM_{i,t}=\alpha_0+\beta_1 LnSize+\beta_2 BigN+\beta_3 VC+\beta_4 Underwriter+\beta_5 BM+\beta_6 Ln(1+age)+\beta_7 CapexGrowth+\beta_8 Lev +\beta_9 ROA+\beta_{10} Loss+\beta_{11} SEO+ IND+ Year +\varepsilon_{i,t.}$$

Where ($EM_{i,t}$) is the different proxies for real and accrual earnings management during the IPO year, (*SEO*) a dummy variable equals 1 if the firm undertakes a seasoned equity offering during the IPO year and 0 otherwise, and all other variables are previously defined. In the second stage, the residuals (ε_{it}) from the above OLS regression are obtained and tested whether the difference in the mean and median residuals between AIM market and Main market IPOs are statistically significant during the IPO year. The residuals of the OLS regressions, therefore, represent the part of real and accrual earnings management that is not explained by size or any of the other factors that are likely to be a significant driver of earnings management. Table II in Appendix A reports the results of this second stage analysis and shows that IPO firms on the AIM market exhibit higher levels of real and accrual earnings management than IPO firms on the Main market. Therefore, this evidence confirms that the results in Table 5.8 can be interpreted in the context of differences in the regulatory environment.

where the dependent variable is a dummy variable equals 1 if the firm listed on the AIM market and 0 if the firm listed on the Main market:

$$\begin{aligned} 0,1 = {} & \alpha_0 + \beta_1 LnSize + \beta_2 LnZeroReturn + \beta_3 Volatility + \beta_4 Litigation + \beta_5 Curr \\ & + \beta_6 Underpricing + \beta_7 AgeSinceIPO + \beta_8 OutDirectors + \beta_9 BrdSize \\ & + \beta_{10} Chrm/CEO + \beta_{11} Ln(1+age) + \beta_{12} ROA + \beta_{13} RetaiOwnership \\ & + IND + Year + \varepsilon_{it} \end{aligned} \quad (5.9)$$

After the inverse Mills ratio is calculated from the probit regression in the first stage, it is included as a control variable in the second stage of the Heckman test to control for sample selection bias. The following model is used in the second stage of Heckman test where ($EM_{i,t}$) is the different proxies for real and accrual earnings management:

$$\begin{aligned} EM_{it} = {} & \alpha_0 + \beta_1 AIM + \beta_2 LnSize + \beta_3 Lev + \beta_4 CapexGrowth + \beta_5 Loss + \beta_6 BM \\ & + \beta_7 Abs(CFO) + \beta_8 Ln(1+age) + \beta_9 BigN + \beta_{10} VC + \beta_{11} Underwriter \\ & + \beta_{12} AudTenure + \beta_{13} Invs\_Mills + IND + Year + \varepsilon_{it} \end{aligned} \quad (5.10)$$

Where (*LnZeroReturn)* is measured as natural logarithm of *(ZeroReturn* /1-*ZeroReturn)* and *ZeroReturn* is defined as the number of zero-return trading days divided by the total number of trading days since the IPO date and up to one year later,[58] (*Litigation)* equals 1 if the firms in a high litigation industry and zero otherwise[59], *(Curr)* is current ratio measured as current assets divided by current liabilities, (*Underpricing*) is the percentage difference between the offer price and the closing price on the first day of trading, *(AgeSinceIPO)* is the age of IPO firms measured as the cumulative number of years since the IPO date and up to the delisted date or 31/12/2011 (the one is sooner), (*Invs_Mills)* is the inverse Mills ratio calculated from the first stage probit regression on the probability of listing on the AIM market. All other variables are previously defined.

The first stage includes a set of control variables that are excluded from the second stage regression (namely *ZeroReturn, Litigation, Curr, Underpricing*, *Volatility*, and *AgeSinceIPO)* to meet the exclusion restriction of Heckman (1979)

[58] This definition of *ZeroReturn* is consistent with Bekaert et al. (2007) and Gerakos et al. (2011).

[59] Following Zang (2012) and Cohen and Zarowin (2010), high litigation industries are SIC codes 2833–2836, 8731–8734, 7371–7379, 3570–3577, and 3600–3674.

test. Further, the proxy of size in the first stage (natural logarithm of market value) is highly correlated with the *Invs_Mills* ratio and, therefore, is replaced with the natural logarithm of sales in the second stage regression.

Recent research shows that firms on the AIM market have higher levels of information asymmetry, lower level of liquidity, higher failure rates, and higher levels of stock return underperformance (Mendoza, 2008; Gerakos et al., 2011). Further, the AIM market imposes lighter requirements for corporate governance. Thus, and following Gerakos et al. (2011), (*ZeroReturn)* is included to control for the liquidity and information asymmetry problems as IPO firms with high level of information asymmetry their stock are less likely to be traded. Also, stock return variability *(Volatility)* is added to the model as Gerakos et al. (2011) show that firms on the AIM market experience greater returns underperformance compared with firms on the Main market and other developed US stock markets. Further, (*Litigation)* is included to control for future litigation risks as IPO firms on the AIM market have higher level of information asymmetry than other firms and regarded as more risky (e.g., Gerakos et al., 2011). The model also includes *(Curr)* to control for the liquidity problem, while *Underpricing* is included as IPO firms on the AIM market have higher levels of information asymmetry and more risky (Gerakos et al., 2011) and, therefore, investors are expected to be compensated by underwriters to taking part in this IPO (e.g., Aggarwal et al., 2002). Finally, *(AgeSinceIPO)* is included as Gerakos et al. (2011) find IPO firms on the AIM market have higher failure rates than IPO firms on the Main market and other US developed market.

The results of the first-stage (Model 1) and the second-stage regressions (Models 2, 3, 4, and 5) are reported in Table 5.9 and show that the previous evidence (reported in Table 5.8) on real and accrual earnings management under different regulatory environments still holds after controlling for the sample selection bias. [60]

[60] The multicollinearity problem is tested in the first and second stage regressions of Heckman (1979) test. The highest Variance Inflation Factor (VIF) was 4 for *Invs_Mills* in the second-stage regression. Thus, the reported results in Table 5.9 are not affected by the multicollinearity problem.

Table 5.9 Relation between regulatory environments and real and accrual earnings management after controlling for sample selection bias

	Model (1) Probit Regression	Model (2) OLS Regression	Model (3) OLS Regression	Model (4) OLS Regression	Model (5) OLS Regression
VARIABLES	**AIM=1**	**Aggregate real earnings management**	**Abnormal cash flows from operations**	**Abnormal discretionary expenses**	**Discretionary accruals**
LnSize	-6.018	0.131	0.069	0.06	-0.111
	(-7.550)***	(1.666)*	(0.967)	(0.864)	(-1.502)
AIM		-0.061	0.076	-0.094	0.079
		(-1.378)	(1.889)*	(-2.183)**	(1.714)*
LnZeroReturn	1.860				
	(3.273)***				
Volatility	0.524				
	(0.979)				
Litigation	0.067				
	(0.122)				
Curr	0.396				
	(0.916)				
Underpricing	-0.009				
	(-0.024)				
AgeSinceIPO	-0.492				
	(-1.376)				
OutDirectors	-0.563				
	(-1.477)				
BrdSize	-0.212				
	(-0.564)				
Chrm/CEO	0.206				
	(0.552)				
ROA	-0.584				
	(-1.337)				
RetaiOwnership	0.706				
	(1.668)*				
Lev		0.062	0.056	0.024	0.06
		(1.396)	(1.416)	(0.551)	(1.409)
CapexGrowth		-0.086	-0.047	-0.063	0.036
		(-1.164)	(-0.661)	(-0.868)	(0.451)
Loss		0.131	0.231	-0.078	0.066
		(3.557)***	(6.988)***	(-2.144)**	(1.805)*
BM		0.153	0.019	0.149	0.135
		(3.252)***	(0.434)	(3.288)***	(2.745)***
Abs(CFO)		0.018	0.252	-0.214	0.105
		(0.279)	(3.919)***	(-3.395)***	(1.593)
Ln(1+age)	-0.215	-0.098	-0.065	-0.073	-0.047
	(-0.585)	(-2.201)**	(-1.560)	(-1.680)*	(-1.040)
Big N		-0.067	0.013	-0.075	-0.021
		(-1.930)*	(0.431)	(-2.292)**	(-0.613)
VC		-0.038	-0.047	-0.004	-0.047
		(-1.188)	(-1.669)*	(-0.113)	(-1.504)

(The table is continued on the next page)

Table 5.9 (Continued)

	Model (1) Probit Regression	Model (2) OLS Regression	Model (3) OLS Regression	Model (4) OLS Regression	Model (5) OLS Regression
VARIABLES	**AIM=1**	**Aggregate real earnings management**	**Abnormal cash flows from operations**	**Abnormal discretionary expenses**	**Discretionary accruals**
Underwriter		-0.014	0.056	-0.066	0.033
		(-0.385)	(1.749)*	(-1.911)*	(0.936)
AudTenure		-0.057	-0.015	-0.022	-0.014
		(-1.527)	(-0.425)	(-0.557)	(-0.344)
Invs_Mills		-0.124	-0.029	-0.008	0.050
		(-1.482)	(-0.387)	(-0.108)	(0.574)
Constant	5.734	0.634	0.249	0.877	0.351
	(4.625)***	(5.520)***	(2.436)**	(8.123)***	(3.120)***
Year and industry dummies	Yes	Yes	Yes	Yes	Yes
N	561	539	539	539	539
Log likelihood	435.10				
Pseudo R^2	0.7002				
Prob > chi2	0.0000				
Adj.R^2		0.090	0.218	0.140	0.068
F-statistic		3.34	7.32	5.52	3.01
Prob (F-statistic)		0.0000	0.0000	0.0000	0.0000
Mean VIF		1.86	1.86	1.86	1.86
Max VIF		4.07	4.07	4.07	4.07

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Robust *t*-statistics (appear in parentheses) are clustered at the firm level as suggested by Petersen (2009). Table 5.9 reports the results of regressions of real and accrual earnings management proxies on the regulatory environments after controlling for the sample selection bias. Model 1 is a probit regression where the dependent variable *(AIM)* is a dummy variable equals 1 if the IPO firms listed on the AIM market and zero if the IPO firms listed on the Main market. Models 2, 3, 4, and 5 are OLS regressions where the dependent variables are proxies of real and accrual earnings management. All other variables are previously defined.

5.5.4 Earnings Management and Post-IPO Stock Performance

5.5.4.1 Post-IPO Stock Performance Sorted by Real and Accrual Earnings Management

Table 5.10 reports post-IPO 3-year abnormal returns measured using BHAR for IPO firms relative to the level of real and accrual earnings management during the IPO year. Table 5.10 (Panel A) reports the results for the pooled sample and shows that long-run underperformance occurs for the quartiles with the highest level of earnings manipulation and that this result is consistent for all earnings management proxies. For example, the underperformance as measured by the mean 3-year BHAR for the discretionary accruals quartiles ranges from -2.1% for the conservative quartile to -43.2% for the aggressive quartile. In addition, considering the aggregate

measure of real earnings management, the BHAR is 4% for the conservative quartile and -31.3% for the most aggressive. Similar results are reported when using an abnormal level of cash flows from operations. These results indicate that IPO firms that have higher levels of earnings management during the IPO year experience a higher decline in stock returns in the post IPO period.

Table 5.10 also provides evidence on the difference between the long-run stock returns for AIM IPO firms (Panel B) and Main IPO firms (Panel C) by sorting the return quartiles relative to the levels of real and accrual earnings management during the IPO year. The results for the Main market show that, in general, IPO firms experience a greater decline in post-IPO stock return performance compared to the AIM market. For example, Panel B reports the results for the AIM market and shows for discretionary accruals, that the BHAR for the aggressive quartile is -46.1% compared to the aggressive quartile presented in Panel C for Main market IPOs, -51.9%. In addition, comparing the stock returns across Panels B and C for the aggregate measure of real earnings management the results show that the stock return performance for aggressive Main market firms is -39.6%, while for AIM firms it is -23.3%.[61] The results of Table 5.10 suggest that IPO firms with high levels of real and accrual earnings management during the IPO year experience a decline in post-IPO returns performance.

This chapter also tests abnormal returns for one-year and two-year holding periods and finds similar results to those are reported in Table 5.10. Further, due to the skewness problems associated with using the buy-and-hold approach, this chapter follows Lyon et al. (1999) and calculates the statistical significance of *t*-tests using a bootstrapped skewness-adjusted *t*-statistic and the results are qualitatively similar to using the conventional *t*-statistic.

[61] These results are significant at 5%.

Table 5.10 Post-IPO 3-year buy-and-hold returns for IPO firms by level of real and accrual earnings management activities

	Buy-and-hold abnormal returns			
	Q1	**Q2**	**Q3**	**Q4**
Panel A: Mean 3-year BHAR: Whole sample (n=571)				
Discretionary accruals	-0.021	0.072	-0.133	-0.432
	(-0.27)	(0.79)	(-1.80)*	(4.76)***
Abnormal cash flows from operations	0.025	-0.039	-0.150	-0.349
	(0.30)	(-0.49)	(-1.61)	(-5.10)***
Abnormal discretionary expenses	-0.091	-0.214	-0.131	-0.076
	(-1.03)	(-2.24)	(-1.50)	(-1.18)
Aggregate real earnings management	0.040	-0.134	-0.109	-0.313
	(0.40)	(-1.73)*	(-1.27)	(-4.37)***
	Q1	**Q2**	**Q3**	**Q4**
Panel B: Mean 3-year BHAR: AIM (n=433)				
Discretionary accruals	-0.101	-0.175	-0.130	-0.461
	(-1.11)	(-1.62)	(-1.48)	(-4.14)***
Abnormal cash flows from operations	0.030	-0.038	-0.142	-0.366
	(0.31)	(-0.34)	(-1.24)	(-4.52)***
Abnormal discretionary expenses	-0.186	-0.260	-0.024	-0.047
	(-1.71)*	(-2.18)**	(-0.23)	(-0.69)
Aggregate real earnings management	-0.018	-0.119	-0.147	-0.233
	(-0.14)	(-1.27)	(-1.32)	(-3.14)***
	Q1	**Q2**	**Q3**	**Q4**
Panel C: Mean 3-year BHAR: Main sample (n=138)				
Discretionary accruals	-0.202	-0.102	-0.095	-0.519
	(-1.31)	(-0.77)	(-0.61)	(-4.46)***
Abnormal cash flows from operations	-0.121	-0.003	-0.290	-0.334
	(-0.82)	(-0.02)	(-1.88)*	(-3.14)***
Abnormal discretionary expenses	-0.200	-0.246	-0.175	-0.291
	(-1.50)	(-1.69)	(-1.19)	(-1.93)*
Aggregate real earnings management	0.253	-0.209	-0.161	-0.396
	(1.76)*	(-1.67)	(-1.15)	(-2.52)**

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Differences in means are estimated using t-tests. Table 5.10 reports the mean 3-year buy-and-hold abnormal returns for the pooled, AIM, and Main IPO samples over the period 1998-2008 by level of earnings management during the IPO year. IPOs in each sample are divided into four quartiles relative to the level of real and accrual earnings management that occurred in the IPO year. The mean 3-year abnormal returns are then calculated for each quartile using BHAR. The holding period is 4 to 40 months after the IPO year. Q1 represents the most conservative quartile (IPO firms with the lowest level of earnings management) and Q4 the most aggressive (IPO firms with highest level of earnings management). Discretionary accruals are estimated using corrected version of the modified Jones (1991) model (Dechow et al., 1995). Abnormal cash flows from operations and abnormal discretionary expenses are estimated using models developed by Dechow et al. (1998) and as implemented by Roychowdhury, (2006). Aggregate real earnings management is the sum of abnormal cash flows from operations and abnormal discretionary expenses. The mean buy-and-hold abnormal return is calculated as follows:

$$BHAR_T = \frac{1}{N}\sum_{i=1}^{N}\left[\prod_{t=1}^{T}(1+R_{i,t}) - \prod_{t=1}^{T}(1+R_{benchmark,t})\right]$$

Where R_t is monthly return for IPO firms in month t and $R_{benchmark}$ is the monthly return for the benchmark.

5.5.4.2 Regressions of Post-IPO Stock Performance

To test whether the real and accrual earnings management activities of IPO firms predicts the stock return performance of IPO firms under different regulatory environments in the following period, this chapter follows prior research (e.g., Teoh et al., 1998a; Roosenboom et al., 2003) by running a cross-sectional regression where the dependent variable is three-year BHAR and the independent variables are the proxies of real and accrual earnings management plus a vector of control variables.

As discussed above, a positive level of discretionary accruals is an indicator of income-increasing earnings management, as are negative abnormal cash flows from operations and abnormal discretionary expenses. As before, abnormal cash flows from operations and abnormal discretionary expenses are multiplied by -1. This allows real and accrual earnings management proxies to have the same interpretation with respect to their effect on stock return performance. Thus, the 3-year BHAR, adjusted on a size and book-to-market matched sample, from month +4 through to month +40 is regressed against the different measures of real and accrual earnings management (*EM*) and their interaction terms with AIM market dummy *(AIM).* Where *(AIM)* is a dummy variable equals 1 if the firm listed on the AIM market and 0 if the firm listed on the Main market

In addition, and following previous research (e.g., Teoh et al., 1998a, 1998b; Roosenboom at al., 2003; Chang et al., 2010), a set of control variables are included, namely; firm size (*LnSize*); returns variability*(Volatility);* leverage ratio (*Lev*)*;* book-to-market ratio (*BM)*; age [*Ln(1+age)*]; capital expenditure growth (*CapexGrowth*); profitability *[ROA and Loss]*; and the absolute value of cash flows from operations [*Abs(CFO)]*. Finally, dummies are added to control for industry (*IND)* and year (*Year*). Specifically, the following OLS regression is estimated using the percentile rank of all variables (dependent and independent) to avoid an outliers problem.

$$\begin{aligned} BHAR_{i,4,40} = {} & \alpha_0 + \beta_1 EM + \beta_2 AIM + \beta_3 EM \ x \ AIM + \beta_4 LnSize + \beta_5 Volatility + \beta_6 Lev \\ & + \beta_7 BM + \beta_8 Ln(1+age) + \beta_9 CapexGrowth + \beta_{10} ROA + \beta_{11} Loss \\ & + \beta_{12} Abs(CFO) + IND + Year + \varepsilon_{it} \end{aligned} \quad (5.11)$$

Table 5.11 reports the results for the analysis of whether the real and accrual earnings management activities of IPO firms predict post-IPO stock return performance. Table 5.11 shows that aggregate real earnings management, abnormal discretionary expenses, and discretionary accruals are associated with post-IPO poor stock returns performance, confirming the hypothesis that IPO firms with high levels of earnings manipulation during the IPO are expected to experience poor long-term stock return performance in the following period.

Table 5.11 Regressions of 3-year post-IPO BHAR on real and accrual earnings management-the whole IPOs sample

$$BHAR_i = \alpha + \beta_1 EM_i + \beta_2 LnSize_i + \beta_3 Volatility_i + \beta_4 Lev_i + \beta_5 BM_i + \beta_6 Ln\,(1+age)_i + \beta_7 CapexGrowth_i + \beta_8 ROA_i + \beta_9 Loss_i + \beta_{10} Abs\,(CFO)_i + IND + Year + \varepsilon_i.$$

	BHAR	**BHAR**	**BHAR**	**BHAR**
Aggregate real earnings management	-0.089 (-1.932)*			
Abnormal cash flows from operations		-0.064 (-1.028)		
Abnormal discretionary expenses			-0.077 (-1.719)*	
Discretionary accruals	-0.124 (-2.628)***	-0.114 (-2.014)**	-0.164 (-3.603)***	-0.152 (-3.359)***
Control variables	Yes	Yes	Yes	Yes
Constant	1.094 (9.104)***	1.077 (9.057)***	1.102 (9.115)***	1.051 (-9.052)***
Year and industry dummies	Yes	Yes	Yes	Yes
N	547	547	547	547
Adj.R^2	0.082	0.077	0.081	0.078
F-statistic	2.89	2.88	2.88	2.94
Prob (F-statistic)	0.000	0.000	0.000	0.000
Mean VIF	1.86	1.93	1.86	1.87
Max VIF	4.60	4.86	4.65	4.60

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Robust *t*-statistics (appear in parentheses) are clustered at the firm level as suggested by Petersen (2009). Table 5.11 reports the results of regressions of abnormal returns on IPO year earnings management proxies for whole IPOs sample. The dependent variable is the 3 year abnormal buy-and-hold return. All other variables are previously defined.

Table 5.12 reports the results for the analysis of whether the regulatory environments impact the relation between real and accrual earnings management activities of IPO firms and post-IPO stock return performance. Compared with AIM IPOs, Table 5.12 provides evidence that IPO firms on the Main market experience more severe post-IPO stock return underperformance due to earnings management activities that take place during the IPO year. Specifically, Model (1) indicates that for every 10% increase in the aggregated measure of real earnings management, post-IPO stock return performance is 2.85% lower in Main IPOs. The incremental

effect of the aggregated measure of real earnings management for post-IPO stock return performance is 2.37% lower in AIM IPOs. Further, Model (3) indicates that for every 10% increase in abnormal discretionary expenses, post-IPO stock return performance is 2.64% lower in Main IPOs, while the incremental effect of abnormal discretionary expenses is 2.30% lower in AIM IPOs. Finally Model (4) indicates that for every 10% increase in discretionary accruals, post-IPO stock return performance is 2.45% lower in Main IPOs.

In summary, the results of Table 5.11 and Table 5.12 presents evidence that real and accrual earnings management predict post-IPO stock return underperformance, and that the regulatory environment impacts the association between real and accrual earnings management and post-IPO stock return performance. Specifically, the Main market is found to have better capabilities/mechanisms than AIM market to evaluate stock prices that were inflated by earnings management during the IPO.

Table 5.12 Regressions of 3-year post-IPO BHAR on real and accrual earnings management under different regulatory environments

$$BHAR_i = \alpha + \beta_1 EM_i + \beta_2 AIM_i + \beta_3 EM_i \times AIM_i + \beta_4 LnSize_i + \beta_5 Volatility_i + \beta_6 Lev_i + \beta_7 BM_i + \beta_8 Ln(1+age)_I + \beta_9 CapexGrowth_i + \beta_{10} ROA_i + \beta_{11} Loss_i + \beta_{12} Abs(CFO)_i + IND + Year + \varepsilon_i.$$

	Model 1 BHAR	Model 2 BHAR	Model 3 BHAR	Model 4 BHAR
Aggregate real earnings management	-0.285			
	(-2.743)***			
Aggregate real earnings management x AIM	0.237			
	(2.106)**			
Abnormal cash flows from operations		-0.136		
		(-1.126)		
Abnormal cash flows from operations x AIM		0.086		
		(0.734)		
Abnormal discretionary expenses			-0.264***	
			(-2.760)	
Abnormal discretionary expenses x AIM			0.230**	
			(2.237)	
Discretionary accruals x AIM				0.117
				(0.994)
Discretionary accruals	-0.119	-0.111	-0.152	-0.245
	(-2.514)**	(-1.956)*	(-3.351)***	(-2.285)**
AIM	-0.180	-0.094	-0.172	-0.113
	(-2.372)**	(-1.073)	(-2.454)**	(-1.348)
LnSize	-0.142	-0.134	-0.135	-0.136
	(-2.087)**	(-1.965)**	(-1.991)**	(-1.996)**
Lev	-0.042	-0.045	-0.038	-0.044
	(-1.026)	(-1.078)	(-0.940)	(-1.060)
Volatility	-0.127	-0.131	-0.120	-0.129
	(-2.710)***	(-2.764)***	(-2.554)**	(-2.741)***
CapexGrowth	0.101	0.102	0.108	0.099
	(1.576)	(1.562)	(1.683)*	(1.517)
ROA	-0.024	-0.037	0.001	-0.021
	(-0.258)	(-0.395)	(0.010)	(-0.230)
Loss	-0.050	-0.051	-0.048	-0.052
	(-0.875)	(-0.892)	(-0.827)	(-0.901)
BM	-0.057	-0.067	-0.059	-0.061
	(-1.109)	(-1.291)	(-1.141)	(-1.172)
Abs(CFO)	-0.051	-0.039	-0.057	-0.053
	(-0.838)	(-0.618)	(-0.925)	(-0.849)
Ln(1+age)	-0.007	-0.001	-0.002	-0.001
	(-0.154)	(-0.018)	(-0.051)	(-0.018)
Constant	1.286	1.196	1.259	1.189
	(8.912)***	(7.657)***	(9.090)***	(8.127)***
N	547	547	547	547
Adj.R2	0.089	0.076	0.087	0.077
F-statistic	3.03	2.85	3.01	2.99
Prob (F-statistic)	0.0000	0.0000	0.0000	0.0000

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Robust *t*-statistics (appear in parentheses) are clustered at the firm level as suggested by Petersen (2009). Table 5.12 reports the results of regressions of abnormal returns on IPO year earnings management proxies and the regulatory environments. The dependent variable is the 3 year abnormal buy-and-hold return. All other variables are previously defined.

5.6 Additional Analysis

5.6.1 Performance-Matched Approach

This chapter also repeats the analysis during the IPO year using the performance-matched approach as suggested by Kothari et al. (2005), which is designed to control for the extreme performance that can bias the estimation of discretionary accruals. Thus, both real and accrual earnings management are estimated following the performance-matched approach. Specifically, each IPO firm is matched with a non-IPO firm based on year, 2-digit SIC industry code and the closest return on assets (+/- 0.20 of IPO firms' return on assets). Table III in Appendix A reports the results and shows qualitatively similar evidence to those reported in (Tables 5.5 and 5.7) that IPO firms manage earnings upward utilizing real and accrual earnings management and that IPO firms on the AIM market exhibit higher levels of earnings management activities than IPO firms on the Main market.

5.6.2 Multivariate Comparison of Earnings Management Activities

For robustness this chapter also follows prior literature (e.g., Roychowdhury, 2006; Ball and Shivakumar, 2005, 2008; Chi et al., 2011, Zang, 2012) by using OLS regressions to examine whether firms with a strong incentive to manage earnings upwards (IPO firms) exhibit evidence of earnings management compared with firms that have no incentive to manipulate reported earnings (all UK non-IPO firms). Thus, real and accrual earnings management are estimated for all firms in the pooled sample, namely IPO and all UK non-IPO firms, over the period 1998-2008, and as explained previously in section 5.4.3 for the estimation process. All financial firms are excluded from the sample due to differences in their financial reporting and disclosure requirements (e.g., Teoh et al., 1998a). After estimating earnings management for the pooled sample, the following OLS model is used to test the differences in real and accrual earnings management across IPO and non-IPO firms:[62]

$$EM_{it} = \alpha_0 + \beta_1 IPO + \beta_2 LnSize + \beta_3 ROA + IND + Year + \varepsilon_{it} \quad (5.12)$$

[62] Following prior research (e.g. Ball and Shivakumar, 2005; Gerakos et al., 2011; Leone et al., 2012), the percentile rank of all variables (dependent and independent) are used in the regression models to avoid an outliers problem.

Where ($EM_{i,t}$) is the different proxies for real and accrual earnings management, (*IPO*) is a dummy variable equalling 1 if the firm is an IPO firm and 0 otherwise. All other variables are previously defined. Further, and following Ball and Shivakumar (2008), model (5.12) is just estimated for industries with at least five IPOs. Ball and Shivakumar (2008) indicate that this restriction reduces the sample size, but leads to an easier interpretation for the coefficients. Hence, each industry-year group in the sample should have at least 5 IPO observations in order to be included to the final sample.

Table IV in Appendix A reports the results and shows evidence that IPO firms in the UK exhibit higher levels of aggregate real earnings management, abnormal cash flows from operation, and discretionary accruals than non-IPO firms. Overall, the reported results in Table IV are consistent with the earlier reported results in Tables 5.5 that IPO firms engage in real activities-based and accrual-based manipulations during the IPO year. [63]

5.6.3 Sample Selection-bias Treatment Effect Model

Sample selection-bias is still a cause for concern in accounting research, notably research that investigates earnings management, audit quality, voluntary disclosure, etc. A recent paper by Lennox et al. (2012) finds evidence that the self-selection model (Heckman two-stage test) is very sensitive to the model specification and the sample composition. Lennox et al. (2012) find any small changes in the model specification or any minor changes in the sample composition lead to change the result of the selection model, while they find that OLS regression is more robust. [64]

For robustness this chapter follows recent literature (e.g. Demirakos et al., 2009) that addresses sample selection-bias by using a treatment effects framework to employ selection-style models (Greene, 2003, pp.787-789; Stata, 2005, pp. 456-465). Specifically, a treatment effect model is employed using a two-step estimator to simultaneously estimate the effect of an endogenous binary variable (*AIM*) on a continuous fully-observed variable (*EM*), conditional on two sets of independent variables (Stata, 2005, pp. 458). The first set of the

[63] Also, the analysis is repeated without imposing the restriction of five IPOs in each industry-year group. The results are reported in Table V in Appendix A and show similar results to those reported in Table IV.

[64] Lennox et al. (2012) find 30 papers out of 545 papers, published in The Accounting Review, Journal of Accounting and Economic, and Journal of Accounting Research through the period 2000-2007, use self-selection models.

independent variables are included in the full choice model (*AIM* model), while the second set are included in the earnings management model. The hazard variable (*lambda*) is computed from the full choice model on the probability of listing on the AIM market.[65] The full choice model includes the following independent variables; *LnSize*, *LnZeroReturn, Curr, RetaiOwnership, Ln(1+age),* and *ROA*, while the earnings management model includes the following independent variables; *LnSales, Lev, CapexGrowth, Loss, BM, Abs(CFO), VC, Underwriter, Big N, AudTenure, OutDirectors, BrdSize* and *Chrm/CEO*. *LnSales* is the natural logarithm of sales and all other variables are previously defined.

The results are reported in Table VI in Appendix A and show similar evidence to the main analysis in Table 5.8 on the association between regulatory environments and real and accrual earnings management around IPOs after correcting for sample-selection bias.

5.7 Conclusions

This chapter examines real and accrual earnings management around IPOs under different regulatory environments. Although prior research has examined accrual earnings management around IPOs (e.g., Friedlan, 1994; Teoh et al. 1998a; Gramlich and Sorensen, 2004; Morsfield and Tan, 2006; Chahine et al., 2012), and a small number of recent papers have started to investigate real earnings management activities and IPOs (e.g., Darrough and Rangan, 2005; Singer and Fedyk, 2011; Wongsunwai, 2012), this chapter progresses the literature by examining the effect of the regulatory environment on real and accrual earnings management activities around IPOs and post-IPO stock return performance.

This chapter contributes to the literature by providing the following evidence. First, the results show that IPO firms engage in both real and accrual based earnings management during the IPO year and the year after. In addition, the results show that IPO firms manage earnings upward by manipulating real activities more extensively than accrual based activities. Second, IPO firms on the lightly regulated AIM market are found to have higher levels of sales-based and accrual-based earnings management during the IPO year compared to those firms that list on the more heavily regulated Main market. Further, IPO firms on the AIM market are found to exhibit lower levels of discretionary expenses-based manipulation.

[65] Lambda is also known as the invers Mills ratio.

This is due to the fact that IPO firms cannot simultaneously engage in sales-based and discretionary expenses-based manipulations, notably that high levels of sales are expected to be combined with high levels of spending on selling and advertising expenses. Thus, managing both sales and discretionary expenses is likely to bring the attention of outsiders e.g. high quality auditors, prestigious underwriters, etc.

Third, the results show that IPO firms with high levels of real and accrual earnings management during the IPO year experience post-IPO stock return underperformance, and that the regulatory environment matters. Specifically, and compared with the AIM market, IPO firms on the Main market are found to experience more severe poor stock return performance due to real and accrual earnings management that occur at the end of the IPO year. This is, in turn, consistent with the view that the Main market has better capabilities/mechanisms than the AIM market to correct stock prices that were inflated by earnings management at the IPO. Further, this evidence confirms the view that earnings management activities are negatively associated with subsequent return and operating performance (e.g., Teoh et al. 1998a; Cohen and Zarowin, 2010; Kothari et al., 2012).[66]

Overall, the findings of this chapter show that the regulatory environment impacts upon the accounting choices of managers and future stock returns performance. This chapter, therefore, adds to the growing evidence (Roychowdhury, 2006; Cohen and Zarowin, 2010; Zang, 2012) that first, earnings management research needs to consider real and accrual-based manipulation and second, that the regulatory environment is an important factor that needs to be considered in future research.

[66] It is worth noting that recent research employed a two-stage model to examine the trade-off between real and accrual earnings management (Cohen and Zarowin, 2010; Zang, 2012). However, such test is less likely to be employed due to the data limitation concerning several variables that need to be incorporated into the empirical models. These variables capture the costs of utilizing real and accrual earnings management e.g. executive compensation, the number of analysts following the firm, net operating assets, the length of operating cycle, the financial health of the firm proxied by Altman's Z-score, the number of times that the firm meet or beat analysts' earnings forecasts in the previous four quarters, etc.

Appendix A

Appendix A Table I Regressions of real and accrual earnings management for AIM IPO sample

	Aggregate real earnings management	Abnormal cash flows from operations	Abnormal discretionary expenses	Discretionary accruals
Big N	-0.073	0.007	-0.088	-0.013
	(-1.812)*	(0.220)	(-2.430)**	(-0.339)
Underwriter	-0.091	0.028	-0.127	0.002
	(-1.913)*	(0.654)	(-3.047)***	(0.032)
LnSize	-0.029	0.098	-0.027	0.179
	(-0.355)	(1.347)	(-0.352)	(2.082)**
Volatility	0.008	0.019	-0.017	0.045
	(0.136)	(0.365)	(-0.325)	(0.776)
Lev	0.047	0.051	0.008	0.042
	(0.905)	(1.117)	(0.160)	(0.805)
BM	0.146	-0.002	0.161	0.095
	(2.686)***	(-0.040)	(3.052)***	(1.698)*
Ln(1+age)	-0.060	0.001	-0.091	-0.008
	(-1.124)	(0.026)	(-1.831)*	(-0.153)
CapexGrowth	-0.055	0.016	-0.083	0.044
	(-0.692)	(0.233)	(-1.125)	(0.547)
AudTenure	-0.037	-0.021	0.006	-0.002
	(-0.779)	(-0.501)	(0.129)	(-0.037)
VC	-0.031	-0.013	-0.031	-0.032
	(-0.755)	(-0.339)	(-0.806)	(-0.727)
ROA	-0.120	-0.428	0.271	-0.141
	(-1.137)	(-4.469)***	(2.651)***	(-1.285)
Loss	0.068	-0.009	0.083	0.002
	(1.028)	(-0.149)	(1.270)	(0.033)
Abs(CFO)	0.004	0.233	-0.210	0.095
	(0.054)	(3.395)***	(-2.953)***	(1.338)
OutDirectors	0.050	-0.089	0.103	0.000
	(0.908)	(-1.826)*	(1.961)*	(0.000)
BrdSize	-0.021	0.035	-0.019	-0.020
	(-0.353)	(0.680)	(-0.353)	(-0.337)
Chrm/CEO	-0.001	0.057	-0.092	0.050
	(-0.018)	(0.898)	(-1.360)	(0.769)
RetaiOwnership	-0.049	-0.001	-0.034	-0.000
	(-0.934)	(-0.022)	(-0.700)	(-0.006)
Constant	0.690	0.643	0.580	0.422
	(4.215)***	(4.638)***	(3.907)***	(2.662)***
Year and industry dummies	Yes	Yes	Yes	Yes
N	412	412	412	412
Adj.R^2	0.080	0.272	0.192	0.075
F-statistic	2.65	8.62	6.39	2.94
Prob (F-statistic)	0.0000	0.0000	0.0000	0.0000
Mean VIF	1.80	1.80	1.80	1.80
Max VIF	4.92	4.92	4.92	4.92

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Robust *t*-statistics (appear in parentheses) are clustered at the firm level as suggested by Petersen (2009). Table I reports the results of regressions of real and accrual earnings management proxies with several explanatory variables for IPO firms on the AIM market. The dependent variables are proxies of real and accrual earnings management and all other variables are previously defined.

Appendix A Table II Differences in real and accrual earnings management residuals between AIM and Main IPOs

	AIM		Main		Differences	
	Median (Mean)	**N**	**Median (Mean)**	**N**	**Median (Mean)**	**z-statistic (t-statistic)**
Aggregate real earnings management	0.020 (-0.011)	433	0.062 (0.034)	138	-0.042 (0.045)	-1.133 (-0.850)
Abnormal cash flows from operations	0.042 (0.009)	433	-0.090 -(0.027)	138	0.132 (0.036)	2.938*** (0.880)
Abnormal discretionary expenses	0.000 -(0.020)	433	0.138 (0.061)	138	-0.138 (-0.081)	-3.170*** (-1.529)
Discretionary accruals	0.030 (0.007)	433	-0.021 (-0.023)	138	0.051 (0.030)	2.572** (0.998)

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Table II reports the difference in median (Wilcoxon Signed Rank test) and mean (t-test) real and accrual earnings management residuals during the IPO year between IPO firms on the AIM and Main markets over the period 1998-2008. The residuals ($\varepsilon_{i,t}$) are taken from the following regression:

$$EM_{i,t}=\alpha_0+\beta_1 LnSize+\beta_2 BigN+\beta_3 VC+\beta_4 Underwriter+\beta_5 BM+\beta_6 Ln(1+age)+\beta_7 CapexGrowth+\beta_8 Lev +\beta_9 ROA +\beta_{10} Loss+\beta_{11} SEO+ IND+ Year +\varepsilon_{i,t}$$

Where *(EM)* is the different proxies for real and accrual earnings management, (*SEO*) is a dummy variable equals 1 if the firm undertakes a Seasoned Equity Offering during the IPO year and 0 otherwise. All other variables are previously defined.

Appendix A Table III Real and accrual earnings management during the IPO year relative to a performance-matched sample

	Whole sample	AIM sample	Main sample
Panel A: The performance-adjusted discretionary accruals			
Median	0.020**	0.035***	-0.014
Mean	0.028*	0.032*	0.007
Panel B: The performance-adjusted abnormal level of cash flows from operations			
Median	0.027***	0.034**	0.011
Mean	0.028	0.022	0.045*
Panel C: The performance-adjusted abnormal level of discretionary expenses			
Median	0.029**	0.049***	-0.048
Mean	0.082**	0.117***	-0.029
Panel D: The performance-adjusted aggregate measure of real earnings management			
Median	0.082***	0.099***	0.021
Mean	0.107***	0.142***	0.007

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Differences in medians are tested using the Wilcoxon Signed Rank test and differences in means are tested using t-tests. Table III reports median and mean the performance-adjusted measures of discretionary accruals, abnormal cash flows from operations, abnormal discretionary expenses and the aggregate measure of real earnings management for the Whole, AIM and Main IPO samples during the IPO year. The performance-adjusted measures are calculated as the difference between the levels of real and accrual earnings management for IPO firms and their matched firms. To create the matched sample, each IPO firm is matched with non-IPO firms based on year and industry membership, and that ROA of non-IPO firms within +/-0.20 of IPO firms' ROA. To avoid outlier problems all financial continuous data for the IPO firms and the control samples are Winsorized at the top 1% and bottom 99%. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation. The aggregate measure of real earnings management is the sum of abnormal cash flows from operations and abnormal discretionary expenses after multiplying by minus one.

Appendix A Table IV Multivariate comparison of real and accrual earnings management after excluding industries with less than five IPOs

VARIABLES	Aggregate real earnings management	Abnormal cash flows from operations	Abnormal discretionary expenses	Discretionary accruals
IPO	0.062	0.100	0.005	0.109
	(2.502)**	(4.045)***	(0.189)	(4.244)***
LnSize	0.043	-0.030	0.030	-0.014
	(1.222)	(-0.940)	(0.822)	(-0.374)
ROA	-0.161	-0.499	0.126	-0.120
	(-5.347)***	(-18.095)***	(4.093)***	(-3.780)***
Constant	0.720	0.912	0.576	0.643
	(13.191)***	(19.146)***	(10.990)***	(12.910)***
Year and industry dummies	Yes	Yes	Yes	Yes
No. of IPO event-years	322	322	322	322
No. of listed non-IPO firm/years	1079	1079	1079	1079
No. of observations, total	1401	1401	1401	1401
Adj.R^2	0.021	0.247	0.014	0.029
F-statistic	2.68	27.59	2.38	3.36
Prob (F-statistic)	0.0000	0.0000	0.0000	0.0000
Mean VIF	2.05	2.05	2.05	2.05
Max VIF	4.22	4.22	4.22	4.22

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Robust *t*-statistics (appear in parentheses). Table IV reports multivariate comparison of real and accrual earnings management across IPO firms and all UK non-IPO firms over the period 1998-2008, excluding industries with less than five IPOs. The dependent variables are proxies of real and accrual earnings management, (*IPO*) is a dummy variable equalling 1 if the firm is an IPO firm and 0 if the firm is non-IPO firm, and all other variables are previously defined. To facilitate ease of interpretation of the coefficients, and following Ball and Shivakumar (2008), industries with less than five IPOs are excluded from the analysis.

Appendix A Table V Multivariate comparison of real and accrual earnings management

VARIABLES	Aggregate real earnings management	Abnormal cash flows from operations	Abnormal discretionary expenses	Discretionary accruals
IPO	0.076	0.050	0.026	0.060
	(4.492)***	(2.919)***	(1.495)	(3.337)***
LnSize	0.014	0.006	0.004	-0.030
	(1.021)	(0.439)	(0.266)	(-2.184)**
ROA	-0.165	-0.431	0.067	-0.088
	(-11.323)***	(-32.270)***	(4.578)***	(-5.760)***
Constant	0.700	0.853	0.566	0.670
	(32.347)***	(45.156)***	(25.752)***	(31.092)***
Year and industry dummies	Yes	Yes	Yes	Yes
No. of IPO event-years	570	570	570	570
No. of listed non-IPO firm/years	6072	6072	6072	6072
No. of observations, total	6642	6642	6642	6642
Adj.R^2	0.031	0.179	0.012	0.013
F-statistic	6.87	43.51	4.19	3.43
Prob (F-statistic)	0.0000	0.0000	0.0000	0.0000
Mean VIF	1.71	1.71	1.71	1.71
Max VIF	2.79	2.79	2.79	2.79

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Robust *t*-statistics (appear in parentheses). Table V reports multivariate comparison of real and accrual earnings management across IPO firms and all UK non-IPO firms over the period 1998-2008. The dependent variables are proxies of real and accrual earnings management, (*IPO*) is a dummy variable equalling 1 if the firm is IPO firm and 0 if the firm is non-IPO firm, and all other variables are previously defined.

Appendix A Table VI Relation between regulatory environments and real and accrual earnings management after controlling for sample selection bias using a treatment effects framework (a two-step estimator)

Panel A: Aggregate real earnings management and abnormal cash flows from operations models

	Model 1		Model 2	
VARIABLES	**AIM=1**	**Aggregate real earnings management**	**AIM=1**	**Abnormal cash flows from operations**
Ln(MarketCapital)	-3.883		-3.883	
	(-8.904)***		(-8.904)***	
LnZeroReturns	1.313		1.313	
	(3.776)***		(3.776)***	
Curr	0.291		0.291	
	(1.029)		(1.029)	
RetaiOwnership	0.123		0.123	
	(0.452)		(0.452)	
Ln(1+age)	-0.459		-0.459	
	(-1.711)*		(-1.711)*	
ROA	-0.258		-0.258	
	(-0.896)		(-0.896)	
AIM		-0.052		0.161
		(-0.789)		(2.632)***
Ln(Sales)		0.139		0.080
		(1.989)**		(1.233)
Lev		0.069		0.032
		(1.664)*		(0.845)
CapexGrowth		-0.175		-0.069
		(-2.507)**		(-1.058)
Loss		0.136		0.252
		(4.053)***		(8.084)***
BM		0.156		0.007
		(3.374)***		(0.156)
Abs(CFO)		0.022		0.331
		(0.373)		(6.090)***
VC		-0.041		-0.039
		(-1.257)		(-1.299)
Underwriter		-0.035		0.061
		(-0.981)		(1.887)*
Big N		-0.072		0.005
		(-2.197)**		(0.174)
AudTenure		-0.074		-0.015
		(-1.975)**		(-0.435)
OutDirectors		0.041		-0.054
		(0.919)		(-1.312)
BrdSize		-0.053		0.020
		(-1.154)		(0.467)
Chrm/CEO		-0.012		-0.011
		(-0.256)		(-0.248)
Constant	3.145	0.531	3.145	0.143
	(5.468)***	(5.164)***	(5.468)***	(1.499)
Chi-square		54.98		143.19
Prob (Chi-square)		0.0000		0.0000
Value hazard of *lambda*		0.013		-0.057
		(0.317)		(-1.455)
N	541	541	541	541

(This Table is continued on the next page)

Table VI (Continued)

Panel B: Abnormal discretionary expenses and discretionary accruals models

	Model 3		Model 4	
VARIABLES	**AIM=1**	**Abnormal discretionary expenses**	**AIM=1**	**Discretionary accruals**
Ln(MarketCapital)	-3.883		-3.883	
	(-8.904)***		(-8.904)***	
LnZeroReturns	1.313		1.313	
	(3.776)***		(3.776)***	
Curr	0.291		0.291	
	(1.029)		(1.029)	
RetaiOwnership	0.123		0.123	
	(0.452)		(0.452)	
Ln(1+age)	-0.459		-0.459	
	(-1.711)*		(-1.711)*	
ROA	-0.258		-0.258	
	(-0.896)		(-0.896)	
AIM		-0.194		0.134
		(-3.015)***		(2.013)**
Ln(Sales)		0.068		-0.069
		(1.006)		(-0.980)
Lev		0.040		0.026
		(0.984)		(0.624)
CapexGrowth		-0.135		-0.009
		(-1.988)**		(-0.132)
Loss		-0.093		0.076
		(-2.831)***		(2.240)**
BM		0.150		0.110
		(3.333)***		(2.365)**
Abs(CFO)		-0.252		0.187
		(-4.422)***		(3.155)***
VC		-0.016		-0.038
		(-0.501)		(-1.166)
Underwriter		-0.075		0.043
		(-2.189)**		(1.223)
Big N		-0.067		-0.009
		(-2.122)**		(-0.260)
AudTenure		-0.055		-0.020
		(-1.507)		(-0.516)
OutDirectors		0.071		-0.005
		(1.635)		(-0.103)
BrdSize		-0.048		-0.016
		(-1.068)		(-0.350)
Chrm/CEO		-0.032		-0.004
		(-0.691)		(-0.089)
Constant	3.145	0.938	3.145***	0.339
	(5.468)***	(9.369)***	(5.468)	(3.269)***
Chi-square		83.60		42.26
Prob (Chi-square)		0.0000		0.0000
Value hazard of		0.071		-0.054
lambda		(1.715)*		(-1.258)
N	541	541	541	541

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Table VI reports the results of regressions of real and accrual earnings management proxies on the regulatory environments after controlling for the sample selection bias using a treatment effects model, two-step estimator. All other variables are previously defined.

Chapter 6
Audit Quality, Real and Accrual Earnings Management and Stock Return Performance

6.1 Introduction

The prior literature on earnings management presents evidence that IPO firms manipulate earnings using accrual earnings management around IPOs and this manipulation leads to inferior post-IPO performance (Friedlan, 1994; Teoh et al., 1998a; DuCharme et al., 2001; Roosenboom et al., 2003; Gramlich and Sorensen, 2004; Morsfield and Tan, 2006; Fan, 2007; Chang et al., 2010). While IPO firms may attempt to manage earnings upward pre the IPO to increase the offer price, there are also strong incentives to manage earnings upward at the end of the IPO year (at the end of the first year of being public firms) to support the stock price (e.g. Teoh et al., 1998a). For example, Teoh et al. (1998a) indicate that the lock-up restriction on managerial shares selling post-IPO, executive compensation, avoiding future litigation risks due to an abnormal reduction in stock prices post-IPO, and meeting earnings forecast are among the most strong incentives to manage earnings upward at the end of the IPO year. Further, prior research provides evidence that big N audit firms help in mitigating accrual-based manipulation that takes place during the IPO year (e.g., Elder and Zhou, 2002; Chen et al., 2005). Thus, this chapter progresses the literature on earnings management by examining whether enhanced audit quality is associated with real and accrual earnings management at the IPO year and whether enhanced audit quality has an impact on relationship between real and accrual earnings management and post-IPO stock return performance.

Recently, there is a growing body of research that shows firms engage extensively in real earnings management (Roychowdhury, 2006; Cohen et al., 2008; Gunny, 2010; Zang, 2012). This research also provides evidence that the levels of real and accrual earnings management are likely to differ depending on the costs and

the benefits of utilizing each of them. Graham et al. (2005) for example provide evidence that managers prefer real over accrual earnings management to avoid the scrutiny of regulators and auditors. Ewert and Wagenhofer (2005) show theoretically that real earnings management increases after accounting standards are strengthened to restrict accrual earnings management. Cohen et al. (2008) find evidence that US firms utilize a higher level of real earnings management post the passage of the Sarbanes-Oxley Act 2002 (SOX) than pre-SOX. Cohen et al. (2008) indicate that more restrictive regulation mitigates accrual earnings management but at the expense of the more extensive use of real earnings management. Further, Zang (2012) finds evidence that managers utilize real and accrual earnings management as substitutes. Thus, firms with strong incentives to manage earnings (e.g. IPO firms) are likely to choose between real and accrual earnings management relative to the flexibility of utilizing each of them (e.g., IPOs backed by reputable venture capitalists have less flexibility to manage real earnings management).[67]

Confirming prior literature on the trade-offs between real and accrual earnings management, Chi et al. (2011) find firms with strong incentives to manage earnings upward (e.g. Seasoned Equity Offering [SEO] firms) engage in a higher level of real earnings management to avoid the monitoring of accrual earnings management by big N audit firms. Further, Cohen and Zarowin (2010) find similar evidence that SEO firms audited by big N audit firms have a higher probability to manage real earnings management during the offer year. Despite this limited research that has examined the effect of audit quality on real earnings management (e.g., Chi et al., 2011; Cohen and Zarowin, 2010), the association between audit quality and accrual earnings management is well-documented. Prior studies provide evidence that high-quality auditing (proxied by the presence of big N audit firms and auditor industry specialism) is associated with a lower level of accrual earnings management (Becker et al., 1998; Johnson et al., 2002; Balsam et al., 2003; Reichelt and Wang, 2010). For example, Elder and Zhou (2002) and Chen et al. (2005) find the presence of big N audit firms and auditor industry specialism mitigates accrual earnings management during the IPO year. Hence, and based on the previous

[67] Wongsunwai (2012) finds evidence that IPO firms backed by reputable venture capitalists exhibit a lower level of real earnings management.

evidence, high-quality auditing is expected to constrain accrual-based manipulation and lead firms that to resort to a higher level of real earnings management.

Further, prior literature finds evidence that IPO and SEO firms experience inferior performance post IPO and SEO due to the higher levels of accrual earnings management during the offer year (Friedlan, 1994; Teoh et al. 1998a, 1998b; Gramlich and Sorensen, 2004; Morsfield and Tan, 2006). For example, Teoh et al. (1998a) and Fan (2007) find IPO firms that have high levels of accrual earnings management during the IPO year experience a decline in stock returns and operating performance after the IPO year. Rangan (1998) focuses on SEO firms and finds similar evidence that accrual earnings management predicts post-SEO return and operating underperformance. More recently, Cohen and Zarowin (2010) find SEO firms manipulate real earnings management activities during the offer year and experience a severe decline in post-SEO operating performance due to this manipulation. They also find the decline in post-SEO operating performance due to real earnings management is greater than the decline due to accrual earnings management. Kothari et al. (2012) find similar evidence to Cohen and Zarowin (2010) that real earnings management has the most severe negative consequences for post-SEO stock return performance.

Consequently, and based on the recent evidence by Chi et al. (2011) and Cohen and Zarowin (2010), the role of high quality auditors on real and accrual earnings management is expected to affect subsequent performance. On the one hand, the monitoring of accrual earnings management by high quality auditors should alleviate the negative consequences of accrual-based manipulation for subsequent performance. On the other hand, the high-quality auditing of accrual-based manipulation may lead firms, which have strong incentives to manage earnings upward, to switch to a higher level of real earnings management that is costly for subsequent performance (Cohen and Zarowin, 2010; Kothari et al., 2012). Therefore, this chapter examines whether the role of big N audit firms has an impact on the association between real and accrual earnings management and post-IPO stock return performance.

By examining accrual-based manipulation and two activities of real earnings management, namely the abnormal reduction of discretionary expenses (discretionary expenses-based manipulation) and the abnormal cash flows from operations (sales-based manipulation), for a sample consisting of 515 IPO firms that went public on the London Stock Exchange over the period 1998-2008, this chapter contributes to the literature by providing the following results.

First, this chapter provides evidence that IPO firms audited by big N audit firms resort to a higher level of sales-based manipulation (conducted through offering more price discounts or/and more lenient credit terms) to avoid the monitoring of discretionary expenses-based and accrual-based manipulations by big N audit firms. The evidence on accrual-based manipulation is consistent with prior literature (Becker et al., 1998, Johnson et al., 2002), while this chapter provides new evidence that high-quality auditing constrains discretionary expenses-based manipulation.

Second, while prior research focuses on accrual-based manipulation and finds evidence that it predicts post-IPO stock return underperformance, this chapter finds evidence that post-IPO stock return underperformance is associated with both real activities-based and accrual-based manipulations in the IPO year, and that sales-based manipulation has the most severe negative consequences for post-IPO stock return performance. Finally, this chapter presents evidence that enhanced audit quality has an impact on the relation between real and accrual earnings management and post-IPO stock return performance. Specifically, IPO firms audited by big N audit firms are found to experience a severe decline in post-IPO stock return performance due to the extensive use of sales-based manipulation during the IPO year.

This chapter proceeds as follows. Section two presents related literature and the development of the hypotheses. Data collection, sample description, and research method are presented in section three. Sections four presents the results. Section five provides additional analyses. Section six concludes.

6.2 Literature Review and Hypotheses Development

First, this chapter reviews the literature on the association between audit quality and real and accrual earnings management. This chapter discusses whether IPO firms are expected to switch between real and accrual earnings management according to the quality of their auditors during the IPO. Second, this chapter reviews the literature whether enhanced auditing of real and accrual earnings management has an impact for subsequent stock return performance.

6.2.1 Audit Quality and Real and Accrual Earnings Management around IPOs

The first objective of this chapter is to examine whether enhanced audit quality affects the use of real and accrual earnings management. Brau and Fawcett (2006) provide evidence that historical earnings represent the most important positive signal that executives attempt to send to outside investors. Consistent with this, prior studies have presented evidence that IPO firms manage accrual-based manipulation to inflate reported earnings upward around the IPO (e.g., Friedlan, 1994; Teoh et al., 1998a; 1998c; DuCharme et al., 2001; Gramlich and Sorensen, 2004; Morsfield and Tan, 2006; Fan 2007; Chang et al., 2010). Despite the extensive research on accrual earnings management, there has been limited research examining whether IPO firms engage in manipulating real activities.

Recently, a growing body of research has revealed that real earnings management is extensively manipulated to inflate reported earnings (e.g. Roychowdhury, 2006; Cohen et al., 2008; Gunny, 2010; Zang, 2012). This research indicates that managers prefer to manage real activities-based over accrual-based manipulations for the following reasons. First, high levels of accrual earnings management are likely to be constrained and discovered by auditors and regulators, while real activities-based manipulation is less susceptible to the scrutiny of regulators and auditors (Graham et al. 2005). Second, managers engage in accrual-based manipulation at the end of the fiscal year or at the end of a quarter, while real activities-based can be used throughout the fiscal year. If managers decided to manipulate reported earnings solely using accrual-based manipulation, and the

amount being manipulated fell short of the desired threshold, there may be insufficient time to manipulate real activities-based during the rest of the year (Roychowdhury, 2006). Finally, the balance sheet accumulates all the prior changes of accounting methods (Barton and Simko, 2002). Therefore, firms that engage in accrual earnings management extensively in previous periods are likely to resort to utilizing real activities-based manipulation in the current period, if they have a continued incentive to manage earnings upward (Gunny, 2010).

These recent developments in the field of real earnings management have led to a renewed interest in examining whether IPO and SEO firms engage in such activities around the offer year. Darrough and Rangan (2005) for example show that IPO firms manage reported earnings upward by reducing R&D expenses during the IPO year. They find that the reduction in R&D expenses is positively associated with managerial share selling as managers believe investors place greater emphasis on current earnings. Wongsunwai (2012) finds evidence that both real and accrual earnings management activities are utilized by IPO firms during the offer year, and that the presence of reputable venture capitalists is associated with a lower level of real activities-based manipulation. Cohen and Zarowin (2010) and Kothari et al. (2012) find evidence that SEO firms engage in real earnings management during the offer year. Taken together, these findings indicate that both real and accrual activities are likely to be manipulated by firms that have strong incentives to inflate reported earnings.

Focusing on monitoring bodies that may mitigate earnings manipulation, prior research finds evidence that high-quality auditing plays a significant role in mitigating accrual earnings management (Becker et al., 1998; Balsam et al., 2003). Becker et al. (1998) for example find evidence that clients of big N audit firms report a lower level of accrual earnings management. Elder and Zhou (2002) find a lower level of accrual earnings management is associated with the presence of big N audit firms and auditor industry expertise during the IPO year. Chen et al. (2005) find similar evidence that big N audit firms mitigate accrual earnings management during the IPO year. Balsam et al. (2003), Krishnan (2003), and Reichelt and Wang (2010) find evidence that auditor industry specialism mitigates accrual-based manipulation. Despite the previous extensive evidence on the association between

accrual earnings management and audit quality, few studies have examined whether enhanced audit quality affects real earnings management activities (e.g. Chi et al. 2011).

Real earnings management represents managerial decisions that deviate from normal business practices (Roychowdhury, 2006) and, therefore, are less subject to the scrutiny of regulators and audit firms (Graham et al., 2005). Consistent with this view, recent research shows high quality auditors play no role in mitigating real earnings management, but rather lead their clients to resort to a higher level of real earnings management to avoid the monitoring of accrual-based manipulation. For example, Cohen and Zarowin (2010) present evidence that the probability of SEO firms to utilize real earnings management during the offer year increases when they are audited by big N audit firms. Chi et al. (2011) examine the association between audit quality and real and accrual earnings management for firms that have strong incentive to manage earnings upward (e.g. firms that just meet or beat earnings benchmarks and firms that issue Seasoned Equity). Chi et al. (2011) find evidence that a higher level of real earnings management is positively associated with high-quality auditing as proxied by the presence of big N audit firms, audit industry specialism, higher audit fees, and longer audit tenure. Chi et al. (2011) indicate that high-quality auditing constrains accrual-based manipulation and, therefore, the clients switch intensively to a higher level of real earnings management. However, whether the association between high-quality auditing and real earnings management extends to the IPO setting is an open question.

6.2.2 Litigation Risk, Audit Quality, and Trade-offs between Real and Accrual Earnings Management around IPOs

Unlike many other settings (e.g. SEOs), the IPO event has different characteristics that may impact the level of monitoring of real land accrual earnings management by audit firms. It is well-documented that high quality auditors help to reduce information asymmetry and IPO underpricing (Balvers et al. 1988; Beatty 1989; Datar et al. 1991; Hogan, 1997) and, therefore, hiring high quality audit firms would help IPO firms to send a positive signal about the offer to outside investors (Titman and Trueman, 1986; Brau and Fawcett, 2006). However, the IPO event is associated

with a higher probability of future litigation risk given the fact that IPO firms have strong incentives to manage earnings upward around IPOs. Hogan (1997) indicates that audit firms who are unable to uncover material misstatement during the IPO (e.g. high levels of earnings management) face a higher litigation risk, especially when IPO firms experience post-IPO poor stock return performance. Indeed, this litigation risk would lead to severe negative consequences for the reputation of high quality auditors (big N audit firms) compared with lower quality auditors (non-big N audit firms) (Hogan, 1997). Therefore, big N audit firms are expected to provide high quality audits during the IPO for items that are considered outside the audit target, but are associated with a potential litigation risk (e.g. discretionary expenses).

While accruals manipulation is considered as one of the main audit targets that auditors are responsible to detect and uncover, real activities represent managerial decisions that are less subject to the scrutiny of audit firms (Graham et al., 2005). However, and given the high risk that is associated with the IPO, high quality auditors are expected to monitor and detect any real earnings management activities that would lead to potential litigation penalties. Consistent with this view, Sohn (2011) conducted a survey with high quality auditors (Big 4) and found that more than 30% of the respondents admitted that real earning management activities are associated with a higher probability of future litigation penalties.

By comparing between real earnings management activities (sales-based and discretionary expenses-based), high quality auditors are expected to provide high quality audits to monitor and detect discretionary expenses-based manipulation for the following reasons. First, audit firms consider the fact that a higher level of sales around IPOs should be combined with higher levels of spending on selling (SG&A) and advertising expenses. In other words, if an IPO firm intend to increase sales through normal business practices, then this should be combined with higher levels of selling and advertising expenses. Based on this view, IPO firms who simultaneously manipulate sales upward (e.g. through providing more price discounts and/or more lenient credit terms) and reduce discretionary expenses to increase reported earnings are likely to bring the attention of outsiders. Thus, and given that IPO firms are expected to experience high growth in sales around IPOs, high quality auditors are expected to provide high quality monitoring on

discretionary expenses-based manipulation that may take place during the IPO year. Second, IPO firms who spend less on discretionary expenses pre the IPO year are found to have a higher probability of IPO failure in the subsequent years (Demers and Joos, 2007). Thus, if an IPO firm experience post-IPO failure or poor stock return performance due to discretionary expenses-based manipulation, then there is a higher probability that audit firms will face potential litigation penalties.

In summary, based on the previous discussion and given the fact the IPO firms have strong incentives to manage earnings upward at the end of the IPO year, IPO firms audited by high quality auditors (big N audit firms) are expected to exhibit a higher level of sales-based manipulation to avoid the monitoring of accrual-based and discretionary expenses-based manipulations by their auditors.[68] Hence, the hypothesis is as follows

HYPOTHESIS 1. *IPO firms that are audited by big N audit firms exhibit a lower level of accrual-based and discretionary expenses-based earnings management and a higher level of sales-based earnings management.*

6.2.3 Audit Quality and its Impact on Real and Accrual Earnings Management and Post-IPO Stock Return Performance

The second objective of this chapter is to examine the effect of real and accrual earnings management on post-IPO stock return performance, and whether high-quality auditing during the offer year has any impact on the relation between real and accrual earnings management and post-IPO stock return performance. Prior research presents evidence that IPO firms that manage earnings upward using accrual-based manipulation during IPOs experience a decline in stock returns in

[68] IPO firms also can engage in real activities through production manipulation. Specifically, IPO firms may produce more units in order to lower the total cost of goods sold, which leads to increase the profit margin. However, production cost manipulation is not considered within the analysis of real earnings management as this is a method that can only be fully utilized by manufacturing companies (Roychowdhury, 2006) and manufacturing companies make up just 26.6% of the total sample.

subsequent periods. Teoh et al. (1998a) for example find IPO firms that have high levels of accrual earnings management during the IPO year experience a decline in stock returns for up to three years after the IPO year. In addition, by comparing post-IPO stock returns across different levels of accrual earnings management Teoh et al. (1998a) find the decline in stock returns is more severe for those firms that aggressively managed their earnings during the IPO. Roosenboom et al. (2003) also find evidence that IPO firms with high levels of accrual earnings management during the IPO year experience worse stock returns post-IPO. Fan (2007) find IPO firms engage in accrual-based manipulation during the IPO and this manipulation leads to deterioration in post-IPO return and operating performance.

More recently, and based on a SEO setting, Cohen and Zarowin (2010) and Kothari et al. (2012) examine the effect of real earnings management on post-SEO operating and stock return performance. Cohen and Zarowin (2010) find real earnings management that takes place during the offer year has severe negative consequences for post-SEO operating performance. Also, compared with the negative consequences of accrual-based manipulation, Cohen and Zarowin (2010) find real earnings management has the most severe negative consequences for post-SEO operating performance. Kothari et al. (2012) focus on post-SEO stock return performance and find similar evidence that real earnings management, which is implemented during the offer year, has the most severe negative consequences for post-SEO stock return performance. Although the recent research has been carried out on the association between real earnings management and post SEO stock return and operating performance (Cohen and Zarowin, 2010; Kothari et al., 2012), no study to date has examined the association between real earnings management and post IPO returns and operating performance.

The extant empirical research has revealed that the role of high-quality auditing is a significant determinant of managers' tendency to utilize real and accrual earnings management. On the one hand, prior literature finds evidence that big N audit firms constrain accrual-based manipulation (Becker et al., 1998; Balsam et al., 2003; Krishnan, 2003; Elder and Zhou, 2002; Chen et al., 2005). For example, Elder and Zhou (2002) and Chen et al. (2005) find evidence for IPO firms that the presence of big N audit firms is associated with a lower level of accrual-based

manipulation during the IPO year. On the other hand, recent literature finds evidence that the monitoring of accrual-based manipulation by big N audit firms leads the clients to resort to a higher level of real activities-based manipulation. For example, Chi et al. (2011) find evidence that high quality auditors constrain accrual-based manipulation that takes place during the SEO year, and this monitoring of accrual earnings management leads SEO firms to resort to a higher level of real activities-based manipulation. Cohen and Zarowin (2010) find similar evidence that SEO firms audited by big N auditors have a higher probability to engage in real earnings management.

Further, prior research finds evidence that accrual-based manipulation during the IPO year is negatively associated with post-IPO return and operating performance (Friedlan, 1994; Teoh et al., 1998a, 1998c; Gramlich and Sorensen, 2004; Morsfield and Tan, 2006; Fan, 2007). For example, Teoh et al. (1998a) and Fan (2007) find evidence that accrual-based manipulation, which takes place during the IPO-year, has a negative consequence for post-IPO stock return and operating performance. More recently, research has examined the relation between real earnings management and subsequent return and operating performance. For example, Cohen and Zarowin (2010) and Kothari et al. (2012) find real earnings management that occurs during the SEO year predicts post-SEO return and operating underperformance. In addition, compared with accrual-based manipulation, Cohen and Zarowin (2010) and Kothari et al. (2012) find real activities-based manipulation has the more severe negative consequences for post-SEO return and operating performance.

Therefore, the presence of big N audit firms during the IPO year is likely to affect the relation between real and accrual earnings management and subsequent performance. On the one hand, the presence of big N audit firms is expected to constrain accrual-based manipulation. This in turn should alleviate the negative consequences of accrual-based manipulation for post-IPO return performance. On the other hand, and based on findings of the recent literature (e.g. Cohen and Zarowin, 2010; Chi et al., 2011), the monitoring of accrual-based manipulation by big N audit firms is expected to lead IPO firms to resort to a higher level of real earnings management. Recent literature (e.g. Cohen and Zarowin, 2010; Kothari et

al. 2012) finds that real earnings management has more severe negative consequences for post-SEO stock return and operating performance than accrual-based manipulation.

In summary, IPO firms that manage real and accrual earnings management during the IPO year are expected to experience long-run stock return underperformance. Further, IPO firms audited by big N audit firms are expected to experience a severe decline in post-IPO return performance due to the extensive use of real activities-based manipulation during the offer year. Hence, the next hypotheses are as follows

HYPOTHESIS 2a. *IPO firms that report high levels of real and/or accrual earnings management during the IPO year will experience post-IPO poor stock returns.*

HYPOTHESIS 2b. *IPO firms audited by big N audit firms, ceteris paribus, will experience a more severe post-IPO poor stock returns performance due to the extensive use of sales-based earnings management during the IPO.*

6.3 Research Methods and Data

6.3.1 Data and Sample Construction

This chapter focuses on IPOs as prior research shows that IPO firms have strong incentives to manage real and accrual earnings management around IPOs (e.g., Friedlan, 1994; Teoh et al., 1998a; Gramlich and Sorensen, 2004; Darrough and Rangan, 2005; Singer and Fedyk, 2011; Wongsunwai, 2012) and to hire higher quality auditors (Titman and Trueman, 1986; Brau and Fawcett, 2006). The sample

consists of 515 IPO firms[69] that went public on the London Stock Exchange between January 1998 and December 2008, as the London Stock Exchange provides data about IPOs on the Main market starting from 1998 while data about IPOs on the AIM market starts from 1995. Therefore, and to be consistent, the sample covers the period from 1998 to 2008. All financial IPO firms are excluded from the sample due to differences in their financial reporting and disclosure requirements (e.g., Teoh et al., 1998a; 1998c; Chen et al., 2005; Morsfield and Tan, 2006; Fan, 2007; Chang et al., 2010; Lee and Masulis, 2011; Chahine et al., 2012; Wongsunwai, 2012).

Further, the sample is restricted to all IPO firms that have available prospectuses and the necessary data to measure real and accrual earnings management. This restriction follows Cohen et al. (2008) and Cohen and Zarowin (2010) and leads to a more conservative test of earnings management by having a sample consisting of successful and large IPO firms. Further, to estimate real and accrual earnings management this chapter follows prior research by excluding from the control sample any industry-year group (2-digit SIC code) that has less than 6 observations.[70] The IPO year, year (0), is defined as the fiscal year during which the IPO occurs.[71]

Data are collected using the following sources: (1) IPO firms are identified using the list of IPOs on the London Stock Exchange website for UK firms that were

[69] The initial sample with available prospectuses and necessary data is 570 IPOs, but the final sample is reduced to 515 IPOs as this chapter analyzes current accrual-based manipulation and the required variables (Δ account receivable, Δ inventory, Δ other current assets, Δ account payable, Δ tax payable, and Δ other current liabilities) to estimate current accruals are not available for the whole sample. The reason to analyze current accruals is that managers have more flexibility to manipulate current accruals compared with long-term accruals (e.g. Teoh et al., 1998a; Chahine et al., 2012). Current accruals manipulation can be conducted by delaying the recognition of expenses and accelerating the recognition of revenues, while non-current (long-term) accruals manipulation can be conducted by decelerating depreciation policies, reducing deferred tax, and realizing unusual gains (Teoh et al., 1998a). Consistent with this view, previous studies analyze current accrual-based manipulation when they examine the effect of several monitoring bodies on accruals manipulation during the IPO [e.g. the role of VCs, Morsfield and Tan, (2006), Chahine et al., (2012), Wongsunwai, (2012); the role of more reputable underwriters, Chang et al., (2010), Lee and Masulis, (2011); the role of high quality auditors, Chen et al., (2005)].

[70] The analysis also is repeated using 10 observations for each industry-year group and the results are qualitatively similar but leads to a decrease in the sample size and, therefore, this chapter follows Rosner, (2003), Iqbal et al., (2009) and Athanasakou et al., (2011) by using 6 observations.

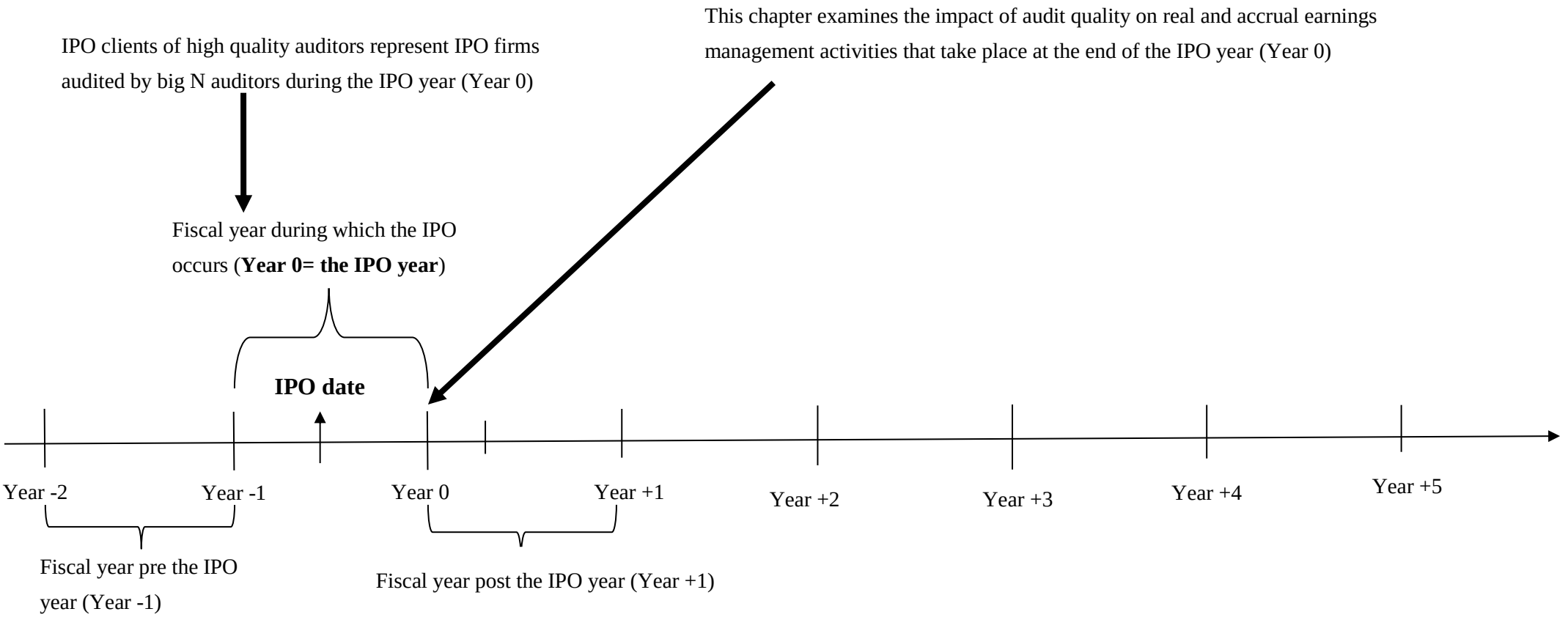
[71] To overcome any misspecification of the financial year end, the financial data obtained from WorldScope are cross checked with the financial data in the prospectus and the results are qualitatively similar.

admitted to the AIM and Main markets during the period 1998-2008, as 1998 is the first year that Main Market IPOs are reported here. This list provides information about IPOs such as, issue price, the date of an IPO, market capitalization, etc; (2) the ICC Plum and Lexis-Nexis databases are used to obtain information about the company identifier for IPO firms, such as the WorldScope and ISIN codes; (3) the prospectuses were then downloaded from the Thomson One Banker database; (4) financial data for the IPO firms and for the control sample of all UK non-IPO firms are obtained from the WorldScope database. WorldScope however, does not provide all the required financial data for the IPO firms; therefore, all missing financial data are manually collected from IPO prospectuses; (5) the DataStream database is used to collect the stock prices for the sample of IPOs and their matched firms; (6) the Fame database is used to collect audit quality data (the name of auditors, audit tenure, and audit and non-audit service fees) and cross checked with the prospectuses. Also, all missing data are manually collected from IPO prospectuses.

6.3.2 Event periods

This chapter focuses on examining the impact of audit quality on real and accrual earnings management that take place at the end of the IPO year. Also, it examines the impact of audit quality on the association between real and accrual earnings management and post-IPO stock returns performance. Analyzing earnings management activities that occur at the end of the IPO year is consistent with prior research that investigates the association between earnings management and audit quality around IPOs (e.g. Elder and Zhou, 2002; Chen et al., 2005). Figure 6.1 depicts the time periods when real and accrual earnings management are estimated.

Figure 6.1 Time periods analyzed and audit quality



6.3.3 Variable Measurement

6.3.3.1 Measuring Accrual-based Earnings Management

Prior research focuses on analyzing current accrual-based manipulation when it examines the impact of monitoring bodies (e.g. VCs, underwriters and auditors) on accrual earnings management at the IPO. This is due to the fact that managers have more flexibility (discretion) to manipulate current accruals (Teoh et al., 1998a; Xie et al., 2003; Chang et al., 2010; Chahine et al., 2012), while managing long-term accruals is likely to bring the attention of auditors. For example, current accrual manipulation can be conducted through delaying the recognition of expenses and accelerating the recognition of revenues, while non-current accrual manipulation can be conducted through decelerating depreciation policies, reducing deferred tax, and realizing unusual gains (Teoh et al., 1998a).

Consistent with this view, Morsfield and Tan (2006), Chahine et al. (2012), and Wongsunwai (2012) investigate the role of Venture Capitalists (VCs) to reduce current accrual-based manipulation at the IPO year. Chang et al. (2010) and Lee and Masulis (2011) examine whether the presence of prestigious underwriters is associated with a lower level of current accrual-based manipulation at the IPO. Chen et al. (2005) explore whether high quality auditors constrain the use of current accrual-based manipulation by IPO firms. Thus, this chapter follows prior research by examining the association between audit quality and accrual-based manipulation that is measured based on current accruals rather than total accruals. Specifically, current accruals are defined as the difference between the change in noncash current assets and change in operating current liabilities (Teoh et al., 1998a; Morsfield and Tan, 2006). IPO firms at the IPO have a strong incentive to manage earnings upward and, therefore, they are expected to intensively engage in current accrual manipulation compared with non-current (long-term) accruals.

Further, and following prior research in earnings management, a cross-sectional adaptation of the modified Jones (1991) model is applied to estimate discretionary current accruals. Ball and Shivakumar (2008) point out estimating discretionary accruals for IPO firms using lagged total assets to scale accrual variables may inflate the measure of accruals in the current year. They argue that

lagged total assets are qualitatively smaller than total assets at the end of the IPO year because IPO firms tend to use proceeds to invest in assets. In order to overcome this problem, this chapter follows Armstrong et al. (2009) and scales all variables by average total assets rather than lagged total assets.[72] A cross-sectional regression is used for each year for all UK non-IPO firms for each 2-digit SIC industry category. This approach, in part, controls for changes in economic conditions that impact on current accruals across different industry groups, but allows for coefficients to vary through time (Cohen and Zarowin, 2010, Kasznik, 1999; DeFond and Jiambalvo, 1994). Also, return on assets (ROA) is added to the model as suggested by Kothari et al. (2005) in order to control for extreme operating performance as this can bias the estimation of discretionary current accruals.[73] The estimated coefficients, then, are taken to estimate discretionary current accruals for the IPO firm. Normal current accruals are therefore estimated using the following cross-sectional regression for each industry and year for all non-IPO firms:[74]

$$\frac{CA_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{\Delta SALES_{it}}{AvAssets_{it}} + \beta_3 ROA_{it} + \varepsilon_{it} \qquad (6.1)$$

Where $CA_{i,t}$ is current accruals defined as the difference between the change in noncash current assets and the change in operating current liabilities (Teoh et al., 1998a; Morsfield and Tan, 2006):

$$CA = \Delta[account\ receivable + inventory + other\ current\ assets] - \Delta[account\ payable + tax\ payable + other\ current\ liabilitie\ s] \qquad (6.2)$$

$AvAssets_{i,t}$ is the sum of total assets at the beginning of the IPO year and the total assets at the end of the IPO year divided by 2, $\Delta\ SALES_{i,t}$ is the change in sales

[72] The analysis also is repeated scaling all variables by lagged total assets and the results are qualitatively similar to those reported in this chapter.

[73] It is worth to mention that the analysis is repeated without controlling on ROA and the results are qualitatively similar to those reported in this chapter.

[74] To take account of extreme values all variables are Winsorized at the top 1% and bottom 99%.

during a year scaled by average total assets, and $ROA_{i,t}$ is return on assets measured as earnings before extraordinary items divided by average total assets.

The coefficient estimates from equation (6.1) are used to estimate normal current accruals for all IPO firms in each year and industry as follows

$$NCA_{it} = \hat{\alpha}_0 + \hat{\beta}_1 \frac{1}{AvAssets_{it}} + \hat{\beta}_2 \frac{\Delta SALES_{it} - \Delta REC_{it}}{AvAssets_{it}} + \hat{\beta}_3 ROA_{it} \quad (6.3)$$

Where $\Delta REC_{i,t}$ is the change in receivables during the year scaled by average total assets.

Discretionary current accruals (*DCA*) are measured as the difference between current accruals and fitted normal current accruals where,

$$DCA_{it} = \left(\frac{CA_{it}}{AvAssets_{it}} \right) - NCA_{it} \quad (6.4)$$

For robustness this chapter also repeats this analysis using performance-matched discretionary current accruals following Kothari et al. (2005) and find qualitatively similar results.[75] Also, this chapter follows prior research by using the absolute value of discretionary current accruals as a proxy of accrual-based manipulation (e.g., Becker et al., 1998; Francis et al., 1999; Krishnan, 2003) as the absolute value can capture both income-increasing and income-decreasing discretionary accruals.

6.3.3.2 Measuring Real Earnings Management

This chapter examines two of real earnings management activities; discretionary expenses-based (abnormal discretionary expenses) and sales-based (abnormal cash flows from operations) manipulations. Discretionary expenses represent the sum of R&D, advertising expenses, and selling, general and administrative expenses

[75] Each IPO firm is matched with a non-IPO firm based on year, 2-digit SIC industry code, and the closest return on assets. Therefore, the performance-matched discretionary current accruals are defined as discretionary current accruals for IPO firms minus the discretionary current accruals for the matched firms.

(SG&A). Reducing discretionary expenses in the current period will boost reported earnings in the current period. In addition, where discretionary expenses are paid for in cash, any reduction in these expenses will increase cash flows in the current period (Cohen and Zarowin, 2010). The second activity that is analyzed is sales-based manipulation. Sales-based manipulation leads to lower levels of cash flows from operations, and can be managed through offering more price discounts and/or more lenient credit terms (see Roychowdhury, 2006). Following prior research real earnings management proxies are estimated based on models developed by Dechow at al. (1998) and applied by Roychowdhury (2006). Later researchers such as Cohen et al., (2008), Cohen and Zarowin, (2010), Wongsunwai, (2012) and Zang, (2012), also apply these models to estimate real earnings management. Similar to the estimation of the measures of accrual earnings management all variables are scaled by average total assets.[76] First, the normal level of cash flows from operations is estimated using the following cross-sectional regression for each industry and year for all non-IPO firms:[77]

$$\frac{CFO_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it}}{AvAssets_{it}} + \beta_3 \frac{\Delta SALES_{it}}{AvAssets_{it}} + \varepsilon_{it} \quad (6.5)$$

Where $CFO_{i,t}$ is cash flows from operations for firm i at period t. The abnormal CFO for IPO firms is calculated as actual CFO minus the normal level of CFO estimated using the coefficients from regression (6.5).

The normal level of discretionary expenses can be expressed as a linear function of contemporaneous sales where

$$\frac{DISX_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it}}{AvAssets_{it}} + \varepsilon_{it} \quad (6.6)$$

[76] Also, the test is repeated by scaling all the variables by lagged total assets and the results are qualitatively similar to those reported in this chapter.

[77] To take account of extreme values all variables Winsorized at the top 1% and bottom 99%.

Roychowdhury (2006) and Cohen and Zarowin (2010) however, point out that estimating a normal level of discretionary expenses as specified in regression (6.6) can lead to poor estimation where firms manage sales upwards to increase reported earnings during any year. If a firm has managed sales upwards, this will result in unusually low residuals from running the regression as specified above. In order to overcome this problem, discretionary expenses are estimated as a function of lagged sales. Therefore, and following Roychowdhury (2006), the normal level of discretionary expenses for the IPO firms is estimated as follows

$$\frac{DISX_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it-1}}{AvAssets_{it}} + \varepsilon_{it} \quad (6.7)$$

Where $DISX_{it}$ is the sum of R&D, SG&A, and advertising expenses for firm $_i$ at period$_t$, and $SALES_{i,t-1}$ is sales during the previous year.

The abnormal level of discretionary expenses for IPO firms is calculated as actual discretionary expenses minus the normal level of discretionary expenses estimated using the coefficients from regression (6.7). As both the abnormal cash flows from operations (sales-based manipulation) and abnormal discretionary expenses represent deviation from the normal levels, the sign of these two activates is expected to be negative when the manipulation occurs. Thus, both abnormal cash flows from operations (sales-based manipulation) and abnormal discretionary expenses (discretionary expenses-based manipulation) are multiplied by minus one, so the same interpretation are applied for accrual-based and real activities-based manipulations (the higher value of these activities the higher earnings manipulation).

6.3.3.3 Measuring Long-run Stock Price Performance

To test whether real and accrual earnings management predict post-IPO stock return performance, and whether the role of big N audit firms on real and accrual earnings management feed through into post-IPO return performance, post-IPO stock return performance is examined using buy-and-hold-abnormal return (BHAR) and

cumulative abnormal return (CAR).[78] Following previous research both BHAR and CAR are computed as the difference between the return for IPO firms and matched non-IPO firms starting 4 months after the date of the IPO to 3 years after the date of the IPO (e.g., Teoh et al., 1998a; Roosenboom at al., 2003).[79] The matched sample is created from all UK non-IPO firms following Lyon et al. (1999). Therefore, the matched sample is identified from all UK non-IPO firms with market capitalizations between 70% and 130% of IPO firms' market values, and then is matched with the closest book-to-market ratio to IPO firms and in the same year and industry.[80] If the IPO firm is delisted prior to the IPO returns' ending date the returns of the IPO firm and its matched firm are set to zero, while if the matched firm is delisted prior to the ending date it is replaced, on a point-forward basis, with another matched firm to avoid survivorship bias in the matched sample.[81] The mean BHAR is calculated as follows:

$$BHAR_T = \frac{1}{N}\sum_{i=1}^{N}\left[\prod_{t=1}^{T}(1+R_{it}) - \prod_{t=1}^{T}(1+Rbenchmark,_t)\right] \quad (6.8)$$

Where $R_{i,\,t}$ is the monthly return for firm $_i$ in month $_t$ and $R_{benchmark,\,t}$ is the monthly return for the benchmark in month $_t$.

[78] The results are consistent using both BHAR and CAR. Therefore, this chapter presents only the BHAR results.

[79] To allow for a reporting lag and following Teoh et al. (1998a), buy and hold returns are calculated starting from month 4.

[80] Following Kothari et al. (2012), the matching approach is based on post-issuance characteristics to control for changing the risk characteristics of the firms. The matched sample is also identified based on pre-issuance characteristics and results are qualitatively similar to those reported in this chapter.

[81] When it is too difficult to find a matching firm in the same industry using the 2-digit SIC code, the criterion is relaxed to a one-digit SIC code. In a very few cases when no matching firm is found based on one-digit SIC code, a matching firm is identify without industry restriction.

6.4 Results

6.4.1 Descriptive Statistics

Table 6.1 (Panel A) presents descriptive statistics for the pooled IPO sample, while Panels B and C present the descriptive statistics based on audit quality. The mean market capitalization for IPO firms audited by big N auditors is approximately £200 million and for IPO firms audited by non-big N auditors it is approximately £25 million. This large difference in market values between the two samples is consistent with view that large firms prefer to hire big N audit firms.

Table 6.2 (Panel A) reports the distribution of IPOs over the period from 1998 to 2008 and shows that the years 2000, 2004, 2005, and 2006 account for more than 65% of the sample. In addition, one consequence of the recent global financial crisis is that the lowest number of IPOs in the sample is in 2008. Table 6.2 (Panel B) shows the frequency of IPOs relative to the industry standard classification, measured by 2-digit SIC codes. Except for the clustering in the Business Services industry, which accounts for approximately 34% of the total sample, the majority of other industries have similar percentages of IPOs ranging from 1% to 11%.

Table 6.1 Descriptive statistics for sample IPO firms during 1998-2008

	Total assets (£ mill.)	Net income (£ mill.)	Market value (£ mill.)	Money raised (£ mill.)
Panel A: Pooled sample (n=515)				
Mean	52.68	1.87	109.97	41.01
Median	4.32	0.00	26.26	7.50
Std. dev	225.21	26.28	287.00	126.85
Minimum	0.07	-124.10	1.44	0.14
Maximum	1969.10	397.47	2020.68	1499.85
Panel B: IPO clients of big N audit firms sample (n=240)				
Mean	102.78	3.95	199.59	75.44
Median	9.65	0.17	57.62	21.73
Std. dev	319.86	38.21	380.08	169.42
Minimum	0.20	-124.10	2.39	0.28
Maximum	1969.10	397.47	2020.68	1499.85
Panel C: IPO clients of non-big N audit firms sample (n=275)				
Mean	8.97	0.05	24.83	10.97
Median	2.03	-0.07	15.00	3.50
Std. dev	42.33	3.88	29.45	56.62
Minimum	0.07	-11.84	1.44	0.14
Maximum	671.60	37.67	147.66	928.80

Table 6.1 presents sample descriptive statistics for the pooled IPOs, IPO clients of big N auditors, and IPO clients of non-big N auditors over the period 1998-2008. Total assets are the beginning of period total assets; net income at the end of the IPO year; market value is the market capitalization for IPO firms immediately after the listing; and money raised is the offer amount of the IPO. Total assets and net income are obtained from the WorldScope database; market value and money raised are obtained from the London Stock Exchange website.

Table 6.2 Time and industry distribution

Panel A: Time distribution of IPOs during 1998-2008

	Pooled sample		Big N clients		non- Big N clients	
Year	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
1998	33	6.41	24	10.00	9	3.27
1999	26	5.05	10	4.17	16	5.82
2000	94	18.25	59	24.58	35	12.73
2001	41	7.96	17	7.08	24	8.73
2002	29	5.63	15	6.25	14	5.09
2003	20	3.88	9	3.75	11	4.00
2004	85	16.50	38	15.83	47	17.09
2005	88	17.09	31	12.92	57	20.73
2006	65	12.62	21	8.75	44	16.00
2007	33	6.41	15	6.25	18	6.55
2008	1	0.19	1	0.42	-	-
Total	515	100.00	240	100.00	275	100.00

Panel B: Industry distribution of IPOs during 1998-2008

		Pooled Sample		Big N clients		non-Big N clients	
Industry	**2-digit SIC**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Oil and gas extraction	13	24	4.66	9	3.75	15	5.45
Food products	20	11	2.14	3	1.25	8	2.91
Printing and publishing	27	11	2.14	5	2.08	6	2.18
Chemicals and allied products	28	35	6.80	19	7.92	16	5.82
Industrial machinery	35	15	2.91	9	3.75	6	2.18
Electronic equipment	36	33	6.41	17	7.08	16	5.82
Instruments and related products	38	22	4.27	10	4.17	12	4.36
Communications	48	27	5.24	15	6.25	12	4.36
Electric, gas, and sanitation	49	8	1.55	2	0.83	6	2.18
Durable goods	50	10	1.94	5	2.08	5	1.82
Eating and drinking establishments	58	14	2.72	5	2.08	9	3.27
Retail	59	8	1.55	3	1.25	5	1.82
Business services	73	173	33.59	87	36.25	86	31.27
Media and entertainment	78	5	0.97	1	0.42	4	1.45
Amusement and recreation	79	26	5.05	7	2.92	19	6.91
Engineering and management services	87	56	10.87	19	7.92	37	13.45
All others	-	37	7.19	24	10.00	13	4.75
Total		**515**	**100.00**	**240**	**100.00**	**275**	**100.00**

Table 6.2 reports time and industry distributions for the pooled IPOs sample, IPO clients of big N auditors, and IPO clients of non-big N auditors over the period 1998-2008. Panel A presents the time distribution, while Panel B presents the industry distribution.

Table 6.3 (Panel A) reports descriptive statistics for all the variables in the regression models for the pooled sample. The results are interpreted on the basis of mean values. Both abnormal cash flows from operation and abnormal discretionary expenses are multiplied by minus one. Thus, for real activities-based and accrual-based manipulations, significant and positive coefficients indicate income-increasing earnings management. Panel A shows preliminary evidence that IPO firms in the UK exhibit higher levels of sales-based manipulation during the IPO year. The mean abnormal cash flows from operations (sales-based manipulation) is 4.9 % positive and statistically significant at the 5 % level. Also, Panel A shows the mean absolute value of discretionary current accruals is 25 % and statistically significant at the 1 % level. Hence, these results show that IPO firms exhibit evidence of real activities-based (sales-based manipulation) and accrual-based earnings management at the end of the IPO year. In addition, Table 6.3 (Panel A) shows that approximately 47 % of the IPO sample is audited by big N audit firms. This in turn provides approximately equivalent numbers of IPOs in each sample (IPO firms audited by big N audit firms versus IPO firms audited by non-big N audit firms) to examine the effect of high-quality auditing on real and accrual earnings management. [82]

Table 6.3 (Panel B) reports descriptive statistics for all the variables based on audit quality (IPO firms audited by big N audit firms versus IPO firms audited by non-big N audit firms). Panel B provides preliminary evidence that IPOs audited by big N audit firms exhibit a higher level of sales-based manipulation, and lower levels of discretionary expenses-based and accrual-based manipulations than IPO firms audited by non-big N audit firms. Specifically, Panel B reports for IPO firms audited by big N auditors (non-big N auditors) the mean abnormal cash flows from operations, abnormal discretionary expenses, and absolute value of discretionary current accruals are 10.5 (0.0) %, -8.6 (10.5) %, and 14.5 (35.3) %, respectively.[83]

[82] Chi et al. (2011) examine the role of audit quality on real and accrual earnings management where 96.8 % of their sample firms are audited by big N audit firms.

[83] The differences in discretionary expenses-based and accrual-based manipulations between the two groups are highly statistically significant at the 1 % level using a t-test, while the difference in abnormal cash flows from operations is statistically significant at the 5 % level.

Table 6.3 Descriptive statistics for the all the variables in the regressions models

Panel A: Distribution of all variables during the IPO year (Pooled sample)

VARIABLES	**Mean**	**Median**	**Std.dev**	**Q1**	**Q3**	**t-values**	**Prob>t**
Abnormal cash flows from operations	0.049	0.028	0.493	-0.134	0.224	2.25	0.0250
Abnormal discretionary expenses	0.016	0.028	0.626	-0.216	0.241	0.58	0.5617
Absolute discretionary current accruals	0.256	0.100	0.442	0.046	0.255	13.14	<0.0001
Big N	0.466	0.000	0.499	0.000	1.000	21.18	<0.0001
LnSize	3.431	3.268	1.446	2.387	4.284	53.84	<0.0001
MB	11.011	4.202	38.057	1.910	8.447	6.57	<0.0001
Ln(1+age)	1.074	0.836	0.885	0.257	1.742	27.55	<0.0001
Lev	0.359	0.110	0.662	0.000	0.434	12.30	<0.0001
Loss	0.499	-	0.500	-	-	-	-
ROA	-0.922	0.001	2.809	-0.827	0.137	-7.45	<0.0001
Capex Growth	0.162	0.019	0.747	-0.002	0.096	4.93	<0.0001
SEO	0.05	-	0.219	-	-	-	-
AIM	0.753	-	0.431	-	-	-	-
VC	0.227	-	0.419	-	-	-	-
Underwriter	0.186	-	0.390	-	-	-	-

Panel B: Distribution of all variables during the IPO year based on audit quality

	Big N clients			**non-Big N clients**			**Difference**	
VARIABLES	**Mean**	**Median**	**Std.dev**	**Mean**	**Median**	**Std.dev**	**Mean**	**Median**
Abnormal cash flows from operations	0.105	0.045	0.396	0.000	0.010	0.560	2.41**	1.63
Abnormal discretionary expenses	-0.086	-0.031	0.513	0.105	0.095	0.698	-3.50***	-4.17***
Absolute discretionary current accruals	0.145	0.076	0.247	0.353	0.137	0.542	-5.46***	-5.79***
LnSize	4.258	4.054	1.396	2.709	2.708	1.050	14.34***	12.30***
MB	12.401	4.046	40.701	9.797	4.412	35.621	0.77	0.06
Ln(1+age)	1.130	1.068	0.908	1.024	0.64	0.862	1.36	0.86
Lev	0.337	0.133	0.549	0.378	0.093	0.747	-0.70	0.94
Loss	0.463	-	0.500	0.531	-	0.500	-1.55	-
ROA	-0.813	0.020	2.564	-1.016	-0.024	3.009	0.82	0.58
Capex Growth	0.164	0.025	0.472	0.161	0.013	0.924	0.05	2.04**
SEO	0.054	-	0.227	0.047	-	0.213	0.36	-
AIM	0.538	-	0.500	0.942	-	0.235	-10.61***	-
VC	0.292	-	0.455	0.171	-	0.377	3.29***	-
Underwriter	0.283	-	0.452	0.102	-	0.303	5.41***	-

*, **, *** Denote 0.1, 0.05, and 0.01 significance levels, respectively. *t*-statistics and *z*-statistics for differences in means and medians across the two groups, respectively. Table 6.3 reports descriptive statistics for the all variables in the regressions models. Panel A presents the descriptive statistics for the pooled sample, while Panel B presents descriptive statistics based on the audit quality (IPO firms audited by big N audit firms versus IPO firms audited by non-big N audit firms) and the difference means (t-test) and medians (Wilcoxon Signed Rank test). Where *Abnormal cash flows from operations* is abnormal levels of cash flows from operations, multiplied by minus one, *Abnormal discretionary expenses* is abnormal levels of discretionary expenses, multiplied by minus one, *Absolute discretionary current accruals* is the absolute value of discretionary current accruals, *Big N* =1 if the firm is audited by big N audit firm and 0 otherwise, *LnSize* is the natural logarithm of market value, *MB* is the market-to-book ratio calculated as the market value of equity divided by the book value of equity, *Ln(1+age)* is the natural logarithm of 1+ IPO firm age where the IPO firm's age is calculated as the difference between the founding date of the IPO firm and the date of its IPO, *Lev* is total debt divided by total assets in the year prior to the IPO, *Loss* = 1 if the firm reported a loss during the IPO year and 0 otherwise, *ROA* is return on assets measured as earnings before extraordinary items divided by total assets in the year prior to the IPO, *CapexGrowth* is capital expenditure growth which is computed as capital expenditure for the IPO year minus previous year scaled by total assets the year prior, *SEO*=1 if the firms issue seasoned equity offering during the IPO year and 0 otherwise, *AIM*= 1 if the firms listed on the Alternative Investment Market (AIM) and 0 otherwise, *VC*= 1 if the firm is backed by a venture capitalist and 0 otherwise, and *Underwriter*=1 if the firm is underwritten by a prestigious underwriter and 0 otherwise, *Abnormal cash flows from operations* and *Abnormal discretionary expenses* are estimated using models developed by Dechow at al. (1998) and as implemented by Roychowdhury (2006). *Discretionary current accruals* are estimated using the corrected version of the modified Jones (1991) model. " –" stands for "not meaningful".

In summary, the results of Table 6.3 confirm the hypothesis that IPO firms audited by high quality auditors (big N) are expected to exhibit a higher level of sales-based earnings management and lower levels of discretionary expenses-based and accrual-based earnings management.

One observation about the results in Table 6.3 (Panel B) concerning real and accrual earnings management is that they may be explained by other factors such as firm size and so on, rather than audit quality. This chapter, therefore, follows the compensation literature (e.g., Smith and Watts, 1992; Core et al., 1999; Murphy, 1999; Core et al., 2008) by undertaking a two-stage analysis. First, the following OLS regression is used:

$$\begin{aligned} EM_{it} = {} & \alpha_0 + \beta_1 LnSize + \beta_2 MB + \beta_3 Ln(1+age) + \beta_4 Capex\ Growth + \beta_5 Lev \\ & + \beta_6 Loss + \beta_7 ROA + \beta_8 SEO + \beta_9 AIM + \beta_{10} VC + \beta_{11} Underwriter \\ & + IND + Year + \varepsilon_{it} \end{aligned} \quad (6.9)$$

Where ($EM_{i,t}$) is the different proxies for real and accrual earnings management. In the second stage, the residuals ($\varepsilon_{i,t}$) from the above OLS regression are obtained and tested whether the differences in mean and median residuals between IPO firms audited by big N audit firms and IPO firms audited by non-big audit firms are statistically significant during the IPO year.

Based on prior research (e.g., Teoh et al., 1998a; Fan, 2007; Cohen et al., 2008; Chi et al., 2011), the model includes a set of control variables that are found to be associated with real and accrual earnings management. To control for the size effect the natural logarithm of market value (*LnSize*) is added to the model, calculated as the number of outstanding shares multiplied by the offer price on the first day of listing.

Growth opportunities are controlled by adding market-to-book ratio (*MB)*; calculated as the market value of equity scaled by the book value of equity; IPO firm age [*Ln(1+age)*] measured as the natural logarithm of 1+IPO firm age, where firm age is the difference between the incorporating date of the firm and its IPO date; and capital expenditure growth (*Capex Growth*) computed as capital expenditure during the IPO year minus the capital expenditure in the previous year divided by total

assets in the year prior to the IPO year *(*e.g., Rangan, 1998; Teoh et al., 1998a; Roosenboom et al., 2003; Cohen and Zarowin, 2010).

Further, as DeFond and Jiambalvo (1994) find the level of debt is positively associated with earnings management, the model includes leverage ratio (*Lev*) measured as total $debt_t$/total $assets_{t-1}$ to control for the level of debt. Profitability is controlled by adding ROA (e.g., Kothari et al., 2005; Gunny, 2010), while (*Loss*) a dummy variable for firms that have reported a loss is added to the model as prior evidence shows that firms that have reported a loss are more likely to manage earnings (e.g., Chi et al., 2011). A SEO dummy *(SEO)* is added to control for those firms that raise further funds during the IPO year as Cohen and Zarowin (2010) find evidence that SEO firms engage in higher levels of real and accrual earnings management during the SEO year.

As there are two stock markets in the UK, namely the Alternative Investment Market (AIM) and the Official List (Main market), an AIM dummy *(AIM)* is added to the model to control for the differences in regulations between these markets. Prior research also finds venture capitalists and high profile underwriters constrain the levels of real and accrual earnings management (e.g., Morsfield and Tan, 2006; Lee and Masulis, 2011; Wongsunwai, 2012). Thus, the model includes dummy variables for venture capitalist (*VC*) and underwriter (*Underwriter*) to control for the monitoring role of these financial institutions.[84] Finally the model includes (*IND)* and (*Year*) dummies to control for industry and time effects, respectively.

Table 6.4 reports the results of this second stage analysis and shows that IPO firms audited by big N audit firms exhibit a higher level of sales-based manipulation, and lower levels of discretionary expenses-based accrual-based manipulations than IPO firms audited by non-big N audit firms.[85] Specifically, for

[84] Prestigious underwriters are those global investment banks as defined by Derrien and Kecskes (2007), while venture capitalist are those investors who hold more than 3 % of a firm's shares and appear in the list of venture capitalists provided by British Venture Capitalist Association. Specifically, data are collected from the prospectuses about all the shareholders who hold more than 3% of the total shares and then shareholder's name is matched with a list of venture capitalists, which is obtained from the British Venture Capitalist Association.

[85]The results of the first stage of this analysis are not reported as the concern is only with the residuals from the regressions.

IPO firms audited by big N auditors (non-big N auditors) the means abnormal cash flows from operations, abnormal discretionary expenses, and absolute value of discretionary current accruals are 3.7 (-3.2) %, -4.7 (4.1) %, and -3.2 (2.8) %, respectively. These differences in real activities-based and accrual-based manipulations between the two groups are statistically significant at the 10 % level using a t-test. Therefore, this evidence confirms that the results in Table 6.3 (Panel B) can be interpreted in the context of differences in audit quality.

In summary, the reported results in Tables 6.3 and 6.4 are consistent with the hypothesis that IPO firms audited by big N audit firms are expected to engage in a higher level of sales-based earnings management to avoid the monitoring of discretionary expenses-based and accrual-based earnings management by their auditors.

Table 6.4 Differences in real and accrual-based earnings management residuals between IPO clients of big N audit firm and IPO clients of non-big N audit firms

	Abnormal cash flows from operations	**Abnormal discretionary expenses**	**Absolute discretionary current accruals**
Panel A: IPO clients of big N audit firms sample (n=240)			
Mean	0.037	-0.047	-0.032
Median	-0.012	0.003	-0.031
Std dev	0.329	0.418	0.259
Panel B: IPO clients of non-big N audit firms sample (n=275)			
Mean	-0.032	0.041	0.028
Median	0.003	0.079	-0.075
Std dev	0.457	0.593	0.459
Panel D: Differences in mean and median real and accrual earnings management residuals between IPO clients of big N audit firms and IPO clients of non-big N audit firms			
Mean	1.94*	-1.92*	-1.78*
Median	0.62	-1.74*	1.10

*, **, *** Denote 0.1, 0.05, and 0.01 significance levels, respectively. *t*-statistics and *z*-statistics for differences in means and medians across the two groups, respectively. Table 6.4 reports the difference mean (t-test) and median (Wilcoxon Signed Rank test) residuals real and accrual earnings management during the IPO year between IPO firms audited by big N audit firms and IPO firms audited by non-big N audit firms. The residuals ($\varepsilon_{i.t}$) are taken from the following OLS regression:

$$EM_{i,t}=\alpha_0+\beta_1 LnSize+\beta_2 MB+\beta_3 Ln(1+age)+\beta_4 CapexGrowth+\beta_5 Lev+\beta_6 Loss+\beta_7 ROA$$
$$+\beta_8 SEO+\beta_9 AIM+\beta_{10} VC+\beta_{11} Underwriter+IND+Year+\varepsilon_{i,t.}$$

Where *(EM)* is a proxy of *Abnormal cash flows from operations* (sales-based manipulation), *Abnormal discretionary expenses*, and *Absolute discretionary current accruals.* All other variables are previously defined. *Abnormal cash flows from operations* (sales-based manipulation) and *Abnormal discretionary expenses* are estimated using models developed by Dechow at al. (1998) and as implemented by Roychowdhury (2006). *Discretionary current accruals* are estimated using the corrected version of the modified Jones (1991) model. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation.

Table 6.5 reports the correlations matrix for all the variables of interest for the pooled sample. Notably, big N auditors are strongly negatively correlated with abnormal discretionary expenses and absolute discretionary current accruals, and positively correlated with abnormal cash flows from operations (sales-based manipulation). These correlations indicate that the levels of discretionary expenses-based and accrual-based manipulations are a decreasing function of high-quality auditing, which in turn leads IPO firms to resort to a higher level of sales-based manipulation. Further, these correlations are consistent with the reported results in Tables 6.3 and 6.4 concerning the relations between audit quality and real and accrual earnings management.

Table 6.5 Correlation matrix

VARIABLES	**Abnormal cash flows from operations**	**Abnormal discretionary expenses**	**Absolute discretionary current accruals**	**Big N**
Abnormal cash flows from operations	1	-0.416***	0.023	0.072
Abnormal discretionary expenses	-0.418***	1	-0.027	-0.184***
Absolute discretionary current accruals	0.037	0.034	1	-0.255***
Big N	0.106**	-0.153***	-0.234***	1

*, **, *** Denote 0.1, 0.05, and 0.01 significance levels, respectively. Table 6.5 reports a correlation matrix for key variables for the pooled sample with Spearman correlations in the upper diagonal and Pearson correlation in the lower diagonal. All other variables are previously defined. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation.

6.4.2 Ordinary Least Square (OLS) Results - Big N Audit Firms and Real and Accrual Earnings Management

To test whether high-quality auditing (proxied by the presence of big N audit firms) affects the levels of real and accrual earnings management during the IPO year, the following model is estimated:

$$\begin{aligned} EM_{it} = {} & \alpha_0 + \beta_1 Big\ N + \beta_2 LnSize + \beta_3 MB + \beta_4 Ln(1+age) + \beta_5 Lev + \beta_6 Loss \\ & + \beta_7 ROA + \beta_8 Capex\ Growth + \beta_9 SEO + \beta_{10} AIM + \beta_{11} VC + \beta_{12} Underwriter \\ & + IND + Year + \varepsilon_{it} \end{aligned} \quad (6.10)$$

Where ($EM_{i,t}$) is the different proxies for real and accrual earnings management and *(Big N)* equals 1 if the firm is audited by a big N audit firm and 0 otherwise. Following prior research (e.g., DeFond and Jiambalvo, 1994; Becker et al., 1998; Rangan, 1998; Teoh et al., 1998a; Balsam et al., 2003; Roosenboom at al., 2003; Kothari et al., 2005; Morsfield and Tan, 2006; Fan, 2007; Cohen et al, 2008; Cohen and Zarowin, 2010; Gunny, 2010; Chi et al., 2011; Zang, 2012), this model includes a number of control variables namely; firm size (*LnSize*); market-to-book ratio (*MB)*; age [*Ln(1+age)*]; leverage ratio (*Lev);* loss *(Loss)*; return on assets *(ROA)*; capital expenditure growth (*Capex Growth*); seasoned equity offering *(SEO)*; the Alternative Investment Market *(AIM)*; venture capitalist (*VC*); underwriter (*Underwriter*); and dummy variables are included to control for time and industry effects. All variables are previously defined.

Table 6.6 reports the results for the analysis of whether enhanced audit quality affects real and accrual earnings management activities of IPO firms during the offer year. The results show a positive coefficient of 0.111 (P <0.01) on *Big N* in the abnormal cash flows from operations (sales-based manipulation) regression. Further, negative coefficients are found of -0.143 (P<0.01) and -0.093 (p<0.05) on *Big N* in the abnormal discretionary expenses and absolute discretionary current accruals regressions, respectively. This evidence is consistent with the results in Tables 6.3 and 6.4 that IPO firms audited by big N audit firms exhibit a higher level of sales-based manipulation, and lower levels of discretionary expenses-based and accrual-based manipulations than IPO firms audited by non-big audit firms. Further, the reported results in Table 6.6 suggest that high quality auditors monitor and constrain discretionary expenses-based and accrual-based manipulations, and this monitoring leads their IPO clients to resort to a higher level of sales-based manipulation.

In summary, while the evidence that IPO firms audited by big N audit firms exhibit lower levels of discretionary expenses-based and accrual-based manipulations and a higher level of sales-based manipulation confirms the hypothesis, this chapter provides new evidence that high quality auditors constrain real activities that occur via discretionary expenses-based manipulation. Although it

is widely-believed that real earnings management activities are less subject to the scrutiny of audit firms, this chapter provides new evidence on this relation.

Table 6.6 Relation between big N audit firms and real and accrual earnings management

VARIABLES	Abnormal cash flows from operations	Abnormal discretionary expenses	Absolute discretionary current accruals
Big N	0.111	-0.143	-0.093
	(2.803)***	(-2.591)***	(-2.379)**
LnSize	0.052	-0.083	-0.076
	(1.883)*	(-2.848)***	(-3.931)***
MB	-0.001	-0.001	0.001
	(-0.733)	(-0.533)	(1.325)
Ln(1+age)	-0.007	-0.063	-0.034
	(-0.293)	(-2.126)**	(-1.900)*
Lev	-0.017	0.021	-0.013
	(-0.514)	(0.412)	(-0.406)
Loss	0.194	-0.037	0.036
	(4.241)***	(-0.644)	(0.900)
ROA	-0.056	0.056	-0.039
	(-3.940)***	(2.472)**	(-2.879)***
Capex Growth	-0.142	0.155	-0.062
	(-2.240)**	(1.657)*	(-0.818)
SEO	0.041	-0.052	-0.128
	(0.776)	(-0.598)	(-1.895)*
AIM	0.051	-0.183	-0.113
	(0.704)	(-2.040)**	(-2.179)**
VC	-0.045	-0.048	-0.094
	(-1.179)	(-0.856)	(-2.475)**
Underwriter	0.032	-0.083	-0.049
	(0.767)	(-1.449)	(-1.461)
Constant	-0.420	0.650	0.660
	(-2.568)**	(3.676)***	(4.854)***
Year and industry dummies	Yes	Yes	Yes
N	515	515	515
Adj.R^2	0.217	0.165	0.188
F-statistic	3.95	3.28	3.55
Prob (F-statistic)	0.0000	0.0000	0.000
Mean VIF	1.32	1.32	1.32
Max VIF	3.26	3.26	3.26

*, **, *** Denote 0.1, 0.05, and 0.01 significance levels, respectively. Table 6.6 reports the regression of real and accrual earnings management measures on audit quality proxy (big N audit firms) and other associated control variables for the IPO sample. All models include year and industry dummies to control for time and industry effects, and robust *t*-statistics (appear in parentheses). To avoid the influence of outliers, all financial continuous data are Winsorized at the top 1% and bottom 99%. All variables are previously defined. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation.

It seems that big N audit firms consider the future litigation risk which is associated with manipulating discretionary expenses, notably that a high level of sales around IPOs is expected to be combined with a high level of discretionary

expenses e.g. selling and advertising expenses. Sohn (2011) conducted a survey with big 4 audit firms and found that 34.1% of the respondents admitted that real earning management is associated with a higher future litigation risk. Further, and consistent with the importance of discretionary expenses, Demers and Joos (2007) find evidence that IPO firms with lower levels of R&D and SG&A spending pre-IPO have a lot higher probability of future failure. Therefore, this explains why high quality auditors pay attention to constrain discretionary expense manipulation even though this manipulation is less subject to the scrutiny of audit firms.

6.4.3 Self-selection Bias

One possible observation about the results in Table 6.6 is that they may be affected by a sample selection-bias. Specifically, prior literature indicates that as firms self-select their auditors (big N auditors vs. non-big N auditors) then this would introduce a bias for estimating the OLS regression (Titman and Trueman 1986; Datar et al, 1991; Chaney et al., 2004; Basioudis and Francis, 2007; Clatworthy et al., 2009; Lawrence et al., 2011). Therefore, this chapter uses a Heckman (1979) two-stage model to control for sample selection bias where in the first stage a probit regression is estimated on the probability of hiring high quality auditors (big N audit firms). Then, the inverse Mills ratio is calculated and included as a control variable in the second stage regression. Following prior literature (e.g., Chaney et al., 2004), in the first stage the following model is estimated to obtain the probability of hiring big N audit firms:

$$\begin{aligned} Big\ N_{it} = {} & \alpha_0 + \beta_1 Underwriter + \beta_2 LnSize + \beta_3 Ln(1+age) + \beta_4 Lev \\ & + \beta_5 Loss + \beta_6 ROA + \beta_7 AssetTurn + \beta_8\ IPO\_proceed + \beta_9 Curr \\ & + \beta_{10} MainMarket + \beta_{11} Litigation + IND + Year + \varepsilon_{it} \end{aligned} \tag{6.11}$$

After the inverse Mills ratio is calculated from the probit regression in the first stage, it is included as a control variable in the second stage of the Heckman test to control

for sample selection bias. The following model is estimated in the second stage of the Heckman test: [86]

$$EM_{it} = \alpha_0 + \beta_1 Big\ N + \beta_2 LnSize + \beta_3 MB + \beta_4 Ln(1+age) + \beta_5 Lev + \beta_6 Loss + \beta_7 ROA + \beta_8 Capex\ Growth + \beta_9 SEO + \beta_{10} AIM + \beta_{11} VC + \beta_{12} Underwriter + \beta_{13} Invs\_Mills + IND + Year + \varepsilon_{it} \quad (6.12)$$

Where ($EM_{i,t}$) is the different proxies for real and accrual earnings management, *(Big N)* equals 1 if the firm is audited by a big N audit firm and 0 otherwise, *AssetTurn* is asset turnover, calculated as sales divided by total assets pre the IPO, *IPO_proceed* is the IPO proceeds, *Curr* is current ratio measured as current assets divided by current liabilities, *MainMarket* equals 1 if the firms listed on the Main market and 0 otherwise, and *Litigation* equals 1 if a firm is in a high litigation industry and 0 otherwise,[87] and *Invs_Mills* is the inverse Mills ratio calculated from the first stage probit regression on the probability of hiring big N audit firms. All other variables are previously defined.

Table 6.7 reports the results and shows that big N audit firms constrain accrual-based and discretionary expenses-based manipulations and, this in turn, leads the clients to resort to a higher level of sales-based manipulation. Therefore, this evidence confirms that the reported results in Table 6.6 on the impact of enhanced audit quality on real and accrual earnings management still holds after controlling for sample selection bias.[88]

---

[86] Also the second stage of the Heckman test is estimated separately for firms that are audited by big N auditors and firms that are audited by non-big N auditors, where the dependent variables are earnings management proxies and the inverse Mills ratio is included in the right hand side of the regression. Similar results are reported confirming that the OLS regression results are not affected by sample selection bias.

[87] Following Zang (2012) and Cohen and Zarowin (2010), high litigation industries are SIC codes 2833–2836, 8731–8734, 7371–7379, 3570–3577, and 3600–3674.

[88] The Propensity Scored Matching (PSM) also is used to control for a sample selection bias. First, a probit regression is estimated to obtain the probability of hiring big N audit firms and then this score is used to match each IPO firm audited by big N audit firms to matched IPO firms audited by non-big N audit firms. By using the PSM, a very small sample size is found (80 IPO firms audited by big N audit firms versus 80 IPO firms audited by non-big N audit firms). However, by repeating the analysis in Table 6.6 for those IPO firms that are matched based on PSM similar evidence is found that big N audit firms effectively mitigate and prevent discretionary expenses-based manipulation.

Table 6.7 Relation between big N audit firms and real and accrual earnings management after controlling for sample selection bias

	Model (1) Probit Regression	Model (2) OLS Regression	Model (3) OLS Regression	Model(4) OLS Regression
VARIABLES	**Big N=1**	**Abnormal cash flows from operations**	**Abnormal discretionary expenses**	**Absolute discretionary current accruals**
Big N		0.110	-0.108	-0.080
		(2.373)**	(-1.716)*	(-1.999)**
LnSize	0.628	0.045	-0.025	0.011
	(6.819)***	(0.759)	(-0.394)	(0.254)
MB		0.000	0.000	0.000
		(0.788)	(0.308)	(3.022)***
Ln(1+age)	-0.028	-0.013	-0.059	-0.047
	(-0.360)	(-0.547)	(-1.962)*	(-2.647)***
Lev	0.134	-0.009	0.032	0.008
	(1.207)	(-0.277)	(0.627)	(0.249)
Loss	0.080	0.235	-0.036	0.101
	(0.497)	(4.852)***	(-0.595)	(2.451)**
ROA	0.014	-0.024	0.028	-0.009
	(0.746)	(-3.363)***	(2.325)**	(-1.222)
Capex Growth		-0.002	0.007	0.000
		(-1.059)	(3.092)***	(0.149)
SEO		0.024	-0.047	-0.142
		(0.466)	(-0.548)	(-2.229)**
AIM		0.052	-0.182	-0.098
		(0.645)	(-1.982)**	(-1.885)*
VC		-0.047	-0.080	-0.114
		(-1.224)	(-1.331)	(-3.110)***
Underwriter	0.372	0.008	0.001	0.006
	(2.018)**	(0.136)	(0.019)	(0.137)
AssetTurn	-0.081			
	(-1.492)			
IPO_proceed	0.000			
	(-0.350)			
Curr	0.000			
	(0.031)			
MainMarket	0.384			
	(1.592)			
Litigation	-0.183			
	(-0.577)			
Invs_Mills		-0.031	0.248	0.236
		(-0.170)	(1.479)	(1.934)*
Constant	-2.441	-0.370	0.087	0.153
	(-5.353)***	(-0.963)	(0.212)	(0.505)
Year and industry dummies	Yes	Yes	Yes	Yes
Log likelihood	-237.55431			
Pseudo R^2	0.3265			
Prob > chi2	0.0000			
Adj.R^2		0.178	0.109	0.163
N	511	511	511	511

(The table is continued on the next page)

Table 6.7 (Continued)

*, **, *** Denote 0.1, 0.05, and 0.01 significance levels, respectively. Robust *t*-statistics (appear in parentheses). Table 6.7 reports the regression of real and accrual earnings management measures on audit quality proxy (big N audit firms) and other associated control variables for the IPO sample, after controlling for sample selection bias. Model 1 reports the result of a probit regression of the probability of hiring big N audit firms. The dependent variable (*Big N)* is a dummy variable =1 if the firm is audited by big N audit firm and 0 otherwise. Models 2, 3 and 4 report the results of OLS regressions after including the *Invs_Mills*, which is obtained from the probit regression, as a control variable. Where *Invs_Mills* is the inverse Mills ratio calculated from the first stage probit regression on the probability of hiring big N audit firms, *AssetTurn* is asset turnover, calculated as sales divided by total assets pre the IPO, *IPO_proceed* is the IPO proceeds, *Curr* is current assets divided by current liabilities, *MainMarket* equals 1 if the firms listed on the Main market and 0 otherwise, and *Litigation* equals 1 if the firms in a high litigation industry and 0 otherwise. All other variables are previously defined. *Abnormal cash flows from operations (sales-based manipulation)* and *Abnormal discretionary expenses* are estimated using models developed by Dechow at al. (1998) and as implemented by Roychowdhury (2006). *Discretionary current accruals* are estimated using the corrected version of the modified Jones (1991) model. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation.

6.4.4 Post-IPO Returns Performance and Real and Accrual Earnings Management

6.4.4.1 Post-IPO Stock Performance Sorted by Real and Accrual Earnings Management

Table 6.8 reports the means and medians three-year BHAR for the IPO firms relative to real and accrual earnings management quartiles, namely abnormal cash flows from operations (sales-based manipulation), abnormal discretionary expenses, and the absolute value of discretionary current accruals during the IPO year.[89] Q1 represents the most conservative group (IPO firms with the lowest level of real and accrual earnings management) and Q4 represents the most aggressive group (IPO firms with highest level of real and accrual earnings management). The results are interpreted on the basis of the mean values.

Table 6.8 (Panel A) reports the results for the pooled sample and shows that long-run underperformance occurs for the quartiles where the highest level of real and accrual earnings management occurs. For example, the mean three-year BHAR for abnormal cash flows from operations (sales-based manipulation) quartiles

[89] Also, the same test is repeated using CAR and the results are qualitatively similar to those reported in Table 6.8.

ranging from 2% for the conservative quartile to -39.3% for the aggressive quartile. The difference between the two groups is statistically significant at the 1% level. For abnormal discretionary expenses quartiles, the mean three-year BHAR ranges from -14.9% for the conservative quartile to -6.3% for the aggressive quartile. However, the difference between the two groups is not statistically significant. Quartiles 2 and 3 of abnormal discretionary expenses experience the most long-run stock return underperformance where means three-year BHAR are -28.9% and -15.7%, respectively. For the absolute value of discretionary current accruals quartiles the mean three-year BHAR ranges from -13.8% for the conservative quartile to -22.7% for the aggressive quartile, but the difference between the two groups is not statistically significant. These results indicate that IPO firms that have higher levels of real and accrual earnings management during the IPO year experience a higher decline in stock returns in the post IPO period.

Table 6.8 (Panel B) reports the results for IPO firms audited by big N audit firms and shows that the greatest long-run underperformance occurs for the aggressive quartile of abnormal cash flows from operation (sales-based manipulation). The underperformance as measured by BHAR for the abnormal cash flows from operations quartiles ranging from 9.1% for the conservative quartile to -48% for the aggressive quartile and the difference between the two groups is statistically significant at the 1% level. For abnormal discretionary expenses quartiles, the most long-run stock return underperformance occurs for Q3 where the mean three-year BHAR is -22.4% and statistically significant at the 10% level. Further, Panel B shows that the underperformance for the absolute value of discretionary current accruals quartiles ranging from 5% for the conservative quartile to -24.3% for the aggressive quartile, but the difference between the two groups is not statistically significant. [90] The most long-run stock return underperformance occurs for quartile 3 of the absolute value of discretionary current accruals where mean three-year BHAR is -32.6% and statistically significant at the 1% level.

[90] However, using the median values the difference between the two groups (conservative and aggressive groups of absolute discretionary current accruals) is statistically significant at the 10% level.

Table 6.8 (Panel C) reports the results for IPO firms audited by non-big N audit firms and shows evidence that real activities-based and accrual-based manipulation predict post-IPO returns underperformance. For example, the mean three-year BHAR for abnormal cash flows from operations (sales-based manipulation) quartiles ranges from -6.8% for the conservative quartile to -35.3% for the aggressive quartile and the difference is statistically significant at the 10% level. While for abnormal discretionary expenses quartiles, the most returns underperformance occurs for quartile 2 where the mean three-year BHAR is -39.6% and statistically significant at the 1% level. Finally, the underperformance for the absolute value of discretionary current accruals quartiles ranges from -31.1% for the conservative quartile to -21.6% for the aggressive quartile, but the difference between the two groups is not statistically significant. Finally Table 6.8 (Panel D) reports the differences in mean and median values between the aggressive quartiles for IPOs audited by big N versus IPOs audited by non-big N. Panel D shows that the difference between the two groups is not statistically significant.

Overall, Table 6.8 provides preliminary evidence that real and accrual earnings management that take place during the IPO year predict post-IPO stock return underperformance and that real earnings management via sales-based manipulation has the most severe negative consequences for post-IPO stock return performance. It is worthwhile to mention that the reported results in Table 6.8 cannot be interpreted in the context of differences in audit quality unless many other covariates (which are found to be associated with real and accrual earnings management) are controlled. In the next section OLS regressions are used to control for the impact of these covariates.

Table 6.8 Post-IPO three-year buy-and-hold returns for IPO firms sorted by the level of real and accrual earnings management during the IPO year

	Q1 Mean (Median)	Q2 Mean (Median)	Q3 Mean (Median)	Q4 Mean (Median)	Difference (Q1-Q4) t-statistic (z-statistic)
Panel A: Mean and median three-year BHAR for pooled IPOs sample (n=515)					
Abnormal cash flows from operations	0.020 (-0.005)	-0.041 (-0.028)	-0.249*** (-0.163)***	-0.393*** (-0.222)***	3.695*** (4.105)***
Abnormal discretionary expenses	-0.149 (-0.056)	-0.289*** (-0.201)***	-0.157* (-0.117)***	-0.063 (-0.048)	-0.721 (-0.231)
Absolute discretionary current accruals	-0.138 (-0.092)*	-0.137* (-0.087)*	-0.157 (-0.140)**	-0.227*** (-0.099)***	0.743 (0.893)
Panel B: Mean and median three-year BHAR for IPO firms audited by big N audit firms (n=240)					
Abnormal cash flows from operations	0.091 (0.164)	0.017 (-0.065)	-0.297** (-0.150)**	-0.480*** (-0.324)***	3.189*** (1.685)*
Abnormal discretionary expenses	-0.088 (-0.030)	-0.210 (-0.226)*	-0.224* (-0.171)**	-0.134 (-0.064)	0.2986 (0.197)
Absolute discretionary current accruals	0.050 (0.036)	-0.142 (-0.101)	-0.326*** (-0.247)***	-0.243* (-0.067)*	1.535 (1.685)*
Panel C: Mean and median three-year BHAR for IPO firms audited by non-big N audit firms (n=275)					
Abnormal cash flows from operations	-0.068 (-0.044)	-0.003 (0.005)	-0.237 (-0.090)**	-0.353**** (-0.190)***	1.835* (2.268)**
Abnormal discretionary expenses	-0.128 (-0.024)	-0.396*** (-0.176)***	-0.076 (-0.061)	-0.061 (-0.095)	-0.393 (0.709)
Absolute discretionary current accruals	-0.311*** (-0.116)***	0.005 (0.003)	-0.141 (-0.076)*	-0.216* (-0.124)**	-0.658 (-0.541)

Panel D: Differences in means and medians three-year BHAR between the aggressive quartiles of IPO firms audited by big N vs. non-big N audit firms.

	Big N Clients Q4 Mean (Median)	non-Big N Clients Q4 Mean (Median)	Difference (Q4-Q4) t-statistic (z-statistic)
Abnormal cash flows from operations	-0.480*** (-0.324)***	-0.353**** (-0.190)***	0.862 (-0.837)
Abnormal discretionary expenses	-0.134 (-0.064)	-0.061 (-0.095)	-0.537 (0.092)
Absolute discretionary current accruals	-0.243* (-0.067)*	-0.216* (-0.124)**	-0.159 (-0.159)

*, **,*** Denote 0.1, 0.05, and 0.01 significance levels, respectively. Differences in means are tested using t-tests and differences in medians are tested using the Wilcoxon Signed Rank test. Table 6.8 reports the mean and median three-year buy-and-hold abnormal returns (BHAR) sorted by the level of real and accrual earnings management during the IPO year and differences in means and medians across groups. IPOs in each sample are divided into four quartiles relative to the level of real and accrual earnings management that occurred in the IPO year. Q1 represents the most conservative quartile (IPO firms with the lowest level of real and accrual earnings management) and Q4 the most aggressive (IPO firms with highest level of real and accrual earnings management).All variables are previously defined.

6.4.4.2 Regressions of Post-IPO Stock Performance

Given the evidence in Table 6.8, this chapter follows prior research (e.g., Teoh et al., 1998a; Roosenboom at al., 2003) by running a cross-sectional regression where the dependent variable is three-year abnormal returns *(AR)*, measured using BHAR and

CAR, adjusted on a size and book-to-market matched sample, from month +4 through to month +40 against different measures of real and accrual earnings management (*EM*). [91]

$$AR_{i,4,40} = \alpha_0 + \beta_1 EM + \beta_2 LnSize + \beta_3 BM + \beta_4 Ln(1+age) + \beta_5 Capex\ Growth + \beta_6 Underpricing + \beta_7 AIM + \beta_8 VC + \beta_9 Underwriter + \beta_{10} Lev + \beta_{11} SEO + \beta_{12} Abs(CFO) + \beta_{13} Abs(TCACC) + IND + Year + \varepsilon_{it} \quad (6.13)$$

In addition, following prior research (e.g., Dechow et al., 1995; Teoh et al., 1998a, 1998b; Roosenboom at al., 2003; Rangan, 1998; Fan, 2007; Chang et al., 2010) the model includes a number of control variables namely; firms size (*LnSize*), the book-to-market ratio (*BM)* is measured as the book value of equity divided by market value of equity, age [*Ln(1+age)*], capital expenditure growth (*CapexGrowth*), IPO underpricing (*Underpricing)* is measured as the percentage difference between the offer price and the closing price on the first day of trading, the lightly regulated environment of the Alternative Investment Market *(AIM)*, venture capitalist (*VC)*, underwriter *(Underwriter)*, leverage ratio *(Lev)*, seasoned equity offering *(SEO)*, the absolute value of cash flows from operations *[Abs(CFO)]*, the absolute value of total current accruals *[Abs(TCACC)]*, and dummy variables to control for industry and time effects. Both *Abs(CFO)* and *Abs(TCACC)* are added to the model when earnings management proxy, *(EM)*, is absolute discretionary current accruals. Dechow et al. (1995) find cash flows from operations is negatively associated with accrual earnings management, while Armstrong et al. (2009) find that the previous negative association between accrual earnings management, and the subsequent decline in stock returns, is an artifact of the mispricing of cash flows. The *Abs(TCACC)* is added to the model to control for the level of total current accruals. All other variables are previously defined.

Table 6.9 reports the results using BHAR for the cross-sectional regressions for the pooled IPOs sample, IPO firms audited by big N audit firms, and IPO firms audited by non-big N audit firms, respectively. For the pooled sample Table 6.9 (Panel A) reports evidence that sales-based and accrual-based manipulations predict

[91] Qualitatively, similar results are found using CAR as the dependent variable.

post-IPO returns underperformance. Specifically, a negative coefficient is found of -0.311 ($p<0.01$) on abnormal cash flows from operations (sales-based manipulation) in the BHAR regression. Table 6.9 also reports a negative coefficient of -0.194 ($p<0.10$) on absolute discretionary current accruals in the BHAR regression. These results confirm the hypothesis that both real (sales-based manipulation) and accrual earnings management have negative consequences for post-IPO returns performance, and suggest that sales-based manipulation has the most severe negative consequences for post-IPO return performance. These results also are consistent with the reported results in Table 6.8 (Panel A).

For IPO firms audited by big N audit firms, Table 6.9 (Panel B) shows that sales-based manipulation has a severe negative consequence for post-IPO stock return performance. A negative coefficient is found of -0.595 ($p<0.01$) on abnormal cash flows from operations (sales-based manipulation) in the BHAR regression. Further, while the signs of the coefficients on abnormal discretionary expenses and absolute discretionary accruals in the BHAR regressions are negative and consistent with the predictions, they are statistically insignificant. These results show that IPO firms audited by big N audit firms experience a severe post-IPO stock return underperformance due to the extensive use of sales-based manipulation during the IPO year. These results also confirm the previous evidence in Table 6.6, which indicates that IPO firms audited by big N auditors resort extensively to a higher level of sales-based manipulation to avoid the monitoring of discretionary expenses-based and accrual-based manipulations.

For IPO firms audited by non-big N audit firms Table 6.9 (Panel C) shows that both sales-based and accrual-based manipulations predict post-IPO returns underperformance. Specifically, Table 6.9 reports negative coefficients of -0.182 ($P<0.10$) and -0.179 ($P<0.10$) on abnormal cash flows from operations (sales-based manipulation) and absolute discretionary current accruals in the BHAR regressions, respectively. These IPO firms are audited by non-big N audit firms and therefore are expected to have more flexibility to manage earnings upward using both real and accrual earnings management. Hence, these results confirm the hypothesis that IPO firms with high levels of real and accrual earnings management during the IPO year are expected to experience long-run stock return underperformance.

Table 6.9 Relation between Post-IPO stock return performance (measured by BHAR) and real and accrual earnings management

$$BHAR_i = \alpha + \beta_1 EM_i + \beta_2 LnSize_i + \beta_3 BM_i + \beta_4 Ln\ (1+age)_i + \beta_5 CapexGrowth_i + \beta_6 Underpricing_i + \beta_7 AIM_{i+} \beta_8 VC_i + \beta_9 Underwriter_i + \beta_{10} Lev_i + \beta_{11} SEO_i + \beta_{12} Abs\ (CFO)_i + \beta_{13} Abs(TCACC)_i + IND + Year + \varepsilon_i.$$

Panel A: Whole sample

	BHAR	**BHAR**	**BHAR**
Abnormal cash flows from operations	-0.311 (-3.524)***		
Abnormal discretionary expenses		0.007 (0.126)	
Absolute discretionary current accruals	-0.132 (-1.247)	-0.162 (-1.556)	-0.194 (-1.938)*
Control variables	Yes	Yes	Yes
Constant	0.664 (2.595)***	0.698 (2.707)****	0.783 (3.021)***
Year and industry dummies	Yes	Yes	Yes
N	507	507	507
Adj.R^2	0.079	0.058	0.078

Panel B: Big N clients

	BHAR	**BHAR**	**BHAR**
Abnormal cash flows from operations	-0.595 (-2.730)***		
Abnormal discretionary expenses		-0.016 (-0.105)	
Absolute discretionary current accruals	-0.335 (-0.791)	-0.537 (-1.114)	-0.626 (-1.331)
Control variables	Yes	Yes	Yes
Constant	0.557 (1.226)	0.442 (0.961)	0.580 (1.258)
Year and industry dummies	Yes	Yes	Yes
N	236	236	236
Adj.R^2	0.144	0.104	0.116

Panel C: non-Big N clients

	BHAR	**BHAR**	**BHAR**
Abnormal cash flows from operations	-0.182 (-1.863)*		
Abnormal discretionary expenses		-0.003 (-0.037)	
Absolute discretionary current accruals	-0.133 (-1.235)	-0.159 (-1.541)	-0.179 (-1.797)*
Control variables	Yes	Yes	Yes
Constant	1.074 (2.485)**	1.140 (2.591)**	1.161 (2.685)***
Year and industry dummies	Yes	Yes	Yes
N	271	271	271
Adj.R2	0.019	0.007	0.030

*, **,*** Denote 0.1, 0.05, and 0.01 significance levels, respectively. Robust *t*-statistics (appear in parentheses). Table 6.9 reports the result of regressions of abnormal returns on year 0 real and accrual earnings management proxies for pooled IPOs sample, IPO firms audited by big N audit firms, and IPO firms audited by non-big N audit firms. The dependent variable is the three-year abnormal return calculated using BHAR relative to the matched sample as previously defined. *BM* is book-to-market ratio is measured as book value of equity divided by market value of equity, *Underpricing* is the percentage of the difference between the offer price and the closing price on the first day of trading, *Abs(CFO)* is the absolute value of cash flows from operations, *Abs(TCACC)* is the absolute value of total current accruals, and all other variables are previously defined. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation.

In summary, the results in Table 6.9 confirm the hypothesis that real and accrual earnings management that have been undertaken during the offer year predict post-IPO stock return underperformance. Further, Table 6.9 confirms the hypothesis that IPO firms audited by big N audit firms are expected to experience a severe decline in post-IPO returns performance due to the extensive use of sales-based earnings management during the IPO year.[92]

6.5 Additional Analysis

6.5.1 Audit and Non-audit Fees

For robustness this chapter also examines other proxy of audit quality such as audit and non-audit fees, which are found to be associated with earnings manipulation. For example, Frankel et al. (2002) find evidence that audit fees are negatively associated with accrual-based manipulation (confirming the view that audit fees are considered as a good proxy of audit quality e.g. DeFond et al. (2000) and Francis (2004)), while non-audit fees are found to be positively associated with accrual-based manipulation (suggesting that non-audit fees may compromise auditor independence). In addition, Basioudis et al. (2008) find evidence that the issuance of going-concern modified audit report is positively associated with the level of audit fees for financially stressed firms in the UK. While for financially stressed firms that paid high non-audit fees Basioudis et al. (2008) find evidence that these firms are less likely to receive a going-concern modified audit report.[93]

Although prior research has focused on examining the association between audit fees, non-audit fees and accrual-based manipulation, limited research has examined whether audit and non-audit fees are associated with real activities-based manipulation (e.g. Chi et al., 2011; Sohn, 2011). For example, Chi et al. (2011) examine the association between audit fees and real activities-based manipulation for firms with strong incentives to manage earnings upward, namely SEO firms and

[92] Table I in Appendix B provides the results of estimating model (6.11) where all the coefficients of the control variables are reported.

[93] In contrast with the evidence of Frankel et al. (2002) and Basioudis et al. (2008), Lim and Tan (2008) find evidence that non-audit fees are associated with high-quality auditing, but just for firms audited by auditor industry expertise.

firms that just meet or beat earnings benchmarks. Chi et al. (2011) find evidence that high quality auditors and higher audit fees are associated with a higher level of real activities-based and a lower level of accrual-based manipulation. Chi et al. (2011) indicate that high-quality auditing (proxied by big N audit firms and higher audit fees) constrains accruals manipulation and, this in turn, leads firms to resort to higher levels of real activities manipulation. Further, Sohn (2011) finds evidence that audit fees are positively associated with real activities-based manipulation, suggesting that audit firms charge their clients higher audit fees due to the higher litigation risk that is associated with real earnings management. Despite the limited research on real earnings management and audit fees (e.g., Chi et al., 2011; Sohn, 2011), no research yet has examined this association based on IPO setting.

Thus, this chapter follows prior research (e.g. Chi et al., 2011; Sohn, 2011) and examines whether audit and non-audit fees are associated with real activities-based and accrual-based manipulations during the IPO year by estimating the following model:

$$\begin{aligned} EM_{it} = {} & \alpha_0 + \beta_1 Fees + \beta_2 LnSize + \beta_3 MB + \beta_4 Ln(1+age) + \beta_5 Lev + \beta_6 Loss \\ & + \beta_7 ROA + \beta_8 Capex\ Growth + \beta_9 SEO + \beta_{10} AIM + \beta_{11} VC + \beta_{12} Underwriter \\ & + IND + Year + \varepsilon_{it} \end{aligned} \quad (6.14)$$

Where ($EM_{i,t}$) is the different proxies for real and accrual earnings management, *(Fees)* as a proxy for *Ln*(*Total-Fees)*, *Ln(Aud-Fees),* and *Ln(Non-AudFees). Ln(Total-Fees)* is the natural logarithm of total audit and non-audit service fees[94], *Ln(Aud-Fees)* is the natural logarithm of audit fees, and *Ln*(*Non-AudFees)* is the natural logarithm of non-audit service fees. All other variables are previously defined.

Table II in Appendix B reports the results on the association between total fees (the sum of audit and non-audit service fees) and real and accrual earnings management. Table II shows no evidence that total fees are associated with real

[94] Prior research indicates that *audit fees* and *non-audit fees* are jointly determined (e.g., Whisenant. et al., 2003) and, therefore, this chapter follows Lim and Tan (2008) by examining the effect of *total audit fees* (the sum of audit and non-audit fees) on earnings management.

activities-based manipulation during the IPO year. However, a negative coefficient is found of -0.052 ($P < 0.05$) on *Ln (Total-Fees)* in the absolute discretionary current accruals regression, suggesting that higher total audit fees are associated with a lower level of accrual-based manipulation during the IPO. This result is consistent with the monitoring role of high quality auditors on accrual-based manipulation, which is presented in Table 6.6. In the next test, total fees are split into audit and non-audit service fees.

Table III in Appendix B reports the results on the association between audit fees and real and accrual earnings management. Table III shows evidence that audit fees are associated with a higher level of sales-based manipulation (abnormal cash flows from operations) and with a lower level of accrual-based manipulation (absolute discretionary current accruals). Specifically, the results show a positive coefficient of 0.059 ($P < 0.05$) and a negative coefficient of -0.078 ($P < 0.01$) on *Ln (Aud-Fees)* in the abnormal cash flows from operations and the absolute discretionary current accruals regressions, respectively. Thus, the results in Table III are consistent with earlier reported results in Table 6.6 that high quality auditing constrains accrual-based manipulation and, therefore, the clients resort to a higher level of sales-based manipulation. In addition, these results are consistent with recent literature (Chi et al., 2011; Sohn, 2011) that audit fees are positively associated with real earnings management.

Table IV in Appendix B reports the results on the association between non-audit service fees and real and accrual earnings management during the IPO year. Table IV shows evidence that discretionary expenses-based manipulation is positively associated with non-audit fees during the IPO, suggesting that audit firms may turn a blind eye on real activities-based manipulation when the clients purchase a higher level of non-audit service fees. Specifically, a positive coefficient is found of 0.034 ($P < 0.10$) on *Ln (Non-AudFees)* in the abnormal discretionary expenses regression. This result also is consistent with Frankel et al. (2002) and Basioudis et al. (2008) that non-audit fees compromise auditor independence.

In summary, the reported results in Tables II and III concerning audit fees confirm the earlier results in Table 6.6 that high quality auditors (big N auditors)

constrain accrual-based manipulation at the IPO and, therefore, the clients resort to higher levels of sales-based manipulation. In addition, Tables IV provides new evidence on a positive association between non-audit service fees and real earnings management via discretionary expenses-based manipulation, suggesting that non-audit service fees may compromise auditor independence.

6.5.2 Auditor Industry Expertise and Audit Tenure

Prior studies also have examined whether accrual earnings management is associated with other proxies of audit quality such as auditor industry expertise (city-level and national-level) and audit tenure. While the majority of prior research provides evidence that auditor industry expertise constrains accrual-based manipulation (e.g., Elder and Zhou, 2002; Balsam et al., 2003; Krishnan, 2003; Reichelt and Wang, 2010), mixed evidence is found on the association between accruals manipulation and audit tenure (e.g., Johnson et al., 2002; Myers et al., 2003; Gul et al., 2009). For example, Johnson et al. (2002) find shorter audit tenure is associated with lower earnings quality, while Davis et al. (2009) find a positive association between having either shorter or longer audit tenure and using accrual earnings management to meet earnings forecasts pre SOX-2002.

Despite the evidence on the associations between auditor industry expertise, audit tenure and accrual earnings management, little research has examined these associations based on real earnings management (e.g., Cohen and Zarowin, 2010; Chi et al., 2011). For example, Cohen and Zarowin (2010) examine real and accrual earnings management around SEOs and find evidence that SEO firms with longer audit tenure have a higher probability to manage real earnings management upward during the offer year. Chi et al. (2011) also examine the association between audit tenure, auditor industry expertise and real earnings management. By examining firms with strong incentives to manage earnings upward (SEO firms and firms that just meet or beat earnings benchmarks), Chi et al. (2011) find evidence that auditor industry expertise (city-level) and longer audit tenure are associated with higher levels of real earnings management. Chi et al. (2011) indicate that high quality auditing (proxied by auditor industry expertise and audit tenure) reduces accrual-

based manipulation and, this in turn, leads the clients to resort to higher levels of real activities-based manipulation.

Thus, and based on the above-evidence, this chapter examines whether enhanced audit quality (proxied by auditor industry expertise national-level[95] and audit tenure) is associated with real earnings management during the IPO year. The following model is estimated to test the association between auditor industry expertise, audit tenure, and real and accrual earnings management during the IPO:

$$\begin{aligned} EM_{it} = {} & \alpha_0 + \beta_1\, Audit\text{-}Proxy + \beta_2 LnSize + \beta_3 MB + \beta_4\, Ln(1+age) + \beta_5\, Lev + \beta_6\, Loss \\ & + \beta_7\, ROA + \beta_8\, Capex\ Growth + \beta_9\, SEO + \beta_{10}\, AIM + \beta_{11} VC + \beta_{12} Underwriter \\ & + IND + Year + \varepsilon_{it} \end{aligned} \quad (6.15)$$

Where ($EM_{i,t}$) is the different proxies for real and accrual earnings management, *Audit-Poxy* as a proxy for (*Expertise)* and *(AudTenure). Expertise* is a dummy variable equals 1 if the auditor is an industry expertise and zero otherwise, *AudTenure* is a continues variable that measures the cumulative number of years of the auditor-client relationship. All other variables are previously defined. Following Mayhew and Wilkins (2003), an auditor is identified as an industry expertise if the auditor is the largest provider of audit services in the industry and the difference between the largest provider and second provider is greater than 10 percent in a specific industry and year. The market share for each auditor is calculated based on the total audit fees and just for big N audit firms to avoid a brand name effect (Craswell et al. 1995).

Table V in Appendix B reports the results on the association between auditor industry expertise and real activities-based and accrual-based earnings management during the IPO year. Table V shows evidence that auditor industry expertise reduces accrual-based manipulation during the IPO. Specifically, a negative coefficient is found of -0.069 ($P<0.05$) on *Expertise* in the absolute discretionary current accruals

[95] Due to the data limitation concerning auditor industry expertise city-level, this chapter just examines the association between auditor industry expertise national-level and real and accrual earnings management.

regression. This evidence on the monitoring role of auditor industry expertise is consistent with prior research (e.g. Elder and Zhou, 2002; Balsam et al., 2003; Krishnan, 2003; Reichelt and Wang, 2010; Chi et al., 2011); however, no evidence is found that the presence of auditor industry expertise is associated with real activities-based manipulation during the IPO.

It is worth noting that this result is consistent with Chi et al. (2011) who examine both national-level and city-level industry expertise and find evidence that just city-level industry expertise is associated with higher levels of real earnings management. The city-level industry expertise is not examined by this thesis due to data limitation, which provides a fruitful avenue for future research.

Table VI in Appendix B reports the results on the association between audit tenure and real and accrual earnings management and shows no evidence that audit tenure is associated with real and accrual earnings management during the IPO year. One possible explanation for these results is that IPO firms are less likely to have longer audit tenure as other firms e.g. SEO firms, notably the majority of the IPO firms in the sample started its business within very short period before the IPO date.[96]

In summary, auditor industry expertise is considered as a good proxy of audit quality as the results show that enhanced audit quality (proxied by either the presence of big N audit firm or auditor industry expertise) constrains accrual-based manipulation during the IPO year.

6.6 Conclusions

This chapter examines real and accrual earnings management activities of IPO firms. Although prior research has examined accrual earnings management around IPOs (e.g., Friedlan, 1994; Teoh et al. 1998a; Gramlich and Sorensen, 2004; Morsfield and Tan, 2006), and a small number of recent papers have started to investigate real earnings management activities and IPOs (e.g., Darrough and Rangan, 2005;

[96] The majority of the IPO sample has gone public on the AIM market (75%) where the regulation allows the IPO firms to go public without having previous earnings records.

Wongsunwai, 2012), this chapter progresses the literature by examining the effect of enhanced audit quality on real and accrual earnings management activities during the IPO year and how this feeds through into post-IPO stock return performance.

This chapter contributes to the literature by providing the following evidence. First, this chapter provides evidence that high quality auditors mitigate and constrain real earnings management that occurs through discretionary expenses-based manipulation. In addition, this chapter provides evidence on the trade-offs between real and accrual earnings management. IPO firms that are audited by high quality auditors are found to resort to a higher level of sales-based manipulation to avoid the monitoring of discretionary expenses-based and accrual-based manipulations by their auditors.

Second, this chapter finds evidence that IPO firms who undertake higher levels of real and accrual-based earnings management during the IPO year experience a more severe decline in stock returns in the post-IPO period. Third, this chapter shows that enhanced audit quality has an impact on the relationship between real and accrual earnings management and post-IPO performance. IPO firms audited by high quality auditors are found to experience a severe decline in post-IPO stock return performance due to the extensive use of sales-based manipulation during the IPO year. While for IPO firms audited by low quality auditors, both sales-based and accrual-based manipulations, which take place during the offer year, are found to predict post-IPO stock return underperformance.

Overall, this chapter shows evidence that enhanced audit quality has an impact on managers' tendency to choose between real and accrual earnings management during the IPO and even this impact is a significant determinant of future IPO performance. The findings of this chapter, therefore, potentially have implications for audit firms, investors, and current policy maker, but they also provide a promising avenue for future research. Future research may investigate the impact of the audit committee on the association between enhanced audit quality and real earnings management.

Appendix B

Appendix B Table I Relation between Post-IPO stock return performance and real and accrual earnings management

	Pooled sample			Big N clients			non-Big N clients		
VARIABLES	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**
Abnormal cash flows from operations	-0.311 (-3.524)***			-0.595 (-2.730)***			-0.182 (-1.863)*		
Abnormal discretionary expenses		0.007 (0.126)			-0.016 (-0.105)			-0.003 (-0.037)	
Absolute discretionary current accruals	-0.132 (-1.247)	-0.162 (-1.556)	-0.194 (-1.938)*	-0.335 (-0.791)	-0.537 (-1.114)	-0.626 (-1.331)	-0.133 (-1.235)	-0.159 (-1.541)	-0.179 (-1.797)*
LnSize	-0.070 (-1.713)*	-0.089 (-2.138)**	-0.141 (-3.313)***	-0.066 (-0.897)	-0.060 (-0.814)	-0.108 (-1.418)	-0.161 (-2.659)***	-0.183 (-3.079)***	-0.229 (-3.324)***
BM	-0.222 (-1.247)	-0.233 (-1.302)	-0.242 (-1.374)	-0.462 (-1.588)	-0.450 (-1.506)	-0.429 (-1.443)	-0.261 (-1.127)	-0.271 (-1.188)	-0.268 (-1.105)
Ln(1+age)	0.027 (0.594)	0.040 (0.884)	0.037 (0.811)	0.090 (1.282)	0.119 (1.646)	0.119 (1.632)	0.009 (0.147)	0.014 (0.228)	0.016 (0.257)
Capex Growth	0.006 (0.995)	0.008 (1.284)	-0.004 (-0.473)	0.003 (0.410)	0.004 (0.660)	-0.002 (-0.234)	0.049 (1.127)	0.049 (1.114)	0.023 (0.563)
Underpricing	-0.075 (-0.418)	-0.080 (-0.445)	-0.059 (-0.329)	0.337 (0.836)	0.186 (0.464)	0.212 (0.527)	-0.063 (-0.373)	-0.075 (-0.446)	-0.095 (-0.563)
AIM	-0.237 (-1.774)*	-0.249 (-1.852)*	-0.239 (-1.791)*	-0.083 (-0.480)	-0.108 (-0.607)	-0.123 (-0.696)	-0.399 (-1.183)	-0.397 (-1.155)	-0.384 (-1.135)
VC	0.005 (0.049)	0.012 (0.130)	0.045 (0.465)	0.125 (0.972)	0.154 (1.169)	0.159 (1.216)	-0.141 (-0.912)	-0.148 (-0.949)	-0.101 (-0.637)

(The table is continued on the next page)

Appendix B Table I (Continued)

	Pooled sample			Big N clients			non-Big N clients		
VARIABLES	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**	**BHAR3**
Underwriter	-0.021	-0.031	-0.014	-0.095	-0.111	-0.099	0.135	0.133	0.113
	(-0.187)	(-0.280)	(-0.125)	(-0.673)	(-0.767)	(-0.668)	(0.631)	(0.613)	(0.538)
Lev	-0.059	-0.068	-0.082	-0.074	-0.092	-0.101	-0.108	-0.110	-0.138
	(-0.784)	(-0.921)	(-1.109)	(-0.449)	(-0.591)	(-0.635)	(-1.314)	(-1.363)	(-1.686)*
SEO	-0.188	-0.182	-0.209	-0.190	-0.114	-0.142	-0.270	-0.275	-0.261
	(-1.097)	(-1.052)	(-1.272)	(-0.806)	(-0.482)	(-0.631)	(-1.026)	(-1.040)	(-1.045)
Abs(CFO)			0.005			0.004			-0.017
			(0.942)			(0.904)			(-0.444)
Abs(TCACC)			0.044			0.011			0.136
			(2.917)***			(1.649)			(2.199)**
Constant	0.664	0.698	0.783	0.557	0.442	0.580	1.074	1.140	1.161
	(2.595)***	(2.707)****	(3.021)***	(1.226)	(0.961)	(1.258)	(2.485)**	(2.591)**	(2.685)***
Year and industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	507	507	507	236	236	236	271	271	271
Adj.R^2	0.079	0.058	0.078	0.144	0.104	0.116	0.019	0.007	0.030
F-statistic	1.89	1.63	1.82	1.81	1.56	1.62	1.12	1.04	1.20
Prob (F-statistic)	0.0005	0.0063	0.0009	0.0027	0.0192	0.0119	0.2899	0.4053	0.2040
Mean VIF	1.32	1.33	1.44	4.25	4.25	4.77	1.34	1.34	1.38
Max VIF	3.22	3.31	3.84	1.54	1.54	1.67	1.94	1.96	2.43

*, **,*** Denote 0.1, 0.05, and 0.01 significance levels, respectively. Robust *t*-statistics (appear in parentheses). Table I reports the result of regressions of abnormal returns on year 0 real and accrual earnings management proxies for pooled IPOs sample, IPO firms audited by big N audit firms, and IPO firms audited by non-big N audit firms. The dependent variable is the three-year abnormal return calculated using BHAR relative to the matched sample. All other variables are previously defined.

Appendix B Table II Relation between total audit fees (the sum of audit and non-audit service fees) and real and accrual earnings management

VARIABLES	Abnormal cash flows from operations	Abnormal discretionary expenses	Absolute discretionary current accruals
Ln(Total-Fees)	0.028	-0.015	-0.052
	(1.320)	(-0.548)	(-2.265)**
LnSize	0.057	-0.125	-0.059
	(1.772)*	(-3.348)***	(-2.399)**
MB	-0.032	0.184	-0.367
	(-0.463)	(2.041)**	(-5.057)***
Ln(1+age)	-0.005	-0.061	-0.033
	(-0.213)	(-2.128)**	(-1.892)*
Lev	-0.019	0.044	-0.045
	(-0.525)	(0.878)	(-1.527)
Loss	0.198	-0.032	0.029
	(4.345)***	(-0.573)	(0.752)
ROA	-0.048	0.051	-0.035
	(-3.687)***	(2.743)***	(-2.908)***
Capex Growth	-0.003	0.009	0.004
	(-1.249)	(3.763)***	(2.102)**
SEO	0.031	-0.048	-0.123
	(0.634)	(-0.607)	(-1.836)*
AIM	0.038	-0.149	-0.035
	(0.530)	(-1.733)*	(-0.660)
VC	-0.036	-0.061	-0.098
	(-0.948)	(-1.106)	(-2.935)***
Underwriter	0.037	-0.070	-0.081
	(0.889)	(-1.250)	(-2.461)**
Constant	-0.179	0.541	0.379
	(-0.921)	(2.409)**	(2.602)***
Year and industry dummies	Yes	Yes	Yes
N	515	515	515
Adj. R^2	0.212	0.174	0.246
F-statistic	3.91	3.72	3.65
Prob (F-statistic)	0.0000	0.0000	0.0000
Mean VIF	1.36	1.36	1.36
Max VIF	3.75	3.75	3.75

*, **, *** Denote 0.1, 0.05, and 0.01 significance levels, respectively. Table II reports the regression of real and accrual earnings management measures on audit quality proxy [total audit fees (the sum of audit and non-audit fees)] and other associated control variables for the IPO sample. All models include year and industry dummies to control for time and industry effects, and robust *t*-statistics (appear in parentheses). To avoid the influence of outliers, all financial continuous data are Winsorized at the top 1% and bottom 99%. All variables are previously defined. *Abnormal cash flows from operations (sales-based manipulation)* and *Abnormal discretionary expenses* are estimated using models developed by Dechow at al. (1998) and as implemented by Roychowdhury (2006). *Discretionary current accruals* are estimated using the corrected version of the modified Jones (1991) model. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation.

Appendix B Table III Relation between audit fees and real and accrual earnings management

VARIABLES	Abnormal cash flows from operations	Abnormal discretionary expenses	Absolute discretionary current accruals
Ln(Aud-Fees)	0.059	-0.033	-0.078
	(2.061)**	(-0.865)	(-2.601)***
LnSize	0.044	-0.119	-0.052
	(1.456)	(-3.132)***	(-2.050)**
MB	-0.031	0.183	-0.375
	(-0.430)	(2.022)**	(-5.183)***
Ln(1+age)	-0.003	-0.062	-0.035
	(-0.140)	(-2.144)**	(-2.038)**
Lev	-0.016	0.043	-0.048
	(-0.472)	(0.863)	(-1.689)*
Loss	0.202	-0.035	0.024
	(4.404)***	(-0.618)	(0.622)
ROA	-0.050	0.051	-0.033
	(-3.791)***	(2.764)***	(-2.662)***
Capex Growth	-0.004	0.009	0.004
	(-1.508)	(3.852)***	(2.356)**
SEO	0.014	-0.038	-0.104
	(0.277)	(-0.483)	(-1.543)
AIM	0.043	-0.152	-0.037
	(0.591)	(-1.765)*	(-0.695)
VC	-0.029	-0.065	-0.108
	(-0.758)	(-1.165)	(-3.213)***
Underwriter	0.038	-0.071	-0.080
	(0.914)	(-1.265)	(-2.391)**
Constant	-0.017	0.452	0.232
	(-0.090)	(1.829)*	(1.325)
Year and industry dummies	Yes	Yes	Yes
N	515	515	515
Adj. R^2	0.217	0.175	0.249
F-statistic	4.03	6.58	2.74
Prob (F-statistic)	0.0000	0.0000	0.0000
Mean VIF	1.37	1.37	1.37
Max VIF	3.97	3.97	3.97

*, **, *** Denote 0.1, 0.05, and 0.01 significance levels, respectively. Table III reports the regression of real and accrual earnings management measures on audit quality proxy (audit fees) and other associated control variables for the IPO sample. All models include year and industry dummies to control for time and industry effects, and robust *t*-statistics (appear in parentheses). To avoid the influence of outliers, all financial continuous data are Winsorized at the top 1% and bottom 99%. All variables are previously defined. *Abnormal cash flows from operations (sales-based manipulation)* and *Abnormal discretionary expenses* are estimated using models developed by Dechow at al. (1998) and as implemented by Roychowdhury (2006). *Discretionary current accruals* are estimated using the corrected version of the modified Jones (1991) model. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation.

Appendix B Table IV Relation between non-audit fees and real and accrual earnings management

VARIABLES	Abnormal cash flows from operations	Abnormal discretionary expenses	Absolute discretionary current accruals
Ln(Non-AudFees)	0.001	0.034	-0.007
	(0.044)	(1.832)*	(-0.491)
LnSize	0.058	-0.135	-0.079
	(1.719)*	(-3.493)***	(-3.171)***
MB	-0.016	0.208	-0.322
	(-0.225)	(2.344)**	(-4.465)***
Ln(1+age)	-0.008	-0.068	-0.034
	(-0.360)	(-2.320)**	(-2.083)**
Lev	-0.005	0.019	-0.024
	(-0.145)	(0.419)	(-0.870)
Loss	0.198	-0.085	0.026
	(4.031)***	(-1.479)	(0.751)
ROA	-0.047	0.047	-0.026
	(-3.187)***	(2.369)**	(-2.359)**
Capex Growth	-0.002	0.007	0.003
	(-0.944)	(3.100)***	(1.559)
SEO	0.016	-0.019	-0.063
	(0.286)	(-0.212)	(-1.159)
AIM	0.009	-0.071	-0.024
	(0.117)	(-0.823)	(-0.466)
VC	-0.046	-0.001	-0.078
	(-1.194)	(-0.026)	(-2.326)**
Underwriter	0.005	-0.039	-0.068
	(0.125)	(-0.710)	(-2.172)**
Constant	-0.211	0.632	0.537
	(-0.985)	(2.664)***	(3.608)***
Year and industry dummies	Yes	Yes	Yes
N	456	456	456
Adj. R^2	0.192	0.130	0.218
F-statistic	3.43	8.46	2.89
Prob (F-statistic)	0.000	0.000	0.000
Mean VIF	1.36	1.36	1.36
Max VIF	3.41	3.41	3.41

*, **, *** Denote 0.1, 0.05, and 0.01 significance levels, respectively. Table IV reports the regression of real and accrual earnings management measures on audit quality proxy (non-audit fees) and other associated control variables for the IPO sample. All models include year and industry dummies to control for time and industry effects, and robust *t*-statistics (appear in parentheses). To avoid the influence of outliers, all financial continuous data are Winsorized at the top 1% and bottom 99%. All variables are previously defined. *Abnormal cash flows from operations (sales-based manipulation)* and *Abnormal discretionary expenses* are estimated using models developed by Dechow at al. (1998) and as implemented by Roychowdhury (2006). *Discretionary current accruals* are estimated using the corrected version of the modified Jones (1991) model. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation.

Appendix B Table V Relation between auditor industry expertise and real and accrual earnings management

VARIABLES	Abnormal cash flows from operations	Abnormal discretionary expenses	Absolute discretionary current accruals
Expertise	0.035	0.017	-0.069
	(0.761)	(0.299)	(-2.248)**
LnSize	0.071	-0.136	-0.085
	(2.402)**	(-4.099)***	(-3.909)***
MB	-0.019	0.179	-0.391
	(-0.273)	(1.959)*	(-5.338)***
Ln(1+age)	-0.005	-0.062	-0.032
	(-0.236)	(-2.128)**	(-1.816)*
Lev	-0.017	0.044	-0.047
	(-0.489)	(0.871)	(-1.650)*
Loss	0.199	-0.031	0.028
	(4.367)***	(-0.548)	(0.693)
ROA	-0.048	0.051	-0.035
	(-3.741)***	(2.767)***	(-2.904)***
Capex Growth	-0.003	0.008	0.003
	(-1.173)	(3.594)***	(2.002)**
SEO	0.041	-0.051	-0.141
	(0.807)	(-0.648)	(-2.092)**
AIM	0.031	-0.143	-0.022
	(0.434)	(-1.686)*	(-0.420)
VC	-0.033	-0.061	-0.104
	(-0.873)	(-1.082)	(-3.125)***
Underwriter	0.030	-0.069	-0.068
	(0.728)	(-1.231)	(-2.057)**
Constant	-0.293	0.606	0.592
	(-1.623)	(3.151)***	(4.930)***
Year and industry dummies	Yes	Yes	Yes
N	515	515	515
Adj. R^2	0.209	0.173	0.235
F-statistic	3.74	5.85	2.70
Prob (F-statistic)	0.0000	0.0000	0.0000
Mean VIF	1.32	1.32	1.32
Max VIF	3.04	3.04	3.04

*, **, *** Denote 0.1, 0.05, and 0.01 significance levels, respectively. Table V reports the regression of real and accrual earnings management measures on audit quality proxy (auditor industry expertise) and other associated control variables for the IPO sample. All models include year and industry dummies to control for time and industry effects, and robust *t*-statistics (appear in parentheses). To avoid the influence of outliers, all financial continuous data are Winsorized at the top 1% and bottom 99%. All variables are previously defined. *Abnormal cash flows from operations (sales-based manipulation)* and *Abnormal discretionary expenses* are estimated using models developed by Dechow at al. (1998) and as implemented by Roychowdhury (2006). *Discretionary current accruals* are estimated using the corrected version of the modified Jones (1991) model. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation.

Appendix B Table VI Relation between audit tenure and real and accrual earnings management

VARIABLES	Abnormal cash flows from operations	Abnormal discretionary expenses	Absolute discretionary current accruals
AudTenure	-0.018	0.006	-0.012
	(-1.082)	(0.340)	(-0.927)
LnSize	0.075	-0.135	-0.090
	(2.569)**	(-4.140)***	(-4.196)***
MB	-0.016	0.177	-0.384
	(-0.233)	(1.938)*	(-5.256)***
Ln(1+age)	0.002	-0.064	-0.029
	(0.082)	(-1.974)**	(-1.566)
Lev	-0.016	0.043	-0.046
	(-0.451)	(0.859)	(-1.601)
Loss	0.194	-0.031	0.029
	(4.305)***	(-0.546)	(0.738)
ROA	-0.049	0.051	-0.035
	(-3.762)***	(2.770)***	(-2.894)***
Capex Growth	-0.003	0.009	0.003
	(-1.103)	(3.690)***	(1.796)*
SEO	0.037	-0.051	-0.138
	(0.720)	(-0.649)	(-2.056)**
AIM	0.026	-0.143	-0.020
	(0.371)	(-1.682)*	(-0.367)
VC	-0.035	-0.062	-0.099
	(-0.931)	(-1.115)	(-3.007)***
Underwriter	0.034	-0.068	-0.071**
	(0.822)	(-1.224)	(-2.130)
Constant	-0.297	0.605	0.595
	(-1.642)	(3.154)***	(4.947)***
Year and industry dummies	Yes	Yes	Yes
N	515	515	515
Adj. R^2	0.21	0.173	0.233
F-statistic	3.72	5.94	2.67
Prob (F-statistic)	0.0000	0.0000	0.0000
Mean VIF	1.32	1.32	1.32
Max VIF	2.94	2.94	2.94

*, **, *** Denote 0.1, 0.05, and 0.01 significance levels, respectively. Table VI reports the regression of real and accrual earnings management measures on audit quality proxy (audit tenure) and other associated control variables for the IPO sample. All models include year and industry dummies to control for time and industry effects, and robust *t*-statistics (appear in parentheses). To avoid the influence of outliers, all financial continuous data are Winsorized at the top 1% and bottom 99%. All variables are previously defined. *Abnormal cash flows from operations (sales-based manipulation)* and *Abnormal discretionary expenses* are estimated using models developed by Dechow at al. (1998) and as implemented by Roychowdhury (2006). *Discretionary current accruals* are estimated using the corrected version of the modified Jones (1991) model. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation.

Chapter 7
Real and Accrual Earnings Management and IPO Failure Risks

7.1 Introduction

The failure of an Initial Public Offering (IPO) is a significant event in a firm's life cycle that has consequences for the firm and its stakeholders (investors, lenders, financial institutions, etc). Fama and French (2004) document that the survival rates of IPO firms have sharply declined over the past several decades due to the new characteristics of IPO firms, which are lower profitability and higher growth that are both driven by the lower cost of equity in the market. Consistent with the importance of IPOs and the impact of their failure, prior research has investigated several factors that are associated with the survivability of IPOs e.g. the presence of venture capitalists (Jain and Kini, 2000), more prestigious underwriters (Schultz, 1993), prestigious auditors and audit report (Willenborg and McKeown, 2001; Weber and Willenborg, 2003; Jain and Martin, 2005), underpricing, size and age at the IPO (Hensler et al., 1997) and corporate governance (Charitou et al., 2007). However, little research has examined whether firms-specific accounting items are associated with IPO failure risk and survivability (e.g. Li and Zhou, 2006; Demers and Joos, 2007).

This chapter explores consequences of real and accrual earnings management for the probability of IPO failure and survivability.[97] Prior accounting literature shows that IPO and SEO firms manipulate earnings upward utilizing real and accrual earnings management around the offer year (e.g., Aharony et al., 1993; Friedlan, 1994; Rangan, 1998; Teoh et al. 1998a, 1998b; DuCharme et al., 2001; Elder and Zhou, 2002; Roosenboom et al., 2003; Gramlich and Sorensen, 2004;

[97] IPO failure is defined as those IPO firms who delisted from the stock exchange for negative reasons (involuntary delisted) within 5 years post-IPO date.

Chen et al., 2005; Morsfield and Tan, 2006; Chang et al., 2010; Ahmad-Zaluki et al., 2011; Lee and Masulis, 2011; Chahine et al. 2012; Wongsunwai, 2012). This literature also found that real and accrual earnings management have severe negative consequences for post IPO and SEO stock returns and operating performance (e.g., Rangan, 1998; Teoh et al. 1998a; Fan, 2007; Roosenboom et al., 2003; Cohen and Zarowin, 2010; Kothari et al., 2012).

The increased interest in IPO failure research has led to an examination of the association between accrual earnings management and IPO failure. Consistent with this, Li and Zhou (2006) have investigated whether accrual earnings management that takes place during the IPO is associated with the probability of IPO failure and survivability in the subsequent periods and find evidence that IPO firms with high levels of accrual manipulation during the IPO year have a higher probability of failure and lower survival rates. In addition, Demers and Joos (2007) have examined whether firms-specific factors are associated with IPO failure risk and found a positive association between the probability of IPO failure and the level of discretionary expenses pre the IPO and find IPO firms that have lower spending on research and development (R&D) and selling, general, and administrative (SG& A) expenses during the year pre the IPO have a higher probability of failure in the following periods.[98]

This chapter progresses the literature on earnings management by examining the effect of real earnings management on the probability of IPO failure and survivability. Real earnings management activities have been found to have severe negative consequences, with even greater than the consequences of accrual earnings management, for subsequent stock returns and operating performance (Cohen and Zarowin, 2010; Kothari et al., 2012). Recent studies show that real earnings management activities are extensively utilized by IPO firms during the IPO year to manage reported earnings upward (e.g., Darrough and Rangan, 2005; Singer and

[98] For non- tech IPO firms Demers and Joos (2007) find that just the level of SG&A expenses during the year pre the IPO is associated with the probability of failure in the following period. Demers and Joos (2007) also examine several other factors such as sales, auditors, underwriters, VC, hot issue market, underpricing, age, offer price, leverage, etc.

Fedyk, 2011; Wongsunwai, 2012). Therefore, IPO firms with high levels of real and accrual earnings management during the IPO year are expected to have a higher probability of failure and lower survival rates in the subsequent periods.

Consistent with this, the results of this chapter present evidence that IPO firms who delisted from the stock exchanges for negative reasons within five years post the IPO date exhibit higher levels of real and accrual earnings management during the IPO year. Further, the results show that IPO firms with high levels of real and accrual earnings management during the IPO year have a higher probability of failure and lower survival rates in subsequent periods.

The study proceeds as follows. Section two reviews the related literature and presents hypotheses development. Section three discusses data, sample construction and empirical methodology. Section four discusses empirical evidence on real and accrual earnings management around IPOs and their relationships with IPO failure and survival rates. Section five presents additional analysis. Section six concludes.

7.2 Literature Review and Hypotheses Development

This chapter first reviews the literature on real and accrual earnings management around IPOs. Second, it discusses how earnings management might affect IPO failure risk and the survivability. This chapter discusses the existing evidence and research in each of these areas and builds on this evidence to state the hypotheses.

7.2.1 Real and Accrual Earnings Management around IPOs

IPO firms are expected to undertake real and accrual earnings management around IPOs, notably IPO firms exhibit higher levels of information asymmetry and agency conflicts around IPOs between insiders and outsiders and, this in turn, provides IPOs' managers with strong incentives and more flexibility to manage reported earnings upward during the IPO. Consistent with this view, prior literature has presented evidence that IPO firms manage reported earnings upward around IPOs utilizing real and accrual earnings management activities (e.g., Aharony et al., 1993; Friedlan, 1994; Teoh et al., 1998a; Gramlich and Sorensen, 2004; Morsfield and Tan, 2006;

Fan, 2007; Wongsunwai, 2012), and that real activities- based and accrual-based manipulations, which take place during the IPO, are negatively associated with post-IPO stock returns and operating performance (e.g. Fan, 2007). Thus, and given the evidence on the existence of information asymmetry around IPOs (e.g. Teoh et al. 1998a), it is expected that IPO firms in the UK will manage reported earnings upward around IPOs utilizing both real activities-based and accrual-based manipulations (Please see Section 5.3.1 for more detailed discussion about real and accrual earnings management around IPOs).

7.2.2 Earnings Management and IPO Failure Risks

The main objective of this chapter is to examine the effect of real activities-based and accrual-based manipulations on the probability of future failure risk. Prior research shows that real and accrual earnings management, which take place during the offer year, have negative consequences for post IPO and SEO operating and stock return performance (e.g., Rangan, 1998; Teoh et al. 1998a, 1998b; DuCharme et al., 2001; Roosenboom et al., 2003; Gramlich and Sorensen, 2004; Morsfield and Tan, 2006; Fan, 2007; Chang et al., 2010; Cohen and Zarowin, 2010; Kothari et al., 2012). For example, Teoh et al. (1998a) find IPO firms that engage in accrual earnings management during the IPO year experience post-IPO stock returns underperformance. Teoh et al. (1998a) also compare post-IPO returns underperformance across their IPOs sample and find evidence that the most stock return underperformance occurs for IPO firms with the highest level of accruals manipulation during the IPO year. Roosenboom et al. (2003) find evidence that IPO firms with high levels of accrual earnings management during the IPO year experience worse stock returns post-IPO. Fan (2007) also find similar evidence that IPO firms with the highest level of accruals manipulation during the IPO experience a decline in post-IPO return and operating performance.

Further, by focusing on the SEO setting Rangan (1998) find SEO firms that manage accounting accruals upward during the offer year experience inferior operating and stock return performance post the SEO. Teoh et al. (1998b) focus on accrual accounting during the year prior to the offer year and find evidence that SEO

firms inflate reported earnings utilizing accrual earnings management. Teoh et al. (1998b) also find accrual accounting prior to the offer year predict post-SEO stock return underperformance. More recently, Cohen and Zarowin (2010) examine both real and accrual earnings management activities for SEO firms and find evidence on earnings manipulations during the offer year. Cohen and Zarowin (2010) also find real and accrual earnings management, which take place during the offer year, have negative consequences for post-SEO operating performance and that real earnings management activities have the most severe negative consequences. Kothari et al. (2012) examine the effect of real and accrual earnings management activities for post-SEO returns performance and find similar evidence to Cohen and Zarowin (2010). Kothari et al. (2012) find evidence that SEO firms manage earnings upward during the offer year utilizing real and accrual earnings management. They also find real earnings management activities have the most severe negative consequences for post-SEO stock return performance.

Thus, if both real and accrual earnings management activities have severe negative consequences for future operating and returns performance, then it is more likely that these activities will be positively associated with the probability of failure (delisted for negative reasons) in the following periods. Consistent with this view, Li and Zhou (2006) examine whether IPO firms that manage accrual accounting upward during the IPO year have a higher probability of failure (delisting from the stock exchange for negative reasons) in the following periods.[99] Li and Zhou (2006) find evidence that IPO firms with a high level of accruals manipulation during the offer year have a higher probability of delisting from the stock exchange for negative reasons in the following periods. Li and Zhou (2006) also examine IPOs survivability and find evidence that IPO firms with high levels of accrual earnings management during the IPO year survive for a shorter period than other IPO firms.

[99] Li and Zhou (2006) define delisting for negative reasons (involuntary delisting) as those IPO firms who delisted from the stock exchange for failure within 5 years after the IPO date and have delisted codes between 400 and 600, excluding the following codes; 501, 502, 503, and 573. Where codes 501, 502, and 503 denote those firms that switch from stock exchange to another, while 573 denotes firms that choose to go private.

In addition, Demers and Joos (2007) examine the association between the probability of IPO failure (delisting from the stock exchanges for negative reasons) and several accounting items. Demers and Joos (2007) find high-tech IPO firms that have lower spending on R&D and SG&A expenses during the year pre-IPO have a higher probability of failure in the following periods. While for both high-tech and non-tech IPO firms, Demers and Joos (2007) find evidence that lower spending on SG&A expenses during the year pre-IPO is positively associated with the probability of failure in the following periods. This evidence by Demers and Joos (2007) is in line with earnings management literature which finds that an abnormal reduction in discretionary expenses (R&D, SG&A, and advertising) leads to inferior subsequent operating and stock return performance (Cohen and Zarowin, 2010; Kothari et al. 2012). [100]

Other bodies of research have examined further covariates that may be found to be associated with the IPO event. For example, Willenborg and McKeown (2001) examine the association between auditor's report and IPO failure and find evidence that IPO firms with a going-concern audit opinion during the IPO have a higher probability of delisting from the stock exchange within two years for deleterious reasons. Further, Weber and Willenborg (2003) find evidence that big N audit firms screen out risky IPO firms when they choose their clients and that big N auditor's report on small IPO firms is more predictive of a post-IPO negative delisting. Weber and Willenborg (2003) also find that big N audit firms are less likely to give a clean audit report during the offer year for IPO firms that are delisted in the subsequent periods.

Therefore, IPO firms that have higher levels of real activities-based and accrual-based manipulations during the IPO year are expected to have a higher

[100] It is worth noting that Demers and Joos (2007) examine the annual level of R&D and SG&A expenses during the year pre the IPO, while Cohen and Zarowin (2010) and Kothari et al. (2012) follow earnings management literature by using empirical models to estimate the abnormal level of discretionary expenses. In addition, Demers and Joos (2007) define IPO failure as IPO firms that are delisted within five years post the IPO and their delisted codes between 400 and 600, excluding the following codes; 501, 502, 503, and 573.

probability of failure in the subsequent periods.[101] Hence, the second hypothesis, in alternative form, as follows:

> **HYPOTHESIS 1a.** *IPO firms that report high levels of real and/or accrual earnings management during the IPO year, ceteris paribus, will have a higher probability of failure in the post-IPO period.*

This chapter also conducts a survival analysis to examine whether real and accrual earnings management, which take place during the IPO year, are associated with IPO survivability in the subsequent periods. Prior studies have extensively used survival analysis to examine whether specific characteristics of IPO firms are associated with IPO survivability in the following periods (e.g., Hensler et al., 1997; Jain and Kini, 2000; Chadha, 2003; Fama and French, 2004; Jain and Martin, 2005; Li and Zhou, 2006; Demers and Joos, 2007; Carpentier and Suret, 2011; Gerakos et al., 2011; Espenlaub et al., 2012). For example, by conducting the survival analysis Jain and Kini (2000) find IPO firms backed by venture capitalists have a better probability of surviving in the following years than non-VC backed IPOs. They also find IPO firms backed by VCs have a higher level of R&D expenditure, better coverage by analysts, more successful road shows and are more likely to be underwritten by reputable underwriters. They find these characteristics, which result from the presence of VCs, contribute positively to higher survival rates and a lower failure risk in the post-IPO period.

---

[101] This chapter focuses on real and accrual earnings management that take place during the IPO year for several reasons. First, the reported results in Table 7.5 show that IPO firms do not manage earnings during the period pre the IPO. These results are consistent with Ball and Shivakumar (2008) who find evidence that IPO firms report more conservatively during the year pre the IPO year in order to improve the quality of their financial reporting, so IPO firms can meet the market demand for high quality financial reporting during the first year as public firms. Further, it is well-known that IPO firms usually time their offerings to take advantage of hot market periods (e.g., Ibbotson and Jaffe, 1975; Lowry and Schwert, 2002). This in turn does not allow having enough time to plan earnings management ahead of the IPO date. Another explanation is that many of the original IPO shareholders are likely to be restricted in their share sales via a lock-up period. Thus, managing earnings upwards pre the IPO would not be overly sensible – in fact, conservative accounting subject to getting the IPO away would be more rational. For IPOs sample the average lock-up period is 14 months after the IPO date. This chapter also does not consider earnings management that takes place during the period post the IPO year as many of IPOs sample are delisted during the first and second anniversary of their IPO date. Thus, this chapter focuses on earnings management during the IPO year.

In addition, Fama and French (2004) examine the characteristics of IPO firms that went public over the period 1973-2001. They find evidence that the survival rate for IPO firms has sharply declined due to the new characteristics of firms going public, which are lower profitability and a higher growth. They suggest these changes in the characteristics of IPO firms are consequences of the lower cost of equity in the market. Gerakos et al. (2011) find evidence that firms listed on the Alternative Investment Market (AIM) in the UK have higher failure rates compared with firms listed on the Main market and other developed US markets. Recently, Espenlaub et al. (2012) examine the survival rates for IPO firms on the AIM market and find evidence that the presence of a reputable Nomad improves the survival rate of an IPO in the subsequent periods.

Accounting research has also conducted the survival analysis to examine whether accounting items are associated with the survivability of IPO firms (e.g., Jain and Martin, 2005; Li and Zhou, 2006; Demers and Joos, 2007). For example, Jain and Martin (2005) examine the association between audit quality and IPO survival rates, and find IPO firms audited by high quality auditors survive longer. Jain and Martin (2005) also find the impact of audit quality on IPO survivability is upheld after controlling for other covariates that are found to affect the survival rates of IPO firms. Demers and Joos (2007) examine IPO failure risks and conduct the survival analysis as a robustness test and find almost similar results to the Logit regression analysis that lower spending of R&D and SG&A expenses during the year pre-IPO is associated with lower survival rates in the following periods. Moreover, Li and Zhou (2006) examine whether accrual earnings management is associated with IPO survivability using the survival analysis and find IPO firms that engage aggressively in accrual earnings management during the IPO year have lower survival rates in the subsequent periods.

Thus, this chapter conducts the survival analysis to examine whether real and accrual earnings management activities during the IPO year are associated with the survivability of IPO firms – it is expected IPO firms that aggressively manage earnings upward during the IPO year, utilizing real and accrual earnings

management, to have lower survival rates in subsequent periods. Hence, the final hypothesis, in alternative form, as follows:

> **HYPOTHESIS 1b.** *IPO firms that report high levels of real and/or accrual earnings management during the IPO year, ceteris paribus, will have lower survival rates post the IPO.*

7.3 Research Methods and Data

7.3.1 Data and Sample Construction

The initial sample of this chapter consists of 571 British IPO companies that have gone public on either the Main or AIM markets between January 1998 and December 2008.[102] All financial IPO firms are excluded from the sample due to differences in their financial reporting and disclosure requirements (e.g., Teoh et al., 1998a; 1998c; Chen et al., 2005; Morsfield and Tan, 2006; Fan, 2007; Chang et al., 2010; Lee and Masulis, 2011; Chahine et al., 2012; Wongsunwai, 2012). Further, the sample is restricted to all IPO firms that have available prospectuses and the necessary data to measure real and accrual earnings management. This restriction leads to have a sample consisting of larger and more successful firms, which results in a more conservative test of earnings management as noted by Cohen et al. (2008) and Cohen and Zarowin (2010). Further, this chapter follows prior research by excluding from the control sample (all UK non-IPO firms) any group of firms with

[102] The London Stock Exchange provides data about IPOs on the Main market starting from 1998 while data about IPOs on the AIM market start from 1995. Therefore, and to be consistent, the sample covers the period 1998 - 2008.

less than 6 observations for each 2-digit SIC code industry-year group.[103, 104] The IPO year (0) is defined as the fiscal year during which the IPO occurs.[105]

Out of 571 UK IPOs, 317 IPOs are delisted prior to December 2011 (of which 90 IPOs are delisted for negative reason). Following prior research (e.g., Li and Zhou, 2006; Demers and Joos, 2007) this chapter defines IPO failure as those IPO firms who delisted from the stock exchanges for negative reasons (involuntary delisted); namely, administration, receivership, liquidation, winding up, and bankruptcy within five years post the IPO date. After imposing this restriction, 60 IPOs left which are delisted for negative reasons within 5 years after the IPO date (the total is 90 IPOs that are delisted for negative reasons over the sample period). [106] This chapter also distinguishes between IPO firms delisted for mergers and acquisitions, at the request of the company (going private) and other delisting reasons.

Data are collected using the following sources: (1) IPO firms are identified using the list of IPOs on the London Stock Exchange website for UK firms that were admitted to the AIM and Main markets during the period 1998-2008. This list provides information about IPOs such as, issue price, the date of an IPO, market capitalization, etc; (2) the ICC Plum and Lexis-Nexis databases were used to obtain information about the company identifier for IPO firms, such as the WorldScope and ISIN codes; (3) financial data for the IPO firms and for the control sample of all UK non-IPO firms were obtained from the WorldScope database; (4) WorldScope

[103] The control sample consists of all UK non-IPO active and dead firms, excluding financial firms, over the sample period to avoid survivorship bias.

[104] The analysis is also repeated using 10 observations for each industry-year group and the results are qualitatively similar but this restriction leads to a large decrease in the sample size and so this chapter follows Rosner, (2003), Iqbal et al., (2009) and Athanasakou et al., (2011) and uses 6 observations.

[105] To overcome any misspecification of the financial year end, the financial data obtained from WorldScope are cross checked with the financial data in the prospectus and the results are qualitatively similar.

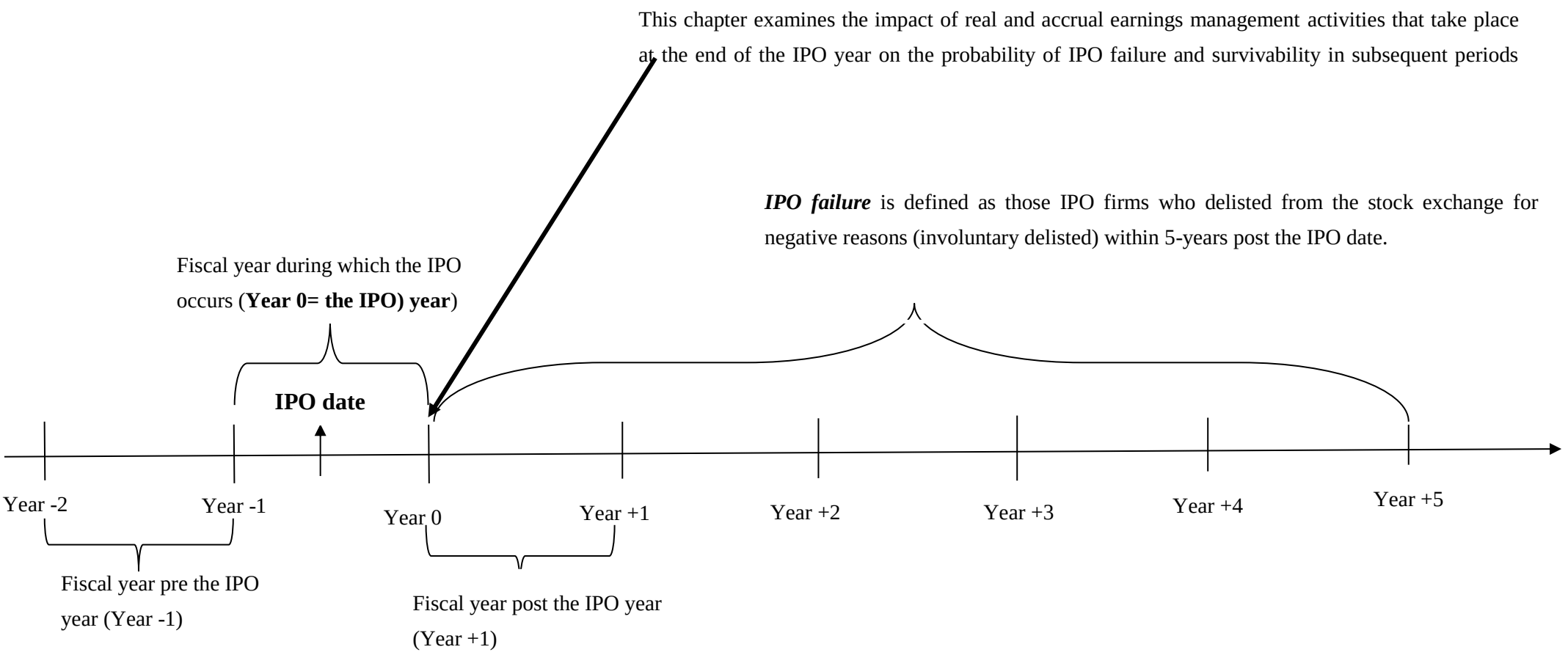
[106] From those 60 delisted IPOs for negative reasons, 35 went into administration, 22 into liquidation, 2 into receivership, and 1 into winding up. Further, the definition of failure that is adopted by this thesis is consistent with García Lara et al. (2009) who examined earnings quality for failed firms in the UK and defined failure as those firm delisted for administration, liquidation and receivership.

however, does not provide all the required financial data for the sample of IPO firms, therefore, IPO prospectuses were downloaded from the Thomson One Banker database and all missing financial data were manually collected from IPO prospectuses; (5) the DataStream database was used to collect the stock prices for the sample of IPOs and their matched firms and the delisted dates, (6) the Fame database is used to collect the reasons of delisting from the stock exchange and date of delisting, which was cross checked with the delisted dates obtained from DataStream. Further, the delisted reasons obtained from Fame are doubled checked with Companies House.

7.3.2 Event periods

This chapter focuses on examining the impact of real and accrual earnings management that take place at the end of the IPO year on the probability of IPO failure and survivability in subsequent periods. Consistent with prior research (e.g., Li and Zhou, 2006; Demers and Joos, 2007), IPO failure is defined as those IPO firms who delisted from the stock exchange for negative reasons (involuntary delisted); namely, administration, receivership, liquidation, winding up, and bankruptcy within five years post the IPO date. Further, and as the survival analysis is dealing with censored data, this chapter follows prior research (Li and Zhou, 2006; Demers and Joos, 2007) by considering IPO firms as "*right censored*" if they have not delisted yet (still trading on the stock exchange since the IPO date) by the end of December 2011 or if they have delisted for any reasons other than negative reasons. Thus, non-survivor IPO firms are defined as those IPO firms who delisted from the stock exchanges just for negative reasons over the period 1998-2011. This approach of analyzing the impact of real and accrual earnings management on the probability of IPO failure and survivability is consistent with prior research (e.g. Li and Zhou, 2006). Figure 7.1 depicts the time periods when real and accrual earnings management are estimated.

Figure 7.1 Time periods analyzed and IPO failure



7.3.3 Variable Measurement

7.3.3.1 Measuring Accrual-based Earnings Management

This chapter follows prior research (e.g. Gramlich and Sorensen, 2004; Fan, 2007; Cohen and Zarowin; 2010) by using the cash flows approach to estimate accrual measures. Following this approach total accruals are defined as earnings before extraordinary items minus cash flows from operations. The advantage of cash flows approach over other approaches is to capture all accrual manipulations that are conducted using either current accruals (short-term) or non-current accruals (long-term). For example, current accrual manipulation can be conducted through delaying the recognition of expenses and accelerating the recognition of revenues, while non-current accrual (long-term accrual) manipulation can be conducted through decelerating depreciation policies, reducing deferred tax, and realizing unusual gains (Teoh et al., 1998a, 1998b; 1998c; Chang et al., 2010; Chahine et al. 2012). Thus, total accruals are decomposed into discretionary accruals (related to managers' discretion) and non-discretionary accruals (related to economic circumstances and outside managers' control) (e.g., Jones, 1991; Dechow et al., 1995; Teoh et al., 1998a).

To estimate discretionary accruals, and following prior research in earnings management, the Dechow et al. (1995) cross-sectional adaptation of the modified Jones (1991) model is used. Ball and Shivakumar (2008) point out estimating discretionary accruals for IPO firms using lagged total assets to scale accrual variables may inflate the measure of accruals in the current year. They argue that lagged total assets are qualitatively smaller than total assets at the end of the IPO year because IPO firms tend to use proceeds to invest in assets. In order to overcome this problem, this chapter follows Armstrong et al. (2009) and scales all variables by average total assets rather than lagged total assets.[107] This chapter uses a cross-sectional regression for each year for all non-IPO firms for each 2-digit SIC industry

[107] Also, the analysis is repeated scaling all variables by lagged total assets and the results are qualitatively similar to those reported in this chapter.

category. This approach, in part, controls for changes in economic conditions that impact on total accruals across different industry groups, but allows for coefficients to vary through time (DeFond and Jiambalvo, 1994; Kasznik, 1999; Cohen and Zarowin, 2010). Return on assets is also added to the model as suggested by Kothari et al. (2005) in order to control for extreme operating performance as this can bias the estimation of discretionary accruals. Then, the estimated coefficients are taken to estimate discretionary accruals for the IPO firm. Normal accruals are, therefore, estimated using the following cross-sectional regression for each industry and year for all non-IPO firms:[108]

$$\frac{TA_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{\Delta SALES_{it}}{AvAssets_{it}} + \beta_3 \frac{PPE_{it}}{AvAssets_{it}} + \beta_4 ROA_{it} + \varepsilon_{it} \tag{7.1}$$

Where $TA_{i,t}$ is total accruals defined as earnings before extraordinary items minus cash flows from operations; $AvAssets_{i,t}$ is the sum of total assets at the beginning of the year and the total assets at the end of the year divided by 2; $\Delta SALES_{i,t}$ is the change in sales during a year scaled by average total assets; $PPE_{i,t}$ is the gross value of property, plant and equipment scaled by average total assets; and $ROA_{i,t}$ is return on assets measured as earnings before extraordinary items scaled by average total assets.

The coefficient estimates from equation (7.1) are used to estimate normal accruals ($NA_{i,t}$) for all IPO firms in each year and industry as follows,

$$NA_{it} = \hat{\alpha}_0 + \hat{\beta}_1 \frac{1}{AvAssets_{it}} + \hat{\beta}_2 \frac{\Delta SALES_{it} - \Delta REC_{it}}{AvAssets_{it}} + \hat{\beta}_3 \frac{PPE_{it}}{AvAssets_{it}} + \hat{\beta}_4 ROA_{it} \tag{7.2}$$

$\Delta REC_{i,t}$ is the change in receivables during the year scaled by average total assets.

[108] To take account of extreme values all variables are Winsorized at the top 1% and bottom 99%.

Discretionary accruals ($DA_{i,t}$) are measured as the difference between total accruals and fitted normal accruals where,

$$DA_{it} = \left(\frac{TA_{it}}{AvAssets_{it}} \right) - NA_{it} \tag{7.3}$$

For robustness this chapter also repeats this analysis using performance-matched discretionary accruals following Kothari et al. (2005). Therefore, each IPO firm is matched with a non-IPO firm based on year, 2-digit SIC industry code and the closest return on assets (+/- 0.20 of IPO firms' return on assets). The results of the performance-matched discretionary accruals are qualitatively similar to those reported where return on assets is added to the model. The imposition of the above restriction, however, reduces the sample by 20% as only appropriate matches are found for 80% of the IPO sample. As the results are qualitatively similar, this chapter reports the results based on the larger sample size that simply controls for return on assets.

7.3.3.2 Measuring Real Earnings Management

Following prior research real earnings management proxies are estimated based on models of real earnings management developed by Dechow et al. (1998) and applied by Roychowdhury (2006). Later researchers such as Cohen et al., (2008), Cohen and Zarowin, (2010), Wongsunwai, (2012) and Zang, (2012), also apply these models to estimate real earnings management. This chapter examines two real earnings management activities; sales-based manipulation and reducing discretionary expenses.[109] Sales-based manipulation leads to lower levels of cash flows from operations, and can be managed through offering more price discounts and/or more lenient credit terms (see Roychowdhury, 2006). Discretionary expenses meanwhile represent the sum of research and development expenses (R&D), advertising expenses, and selling, general and administrative expenses (SG&A). Reducing

[109] This chapter does not consider production cost manipulation within the analysis of real earnings management as this is a method that can only be fully utilized by manufacturing companies (Roychowdhury, 2006) and manufacturing companies make up just 26.6% of the total sample.

discretionary expenses in the current period will boost reported earnings in the current period. In addition, where discretionary expenses are paid for in cash, any reduction in these expenses will increase cash flows in the current period (Cohen and Zarowin, 2010). Similar to the estimation of accrual earnings management measure all variables are scaled by average total assets.[110] First, the normal level of cash flows from operations is estimated using the following cross-sectional regression for each industry and year for all non-IPO firms:[111]

$$\frac{CFO_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it}}{AvAssets_{it}} + \beta_3 \frac{\Delta SALES_{it}}{AvAssets_{it}} + \varepsilon_{it} \quad (7.4)$$

Where $CFO_{i,t}$ is cash flows from operations for firm i at period t. The abnormal CFO for IPO firms is calculated as actual CFO minus the normal level of CFO estimated using the coefficients from regression (7.4).

The normal level of discretionary expenses can be expressed as a linear function of contemporaneous sales as follows:

$$\frac{DISX_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it}}{AvAssets_{it}} + \varepsilon_{it} \quad (7.5)$$

Roychowdhury (2006) and Cohen and Zarowin (2010) point out, however, that estimating a normal level of discretionary expenses as specified in regression (7.5) can lead to poor estimation where firms manage sales upwards to increase reported earnings during any year. If a firm has managed sales upwards, this will result in unusually low residuals from running the regression as specified above. In order to overcome this problem, discretionary expenses are estimated as a function of lagged sales. This chapter, therefore, follows Roychowdhury (2006) and estimates the normal level of discretionary expenses for the IPO firms as follows,

[110] The test also is repeated by scaling all the variables by lagged total assets and the results are qualitatively similar to those reported in this chapter.

[111] To take account of extreme values all variables are Winsorized at the top 1% and bottom 99%.

$$\frac{DISX_{it}}{AvAssets_{it}} = \alpha_0 + \beta_1 \frac{1}{AvAssets_{it}} + \beta_2 \frac{SALES_{it-1}}{AvAssets_{it}} + \varepsilon_{it} \quad (7.6)$$

$DISX_{i,t}$ is, therefore, calculated as the sum of, R&D, SG&A, and advertising expenses for firm i at period t . $SALES_{i,t-1}$ is sales during the previous year. The abnormal level of discretionary expenses for IPO firms is calculated as actual discretionary expenses minus the normal level of discretionary expenses estimated using the coefficients from regression (7.6).

In order to measure the total effect of real earnings management, and following Cohen et al. (2008) and Cohen and Zarowin (2010), the abnormal level of cash flows from operations and the abnormal level of discretionary expenses are combined to compute an aggregate measure of real earnings management. Specifically, abnormal cash flow from operations and abnormal discretionary expenses are multiplied by -1, and then calculated as one aggregate measure. A higher amount of this aggregate measure implies that IPO firms are more likely to be manipulating sales to increase reported earnings and cutting discretionary expenses.

7.3.3.3 Measuring the Survival Rates

To test whether real and accrual earnings management are associated with post-IPO survival rates, this chapter examines the survivability of IPO firms using Kaplan-Meier estimator and Cox proportional hazard model as developed by Cox (1972). In the first step the survival function of IPO firms is estimated using Kaplan-Meier estimator, which allows making inferences as to whether earnings management proxies are significant determinants for the IPO survival rates in the subsequent periods. Kaplan-Meier estimator is defined as

$$\hat{S}(t) = \prod_{t_i<t} \frac{n_i - d_i}{n_i} \quad (7.7)$$

Where n_i is the number of IPO firms that are still at risk at time t_i and d_i is the number of firms that actually delisted (failed) at time *t.* This chapter uses the log

rank test to examine whether IPO firms relative to a specific stratum sharing the same curve of Kaplan-Meier. The strata are the variables of interest, namely real and accrual earnings management activities.

In the second step, the Cox proportional hazard model is estimated as developed by Cox (1972) as follows

$$h(t) = h_0(t)\exp\,[\beta_1 EMD_{it} + \beta_2 Big\ N_{it} + \beta_3 VC_{it} + \beta_4 Underwriter_{it} + \beta_5 LnSize_{it} + \beta_6 Underpricing_{it} + \beta_7 Offer\text{-}price_{it} + \beta_8 BM_{it} + \beta_9 Ln(1+age)_{it} + \beta_{10} Lev_{it} + \beta_{11} ROA_{it} + \beta_{12} Abs(CFO)_{it} + IND + Year\ ] \quad (7.8)$$

Where $h_0(t)$ is the base-line hazard function, t is the duration to the date of an event (failure), (*EMD)* is a proxy for *REM_Index*, *ABNCFO*, *ABNDEXP*, and *DISACCR*. *(REM_Index)* is a dummy variable equalling to 1 if the level of the aggregate measure of real earnings management during the IPO year for an IPO firm is greater than zero (positive) and 0 otherwise, *(ABNCFO)* is a dummy variable equalling to 1 if the level of the abnormal cash flows from operations during the IPO year for an IPO firm is greater than zero and 0 otherwise, *(ABNDEXP)* is a dummy variable equalling to 1 if the level of the abnormal discretionary expenses during the IPO year for an IPO firm is greater than zero and 0 otherwise, and (*DISACCR)* is a dummy variable equalling to 1 if the level of the discretionary accruals during the IPO year for an IPO firm is greater than zero and 0 otherwise.[112] Compared with other hazard models, the advantage of the Cox (1972) model is that no assumption is required to about the distribution of the data.

In addition, and following previous research (e.g., Schultz, 1993; Hensler et al., 1997; Jain and Kini, 2000; Willenborg and McKeown, 2001; Weber and Willenborg, 2003; Jain and Martin, 2005; Li and Zhou, 2006; Charitou et al., 2007; Demers and Joos, 2007), the model includes a set of control variables that are found to be associated with IPO survivability. For example, Jain and Martin (2005) find

[112] Also the model is re-estimated by adding a dummy variable for high tech industries and the results are qualitatively similar to those reported in this chapter.

evidence that IPO firms audited by high quality auditors survive longer. Jain and Kini (2000) find evidence that IPO firms backed by venture capitalists have a higher probability of surviving in the following years than non-VC backed IPOs. Schultz (1993) finds evidence that the presence of more reputable underwriters is positively associated with IPO survivability. Thus, the model includes *(Big N)* which is a dummy variable that equals 1 if the IPO firm's auditor is a Big N audit firm and zero otherwise, *(VC)* which is a dummy variable that equals 1 if the IPO firms backed by venture capitalists and zero otherwise, and (*Underwriter*) a dummy variable equalling 1 if the IPO firms have high profile underwriters and zero otherwise. [113]

The possible impact of a size effect is controlled by adding the natural logarithm of market value (*LnSize*) to the model, calculated as the offer price multiplied by the number of outstanding shares on the first day of listing, while IPO underpricing (*Underpricing*), defined as the percentage difference between the offer price and the closing price on the first day of trading, the offer price *(Offer-price)*, and leverage ratio (*Lev*) are added to the model as suggested by previous studies (e.g., Schultz, 1993; Hensler et al., 1997; Li and Zhou, 2006; Demers and Joos, 2007). Schultz (1993) for example finds evidence that the offer size, age, initial returns, and more prestigious underwriters are positively associated with IPO survivability. Demers and Joos (2007) find evidence that leverage ratio is positively associated with the probability of failure, while IPO firms with higher offer prices are less likely to fail.

In order to control for growth opportunities the model includes book-to-market (*BM)*; calculated as the book value of equity divided by the market value of equity; and IPO firm age [*Ln(1+age)*] measured as the natural logarithm of 1+IPO firm age, where firm age is calculated as the difference between the founding date of the firm and the date of its IPO *(*e.g., Rangan, 1998; Teoh et al., 1998a;

[113] Prestigious underwriters are those global investment banks as defined by Derrien and Kecskes (2007), while venture capitalist are those investors who hold more than 3 % of a firm's shares and appear in the list of venture capitalists provided by British Venture Capitalist Association. Specifically, data are collected from the prospectuses about all the shareholders who hold more than 3% of the total shares and then shareholder's name is matched with a list of venture capitalists, which is obtained from the British Venture Capitalist Association.

Roosenboom et al., 2003; Cohen and Zarowin, 2010). Further, as the focus of this chapter is to examine the performance failure, and following prior research (e.g. Li and Zhou, 2006), the model controls for profitability proxied by return on assets *(ROA)* and the possible impact of operating cash flows [*Abs(CFO)*], which is defined as the absolute value of cash flows from operations. Finally, dummies are added to the model to control for industry (*IND)* and year (*Year*) effect.

7.4 Results

7.4.1 Descriptive Statistics

Table 7.1 present a breakdown of delisted IPO firms by delisted reasons and shows that 28.39% (90 IPOs) are delisted for negative reasons, 44.16% are delisted for being acquired by other firms, 21.46% are delisted at the request of the company, and 5.99% are delisted for other reasons. As this chapter imposes the 5-year restriction, 60 IPOs are left out of 90 IPOs that are delisted for negative reasons.

Table 7.2 (Panels A, B, and C) presents descriptive statistics for the IPO samples. The means market capitalization for the pooled, delisted and survivor IPO samples are approximately £114 million, £33 million and £141 million, respectively. This large difference in market values between IPO firms delisted for negative reasons and other IPO firms suggests that small IPO firms have a higher probability of failure in the period following the IPO. Table 7.3 (Panel A) reports the distribution of IPOs over the period from 1998 to 2008 and shows that the years 2000, 2004, 2005, and 2006 account for more than 60% of the sample. In addition, one consequence of the recent global financial crisis is that the lowest number of IPOs in the sample is in 2008. Table 7.3 (Panel B) shows the frequency of IPOs relative to the industry standard classification, measured by 2-digit SIC codes. Except for the clustering in the Business Services industry, which accounts for approximately 32% of the total sample, the majority of other industries have similar percentages of IPOs ranging from 1% to 10%.

Table 7.4 presents descriptive statistics of the characteristics of the IPO sample (pooled, delisted for negative reasons and survivor IPO samples) over the

period from 1998 to 2008. Table 7.4 shows that IPO firms delisted for negative reasons have lower levels of offer prices, stock return performance (post-IPO three-year buy-and-hold-abnormal return [BHAR]) and operating cash flows compared with survivor IPOs. Further, Table 7.4 shows that the percentage of IPO firms delisted for negative reasons that are audited by big N audit firms is lower than the percentage of survivor IPO firms. The presence of those more reputable accounting firms are found to be positively associated with IPO survival rates in the following periods (e.g., Jain and Martin, 2005). Also, Panel B shows that IPO firms delisted for negative reasons have higher levels of initial underpricing and Chairman/CEO duality, and a lower level of board size than survivor IPO firms.

Table 7.1 Data on reasons for the cancellation (delisting) of 317 IPOs between January 1998 and December 2011

Delisted reasons	Since the IPO date and up to December 2011		Since the IPO date and up to 5 years after the IPO date	
	Number	**Percentage (%)**	**Number**	**Percentage (%)**
Negative reasons	90	28.39	60	36.58
Takeover (being acquired)	140	44.16	72	43.90
At the request of the company	68	21.46	51	31.09
Other reasons	19	5.99	11	6.71
Total delisted IPOs	317	100.00	164	100.00

Table 7.1 reports the distribution and reasons for the cancellation (delisting) of 317 IPOs between January 1998 and December 2011.

Table 7.2 Descriptive statistics for sample IPO firms during 1998-2008

	Total assets (£ mill.)	**Net income (£ mill.)**	**Market value (£ mill.)**	**Money raised (£ mill.)**
Panel A: Pooled sample (n=570)				
Mean	56.12	1.93	113.93	43.41
Median	4.47	-0.03	25.11	7.00
Std. dev	233.90	25.38	302.19	136.22
Minimum	0.07	-124.10	1.44	0.14
Maximum	1969.10	397.47	2020.68	1499.85
Panel B: IPO delisted for negative reasons within 5 years post IPO (n=60).				
Mean	7.75	-0.54	33.34	10.45
Median	2.58	-0.32	18.26	4.70
Std. dev	13.84	3.78	41.78	13.91
Minimum	0.12	-11.84	1.44	0.25
Maximum	75.18	16.19	193.04	55.00
Panel C: IPO survivors (n=253)				
Mean	78.45	4.51	140.80	60.86
Median	4.11	0.01	26.12	6.64
Std. dev	284.31	33.98	349.29	184.76
Minimum	0.07	-124.10	1.44	0.14
Maximum	1969.10	397.47	2020.68	1499.85

Table 7.2 presents sample descriptive statistics for the pooled IPOs, IPO firms delisted for negative reasons within 5 years post IPO, and survivor IPO firms. Total assets are the beginning of period total assets; net income at the end of the IPO year; market value is the market capitalization for IPO firms immediately after the listing; and money raised is the offer amount of the IPO. Total assets and net income are obtained from the WorldScope database; market value and money raised are obtained from the London Stock Exchange website.

Table 7.3 Time and industry distribution

Panel A: Time distribution of IPOs during 1998-2008

	Pooled sample		Delisted for negative reasons within 5 years post IPO		Survivors	
Year	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
1998	35	6.14	4	6.67	8	3.16
1999	29	5.09	3	5.00	6	2.37
2000	102	17.89	13	21.67	29	11.46
2001	43	7.54	2	3.33	19	7.51
2002	35	6.14	1	1.67	19	7.51
2003	23	4.04	3	5.00	8	3.16
2004	97	17.02	12	20.00	47	18.58
2005	94	16.49	15	25.00	42	16.60
2006	70	12.28	7	11.67	42	16.60
2007	40	7.02	-	-	31	12.25
2008	2	0.35	-	-	2	0.79
Total	570	100.00	60	100.00	253	100.00

Panel B: Industry distribution of IPOs during 1998-2008

		Pooled Sample		Delisted for negative reasons within 5 years post IPO		Survivors	
Industry	**2-digit SIC**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Oil and gas extraction	13	26	4.56	2	3.33	17	6.72
Food products	20	11	1.93	1	1.67	4	1.58
Printing and publishing	27	13	2.28	1	1.67	6	2.37
Chemicals and allied products	28	37	6.49	5	8.33	16	6.32
Industrial machinery	35	16	2.81	2	3.33	6	2.37
Electronic equipment	36	36	6.32	6	10.00	19	7.51
Instruments and related products	38	22	3.86	2	3.33	9	3.56
Communications	48	27	4.74	1	1.67	12	4.74
Electric, gas, and sanitation	49	10	1.75	1	1.67	5	1.98
Durable goods	50	11	1.93	-	-	2	0.79
Eating and drinking establishments	58	15	2.63	3	5.00	5	1.98
Retail	59	8	1.40	-	-	3	1.19
Business services	73	182	31.93	19	31.67	76	30.04
Media and entertainment	78	8	1.40	1	1.67	5	1.98
Amusement and recreation	79	27	4.74	7	11.67	8	3.16
Engineering and management services	87	58	10.18	1	1.67	28	11.07
All others	-	63	11.05	8	13.36	32	12.64
Total		570	100.00	60	100.00	253	100.00

Table 7.3 reports time and industry distributions for the pooled IPO sample, IPOs delisted for negative reasons and survivor IPO firms. Panel A presents the time distribution, while Panel B presents the industry distribution.

Table 7.4 Distribution of IPO firms' characteristics during the IPO year based on the listing status.

	Pooled sample	Delisted for negative reasons within 5 years post IPO	Survivors	Delisted - Survivors Differences
VARIABLES	**Mean (Median)**	**Mean (Median)**	**Mean (Median)**	**t-statistics (z-statistics)**
Age	1.047	3.368	3.990	-0.565
	(0.763)	(0.701)	(1.307)	(-1.540)
Offer-price	1.163	0.765	1.145	-2.629***
	(0.980)	(0.615)	(1.000)	(-2.729)***
Underpricing	0.209	0.671	0.150	1.981**
	(0.063)	(0.094)	(0.058)	(1.836)*
Underwriter	0.187	0.183	0.174	0.172
	-	-	-	-
VC	0.221	0.150	0.209	-1.038
	-	-	-	-
Big N	0.468	0.267	0.439	-2.456**
	-	-	-	-
BHAR	-0.140	-0.498	0.021	-3.834***
	(-0.100)	(-0.388)	(0.000)	-4.403***
Cash flows	6.247	-0.254	11.228	-1.802*
	(-0.027)	(-0.551)	(0.040)	(-2.585)***
Lev	0.353	0.452	0.371	0.787
	(0.108)	(0.166)	(0.084)	(1.564)
Chrm/CEO	0.082	0.200	0.071	3.085***
	-	-	-	-
BrdSize	5.708	4.867	5.822	-3.965***
	(6.000)	(5.000)	(6.000)	(-4.052)***
OutDirectors	0.452	0.453	0.455	-0.113
	(0.500)	(0.500)	(0.500)	(-0.082)
N	570	60	253	-

*, **, *** Denote significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively. Differences in medians are tested using the Wilcoxon Signed Rank test and differences in means are tested using t-tests. Table 7.4 reports sample descriptive statistics of pooled IPOs sample, IPO firms delisted for negative reasons and survivor IPO firms. Where (*Age)* is the IPO firm age in years where the IPO firm's age is calculated as the difference between the founding date of the IPO firm and the date of its IPO, (*Offer-price*) is the IPO issue price, (*Underpricing*) is the percentage difference between the offer price and the closing price on the first day of trading, *Underwriter*=1 if the IPO is underwritten by a prestigious underwriter and 0 otherwise, *VC*= 1 if the firm is backed by a venture capitalist and 0 otherwise, *Big N*=1 if the firm is audited by a big N auditor and 0 otherwise, (*BHAR*) is the mean 3-year buy-and-hold abnormal returns for IPOs sample (adjusted to matched sample based on size and book-to-market ratio) where the holding period is 4 to 40 months after the IPO date, (Cash flows) is cash flows from operations, *(Lev)* is leverage ratio measured as total $debt_t$/total $assets_{t-1}$, *(Chrm/CEO)* is a dummy variable equalling 1 if the Chairman and the CEO is the same director and zero otherwise, *(BrdSize)* is the number of directors on the board, and (*OutDirectors)* is the percentage of outside directors on the board. " –" stands for "not meaningful".

7.4.2 Empirical Evidence on Earnings Management around IPOs

Table 7.5 presents time-series profiles of mean and median aggregate real earnings management, abnormal cash flows from operations (sales-based), abnormal discretionary expenses, and discretionary accruals for years -2 to +3 relative to the IPO year which is year 0. The results are interpreted on the basis of median values. Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by -1 to allow the measures of real earnings management to have the same interpretation as the measure of accrual-based earnings management. Thus, for real activities-based and accrual-based a significant and positive coefficient indicates income-increasing earnings management.

Table 7.5 shows that IPO firms exhibit evidence of real activities-based and accrual-based manipulations during and after the IPO year. For example, the median aggregate measure of real earnings management during the IPO year is positive and statistically significant indicating that in aggregate, IPO firms manage earnings upwards utilizing real activities. The aggregate measure of real earnings management declines in the year post-IPO but remains significant. Table 7.5 also shows that the median abnormal cash flows from operations during the IPO year is significant and positive. This is consistent with IPO firms manage sales upward during the IPO year to inflate reported earnings. In the post-IPO period the median abnormal cash flows from operations decreases but remains significant and positive.

However, Table 7.5 shows no evidence that IPO firms reduce discretionary expenses during the IPO year to increase reported earnings. One possible explanation for this result is that discretionary expenses are associated with higher future litigations risks and, therefore, discretionary expenses-based manipulation is likely to attract the attention of underwriters and auditors. In line with the importance of discretionary expenses around IPOs, Demers and Joos (2007) find evidence that IPO firms with lower spending on R&D and SG& A expenses during the year pre the IPO have a higher probability of failure in the subsequent periods.

Finally, and in line with prior research (e.g. Friedlan (1994), Teoh et al. (1998a), and Morsfield and Tan (2006)), Table 7.5 shows evidence that IPO firms

manage earnings upward utilizing accrual-based manipulation. The results also show that IPO firms manage earnings upwards in the post-IPO period, and the level of discretionary accruals increases above the IPO year level in the post-IPO year but is lower in years +2 and +3. Also, Table 7.5 shows that the mean and median discretionary accruals during the year pre the IPO are approximately zero. This result is consistent with Ball and Shivakumar (2008) evidence that IPO firms in the UK do not manage earnings upward utilizing accrual earnings management pre the IPO. Ball and Shivakumar (2008) suggest that IPO firms report more conservatively to improve their financial reporting due to the expected high demand (by the market participants e.g. investors, regulators, analysts, etc.) on high quality financial reporting during first year as public firms.

Collectively, the reported results in Table 7.5 confirm the view that IPO firms manipulate reported earnings upward utilizing both real activities-based and accrual-based earnings management during the IPO year.

Table 7.5 Time-series profiles of real and accrual earnings management

Year	**-2**	**-1**	**0**	**1**	**2**	**3**
Aggregate real earnings management						
Median	0.035	0.013	0.073***	0.051***	0.045*	0.011
Mean	-0.042	-0.023	0.092***	0.055***	0.038	0.010
Abnormal cash flows from operations (Sales)						
Median	-0.014	0.009	0.037***	0.036***	0.015***	0.017***
Mean	-0.167	0.065	0.061**	0.080***	0.098***	0.086***
Abnormal discretionary expenses						
Median	-0.011	-0.010	0.023	-0.003	-0.017**	-0.003
Mean	0.125	-0.088	0.031	-0.024	-0.059**	-0.076***
Discretionary accruals						
Median	0.007	0.007	0.018***	0.046***	0.010*	0.015**
Mean	-0.099	-0.051	0.022	0.042***	0.029*	0.031***

*, **, *** Denote significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively. Differences in medians are tested using the Wilcoxon Signed Rank test and differences in means are tested using t-tests. Table 7.5 presents the time-series profiles of median and mean aggregate real earnings management, abnormal cash flows from operations, abnormal discretionary expenses and discretionary accruals for the pooled sample over the period two years prior to the IPO year, the IPO year, and three years after the IPO year. The IPO year is year 0. To avoid the influence of outliers all continuous financial data are Winsorized at the top 1% and bottom 99%. Discretionary accruals are estimated using corrected version of the modified Jones (1991) model (Dechow et al., 1995). Abnormal cash flows from operations and abnormal discretionary expenses are estimated using models developed by Dechow et al. (1998) and as implemented by Roychowdhury, (2006). Abnormal cash flows from operations and abnormal discretionary expenses are multiplied by minus one to allow real and accrual earnings management proxies to have the same interpretation. The aggregate measure of real earnings management is the sum of abnormal cash flows from operations and abnormal discretionary expenses.

7.4.3 Differences in Real and Accrual Earnings Management Based on Listing Status

Table 7.6 reports descriptive statistics of differences in real and accrual earnings management during the IPO year between IPO firms delisted for negative reasons and survivors. Table 7.6 shows that IPO firms delisted for negative reasons have higher levels of real activities-based and accrual-based manipulations during the IPO year than survivor IPO firms. The differences in the mean and median aggregate measure of real earnings management are statistically significant at the 1% level. For abnormal cash flows from operations, the differences in mean and median values are statistically significant at the 5% level. While for discretionary accruals, the differences in mean (median) values are statistically significant at the 10% (1%) level. However, Table 7.6 shows that the difference of discretionary expenses-based manipulation between the two samples is not statistically significant, confirming the results in Table 7.5 that IPO firms do not exhibit evidence of discretionary expenses-based manipulation during the offer year.

In summary, Table 7.6 presents preliminary evidence that IPO firms delisted for negative reasons exhibit higher levels of real and accrual earnings management during the IPO year than survivor IPO firms. However, these results cannot be interpreted in the context of differences in the listing status unless controlling for many other covariates that are associated with real and accrual earnings management. In the next section OLS regressions are estimated to control for the impact of these covariates.

Table 7.6 Difference in real and accrual earnings management during the offer year between IPO firms delisted for negative reasons and survivor IPO firms

	Delisted for negative reasons within 5 years post IPO		Survivors		Difference	
VARIABLES	**Mean (Median)**	**N**	**Mean (Median)**	**N**	**Mean (Median)**	**t-statistic (z-statistic)**
Aggregate real earnings management	0.420** (0.229)***		-0.037 (-0.006)		0.457 (0.235)	2.709*** (2.975)***
Abnormal cash flows from operations	0.186*** (0.101)***		0.034 (0.014)		0.152 (0.087)	2.109** (2.075)**
Abnormal discretionary expenses	0.108 (0.049)*		0.019 (0.012)		0.089 (0.037)	1.060 (0.947)
Discretionary accruals	0.110*** (0.120)***	60	0.019 (0.003)	253	0.091 (0.117)	1.887* (3.375)***

*, **, *** Denote two tailed tests significantly different at the 10 percent, 5 percent, and 1 percent levels, respectively. Table 7.6 reports the difference in mean (t-test) and median (Wilcoxon Signed Rank test) real and accrual earnings management during the IPO year between IPO firms delisted for negative reasons and survivors. All delisted IPOs are defined as those IPO firms that are delisted for negative reasons within 5 years post the IPO date. All variables are previously defined.

7.4.4 Real and Accrual Earnings Management and IPO Failure

To test whether real and accrual earnings management during the IPO year are associated with probability of IPO failure in the subsequent periods, this chapter follows Li and Zhou (2006) and Demers and Joos (2007) by estimating the following Logit model:

$$\begin{aligned} Failure_{it} = {} & \alpha_0 + \beta_1 EM_{it} + \beta_2 Big\ N_{it} + \beta_3 VC_{it} + \beta_4 Underwriter_{it} + \beta_5 LnSize_{it} \\ & + \beta_6 Underpricing_{it} + \beta_7 Offer\text{-}price_{it} + \beta_8 BM_{it} + \beta_9 Ln(1+age)_{it} \\ & + \beta_{10} Lev_{it} + \beta_{11} ROA_{it} + \beta_{12} Abs(CFO)_{it} + IND + Year \end{aligned} \quad (7.9)$$

Where $Failure_{it}$ is a dummy variable equals 1 if the IPO firms delisted for negative reasons (performance failure) within five years after the IPO date and EM_{it} are the different proxies for real and accrual earnings management. The definition of IPO failure is consistent with Li and Zhou (2006) and Demers and Joos (2007). Following prior research (e.g., Schultz, 1993; Hensler et al., 1997; Jain and Kini, 2000; Willenborg and McKeown, 2001; Weber and Willenborg, 2003; Jain and Martin, 2005; Li and Zhou, 2006; Charitou et al., 2007; Demers and Joos, 2007), a

number of control variables are added to the model that might affect the probability of failure namely; audit quality *(Big N);* venture capitalists *(VC);* underwriters *(Underwriter);* firm size (*LnSize*); IPO underpricing (*Underpricing*); the offer price *(Offer_price)*; book-to-market ratio (*BM)*; age [*Ln(1+age)*]; leverage ratio (*Lev*); profitability *(ROA)*; and the absolute value of cash flows from operations [*Abs(CFO)]*[114]. Finally, dummies are added to the model to control for industry (*IND)* and year (*Year*) effect. All variables are previously defined.

Table 7.7 reports the results for the analysis of whether real and accrual earnings management activities of IPO firms during the offer year are associated with the probability of IPO failure in the subsequent periods. The analysis focuses on IPO firms delisted for negative reasons (performance failure) within five years after the IPO date. The results show a positive coefficient of 0.478 (P <0.01) on *The aggregate measure of real earnings management* in Model 1, confirming that IPO firms with high levels of real earnings management during the IPO year have a higher probability of failure in the subsequent periods. Further, a positive coefficient is found of 0.833 (P<0.05) on *Abnormal cash flows from operations* (sales-based manipulation) in Model 2. Again, this result suggests that IPO firms with high levels of sales-based manipulation during the IPO year have a higher probability of IPO failure in the subsequent periods.

However, Table 7.7 shows no evidence that discretionary expenses-based manipulation is associated with IPO failure in the following periods. The coefficient on *Abnormal discretionary expenses* in Model 3 is not statistically significant. This result is consistent with the previous results in Table 7.5 that IPO firms in the UK do not exhibit evidence of discretionary expenses manipulation during the IPO year, and with the reported results of Tables 7.6 that IPO firms delisted for negative reasons do not exhibit evidence of abnormal discretionary expenses compared with survivor IPO firms.

[114] See Model 5.8 for more details about the relationships between the probability of failure and the control variables.

Further, Table 7.7 presents evidence that accrual-based manipulation is positively associated with IPO failure in the following years. The results report a positive coefficient of 1.115 ($P<0.05$) on *Discretionary accruals* (accrual-based manipulation) in Model 4. This result is consistent with Li and Zhou (2006) who find evidence that accruals manipulation during the IPO year is positively associated with IPO failure in the subsequent periods. Finally, Table 7.7 (Model 5) reports the results where all earnings management activities are included, namely the aggregate measure of real earnings management (a combination between sales-based and discretionary expenses-based manipulations) and discretionary accruals. Model 5 provides evidence that real earnings management activities are considered as significant determinants of IPO failure after controlling for the impact of accruals manipulation.

In summary, the reported results in Table 7.7 support the hypothesis that IPO firms with high levels of real and accrual earnings management during the IPO year have a higher probability of failure (delisted for negative reasons) in the following years.[115]

[115] For robustness test the analysis also is repeated by controlling for high-tech industries [as suggested by Demers and Joos (2007)] and the results are qualitatively similar to those reported in this chapter.

Table 7.7 Logistic regression estimation: prediction failure within five years of IPO

VARIABLES	Model 1 Logit Regression Failure=1	Model 2 Logit Regression Failure=1	Model 3 Logit Regression Failure=1	Model 4 Logit Regression Failure=1	Model 5 Logit Regression Failure=1
The aggregate measure of real earnings management	0.478 (2.747)***				0.392 (2.059)**
Abnormal cash flows from operations		0.833 (2.373)**			
Abnormal discretionary expenses			0.164 (0.662)		
Discretionary accruals				1.115 (2.275)**	0.699 (1.303)
Big N	-0.895 (-2.318)**	-0.970 (-2.530)**	-0.830 (-2.190)**	-0.939 (-2.449)**	-0.937 (-2.414)**
VC	-0.333 (-0.795)	-0.418 (-0.999)	-0.368 (-0.883)	-0.391 (-0.937)	-0.340 (-0.809)
Underwriter	0.502 (1.182)	0.436 (1.038)	0.469 (1.118)	0.444 (1.051)	0.486 (1.142)
LnSize	0.057 (0.274)	-0.025 (-0.121)	0.007 (0.034)	-0.039 (-0.193)	0.039 (0.186)
Underpricing	0.003 (0.006)	0.056 (0.129)	0.095 (0.221)	0.001 (0.002)	-0.041 (-0.091)
Offer-price	-0.361 (-1.069)	-0.336 (-0.976)	-0.375 (-1.099)	-0.362 (-1.042)	-0.364 (-1.062)
BM	0.900 (1.849)*	0.982 (2.012)**	0.910 (1.873)*	0.995 (2.025)**	0.964 (1.956)*
Ln(1+ age)	0.032 (0.177)	-0.034 (-0.190)	-0.033 (-0.190)	-0.044 (-0.250)	0.022 (0.119)
Lev	0.426 (1.907)*	0.482 (2.156)**	0.408 (1.853)*	0.427 (1.936)*	0.436 (1.957)*
ROA	0.031 (0.604)	0.052 (0.941)	-0.004 (-0.079)	0.013 (0.255)	0.035 (0.647)
Abs(CFO)	-0.027 (-0.683)	-0.025 (-0.621)	-0.026 (-0.665)	-0.023 (-0.581)	-0.026 (-0.649)
Constant	-18.56 (-0.016)	-18.316 (-0.017)	-17.087 (-0.030)	-18.519 (-0.015)	-18.546 (-0.017)
Year and industry dummies	Yes	Yes	Yes	Yes	Yes
N Failure within five years	60	60	60	60	60
N Total observations	567	567	567	567	567
Log likelihood	-159.21649	-160.24011	-163.09245	-160.48576	-158.33157
Pseudo R^2	0.1684	0.1631	0.1482	0.1618	0.1731
chi2	64.50	62.46	56.75	61.96	66.27
Prob > chi2	0.0012	0.0021	0.0085	0.0024	0.0011

*, **, *** Denote two tailed tests significantly different at the 10 percent, 5 percent, and 1 percent levels, respectively. Table 7.7 reports the results of Logistic regression estimates. The dependent variable (*Failure)* is a dummy variable equals to 1 if the IPO firms delisted for negative reasons within 5 years after the IPO date and 0 otherwise. Where [*Abs(CFO)*] is the absolute value of cash flows from operations. All other variables are previously defined.

7.4.5 Real and Accrual Earnings Management and IPO Survival Rates

7.4.5.1 Results of Kaplan-Meier Estimator Analysis

In order to investigate the impact of earnings manipulation on the survivability of IPO firms, the survival function curve of Kaplan-Meier is constructed for IPOs sample based on the level of real and accrual earnings management during the IPO year. Specifically, IPOs sample is divided into two groups (conservative and aggressive) based on the level of real and accrual earnings management during the IPO year. The conservative group represents IPO firms with a negative earnings management during the IPO year (the level of earnings management is less than zero), while the aggressive group represents IPO firms with a positive earnings management (the level of earnings management is greater than zero). Therefore, it is expected that the survival function curve for the conservative group to be above the survival function curve for the aggressive group, implying that IPO firms with lower levels of earnings management during the IPO have higher survival rates in the subsequent periods.

Figure 7.2 depicts survival functions for the IPO sample based on the level of the aggregate measure of real earnings management during the IPO year. As predicted, the survival function curve for conservative IPO firms is above the survival function curve for the aggressive group, indicating that IPO firms with the lower levels of real earnings management during the IPO year survive longer than other IPO firms in the following periods. Table 7.8 (Panel A) reports the test of equality across strata (the Log Likelihood Test) and shows that the survival function for the conservative group is significantly different from that of the aggressive group.

Figure 7.3 depicts survival functions for the IPO sample based on the level of abnormal cash flows from operations during the IPO year. Figure 7.3 shows similar evidence to Figure 7.2 that IPO firms with lower levels of abnormal cash flows from operations during the IPO year experience higher survival rates. Specifically, the survival function curve for the conservative group is above the survival function curve for the aggressive group. Table 7.8 (Panel B) reports the test of equality across

IPO groups and presents evidence that the survival function for the conservative group is significantly different from that of the aggressive group.

The survival function curves for the IPO sample based on the level of abnormal discretionary expenses during the IPO year are depicted in Figure 7.4. Specifically, the survival function curves for the conservative and aggressive groups overlap, indicating that discretionary expenses manipulation is not a significant determinant of IPO survivability. In addition, the log likelihood test in Table 7.8 (Panel C) indicates that there is no statistically significant difference between the survival function curves for the two groups. This result is consistent with the previous reported results in Table 7.5 that IPO firms in the UK do not exhibit evidence of discretionary expenses manipulation during the IPO year and, therefore, there is no expectation of observing an impact of discretionary expenses manipulation on post-IPO survivability. Also, this result confirms the results of the Logistic regression in Table 7.7 that discretionary expenses manipulation is not associated with the probability of IPO failure in the following periods.

Figure 7.5 depicts the survival functions for IPOs sample based on the level of discretionary accruals during the IPO. Consistent with the evidence in Figures 7.2 and 7.3, the survival function curve for the conservative group is found to be above the survival function curve for the aggressive group. This result indicates that IPO firms with lower level of accruals manipulation during the IPO year experience significantly higher survival rates than other IPO firms in the following periods. The test of equality across these groups is presented in Table 7.8 (Panel D), providing evidence that the survival function for the conservative group is significantly different from that of the aggressive group. Thus, IPO firms that engage in a lower level of accruals manipulation during the IPO year experience higher survival rates in the post-IPO period.

In summary, the above results provide preliminary evidence that both real and accrual earnings management that take place during the IPO year are negatively associated with the survivability of IPO firms in the post-IPO period. The results show that IPO firms with lower levels of the aggregate measure of real earnings

management, abnormal cash flows from operations and discretionary accruals during the IPO year survive longer than other IPO firms in the following periods

Table 7.8 Non-parametric analysis of IPO firms survivability

	Number of firms	Number of survivors (Survival rate)	Log rank test
Panel A: The aggregate measure of real earnings management (REM_Index)			
REM_Index < 0 (conservative IPOs)	227	147 (64.75%)	9.06*** (0.0026)
REM_Index > 0 (aggressive IPOs)	343	164 (47.81%)	
Panel B: Abnormal cash flows from operations (ABNCFO)			
ABNCFO < 0 (conservative IPOs)	251	118 (47.01%)	3.50* (0.0615)
ABNCFO > 0 (aggressive IPOs)	319	135 (42.31%)	
Panel C: Abnormal discretionary expenses (ABNDEXP)			
ABNDEXP < 0 (conservative IPOs)	268	121 (45.14%)	0.74 (0.3906)
ABNDEXP > 0 (aggressive IPOs)	302	132 (43.70%)	
Panel D: Discretionary accruals (DISACCR)			
DISACCR < 0 (conservative IPOs)	255	124 (48.62%)	5.78** (0.0162)
DISACCR > 0 (aggressive IPOs)	315	129 (40.95%)	

*, **, *** Denote significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively. Table 7.8 reports the results of the log rank test across the conservative and aggressive IPO groups based on their level of real and accrual earnings management (*REM_Index*, *ABNCFO*, *ABNDEXP*, and *DISACCR)* during the IPO year. Where *(REM_Index < 0)* represents the conservative IPOs group which their level of the aggregate measure of real earnings management during the IPO year is less than zero, *(REM_Index >0)* represent the aggressive IPOs group which their level of the aggregate measure of real earnings management during the IPO year is greater than zero, *(ABNCFO < 0)* represents the conservative IPOs group which their level of abnormal cash flows from operations during the IPO year is less than zero, *(ABNCFO > 0)* represents the aggressive IPOs group which their level of abnormal cash flows from operations during the IPO year is greater than zero, (ABNDEXP < 0) represents the conservative IPOs group which their level of abnormal discretionary expenses during the IPO year is less than zero, (ABNDEXP > 0) represents the aggressive IPOs group which their level of abnormal discretionary expenses during the IPO year is greater than zero, *(DISACCR < 0)* represents the conservative IPOs group which their level of discretionary accruals during the IPO year is less than zero, *(DISACCR > 0)* represents the aggressive IPOs group which their level of discretionary accruals during the IPO year is greater than zero. All other variables are previously defined.

Figure 7.2 Survival function by the aggregate real earnings management (REM_Index)

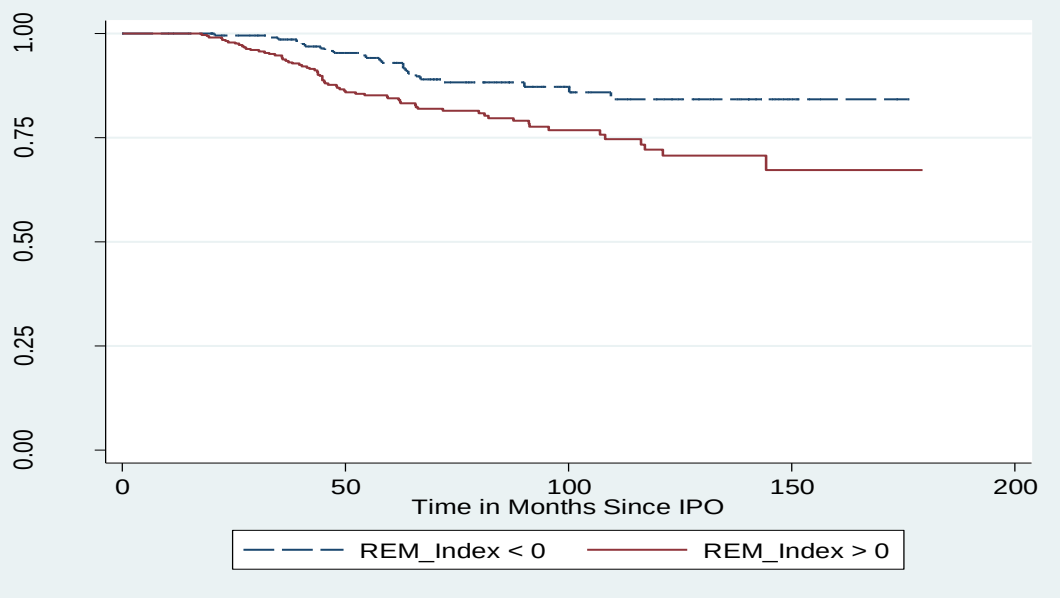


Figure 7.2 depicts the survival functions for the IPO sample based on the level of the aggregate measure of real earnings management during the IPO year. Where *(REM_Index < 0)* represents the conservative IPOs group which their level of the aggregate measure of real earnings management during the IPO year is less than zero, *(REM_Index > 0)* represent the aggressive IPOs group which their level of the aggregate measure of real earnings management during the IPO year is greater than zero. All other variables are previously defined.

Figure 7.3 Survival function by the abnormal cash flows from operations (ABNCFO)

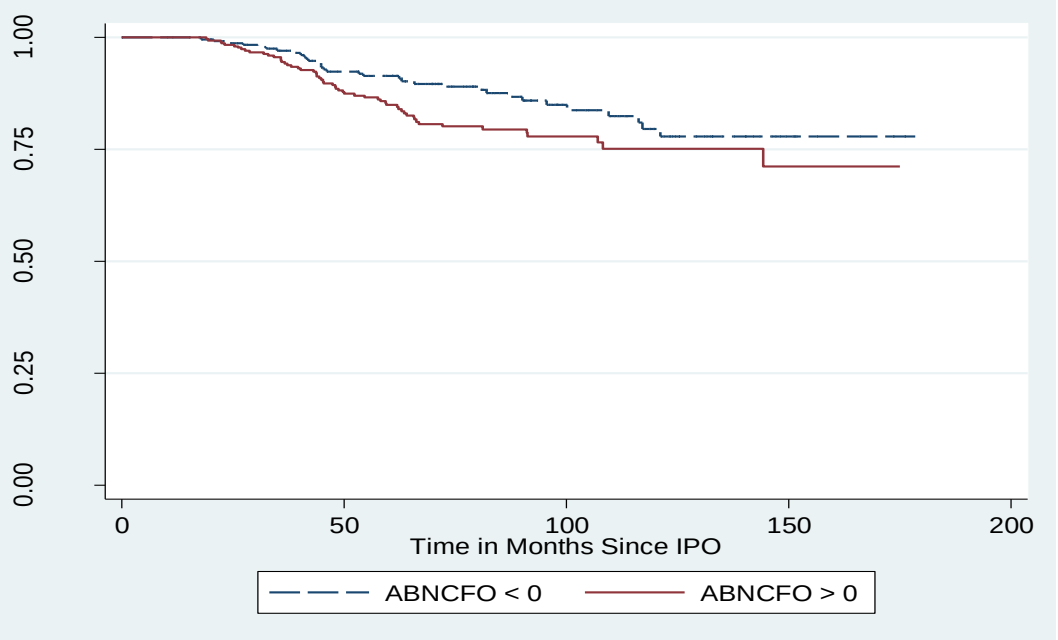


Figure 7.3 depicts the survival functions for the IPO sample based on the level of abnormal cash flows from operations during the IPO year. Where *(ABNCFO < 0)* represents the conservative IPOs group which their level of abnormal cash flows from operations during the IPO year is less than zero, *(ABNCFO > 0)* represents the aggressive IPOs group which their level of abnormal cash flows from operations during the IPO year is greater than zero. All other variables are previously defined.

Figure 7.4 Survival function by the abnormal discretionary expenses (ABNDEXP)

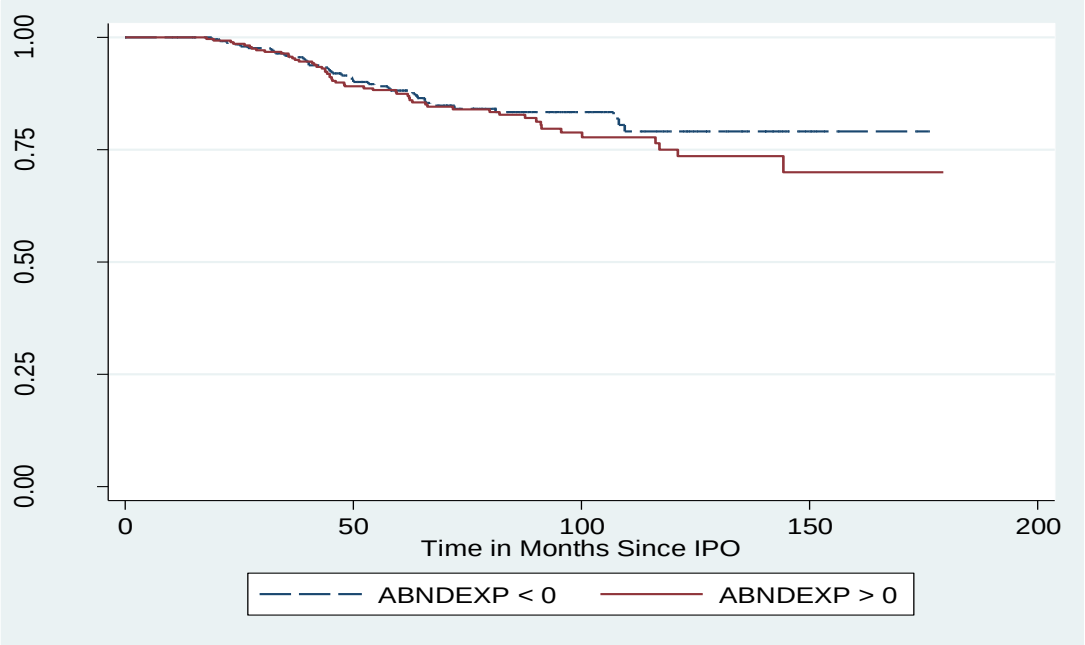


Figure 7.4 depicts the survival functions for the IPO sample based on the level of abnormal discretionary expenses during the IPO year. Where *(ABNDEXP < 0)* represents the conservative IPOs group which their level of abnormal discretionary expenses during the IPO year is less than zero, *(ABNDEXP > 0)* represents the aggressive IPOs group which their level of abnormal discretionary expenses during the IPO year is greater than zero. All other variables are previously defined.

Figure 7.5 Survival function by discretionary accruals (DISACCR)

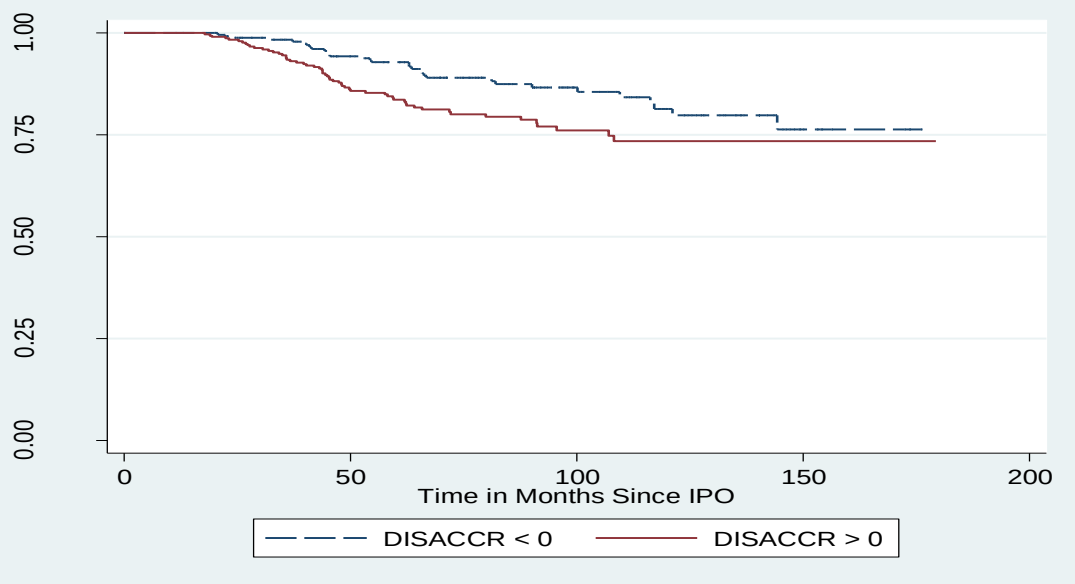


Figure 7.5 depicts the survival functions for the IPO sample based on the level of discretionary accruals during the IPO year**.** Where *(DISACCR < 0)* represents the conservative IPOs group which their level of discretionary accruals during the IPO year is less than zero, *(DISACCR > 0)* represents the aggressive IPOs group which their level of discretionary accruals during the IPO year is greater than zero. All other variables are previously defined.

7.4.5.2 Results of Cox Proportional Hazards Model

The results of the estimation of Cox proportional hazard model are presented in Table 7.9 where the dependent variable is the logarithm of the hazard rate, which is based on the delisting event. Thus, a positive (negative) coefficient implies that an increase in the independent variable leads to an increase (decrease) in the probability of delisting in the subsequent periods (Carpentier and Suret, 2011). Further, and since the survival analysis is dealing with censored data, this chapter follows prior research (Li and Zhou, 2006; Demers and Joos, 2007) by considering IPO firms as "*right censored*" if they have not delisted yet (still trading on the stock exchange) by the end of December 2011 or if they have delisted for any reasons other than negative reasons. In other words, non-survivor IPO firms are defined as those IPO firms who delisted from the stock exchanges just for negative reasons over the period 1998-2011.

The hazard ratio for each variable is reported and computed as the exponentiated coefficient for each variable. For a dichotomous variable, the risk ratio is the ratio of the estimated hazard for firms with "1" to the estimated hazard ratio for firms with "0" (Jain and Martin, 2005; Carpentier and Suret, 2011). While the interpretation of the hazard ratio for a continuous variable is that (hazard ratio – 1)*100 represents the percentage of changes in hazard for each unit increase in the variable (Allison, 1995; Jain and Martin, 2005). Following prior research (e.g., Teachman 1983; LeClere, 2000, Jain and Martin, 2005), risk ratios greater than 1, equal 1, and less than 1 are interpreted as follows: rapid time to failure, no impact on failure and slower time to failure, respectively.

Table 7.9 (Model 1) reports the results based on the aggregate level of real earnings management. The results show a positive coefficient of 0.710 ($P<0.01$) on *REM_Index*, implying that IPO firms with high levels of the aggregate measure of real earnings management during the IPO year have lower survival rates in the following periods. This result is consistent with the previous evidence from the non-parametric analysis (Figure 7.2) that IPO firms with high levels of real earnings management (the aggregate measure) during the IPO year survive for a shorter time

than other IPO firms. The risk ratio (2.034) suggests that the failure risk of IPO firms with high levels of aggregate real earnings management (*REM_Index* > 0) is 203% of the failure risk of IPO firms with low levels of aggregate real earnings management (*REM_Index* < 0).

Table 7.9 (Model 2) presents the results based on the level of abnormal cash flows from operations during the IPO year and shows similar evidence to the result reported in Model 1. Specifically, a positive coefficient is found of 0.606 (P<0.05) on *ABNCFO*, indicating that the IPO firms with higher levels of abnormal cash flows from operations during the IPO year survive for a shorter period. The risk ratio (1.832) suggests that the failure risk of IPO firms with high levels of abnormal cash flows from operations (*ABNCFO* > 0) is 183% of the failure risk of IPO firms with low levels of abnormal cash flows from operations (*ABNCFO* < 0). Taken together, these results are consistent with the earlier non-parametric analysis (Figure 7.3) that the higher the levels of abnormal cash flows from operations during the IPO year the higher the probability of failure (shorter time to survive).

The results based on the level of discretionary expenses-based manipulation are reported in Table 7.9 (Model 3). The results show a positive coefficient of 0.041 on *ABNDEXP*, but it is statistically insignificant. This evidence confirms the analysis in Figure 7.4 that discretionary expenses-based manipulation is not associated with IPO survivability. In addition, this evidence is consistent with the reported results in Table 7.5 that IPO firms exhibit no evidence of discretionary expenses-based manipulation during the IPO year, and with the results of Table 7.7 that discretionary expenses-based manipulation is not associated with the probability of IPO failure.

Finally, Table 7.9 (Model 4) presents the results based on the level of accrual-based manipulation during the IPO year. A positive coefficient is reported of 0.687 (P<0.01) on *DISACCR*, suggesting that IPO firms with higher levels of accruals manipulation during the IPO year experience lower survival rates in the following periods. The risk ratio (1.989) indicates that the failure risk of IPO firms with high levels of accrual-based manipulation (*DISACCR* > 0) is approximately

199% of the failure risk of IPO firms with low levels of accrual-based manipulation (*DISACCR* < 0). Further, these results are consistent with the non-parametric analysis (Figure 7.5) that IPO firms with high levels of accrual-based manipulation during the IPO year experience lower survival rates in the following period.

In summary, the reported results in Table 7.9 (Models 1, 2, 3, and 4) confirm the hypothesis that IPO firms which engage in higher levels of real and accrual earnings management during the IPO year are expected to have lower survival rates in the subsequent periods. Further, the reported results of Cox model in Table 7.9 are consistent with the earlier reported results of the Logit model in Table 7.7. [116]

[116] Table 7.9 (Model 5) reports the results where all real and accrual earnings management activities are included and shows similar evidence that earnings management is a significant determinant of IPO survivability. Specifically, Model 5 includes the aggregate measure of real earnings management (a combination of sales-based and discretionary expenses-based manipulation) and discretionary accruals.

Table 7.9 Coefficient estimates from multivariate Cox Hazard models, time to failure.

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeff. (P-value)	[HR]	Coeff. (P-value)	[HR]	Coeff. (P-value)	[HR]	Coeff. (P-value)	[HR]	Coeff. (P-value)	[HR]
REM_Index	0.710*** (0.006)	[2.034]							0.571** (0.032)	[1.770]
ABNCFO			0.606** (0.020)	[1.832]						
ABNDEXP					0.041 (0.868)	[1.042]				
DISACCR							0.687*** (0.006)	[1.989]	0.542** (0.038)	[1.720]
Big N	-0.577** (0.039)	[0.562]	-0.572** (0.038)	[0.564]	-0.535* (0.051)	[0.585]	-0.585** (0.033)	[0.557]	-0.598** (0.031)	[0.550]
VC	0.186 (0.509)	[1.204]	0.242 (0.390)	[1.274]	0.205 (0.466)	[1.227]	0.243 (0.386)	[1.275]	0.221 (0.432)	[1.247]
Underwriter	0.212 (0.528)	[1.236]	0.189 (0.568)	[1.208]	0.175 (0.600)	[1.192]	0.205 (0.538)	[1.228]	0.239 (0.476)	[1.269]
LnSize	0.034 (0.821)	[1.034]	-0.089 (0.560)	[0.915]	-0.011 (0.940)	[0.989]	-0.069 (0.651)	[0.934]	-0.017 (0.913)	[0.984]
Underpricing	-0.160 (0.673)	[0.852]	-0.102 (0.788)	[0.903]	-0.133 (0.730)	[0.875]	-0.094 (0.802)	[0.910]	-0.127 (0.732)	[0.881]
Offer-price	-0.302 (0.204)	[0.739]	-0.195 (0.408)	[0.823]	-0.256 (0.282)	[0.775]	-0.253 (0.292)	[0.776]	-0.288 (0.229)	[0.750]
BM	0.587 (0.138)	[1.799]	0.681* (0.073)	[1.975]	0.709* (0.071)	[2.033]	0.579 (0.140)	[1.784]	0.502 (0.209)	[1.652]
Ln(1+age)	0.077 (0.551)	[1.081]	0.033 (0.803)	[1.033]	0.036 (0.779)	[1.037]	0.032 (0.803)	[1.033]	0.071 (0.586)	[1.074]
Lev	0.263 (0.105)	[1.301]	0.295* (0.064)	[1.343]	0.270* (0.090)	[1.309]	0.266* (0.090)	[1.305]	0.263 (0.101)	[1.301]
ROA	-0.028 (0.421)	[0.973]	-0.011 (0.763)	[0.990]	-0.030 (0.377)	[0.970]	-0.024 (0.478)	[0.976]	-0.025 (0.482)	[0.976]
Abs(CFO)	-0.026 (0.264)	[0.974]	-0.021 (0.339)	[0.979]	-0.026 (0.264)	[0.974]	-0.017 (0.389)	[0.983]	-0.020 (0.343)	[0.981]
Industry Dm	Yes		Yes		Yes		Yes		Yes	
Year Dm	Yes		Yes		Yes		Yes		Yes	
Chi-square	65.7		63.03		57.46		65.25		70.11	
Chi-square test Prob	0.0006		0.0013		0.0052		0.0007		0.0003	
N	567		567		567		567		567	

*, **, *** Denote significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively. P-value appears between parentheses and hazard ratio appears between brackets. Table 7.9 reports the results for Cox proportional hazard models. Model 1, 2, 3, and 4 report the results where the dependent variable is the logarithm of the hazard rate, which is based on the delisting event. Where *(REM_Index)* is a dummy variable equalling to 1 if the level of the aggregate measure of real earnings management during the IPO year for an IPO firm is greater than zero (positive) and 0 otherwise, *(ABNCFO)* is a dummy variable equalling to 1 if the level of the abnormal cash flows from operations during the IPO year for an IPO firm is greater than zero and 0 otherwise, *(ABNDEXP)* is a dummy variable equalling to 1 if the level of the abnormal discretionary expenses during the IPO year for an IPO firm is greater than zero and 0 otherwise, and (*DISACCR)* is a dummy variable equalling to 1 if the level of the discretionary accruals during the IPO year for an IPO firm is greater than zero and 0 otherwise. The time to failure is measured as the number of months elapsed between the IPO month and the month in which the firm is delisted from the stock exchanges for negative reasons. The hazard ratio (HR) is calculated as the exponential of the estimated coefficient, exp (β). All other variables are previously defined.

7.5 Additional Analysis

7.5.1 A Broad Definition of IPO Failure

In the previous survival analysis, the IPO firms are considered as "*right censored*" if they have not delisted yet (still trading on the stock exchange) by the end of December 2011 or if they have delisted for any reasons other than negative reasons. For robustness this chapter also re-estimate Cox model where IPO firms are considered as "*right censored*" if they have not delisted yet from the stock exchange (still trading on the stock exchange). In other words, non-survivor IPO firms are defined as those IPO firms who delisted from the stock exchanges for negative reasons, mergers and acquisition, at the request of the company, and any other delisted reasons over the period from January 1998 to December 2011.

Table I in Appendix C reports the results and shows qualitatively similar results to those reported in Table 7.10. Overall, these results confirm that IPO firms with high levels of real and accrual earnings management during the IPO year survive shorter time than other firms. Further, these results confirm the recent literature (Cohen and Zarowin, 2010; Kothari et al., 2012) on the negative impact of real and accrual earnings management for future performance.

7.5.2 Post-IPO Stock Performance Sorted by Listing Status and Real and Accrual Earnings Management

This chapter also examines whether real and accrual earnings management during the IPO year are associated with post-IPO stock return underperformance and whether these relationships are affected by the listing status. IPO firms that are delisted for negative reasons are expected to experience the most severe post-IPO stock returns underperformance due to the higher levels of real and accrual earnings management during the IPO year. Thus, IPOs sample is divided into four sub-samples based on the listing status; namely IPOs delisted for negative reasons (within five years post-IPO), IPOs delisted for mergers and acquisitions (within five years post-IPO), IPOs delisted at the request of the company (within five years post-

IPO) and survivor IPO firms. Then, each sub-sample is divided into four quartiles (Q1, Q2, Q3, and Q4) based on the level of real and accrual earnings management during the IPO and the mean 3-years buy-and-hold abnormal returns (BHAR) is calculated for each quartile. Q1 represents the most conservative quartile (IPO firms with the lowest level of earnings management during the IPO year) and Q4 the most aggressive quartile (IPO firms with highest level of earnings management during the IPO year).

The BHAR is computed as the difference between the return for IPO firms and matched non-IPO firms starting 4 months after the date of the IPO to 3 years after the date of the IPO.[117] Also, a matched sample is created from all UK non-IPO firms following Lyon et al. (1999). A firm is included in the matched sample if its market capitalization is between 70% and 130% of the IPO firms' market value; then it will be matched with the closest book-to-market ratio to the IPO firms.[118] Following prior research (e.g., Teoh et al., 1998a) if the IPO firm is delisted prior to the IPO returns' ending date the returns of the IPO firm and its matched firm are set to zero, while if the matched firm is delisted prior to the ending date it is replaced, on a point-forward basis, with another matched firm to avoid survivorship bias in the matched sample. The mean BHAR is calculated as follows

$$BHAR_T = \frac{1}{N}\sum_{i=1}^{N}\left[\prod_{t=1}^{T}(1+R_{it}) - \prod_{t=1}^{T}(1+R_{benchmark_t})\right] \quad (7.10)$$

Where $R_{i,t}$ is the monthly return for firm i in month t and $R_{benchmark,t}$ is the monthly return for the benchmark in month t.

[117] To allow for a reporting lag and following Teoh et al. (1998a), the buy and hold returns are calculated starting from month 4.

[118] The matching approach is consistent with Kothari et al. (2012) who match on post-issuance characteristics rather than pre-issuance. Kothari et al. (2012) indicate that equity offerings may change the risk characteristics of the firms and, therefore, matching on post-issuance reduces the complications of these changes.

.

Table II in Appendix C reports post-IPO 3-year abnormal returns measured using BHAR for IPO firms relative to the listing status and the level of real and accrual earnings management during the IPO year. Table II (Panel A) reports the results for IPO firms delisted for negative reasons and shows that long-run stock return underperformance occurs for the quartile with the highest level of earnings manipulation across all earnings management proxies. For example, considering the aggregate measure of real earnings management, the BHAR is -6.4% for the conservative quartile (Q1) and -59.7% for the most aggressive quartile (Q4). Similar results are reported for abnormal cash flows from operations and abnormal discretionary expenses. In addition, the underperformance as measured by the mean 3-year BHAR for the discretionary accruals quartiles ranges from -31.3% for the conservative quartile (Q1) to -85.1% and -35.7% for quartiles three (Q3) and four (Q4), respectively. Taken together, these results indicate that IPO firms delisted for negative reasons experience post-IPO stock return underperformance due to the higher levels of real and accrual earnings management during the IPO year.

Table II (Panel B) reports the results for IPO firms delisted for being taken over and shows evidence that these delisted IPOs experience a greater decline in post-IPO stock return performance due to the higher level of real earnings management during the IPO year. For example, Panel B shows that the BHAR for the aggressive quartile of the aggregate measure of real earnings management is (-58%) and for the aggressive quartile of abnormal discretionary expenses is (-35.1%). However, the results show no evidence that abnormal cash flows from operations and discretionary accruals are associated with post-IPO stock return performance.

Table II (Panel C) reports the results for IPO firms delisted at the request of the company and provides evidence that IPO firms in quartile three (Q3) of the aggregate measure of real earnings management, abnormal cash flows from operations, and discretionary accruals experience the most post-IPO stock return underperformance. Finally, Table II (Panel D) reports the results for survivor IPO firms and shows evidence that IPO firms in the aggressive quartiles of the aggregate measure of real earnings management, abnormal cash flows from operations, and discretionary accruals experience the most post-IPO stock return underperformance.

These results confirm our previous results that real and accrual earnings management have negative consequences for subsequent performance.

In summary, the results of Table II in Appendix C confirm the expectations that IPO firms delisted for negative reasons experience the most severe decline in post-IPO stock return performance due to the higher levels of real and accrual earnings management that take place during the IPO year.[119] Further, these results confirm the evidence of this chapter that IPO firms with higher levels of real and accrual earnings management during the IPO year experience a higher probability of failure and lower survival rates in the subsequent periods.

7.5.3 Delisted IPOs for being Taken Over and Earnings Management

One observation about the survival analysis is that IPO firms who are delisted for being taken over may exhibit higher quality than other delisted firms and, therefore, they should be considered as survivor rather than delisted IPOs. For robustness this chapter repeats the survival analysis by considering IPOs delisted for takeover as survivors.

Table III in Appendix C presents descriptive statistics of the characteristics of IPOs delisted for being taken over and survivor IPO firms over the period from 1998 to 2008. Table III shows that IPO firms delisted for being taken over have lower levels of aggregate real earnings management and stock return performance (post-IPO three-year buy-and-hold-abnormal return [BHAR]), and a higher market capitalization compared with survivor IPOs. Further, Table III shows that the percentage of IPO firms delisted for being taken over that are audited by big N audit firms is higher than the percentage of survivor IPO firms, while for other characteristics there is no a statistically significant difference, suggesting that IPO firms delisted for being taken over exhibit similar characteristics to survivor IPOs.

[119] It is worth noting for IPO firms delisted for negative reasons that 13.34% are delisted after the first anniversary of their IPO date, 25% are delisted after the second anniversary of their IPO date, and 61.66% are delisted after the third anniversary of their IPO date.

Thus, the survival analysis (Model 7.8) is repeated where all IPOs delisted for being taken over are considered as survivors. Specifically, the IPO firms are considered as "*right censored*" if they have not delisted yet (still trading on the stock exchange) by the end of December 2011 or if they have delisted for being taken over, while non-survivor IPO firms are defined as those IPO firms who delisted from the stock exchanges for negative reasons over the period from January 1998 to December 2011. Table IV in Appendix C reports the results and shows qualitatively similar results to the main analysis that is reported in Table 7.10. This in turn suggests that considering IPOs delisted for being taken over as survivor IPOs has no impact on the main analysis of this chapter.[120]

7.6 Conclusions

This chapter examines whether IPO firms manage real and accrual earnings management activities during the IPO year and whether these activities are associated with the probability of IPO failure in subsequent periods. Although limited research has examined the association between accrual earnings management and IPO failure risks (e.g., Li and Zhou, 2006), this chapter progresses the literature on earnings management by examining whether real earnings management activities during the IPO year are associated with IPO failure risks in the subsequent periods. Cohen and Zarowin (2010) and Kothari et al. (2012) find that real earnings management activities have severe negative consequences for subsequent operating and stock return performance, with even greater consequences than accruals manipulation.

This chapter contributes to the literature by providing the following evidence. First, this chapter presents evidence that IPO firms delisted for negative reasons have higher levels of real and accrual earnings management during the IPO year than surviving firms. Second, this chapter provides evidence that both real and

[120] Also, the analysis is repeated by considering IPOs delisted for being taken over as non-survivors and the results are qualitatively similar. Specifically, non-survivor IPOs are defined as those IPO firms who delisted from the stock exchanges for being taken over or negative reasons over the period from January 1998 to December 2011, while survivor IPOs represent IPO firms that have not delisted yet (still trading on the stock exchange) by the end of December 2011.

accrual earnings management during the IPO year are positively associated with post-IPO failure. Specifically, IPO firms with high levels of real and accrual earnings management during the IPO year have a higher probability of delisting from the stock exchanges for negative reasons in the subsequent periods. Further, this chapter presents evidence that IPO firms with higher levels of real and accrual earnings management during the IPO year have a lower survival rate in the subsequent periods.

Overall, the evidence of this chapter contributes to the earnings management literature by showing that real and accrual earnings management are significant determinants of IPO failure risks. Further, the evidence confirms the recent accounting literature that real and accrual earnings management have a negative impact on the performance of firms (Rangan, 1998; Teoh et al. 1998a; Fan, 2007; Cohen and Zarowin, 2010; Kothari et al., 2012).

Appendix C

Appendix C Table I Coefficient estimates from multivariate Cox hazard models, time to failure

	Model 1		Model 2		Model 3		Model 4	
	Coeff. (P-value)	[HR]	Coeff. (P-value)	[HR]	Coeff. (P-value)	[HR]	Coeff. (P-value)	[HR]
REM_Index	0.189 (0.125)	[1.208]						
ABNCFO			0.258** (0.046)	[1.294]				
ABNDEXP					-0.024 (0.845)	[0.976]		
DISACCR							0.308** (0.014)	[1.361]
Big N	0.078 (0.577)	[1.081]	0.063 (0.651)	[1.065]	0.069 (0.622)	[1.071]	0.064 (0.644)	[1.066]
VC	0.189 (0.195)	[1.208]	0.205 (0.160)	[1.228]	0.182 (0.213)	[1.199]	0.201 (0.167)	[1.223]
Underwriter	0.075 (0.632)	[1.078]	0.079 (0.614)	[1.082]	0.07 (0.658)	[1.072]	0.069 (0.658)	[1.072]
LnSize	0.045 (0.543)	[1.046]	0.017 (0.816)	[1.017]	0.037 (0.613)	[1.038]	0.034 (0.649)	[1.034]
Underpricing	-0.143 (0.469)	[0.866]	-0.133 (0.502)	[0.876]	-0.146 (0.464)	[0.864]	-0.139 (0.482)	[0.870]
Offer-price	-0.131 (0.180)	[0.877]	-0.114 (0.241)	[0.892]	-0.121 (0.216)	[0.886]	-0.128 (0.193)	[0.880]
BM	0.15 (0.515)	[1.162]	0.175 (0.443)	[1.191]	0.196 (0.395)	[1.217]	0.094 (0.686)	[1.098]
Ln(1+age)	-0.029 (0.679)	[0.971]	-0.035 (0.613)	[0.965]	-0.041 (0.555)	[0.960]	-0.029 (0.680)	[0.972]
Lev	0.008 (0.939)	[1.008]	0.023 (0.830)	[1.023]	0.016 (0.876)	[1.017]	0.007 (0.944)	[1.007]
ROA	0.017 (0.437)	[1.017]	0.024 (0.280)	[1.024]	0.017 (0.447)	[1.017]	0.021 (0.344)	[1.021]
Abs(CFO)	-0.007 (0.134)	[0.993]	-0.006 (0.216)	[0.994]	-0.007 (0.128)	[0.993]	-0.005 (0.248)	[0.995]
Industry Dm	Yes		Yes		Yes		Yes	
Year Dm	Yes		Yes		Yes		Yes	
Chi-square	48.77		50.40		46.43		52.5	
Chi-square test Prob	0.0484		0.0348		0.0758		0.0223	
N	567		567		567		567	

*, **, *** Denote significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively.

P-value appears between parentheses and Hazard ratio appears between brackets. Table I reports the results for Cox proportional hazard models. Model 1, 2, 3, and 4 report the results where the dependent variable is the logarithm of the hazard rate, which is based on the delisting event. All other variables are previously defined. The time to failure is measured as the number of months elapsed between the IPO month and the month in which the firm is delisted from the stock exchanges for negative reasons, mergers and acquisitions, at the request of the company, and any other delisted reasons. The hazard ratio (HR) is calculated as the exponential of the estimated coefficient, exp (β).

Appendix C Table II Post-IPO 3-year buy-and-hold abnormal returns for IPO firms sorted by the listing status and the level of real and accrual earnings management during the offer year.

	Q1	**Q2**	**Q3**	**Q4**
Panel A: Mean 3-year BHAR: IPO firms delisted for negative reasons within 5 years post IPO (n=60)				
Aggregate real earnings	-0.064	-0.535	-0.795	-0.597
management	(-0.369)	(-3.220)***	(-5.160)***	(-2.997)***
Abnormal cash flows from	-0.288	-0.418	-0.547	-0.738
operations	(-0.115)	(-1.865)*	(-5.013)***	(-3.569)***
Abnormal discretionary expenses	-0.081	-0.662	-0.793	-0.454
	(-0.464)	(-5.254)***	(-3.454)***	(-3.049)***
Discretionary accruals	-0.313	-0.471	-0.851	-0.357
	(-2.291)**	(-1.958)*	(-5.317)***	(0.048)**
	Q1	**Q2**	**Q3**	**Q4**
Panel B: Mean 3-year BHAR: IPO firms delisted for being taken over within 5 years post IPO (n=72)				
Aggregate real earnings	0.166	-0.392	-0.098	-0.580
management	(0.545)	(-1.713)	(-0.377)	(-3.671)***
Abnormal cash flows from	0.021	-0.238	-0.376	-0.311
operations	(0.066)	(-1.075)	(-1.678)	(-1.409)
Abnormal discretionary expenses	0.032	-0.306	-0.278	-0.351
	(0.135)	(-0.939)	(-1.230)	(-1.811)*
Discretionary accruals	-0.218	-0.320	-0.063	-0.303
	(-0.669)	(-1.386)	(-0.257)	(-1.611)
	Q1	**Q2**	**Q3**	**Q4**
Panel C: Mean 3-year BHAR: IPO firms delisted at the request of the company within 5 years post IPO (n=51)				
Aggregate real earnings	-0.421	-0.012	-0.364	-0.392
management	(-1.642)	(-0.071)	(-2.520)**	(-0.933)
Abnormal cash flows from	0.005	-0.181	-0.391	-0.641
operations	(0.025)	(-1.230)	(-1.910)*	(-1.552)
Abnormal discretionary expenses	-0.381	-0.675	0.036	-0.151
	(-2.067)*	(-2.019)*	(0.124)	(-1.036)
Discretionary accruals	0.074	-0.294	-0.263	-0.732
	(0.326)	(-1.587)	(-2.176)*	(-1.761)
	Q1	**Q2**	**Q3**	**Q4**
Panel D: Mean 3-year BHAR: Survivor IPO firms (n=253)				
Aggregate real earnings	0.230	0.088	-0.029	-0.211
management	(1.840)*	(0.734)	(-0.200)	(-2.079)**
Abnormal cash flows from	0.107	0.084	0.128	-0.241
operations	(1.065)	(0.659)	(0.827)	(-2.322)**
Abnormal discretionary expenses	0.015	-0.035	0.053	0.049
	(0.145)	(-0.221)	(0.378)	(0.574)
Discretionary accruals	0.020	0.265	0.116	-0.320
	(0.174)	(2.139)**	(0.850)	(-2.840)***

*, **, *** Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Table II reports the mean 3-year buy-and-hold abnormal returns for IPOs delisted (within 5 years post IPO) for negative reasons, being taken over, at the request of the company, and survivor IPO firms by level of earnings management during the IPO year. IPOs in each sample are divided into four quartiles relative to the level of real and accrual earnings management that occurred in the IPO year. The mean 3-year abnormal returns are then calculated for each quartile using BHAR. The holding period is 4 to 40 months after the IPO year. Q1 represents the most conservative quartile (IPO firms with the lowest level of earnings management) and Q4 the most aggressive (IPO firms with highest level of earnings management). The mean buy-and-hold abnormal return is calculated as follows:

$$BHAR_T = \frac{1}{N}\sum_{i=1}^{N}\left[\prod_{t=1}^{T}(1+R_{i,t}) - \prod_{t=1}^{T}(1+R_{benchmark,t})\right]$$

Where R_t is monthly return for IPO firms in month t and $R_{benchmark}$ is the monthly return for the matched firms in month t. All other variables are previously defined.

Appendix C Table III Descriptive statistics for IPOs delisted for takeover and survivor IPOs during 1998-2008

	Delisted for takeover	Survivors	Takeover - Survivors Differences
VARIABLES	**Mean (Median)**	**Mean (Median)**	**t-statistics (z-statistics)**
Aggregate real earnings management	-0.297 (-0.076)	-0.037 (-0.006)	-1.790* (-1.480)
Abnormal cash flows from operations	-0.009 -0.027	0.034 (0.014)	-0.666 (-0.009)
Abnormal discretionary expenses	-0.086 (-0.027)	0.019 (0.012)	-1.440 (-1.353)
Discretionary accruals	-0.029 (0.005)	0.019 (0.003)	-1.094 (0.656)
Market value	94.324 (35.719)	140.800 (26.120)	-1.100 (2.131)**
Age	3.777 (0.936)	3.990 (1.307)	-0.210 (-0.292)
Offer-price	1.363 (1.000)	1.145 (1.000)	1.201 (1.348)
Underpricing	0.155 (0.057)	0.150 (0.058)	0.060 (0.048)
Underwriter	0.236 -	0.174 -	1.192 -
VC	0.292 -	0.209 -	1.468 -
Big N	0.597 -	0.439 -	2.390** -
BHAR	-0.226 (-0.176)	0.021 (0.000)	-1.839* (-1.609)
Cash flows	3.840 (0.478)	11.228 (0.040)	-1.254 (1.520)
Lev	0.243 (0.090)	0.371 (0.084)	-1.491 (0.109)
Chrm/CEO	0.069 -	0.071 -	-0.050 -
BrdSize	6.000 (6.000)	5.822 (6.000)	0.796 (1.226)
OutDirectors	0.460 (0.429)	0.455 (0.500)	0.205 (-0.492)
N	72	253	

*, **, *** Denote significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively. Differences in medians are tested using the Wilcoxon Signed Rank test and differences in means are tested using t-tests. Table III reports the difference in mean and median sample characteristics of IPO firms delisted for takeover (within 5 years post IPO) and survivor IPOs. All variables are previously defined.

Appendix C Table IV Coefficient estimates from multivariate Cox hazard models, time to failure

	Model 1		Model 2		Model 3		Model 4	
	Coeff. (Z-statistic)	[HR]	Coeff. (Z-statistic)	[HR]	Coeff. (Z-statistic)	[HR]	Coeff. (Z-statistic)	[HR]
REM_Index	0.656 (2.546)**	1.927						
ABNCFO			0.605 (2.282)**	[1.832]				
ABNDEXP					0.014 (0.057)	[1.014]		
DISACCR							0.777 (3.056)***	[2.174]
Big N	-0.521 (-1.870)*	[0.594]	-0.500 (-1.815)*	[0.607]	-0.482 (-1.754)*	[0.617]	-0.526 (-1.911)*	[0.591]
VC	0.223 (0.780)	[1.250]	0.310 (1.075)	[1.363]	0.238 (0.834)	[1.268]	0.315 (1.099)	[1.370]
Underwriter	0.200 (0.593)	[1.222]	0.171 (0.513)	[1.187]	0.151 (0.448)	[1.162]	0.197 (0.588)	[1.218]
LnSize	0.002 (0.013)	[1.002]	-0.111 (-0.739)	[0.895]	-0.042 (-0.282)	[0.959]	-0.094 (-0.628)	[0.910]
Underpricing	-0.293 (-0.739)	[0.746]	-0.250 (-0.629)	[0.779]	-0.296 (-0.731)	[0.744]	-0.237 (-0.605)	[0.789]
Offer-price	-0.372 (-1.528)	[0.689]	-0.292 (-1.203)	[0.747]	-0.335 (-1.381)	[0.715]	-0.357 (-1.445)	[0.700]
BM	0.540 (1.404)	[1.716]	0.618 (1.661)*	[1.855]	0.662 (1.727)*	[1.938]	0.492 (1.275)	[1.635]
Ln(1+age)	0.046 (0.355)	[1.047]	0.006 (0.043)	[1.006]	0.001 (0.006)	[1.001]	-0.003 (-0.026)	[0.997]
Lev	0.274 (1.615)	[1.316]	0.344 (2.039)**	[1.410]	0.292 (1.741)*	[1.340]	0.305 (1.865)*	[1.357]
ROA	-0.016 (-0.478)	[0.984]	-0.000 (-0.014)	[1.000]	-0.018 (-0.529)	[0.982]	-0.014 (-0.387)	[0.987]
Abs(CFO)	-0.022 (-1.033)	[0.978]	-0.018 (-0.872)	[0.982]	-0.022 (-1.029)	[0.979]	-0.013 (-0.760)	[0.980]
Industry Dm	Yes		Yes		Yes		Yes	
Year Dm	Yes		Yes		Yes		Yes	
Chi-square	67.39		65.81		60.41		70.22	
Chi-square test Prob	0.0004		0.0006		0.0025		0.0002	
N total	481		481		481		481	
N survivors	391		391		391		391	
Still trading	251		251		251		251	
Taken over	140		140		140		140	
N failure	90		90		90		90	

*, **, *** Denote significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively.

Z-statistic appears between parentheses and Hazard ratio appears between brackets. Table IV reports the results for Cox proportional hazard models. Model 1, 2, 3, and 4 report the results where the dependent variable is the logarithm of the hazard rate, which is based on the delisting event. All other variables are previously defined. IPO firms are considered as "*right censored*" if they have not delisted yet (still trading on the stock exchange) by the end of December 2011 or if they have delisted for being taken over, while the time to failure is measured as the number of months elapsed between the IPO month and the month in which the firm is delisted from the stock exchanges for negative reasons. The hazard ratio (HR) is calculated as the exponential of the estimated coefficient, exp (β).

Chapter 8
Conclusions

8.1 Introduction

This thesis builds on information asymmetry, agency conflicts and litigation-risk backgrounds to investigate earnings management activities around IPOs, mitigating factors (regulators and auditors), and consequences for future performance (stock return and IPO survivability). The IPO event is associated with a higher level of information asymmetry between insiders and outsiders due to the fact that an IPO firm is a private firm with limited information that is available to the public. This information asymmetry during the IPO is found to lead to two types of agency conflicts, namely moral hazard and adverse selection (e.g. Ritter and Welch, 2002; Bruton et al., 2009)[121], which in turn provide managers with strong incentives to engage in certain transactions (e.g. earnings management) that aim to maximise their wealth instead of shareholders (Jensen and Meckling, 1976). As a result of the information asymmetry around IPOs, IPO firms hire high quality auditors during the IPO to send positive signals about the offer to outside investors (Titman and Trueman, 1986), notably that high quality auditors are expected to provide high-quality audits to avoid any future litigation risks (DeAngelo, 1981). This high quality audits during the IPO is found to lead to lower levels of information asymmetry and IPO underpricing (Balvers et al. 1988; Hogan, 1997).

Consistent with the existence of information asymmetry and agency conflicts around IPOs, prior research finds evidence that IPO firms manipulate reported earnings upward around IPOs utilizing earnings management activities (e.g. Teoh et

[121] Moral hazard implies that managers may not perform their duties efficiently in line with the interest of shareholders due to the information asymmetry between managers and shareholder (Nygaard and Myrtveith, 2000), while adverse selection implies that managers have better information about the firm and therefore, they may not reveal all they know about the firm to outsiders e.g. shareholders (e.g. Bruton et al., 2009).

al. 1998a). However, no research to date has examined whether the regulatory environments have an impact on level of information asymmetry and agency conflicts during the IPO and, therefore, the use of real and accrual earnings management. Indeed, it is well-documented that disclosure systems and financial reporting quality in the capital markets are associated with the level of information asymmetry and agency conflicts (Ball, 2001; Heal and Palepu, 2001). Therefore, this thesis theoretically contributes to the knowledge by examining whether different regulatory environments (restrictive vs. lighter) that have different disclosure systems and financial reporting quality would have different impacts on the level of information asymmetry and agency conflicts and, therefore, the use of real and accrual earnings management. The findings of this thesis show that a lighter regulatory environment that has lower quality disclosure systems and financial reporting exhibits higher levels of information asymmetry and agency conflicts during the IPO and, therefore, provides IPOs' managers with more flexibility and strong incentives to inflate reported earnings upward during the IPO utilizing real and accrual earnings management.[122]

Further, prior research examines the litigation-risk hypothesis and audit quality around IPOs and finds evidence that high quality auditors mitigate the use of accrual earnings management during the IPO to avoid potential litigation risks (e.g. Elder and Zhou, 2002; Chen et al., 2005).[123] In contrast with accrual manipulation which is considered as a primary audit target, real activities represent managerial decisions that are less subject to the scrutiny of audit firms (Graham et al., 2005) and,

[122] In this thesis, a higher level of real and accrual earnings management during the IPO is used as a proxy for the presence of higher levels of information asymmetry and agency conflicts between managers and outsiders e.g. shareholders. In addition to this proxy, the presence of a higher level of information symmetry during the IPO on the AIM market is supported by the results of chapter five. Specifically, the results of Table 5.9 show that the coefficient of *ZeroReturn* is positive and statistically significant, suggesting AIM IPOs exhibit a higher level of information asymmetry during the IPO year than Main IPOs. The variable *ZeroReturn* is included into Model 5.9 to control for information asymmetry problems as IPO firms with high levels of information asymmetry their stock are less likely to be traded. *ZeroReturn* is defined as the number of zero-return trading days divided by the total number of trading days since the IPO date and up to one year later.

[123] Khurana and Raman (2004) examine the association between litigation risk, reputation damage, and enhanced audit quality and found that avoiding litigation risk is the primary driver for providing high quality audits by more reputable audit firms.

therefore, researchers have not examined the relationship between audit quality and real activities during the IPO. Therefore, this thesis theoretically contributes to the knowledge by examining whether a litigation-risk hypothesis would impact high quality auditors' response to the use of real earnings management activities during the IPO year. The findings of this thesis show that litigation risks do impact the monitoring role of high quality auditors on real activities manipulation during the IPO. Specifically, high quality auditors are found to mitigate real earnings management activities that occur via discretionary expenses-based manipulation during the IPO year to avoid potential litigation risks. Finally, this thesis also empirically contributes to the knowledge in many aspects that are discussed in the following sections.

This chapter presents a summary of the main findings of this thesis, limitations and future research avenues. The chapter proceeds as follows. Section two provides a summary of results. Section three presents policy implications. Section four presents future research directions and research limitations.

8.2 Summary of Results

This thesis presents a detailed analysis of earnings management around IPOs and its consequences for future IPO performance, with a particular focus on real and accrual earnings management. Chapter two provided an overview on earnings management definitions, activities, and how this differs from accounting fraud. The motivations, mitigating factors, and theories that are related to earnings management were discussed and reviewed in chapter three. Chapter four discussed data sources, sample construction, and methodology. This thesis then examined three research questions in chapters five, six, and seven. In the next sections the main findings of these empirical chapters will be presented.

8.2.1 Real and Accrual Earnings Management under Different Regulatory Environments

The objectives of chapter five are as follows. First, it examines whether the regulatory environments impact the use of real and accrual earnings management

around IPOs via an analysis of the heavily regulated Main market of the London Stock Exchange and the more lightly regulated Alternative Investment Market (AIM). Second, it examines whether different regulatory environments (restrictive vs. lighter) have different mechanisms/capabilities to correct stock prices that were inflated by earnings management during the IPO. The results of chapter five show that IPO firms in the UK manage earnings upward by manipulating both real and accrual earnings management, and that IPO firms engage in real activities more extensively than accrual-based activities around IPOs. Further, IPO firms listing on the lightly regulated UK Alternative Investment Market are found to have higher levels of sales-based and accrual-based and a lower level of discretionary expenses-based earnings management as compared to those firms listing on the more heavily regulated Main market of the London Stock Exchange. These results suggest that under a more lightly regulated environment IPOs' managers have strong incentives and more flexibility to manage earnings upwards and, therefore, to choose between real and accrual earnings management activities based on the costs and benefits of utilizing each of them.[124]

Finally, the results of chapter five show both real and accrual earnings management are negatively associated with post-IPO stock return performance and that IPO firms on the Main market are found to experience greater long-run stock return underperformance. IPO firms on the Main market are therefore more likely to be punished in the following period for any earnings manipulation during the IPO year due to the existence of a much larger number of professional investors and much greater coverage by analysts (Arcot et al., 2007). Thus, these results confirm that a more restrictive regulatory environment that attracts the attention of sophisticated investors and analysts is expected to have better mechanisms/capabilities to re-evaluate stock prices that were inflated by earnings manipulation during the IPO year.

[124] For example, the results show that IPO firms on the AIM market avoid managing earnings upward during the IPO year utilizing discretionary expenses-based manipulation due the monitoring of high quality auditors and prestigious underwriters. For more details please see Table I in Appendix A.

8.2.2 Audit Quality, Real and Accrual Earnings Management and Stock Return Performance

Chapter six examines whether enhanced audit quality impacts real earnings management activities during the IPO and whether enhanced audit quality has an impact on managers' tendency to choose between real and accrual earnings management. Further, this chapter examines whether enhanced audit quality affects the relationships between real and accrual earnings management and post-IPO stock return performance. Recent research examines firms with strong incentives to manage earnings upward and finds evidence that firm audited by high quality auditor engage more in real earnings management to avoid the monitoring of accrual earnings management (Cohen and Zarowin, 2010; Chi et al. 2011). In contrast with this view that real activities-based manipulation is less subject to the scrutiny of audit firms (e.g. Cohen and Zarowin, 2010; Chi et al., 2011), the results of this chapter provide new evidence that high quality auditors monitor and constrain real earnings management activities. Specifically, the findings show that high quality auditors constrain the use of discretionary expenses-based manipulation to inflate reported earnings upward during the IPO year. Further, the findings of this chapter show that high quality auditors constrain accrual-based manipulation during the IPO, and that this constraint on discretionary expenses-based and accrual-based manipulations leads IPO firms to resort to a higher level of sales-based manipulation to manage earnings upward during the IPO year.

The results also show that both sales-based and accrual-based manipulations predict post-IPO stock return underperformance, and that sales-based manipulation has the most negative consequences for future stock return performance. In addition, this chapter shows that enhanced audit quality impacts the relationship between earnings manipulation and post-IPO returns performance. Specifically, the findings of this chapter provide evidence that IPO firms audited by high quality auditors experience a severe decline in post-IPO stock return performance due to the extensive use of sales-based manipulation that takes place during the offer year.

8.2.3 Real and Accrual Earnings Management and IPO Failure Risks

Chapter seven analyzes the relation between real and accrual earnings management activities that take place during the IPO year and IPO failure risks and survivability in the following periods. Prior literature finds evidence that IPO firms with high level of accruals manipulation during the IPO year have higher probability of failure in the subsequent period (Li and Zhou, 2006), and that IPO firms with lower spending on research and development (R&D) and selling, general, and administrative (SG&A) expenses during the year pre the IPO have a higher probability of failure in the following periods (Demers and Joos, 2007). Consistent with this view, the results of this chapter show that IPO firms with higher levels of real and accrual earnings management during the IPO year have a higher probability of IPO failure and lower survival rates in the subsequent periods. Thus, the results of this chapter confirm the earlier evidence (presented in chapters five and six) that real and accrual earnings management are utilized by IPO firms to manage earnings upward, and that these activities have severe negative consequences for post-IPO stock return performance. Further, the results of this chapter are consistent with recent research that real and accrual earnings management activities have negative consequences for subsequent operating and stock return performance (Cohen and Zarowin, 2010; Kothari et al., 2012) and, therefore, these activities are positively associated with the likelihood of IPO failure (Li and Zhou, 2006; Demers and Joos, 2007).

8.3 Policy Implications

The findings of this thesis have a number of implications for regulators, policy makers, accounting standards setters, investors, audit firms and financial institutions e.g. underwriters and venture capitalist. First, the regulators should enhance the disclosure systems and financial reporting quality in the capital markets to reduce information asymmetry and agency conflicts between managers and shareholders. This in turn will help to prevent and mitigate real and accrual earnings management activities that take place around equity offering e.g. IPOs. While stock markets with lighter and more flexible regulation (e.g. AIM market in the UK, OTCQC market in

the US, AIM Italia market in Italy, AIM Tokyo market in Japan, etc) are designed to reduce the compliance and the listing costs by providing small and medium size firms with greater opportunities to raise capital from the public, the results of this thesis show that IPO firms on the lightly regulated environment (the AIM market) exhibit higher levels of information asymmetry and agency conflicts that result in more flexibility and strong incentives to engage in real and accrual earnings management activities around IPOs as compared to IPO firms on the more heavily regulated environment (the Main market). The results also show that IPO firms with high levels of real and accrual earnings management during the IPO year experience post-IPO stock return underperformance, a higher probability of IPO failure, and lower survival rates. Hence, reforming the disclosure systems and financial reporting in the capital markets will help to reduce information asymmetry and agency conflicts between insiders and outsiders and, therefore, constrain real and accrual earnings management activities. This in turn will alleviate the negative consequences of these activities for future performance.

Second, high quality auditors should consider real activities that occurs via sales-based manipulation when they move to constrain discretionary expenses-based and accrual-based manipulations. The findings of this thesis show that firms audited by high quality auditors manage earnings upward during the IPO year by resorting to more sales-based manipulation (conducted through offering greater price discounts and/or more lenient credit terms) to avoid the monitoring of discretionary expenses-based and accrual-based manipulations. This extensive use of real activities via sales-based manipulation is found to have greater negative consequences for subsequent returns performance, with even greater consequences than discretionary expenses-based and accrual-based manipulations.

Third, this thesis shows that IPO firms with high levels of real and accrual earnings management during the IPO year have a higher probability of failure and lower survival rates. Thus, and given the fact the failure of an IPO has negative consequences for the firm and its investors, lenders, financial institutions and other stakeholders, further steps should be taken by the investment banks (underwriters) to mitigate real activities-based and accrual-based manipulations around IPOs. Finally,

investors should consider real and accrual earnings management when they invest in IPOs. The findings of this thesis present evidence that investors of IPOs experience future negative stock returns due to the high levels of real activities-based and accrual-based manipulations that are being undertaken by IPO firms during the offer year.

8.4 Further Work and Research Limitations

The relation between real and accrual earnings management and the regulatory environment has not received more attention in prior research. Thus, future research will examine this relation in a SEO context, notably that managers of SEO firms have strong incentives to manage earnings upward during the offer year. For example, Cohen and Zarowin (2010), Chi et al. (2011), and Kothari et al. (2012) find evidence that SEO firms engage in real and accrual earnings management activities during the offer year to manage reported earnings upward. Thus, whether the regulatory environments impact managers' tendency to manage earnings upwards around SEO and to choose between real activities-based and accrual-based earnings management represents a potentially fruitful line of empirical enquiry.

In addition, while this thesis presents evidence that real earnings management activities are utilized by IPO firms and have severe negative consequences for post-IPO stock return performance, a further extension of this study might be to examine the impact of real and accrual earnings management for post-IPO operating performance. Prior research finds evidence that accrual earnings management, which takes place during the IPO year, is negatively associated with post-IPO operating performance (e.g. Fan, 2007).

Further, the relation between real earnings management and IPO failure has not been examined by previous literature. This study is the first to examine this research question based on UK data and, therefore, further research can re-examine

this relationship using data other than UK data e.g. US data.[125] For example, recent research finds evidence that IPO firms in the US engage in both real activities manipulation and accrual-based earnings management during the IPO year to manage earnings upward (e.g. Wongsunwai, 2012). Therefore, it would be worthwhile for future research to investigate whether real activities manipulation that occurs during the IPO is associated with IPO failure risks.

Regarding the research limitations, a potential limitation relates to sample period as the data used extend only to 2008, which provides an avenue for future research. Further, another limitation relates to the post-IPO stock return period that is examined in this thesis, which may be inadequate length of time that the impact of earnings management to be revealed. Finally, a potential limitation arises from the fact that this thesis examines auditor industry expertise based on the national-level, while recent research finds that an industry expert based on the city-level is associated with higher levels of real activities manipulation (e.g. Chi et al., 2011). However, this provides interesting paths for future research.

[125] It is worth noting that Demers and Joos (2007) examine whether the level of SG&A expenses and sales during the year pre the IPO is associated with the probability of IPO failure in the following period. However, while Demers and Joos (2007) just examine the annual level of these items pre the IPO, this thesis uses empirical models developed by Roychowdhury (2006) to estimate real activities manipulation during the IPO year.

Bibliography

AGGARWAL, R., NAGPURNANAND, R. P. & PURI, M. 2002. Institutional Allocation in Initial Public Offerings: Empirical Evidence. *The Journal of Finance,* 57**,** 1421-1442.

AGRAWAL, A. & COOPER, T. 2009. Accounting Scandals in IPO Firms: Do Underwriters and VCs Help? *SSRN eLibrary.* Available at http://ssrn.com/abstract=1009782

AHARONY, J., LIN, C.-J. & LOEB, M. P. 1993. Initial Public Offerings, Accounting Choices, and Earnings Management*. *Contemporary Accounting Research,* 10**,** 61-81.

AHMAD-ZALUKI, N. A., CAMPBELL, K. & GOODACRE, A. 2011. Earnings Management in Malaysian IPOs: The East Asian Crisis, Ownership Control, and Post-IPO Performance. *The International Journal of Accounting,* 46**,** 111-137.

AHMED, A. S., BILLINGS, B. K., MORTON, R. M. & STANFORD-HARRIS, M. 2002. The Role of Accounting Conservatism in Mitigating Bondholder-Shareholder Conflicts over Dividend Policy and in Reducing Debt Costs. *The Accounting Review,* 77**,** 867-890.

AHMED, A. S., NEEL, M. J. & WANG, D. 2012. Does Mandatory Adoption of IFRS Improve Accounting Quality? Preliminary Evidence. *SSRN eLibrary*. Available at*:* http://ssrn.com/abstract=1502909

ALLISON, P. D. 1995. Survival Analysis Using SAS: A Practical Guide.Cary, NC: SAS Publishing.

ANDERSON, M. C., BANKER, R. D. & JANAKIRAMAN, S. N. 2003. Are Selling, General, and Administrative Costs "Sticky"? *Journal of Accounting Research,* 41**,** 47-63.

ANTLE, R., GORDON, E., NARAYANAMOORTHY, G. & ZHOU, L. 2006. The Joint Determination of Audit Fees, Non-Audit Fees, and Abnormal Accruals. *Review of Quantitative Finance and Accounting,* 27**,** 235-266.

ARCOT, S., BLACK, J. & OWEN, G. 2007. From Local to Global: The Rise of AIM as a Stock Market for Growing Companies: A Comprehensive Report Analysing the Growth of AIM. Working paper, *London School of Economics and Political Science.*

ARMSTRONG, C. S., FOSTER, G. & TAYLOR, D. 2009. Earnings Management Around Initial Public Offerings: A Re-Examination. *SSRN eLibrary*. Available at http://ssrn.com/abstract=1147328

ARYA, A., GLOVER, J. C. & SUNDER, S. 2003. Are Unmanaged Earnings Always Better for Shareholders? *Accounting Horizons,* 17**,** 111-116.

ATHANASAKOU, V. E., STRONG, N. C. & WALKER, M. 2009. Earnings Management or Forecast Guidance to Meet Analyst Expectations? *Accounting & Business Research,* 39**,** 3-35.

ATHANASAKOU, V., STRONG, N. C. & WALKER, M. 2011. The Market Reward for Achieving Analyst Earnings Expectations: Does Managing Expectations or Earnings Matter? *Journal of Business Finance & Accounting,* 38**,** 58-94.

BABER, W. R., FAIRFIELD, P. M. & HAGGARD, J. A. 1991. The Effect of Concern about Reported Income on Discretionary Spending Decisions: The Case of Research and Development. *The Accounting Review,* 66**,** 818-829.

BALL, R. 2001. Infrastructure Requirements for an Economically Efficient System of Public Financial Reporting and Disclosure. *Brookings-Wharton Papers on Financial Services,* 127-69.

BALL, R. & SHIVAKUMAR, L. 2005. Earnings Quality in UK Private Firms: Comparative Loss Recognition Timeliness. *Journal of Accounting and Economics,* 39**,** 83-128.

BALL, R. & SHIVAKUMAR, L. 2008. Earnings Quality at Initial Public Offerings. *Journal of Accounting and Economics,* 45**,** 324-349.

BALSAM, S. 1998. Discretionary Accounting Choices and CEO Compensation. *Contemporary Accounting Research,* 15**,** 229-252.

BALSAM, S., KRISHNAN, J. & YANG, J. S. 2003. Auditor Industry Specialization and Earnings Quality. *Auditing: A Journal of Practice & Theory,* 22**,** 71-97.

BALVERS, R. J., MCDONALD, B. & MILLER, R. E. 1988. Underpricing of New Issues and the Choice of Auditor as a Signal of Investment Banker Reputation. *The Accounting Review,* 63**,** 605-622.

BARBER, B. M. & LYON, J. D. 1996. Detecting Abnormal Operating Performance: The Empirical Power and Specification of Test Statistics. *Journal of Financial Economics,* 41**,** 359-399.

BARBER, B. M. & LYON, J. D. 1997. Detecting Long-Run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics. *Journal of Financial Economics,* 43**,** 341-372.

BARTH, M. E., LANDSMAN, W. R. & LANG, M. H. 2008. International Accounting Standards and Accounting Quality. *Journal of Accounting Research,* 46**,** 467-498.

BARTON, J. & SIMKO, P. J. 2002. The Balance Sheet as an Earnings Management Constraint. *The Accounting Review,* 77**,** 1-27.

BARTOV, E. 1993. The Timing of Asset Sales and Earnings Manipulation. *The Accounting Review,* 68**,** 840-855.

BASIOUDIS, I. G. & FRANCIS, J. R. 2007. Big 4 Audit Fee Premiums for National and Office Level Industry Leadership in the United Kingdom. *Auditing: A Journal of Practice and Theory,* 26**,** 143-166.

BASIOUDIS, I. G., PAPAKONSTANTINOU, E. & GEIGER, M. A. 2008. Audit Fees, Non-Audit Fees and Auditor Going-Concern Reporting Decisions in the United Kingdom. *Abacus,* 44**,** 284-309.

BEATTY, R. P. & RITTER, J. R. 1986. Investment Banking, Reputation, and the Underpricing of Initial Public Offerings. *Journal of Financial Economics,* 15**,** 213-232.

BEATTY, R. P. 1989. Auditor Reputation and the Pricing of Initial Public Offerings. *The Accounting Review,* 64**,** 693-709.

BEAVER, W. H. & MCNICHOLS, M. F. 2001. Do Stock Prices of Property Casualty Insurers Fully Reflect Information about Earnings, Accruals, Cash Flows, and Development? *Review of Accounting Studies,* 6**,** 197-220.

BECKER, C. L., DEFOND, M. L., JIAMBALVO, J. & SUBRAMANYAM, K. R. 1998. The Effect of Audit Quality on Earnings Management. *Contemporary Accounting Research,* 15**,** 1-24.

BEKAERT, G., HARVEY, C. R. & LUNDBLAD, C. 2007. Liquidity and Expected Returns: Lessons from Emerging Markets. *Review of Financial Studies,* 20**,** 1783-1831.

BENEISH, M. D. 1999. The Detection of Earnings Manipulation. *Financial Analysts Journal,* 55**,** 24-36.

BERGER, P. G. 1993. Explicit and Implicit Tax Effects of the R & D Tax Credit. *Journal of Accounting Research,* 31**,** 131-171.

BERGSTRESSER, D. & PHILIPPON, T. 2006. CEO Incentives and Earnings Management. *Journal of Financial Economics,* 80**,** 511-529.

BOOTH, J. R. & SMITH II, R. L. 1986. Capital Raising, Underwriting and the Certification Hypothesis. *Journal of Financial Economics,* 15**,** 261-281.

BRAU, J. C., LAMBSON, V. E. & MCQUEEN, G. 2005. Lockups Revisited. *Journal of Financial and Quantitative Analysis,* 40, 519-530.

BRAU, J. C. & FAWCETT, S. E. 2006. Initial Public Offerings: An Analysis of Theory and Practice. *The Journal of Finance,* 61**,** 399-436.

BRUTON, G. D., CHAHINE, S. & FILATOTCHEV, I. 2009. Founders, Private Equity Investors, and Underpricing in Entrepreneurial IPOs. *Entrepreneurship Theory and Practice,* 33, 909-928.

BURGSTAHLER, D. & DICHEV, I. 1997. Earnings Management to Avoid Earnings Decreases and Losses. *Journal of Accounting and Economics,* 24**,** 99-126.

BUSHEE, B. J. 1998. The Influence of Institutional Investors on Myopic R&D Investment Behavior. *The Accounting Review,* 73**,** 305-333.

CALLAO, S. & JARNE, J. I. 2010. Have IFRS Affected Earnings Management in the European Union? *Accounting in Europe,* 7**,** 159-189.

CAMPBELL, K. & TABNER, I. T. 2011. Bonding, Firm Value and Liquidity: An Analysis of Migrations between the AIM and the Official List of the London Stock Exchange. *SSRN eLibrary*. Available at http://ssrn.com/paper=1608403

CAO, J. & LAKSMANA, I. 2010. The Effect of Capital Market Pressures on the Association Between R&D Spending and CEO Option Compensation *Review of Quantitative Finance and Accounting,* 34.

CARAMANIS, C. & LENNOX, C. 2008. Audit Effort and Earnings Management. *Journal of Accounting and Economics,* 45**,** 116-138.

CARCELLO, J. V., HOLLINGSWORTH, C. W. & KLEIN, A. 2006. Audit Committee Financial Expertise, Competing Corporate Governance Mechanisms, and Earnings Management. *SSRN eLibrary*. Available at http://ssrn.com/abstract=1280676

CARPENTIER, C. & SURET, J.-M. 2011. The Survival and Success of Canadian Penny Stock IPOs. *Small Business Economics,* 36**,** 101-121.

CARTER, R. & MANASTER, S. 1990. Initial Public Offerings and Underwriter Reputation. *The Journal of Finance,* 45**,** 1045-1067.

CAZIER, R. A. 2009. R&D Spending Among Short-Horizon CEOs: A Re-Examination. *SSRN eLibrary*. Available at http://ssrn.com/abstract=1532270

CECCHINI, M., JACKSON, S. & LIU, X. 2012. Do Initial Public Offering Firms Manage Accruals? Evidence from Individual Accounts. *Review of Accounting Studies,* 17**,** 22-40.

CHADHA, S. 2003. Do Insiders Knowingly Issue Overvalued Equity? Evidence from IPOs that Get Delisted. *SSRN eLibrary*. Available at http://ssrn.com/abstract=437441

CHAHINE, S., ARTHURS, J. D., FILATOTCHEV, I. & HOSKISSON, R. E. 2012. The Effects of Venture Capital Syndicate Diversity on Earnings Management and Performance of IPOs in the US and UK: An institutional Perspective. *Journal of Corporate Finance,* 18**,** 179-192.

CHANEY, P. K., JETER, D. C. & SHIVAKUMAR, L. 2004. Self-Selection of Auditors and Audit Pricing in Private Firms. *The Accounting Review,* 79**,** 51-72.

CHANG, S.-C., CHUNG, T.-Y. & LIN, W.-C. 2010. Underwriter Reputation, Earnings Management and the Long-Run Performance of Initial Public Offerings. *Accounting & Finance,* 50**,** 53-78.

CHARITOU, A., LOUCA, C. & VAFEAS, N. 2007. Boards, Ownership Structure, and Involuntary Delisting from the New York Stock Exchange. *Journal of Accounting and Public Policy,* 26**,** 249-262.

CHEMMANUR, T. J. & FULGHIERI, P. 1994. Investment Bank Reputation, Information Production, and Financial Intermediation. *The Journal of Finance,* 49**,** 57-79.

CHEN, K. Y., LIN, K.-L. & ZHOU, J. 2005. Audit quality and Earnings Management for Taiwan IPO Firms. *Managerial Auditing Journal,* 20**,** 86-104.

CHENG, Q. & WARFIELD, T. D. 2005. Equity Incentives and Earnings Management. *The Accounting Review,* 80**,** 441-476.

CHENG, S. 2004. R&D Expenditures and CEO Compensation. *The Accounting Review,* 79**,** 305-328.

CHI, W., LISIC, L. L. & PEVZNER, M. 2011. Is Enhanced Audit Quality Associated with Greater Real Earnings Management? *Accounting Horizons,* 25**,** 315-335.

CHUNG, H., SHEU, H.-J. & WANG, J.-L. 2009. Do Firms' Earnings Management Practices Affect Their Equity Liquidity? *Finance Research Letters,* 6**,** 152-158.

CHUNG, R., FIRTH, M. & KIM, J.-B. 2002. Institutional Monitoring and Opportunistic Earnings Management. *Journal of Corporate Finance,* 8**,** 29-48.

CLATWORTHY, M. A., MAKEPEACE, G. H. & PEEL, M. J. 2009. Selection Bias and the Big Four Premium: New Evidence Using Heckman and Matching Models. *Accounting and Business Research,* 39**,** 139-166.

COAKLEY, J., HADASS, L. & WOOD, A. 2007. Post-IPO Operating Performance, Venture Capital and the Bubble Years. *Journal of Business Finance & Accounting,* 34**,** 1423-1446.

COAKLEY, J., HADASS, L. & WOOD, A. 2009. UK IPO Underpricing and Venture Capitalists. *The European Journal of Finance,* 15**,** 421-435.

COHEN, D. A., DEY, A. & LYS, T. Z. 2008. Real and Accrual-Based Earnings Management in the Pre- and Post-Sarbanes-Oxley Periods. *The Accounting Review,* 83**,** 757-787.

COHEN, D. A. & ZAROWIN, P. 2010. Accrual-Based and Real Earnings Management Activities around Seasoned Equity Offerings. *Journal of Accounting and Economics,* 50**,** 2-19.

CORE, J. E., GUAY, W. & LARCKER, D. F. 2008. The Power of the Pen and Executive Compensation. *Journal of Financial Economics,* 88**,** 1-25.

CORE, J. E., HOLTHAUSEN, R. W. & LARCKER, D. F. 1999. Corporate Governance, Chief Executive Officer Compensation, and Firm Performance. *Journal of Financial Economics,* 51**,** 371-406.

CORNETT, M. M., MARCUS, A. J. & TEHRANIAN, H. 2008. Corporate Governance and Pay-for-Performance: The Impact of Earnings Management. *Journal of Financial Economics,* 87**,** 357-373.

COURTEAU, L. 1995. Under-Diversification and Retention Commitments in IPOs. *Journal of Financial and Quantitative Analysis,* 30, 487-517.

COX, D. R. 1972. Regression Models and Life-Tables. *Journal of the Royal Statistical Society. Series B (Methodological),* 34**,** 187-220.

CRASWELL, A. T., FRANCIS, J. R. & TAYLOR, S. L. 1995. Auditor Brand Name Reputations and Industry Specializations. *Journal of Accounting and Economics,* 20**,** 297-322.

DARROUGH, M. & RANGAN, S. 2005. Do Insiders Manipulate Earnings When They Sell Their Shares in an Initial Public Offering? *Journal of Accounting Research,* 43**,** 1-33.

DATAR, S. M., FELTHAM, G. A. & HUGHES, J. S. 1991. The Role of Audits and Audit Quality in Valuing New Issues. *Journal of Accounting and Economics,* 14**,** 3-49.

DAVIS, L. R., SOO, B. S. & TROMPETER, G. M. 2009. Auditor Tenure and the Ability to Meet or Beat Earnings Forecasts. *Contemporary Accounting Research,* 26**,** 517-548.

DEANGELO, L. E. 1981. Auditor Size and Audit Quality. *Journal of Accounting and Economics,* 3**,** 183-199.

DEANGELO, L. E. 1986. Accounting Numbers as Market Valuation Substitutes: A Study of Management Buyouts of Public Stockholders. *The Accounting Review,* 61**,** 400-420.

DECHOW, P. M. & DICHEV, I. D. 2002. The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. *The Accounting Review,* 77**,** 35-59.

DECHOW, P. M., KOTHARI, S. P. & L. WATTS, R. 1998. The Relation between Earnings and Cash Flows. *Journal of Accounting and Economics,* 25**,** 133-168.

DECHOW, P. M. & SKINNER, D. J. 2000. Earnings Management: Reconciling the Views of Accounting Academics, Practitioners, and Regulators. *Accounting Horizons,* 14**,** 235-250.

DECHOW, P. M. & SLOAN, R. G. 1991. Executive Incentives and the Horizon Problem : An Empirical Investigation. *Journal of Accounting and Economics,* 14**,** 51-89.

DECHOW, P. M., SLOAN, R. G. & SWEENEY, A. P. 1995. Detecting Earnings Management. *The Accounting Review,* 70**,** 193-225.

DECHOW, P. M., SLOAN, R. G. & SWEENEY, A. P. 1996. Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC*. *Contemporary Accounting Research,* 13**,** 1-36.

DEFOND, M. L., HANN, R. N. & HU, X. 2005. Does the Market Value Financial Expertise on Audit Committees of Boards of Directors? *Journal of Accounting Research,* 43**,** 153-193.

DEFOND, M., FRANCIS, J. & WONG, T. J. 2000. Auditor Industry Specialization and Market Segmentation: Evidence from Hong Kong. *Auditing: A Journal of Practice & Theory* 19**,** 49-66.

DEFOND, M. L. & JIAMBALVO, J. 1994. Debt Covenant Violation and Manipulation of Accruals. *Journal of Accounting and Economics,* 17**,** 145-176.

DEGEORGE, F., PATEL, J. & ZECKHAUSER, R. 1999. Earnings Management to Exceed Thresholds. *The Journal of Business,* 72**,** 1-33.

DEMERS, E. & JOOS, P. 2007. IPO Failure Risk. *Journal of Accounting Research,* 45**,** 333-371.

DEMIRAKOS, E. G., STRONG, N. C. & WALKER, M. 2010. Does Valuation Model Choice Affect Target Price Accuracy? *European Accounting Review,* 19**,** 35-72.

DEMSKI, J. S. 1998. Performance Measure Manipulation*. *Contemporary Accounting Research,* 15**,** 261-285.

DERRIEN, F. & KECSKÉS, A. 2007. The Initial Public Offerings of Listed Firms. *The Journal of Finance,* 62**,** 447-479.

DUCHARME, L. L., MALATESTA, P. H. & SEFCIK, S. E. 2001. Earnings Management: IPO Valuation and Subsequent Performance. *Journal of Accounting, Auditing & Finance,* 16**,** 369-396.

ELDER, R. & ZHOU, J. 2002. Audit Firm Size, Industry Specialization and Earnings Management by Initial Public Offering Firms. *SSRN eLibrary*. Available at http://ssrn.com/abstract=321041

ERICKSON, M. & WANG, S.-W. 1999. Earnings Management by Acquiring Firms in Stock for Stock Mergers. *Journal of Accounting and Economics,* 27**,** 149-176.

ESPENLAUB, S., KHURSHED, A. & MOHAMED, A. 2012. IPO Survival in a Reputational Market. *Journal of Business Finance & Accounting,* 39**,** 427-463.

EWERT, R. & WAGENHOFER, A. 2005. Economic Effects of Tightening Accounting Standards to Restrict Earnings Management. *The Accounting Review,* 80**,** 1101-1124.

FAMA, E. F. & FRENCH, K. R. 2004. New lists: Fundamentals and Survival Rates. *Journal of Financial Economics,* 73**,** 229-269.

FAN, Q. 2007. Earnings Management and Ownership Retention for Initial Public Offering Firms: Theory and Evidence. *The Accounting Review,* 82**,** 27-64.

FENG, M., GE, W., LUO, S. & SHEVLIN, T. 2011. Why Do CFOs become Involved in Material Accounting Manipulations? *Journal of Accounting and Economics,* 51**,** 21-36.

FRANCIS, J. 2004. What Do We Know about Audit Quality? *The British Accounting Review,* 36**,** 345-368.

FRANCIS, J. R. & KRISHNAN, J. 1999. Accounting Accruals and Auditor Reporting Conservatism. *Contemporary Accounting Research,* 16**,** 135-165.

FRANCIS, J. R., MAYDEW, E. L. & SPARKS, H. C. 1999. The Role of Big 6 Auditors in the Credible Reporting of Accruals. *Auditing: A Journal of Practice & Theory,* 18**,** 17-34.

FRANKEL, R. M., JOHNSON, M. F. & NELSON, K. K. 2002. The Relation between Auditors' Fees for Nonaudit Services and Earnings Management. *The Accounting Review,* 77**,** 71-105.

FRIEDLAN, J. M. 1994. Accounting Choices of Issuers of Initial Public Offerings. *Contemporary Accounting Research,* 11**,** 1-31.

GARCÍA LARA, J. M., OSMA, B. G. & NEOPHYTOU, E. 2009. Earnings Quality in Ex-Post Failed Firms. *Accounting and Business Research,* 39**,** 119-138.

GERAKOS, J. J., LANG, M. H. & MAFFETT, M. G. 2011. Listing Choices and Self-Regulation: The Experience of the AIM. *SSRN eLibrary*. Available at http://ssrn.com/abstract=1740809

GIVOLY, D. & HAYN, C. 2000. The Changing Time-Series Properties of Earnings, Cash Flows and Accruals: Has Financial Reporting Become More Conservative? *Journal of Accounting and Economics,* 29**,** 287-320.

GOMPERS, P. & LERNER, J. 1999. An Analysis of Compensation in the U.S. Venture Capital Partnership. *Journal of Financial Economics,* 51**,** 3-44.

GOMPERS, P. & LERNER, J. 2001. The Venture Capital Revolution. *The Journal of Economic Perspectives,* 15**,** 145-168.

GRAHAM, J. R., HARVEY, C. R. & RAJGOPAL, S. 2005. The Economic Implications of Corporate Financial Reporting. *Journal of Accounting and Economics,* 40**,** 3-73.

GRAMLICH, J. D. & SORENSEN, O. 2004. Voluntary Management Earnings Forecasts and Discretionary Accruals: Evidence from Danish IPOs. *European Accounting Review,* 13**,** 235 - 259.

GREENE, W. 2003. *Econometric Analysis*. Englewood Cliffs, NJ: Prentice Hall.

GUAY, W. R., KOTHARI, S. P. & WATTS, R. L. 1996. A Market-Based Evaluation of Discretionary Accrual Models. *Journal of Accounting Research,* 34**,** 83-105.

GUL, F. A., FUNG, S. Y. K. & JAGGI, B. 2009. Earnings Quality: Some Evidence on the Role of Auditor Tenure and Auditors' Industry Expertise. *Journal of Accounting and Economics,* 47**,** 265-287.

GUNNY, K. A. 2010. The Relation Between Earnings Management Using Real Activities Manipulation and Future Performance: Evidence from Meeting Earnings Benchmarks*. *Contemporary Accounting Research,* 27**,** 855-888.

HAN, J. C. Y. & WANG, S.-W. 1998. Political Costs and Earnings Management of Oil Companies during the 1990 Persian Gulf Crisis. *The Accounting Review,* 73**,** 103-117.

HEALY, P. 1996. Discussion of a Market-Based Evaluation of Discretionary Accrual Models. *Journal of Accounting Research,* 34**,** 107-115.

HEALY, P. M. 1985. The Effect of Bonus Schemes on Accounting Decisions. *Journal of Accounting and Economics,* 7**,** 85-107.

HEALY, P. M. & PALEPU, K. G. 1993. The Effect of Firms' Financial Disclosure Strategies on Stock Prices. *Accounting Horizons,* 7**,** 1-11.

HEALY, P. M. & PALEPU, K. G. 2001. Information Asymmetry, Corporate Disclosure, and the Capital Markets: A Review of the Empirical Disclosure Literature. *Journal of Accounting and Economics,* 31, 405-440.

HECKMAN, J. J. 1979. Sample Selection Bias as a Specification Error. *Econometrica,* 47**,** 153-161.

HENSLER, D. A., RUTHERFORD, R. C. & SPRINGER, T. M. 1997. The Survival of Initial Public Offerings in the Aftermarket. *Journal of Financial Research,* 20**,** 93-110.

HERRMANN, D., TATSUO, I. & B., T. W. 2003. The Sale of Assets to Manage Earnings in Japan. *Journal of Accounting Research,* 41**,** 89-108.

HOGAN, C. E. 1997. Costs and Benefits of Audit Quality in the IPO Market: A Self-Selection Analysis. *The Accounting Review,* 72**,** 67-86.

HOLTHAUSEN, R. W. 1990. Accounting Method Choice: Opportunistic Behavior, Efficient Contracting, and Information Perspectives. *Journal of Accounting and Economics,* 12**,** 207-218.

HRIBAR, P. & NICHOLS, D. C. 2007. The Use of Unsigned Earnings Quality Measures in Tests of Earnings Management. *Journal of Accounting Research,* 45**,** 1017-1053.

HSU, G. C. M. & PING-SHENG, K. 2005. Does the Presence of Institutional Investors Influence Accruals Management? Evidence from Australia. *Corporate Governance: An International Review,* 13**,** 809-823.

IBBOTSON, R. G. & JAFFE, J. F. 1975. "Hot Issue" Markets. *The Journal of Finance,* 30**,** 1027-1042.

IPINO, E. & PARBONETTI, A. 2011. Mandatory IFRS Adoption: The Trade-Off between Accrual and Real-Based Earnings Management. *SSRN eLibrary*. Available at*:* http://ssrn.com/abstract=2039711

IQBAL, A., ESPENLAUB, S. & STRONG, N. 2009. Earnings Management around UK Open Offers. *The European Journal of Finance,* 15**,** 29-51.

JAGGI, B. & PICHENG, L. 2002. Earnings Management Response to Debt Covenant Violations and Debt Restructuring. *Journal of Accounting, Auditing & Finance,* 17**,** 295-324.

JAIN, B. A. & KINI, O. 1994. The Post-Issue Operating Performance of IPO Firms. *The Journal of Finance,* 49**,** 1699-1726.

JAIN, B. A. & KINI, O. 2000. Does the Presence of Venture Capitalists Improve the Survival Profile of IPO Firms? *Journal of Business Finance & Accounting,* 27**,** 1139-1183.

JAIN, B. A. & MARTIN, C. L. 2005. The Association Between Audit Quality and Post-IPO Performance: A Survival Analysis Approach. *Review of Accounting and Finance,* 4**,** 50 - 75.

JEANJEAN, T. & STOLOWY, H. 2008. Do Accounting Standards Matter? An Exploratory Analysis of Earnings Management before and after IFRS Adoption. *Journal of Accounting & Public Policy,* 27**,** 480-494.

JENKINSON, T. & RAMADORAI, T. 2010. Does One Size Fit All? The Consequences of Switching Markets with Different Regulatory Standards*. *SSRN eLibrary*. Available at http://ssrn.com/abstract=971699

JENSEN, M. C. 1993. The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems. *The Journal of Finance,* 48**,** 831-880.

JENSEN, M. C. & MECKLING, W. H. 1976. Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics,* 3**,** 305-360.

JIANG, J., PETRONI, K. R. & YANYAN WANG, I. 2010. CFOs and CEOs: Who Have the Most Influence on Earnings Management? *Journal of Financial Economics,* 96**,** 513-526.

JIRAPORN, P., MILLER, G. A., YOON, S. S. & KIM, Y. S. 2008. Is Earnings Management Opportunistic or Beneficial? An Agency Theory Perspective. *International Review of Financial Analysis,* 17**,** 622-634.

JO, H., KIM, Y. & PARK, M. 2007. Underwriter Choice and Earnings Management: Evidence from Seasoned Equity Offerings. *Review of Accounting Studies,* 12**,** 23-59.

JOHNSON, E., KHURANA, I. K. & REYNOLDS, J. K. 2002. Audit-Firm Tenure and the Quality of Financial Reports*. *Contemporary Accounting Research,* 19**,** 637-660.

JONES, J. J. 1991. Earnings Management During Import Relief Investigations. *Journal of Accounting Research,* 29**,** 193-228.

KASZNIK, R. 1999. On the Association between Voluntary Disclosure and Earnings Management. *Journal of Accounting Research,* 37**,** 57-81.

KEASEY, K. 2006. Executive Compensation in the UK. *Journal of Financial Regulation and Compliance,* 14**,** 235 - 241.

KEASEY, K., MCGUINNESS, P. & SHORT, H. 1990. Multilogit Approach to Predicting Corporate Failure—Further Analysis and the Issue of Signal Consistency. *Omega,* 18**,** 85-94.

KEASEY, K., THOMPSON, S. R. & WRIGHT, M. 2005. *Corporate Governance: Accountability, Enterprise and International Comparisons*: John Wiley & Sons Ltd.

KEY, K. G. 1997. Political Cost Incentives for Earnings Management in the Cable Television Industry. *Journal of Accounting and Economics,* 23**,** 309-337.

KHURANA, I. K. & RAMAN, K. K. 2004. Litigation Risk and the Financial Reporting Credibility of Big 4 versus Non-Big 4 Audits: Evidence from Anglo-American Countries. *The Accounting Review,* 79**,** 473-495.

KIM, B. H., LISIC, L. L. & PEVZNER, M. 2011. Debt Covenant Slack and Real Earnings Management. *SSRN eLibrary*. Available at http://ssrn.com/abstract=1701218

KLEIN, A. 2002. Audit Committee, Board of Director Characteristics, and Earnings Management. *Journal of Accounting and Economics,* 33**,** 375-400.

KOTHARI, S. P., LEONE, A. J. & WASLEY, C. E. 2005. Performance Matched Discretionary Accrual Measures. *Journal of Accounting and Economics,* 39**,** 163-197.

KOTHARI, S. P., MIZIK, N. & ROYCHOWDHURY, S. 2012. Managing for the Moment: The Role of Real Activity Versus Accruals Earnings Management in SEO Valuation. *SSRN eLibrary*. Available at http://ssrn.com/abstract=1982826

KRISHNAN, G. V. 2003. Does Big 6 Auditor Industry Expertise Constrain Earnings Management? *Accounting Horizons,* 17**,** 1-16.

KRISHNAN, G. V. & VISVANATHAN, G. 2008. Does the SOX Definition of an Accounting Expert Matter? The Association between Audit Committee Directors' Accounting Expertise and Accounting Conservatism*. *Contemporary Accounting Research,* 25**,** 827-858.

KUANG, Y. F. 2008. Performance-Vested Stock Options and Earnings Management. *Journal of Business Finance & Accounting,* 35**,** 1049-1078.

LANG, M., SMITH RAEDY, J. & WILSON, W. 2006. Earnings Management and Cross Listing: Are Reconciled Earnings Comparable to US Earnings? *Journal of Accounting and Economics,* 42**,** 255-283.

LAUX, C. & LAUX, V. 2009. Board Committees, CEO Compensation, and Earnings Management. *The Accounting Review,* 84**,** 869-891.

LAWRENCE, A., MINUTTI-MEZA, M. & ZHANG, P. 2011. Can Big 4 Versus Non-Big 4 Differences in Audit-Quality Proxies Be Attributed to Client Characteristics? *The Accounting Review,* 86**,** 259-286.

LECLERE, M. J. 2000. The Occurrence and Timing of Events: Survival Analysis Applied to the Study of Financial Distress. *Journal of Accounting Literature,* 19**,** 158-189.

LEE, G. & MASULIS, R. W. 2011. Do More Reputable Financial Institutions Reduce Earnings Management by IPO Issuers? *Journal of Corporate Finance,* 17**,** 982-1000.

LEGGETT, D., PARSONS, L. M. & REITENGA, A. L. 2009. Real Earnings Management and Subsequent Operating Performance. *SSRN eLibrary*. Available at http://ssrn.com/abstract=1466411

LENNOX, C. S., FRANCIS, J. R. & WANG, Z. 2012. Selection Models in Accounting Research. *The Accounting Review,* 87**,** 589-616.

LEONE, A. J., MINUTTI-MEZA, M. & WASLEY, C. 2012. Outliers and Inference in Accounting Research. Chicago Booth Business School-Accounting Research Center. Available at: http://faculty.chicagobooth.edu/workshops/accounting/archive/pdf/LMW_2012_April15.pdf.

LEVITT, A. L. 1998. The "Numbers Game."Remarks by Chairman Arthur Levitt to the NYU Centre for Law and Business, New York. Available at: http://www.sec.gov/news/speech/speecharchive/1998/spch220.txt

LI, J. & ZHOU, J. 2006. Earnings Management and Delisting Risk of Initial Public Offerings. *SSRN eLibrary*. Available at: http://ssrn.com/abstract=641021

LIM, C.-Y. & TAN, H.-T. 2008. Non-audit Service Fees and Audit Quality: The Impact of Auditor Specialization. *Journal of Accounting Research,* 46**,** 199-246.

LIN, J.-R. P. 2003. The Long-Run Underperformance of Post-Listing Stock Returns: The Evidence of Earnings Management. *SSRN eLibrary*. Available at http://ssrn.com/abstract=341740

LITVINTSEV, G. S. 2009. At What Do Venture Capitalists AIM? *SSRN eLibrary*. Available at*:* http://ssrn.com/abstract=1677633

LO, K. 2008. Earnings Management and Earnings Quality. *Journal of Accounting and Economics,* 45**,** 350-357.

LOUIS, H. 2004. Earnings Management and the Market Performance of Acquiring Firms. *Journal of Financial Economics,* 74**,** 121-148.

LOWRY, M. & SCHWERT, G. W. 2002. IPO Market Cycles: Bubbles or Sequential Learning? *The Journal of Finance,* 57**,** 1171-1200.

LYON, J. D., BARBER, B. M. & TSAI, C.-L. 1999. Improved Methods for Tests of Long-Run Abnormal Stock Returns. *The Journal of Finance,* 54**,** 165-201.

MAYHEW, B. W. & WILKINS, M. S. 2003. Audit Firm Industry Specialization as a Differentiation Strategy: Evidence from Fees Charged to Firms Going Public. *Auditing: A Journal of Practice & Theory,* 22**,** 33-52.

MCNICHOLS, M. & WILSON, G. P. 1988. Evidence of Earnings Management from the Provision for Bad Debts. *Journal of Accounting Research,* 26**,** 1-31.

MCVAY, S. E. 2006. Earnings Management Using Classification Shifting: An Examination of Core Earnings and Special Items. *The Accounting Review,*3, 501-503.

MEGGINSON, W. L. & WEISS, K. A. 1991. Venture Capitalist Certification in Initial Public Offerings. *The Journal of Finance,* 46**,** 879-903.

MENDOZA, J. M. 2008. Securities Regulation in Low-tier Listing Venues: The Rise of the Alternative Investment Market. *Fordham Journal of Corporate and Financial Law***,** 257–328.

MILLER, G. S. & SKINNER, D. J. 1998. Determinants of the Valuation Allowance for Deferred Tax Assets under SFAS No. 109. *The Accounting Review,* 73**,** 213-233.

MORSFIELD, S. G. & TAN, C. E. L. 2006. Do Venture Capitalists Influence the Decision to Manage Earnings in Initial Public Offerings? *The Accounting Review,* 81**,** 1119-1150.

MURPHY, K. 1999. Chapter 38 Executive Compensation. In: ORLEY, C. A. & DAVID, C. (eds.) *Handbook of Labor Economics.* Elsevier.

MYERS, J. N., MYERS, L. A. & OMER, T. C. 2003. Exploring the Term of the Auditor-Client Relationship and the Quality of Earnings: A Case for Mandatory Auditor Rotation? *The Accounting Review,* 78**,** 779-799.

NYGAARD, A. & MYRTVEIT, I. 2000. Moral Hazard, Competition and Contract Design: Empirical Evidence from Managerial, Franchised and Entrepreneurial Businesses in Norway. *Applied Economics,* 32, 349-356.

OSMA, B. G. 2008. Board Independence and Real Earnings Management: The Case of R&D Expenditure. *Corporate Governance: An International Review,* 16**,** 116-131.

OSMA, B. G. A. & YOUNG, S. 2009. R&D Expenditure and Earnings Targets. *European Accounting Review,* 18**,** 7-32.

PEASNELL, K., POPE, P. & YOUNG, S. 2005. Board Monitoring and Earnings Management: Do Outside Directors Influence Abnormal Accruals? *Journal of Business Finance & Accounting,* 32**,** 1311-1346.

PERRY, S. & GRINAKER, R. 1994. Earnings Expectations and Discretionary Research and Development Spending. *Accounting Horizons,* 8**,** 43-51.

PETERSEN, M. A. 2009. Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. *Review of Financial Studies,* 22**,** 435-480.

RANGAN, S. 1998. Earnings Management and the Performance of Seasoned Equity Offerings. *Journal of Financial Economics,* 50**,** 101-122.

REICHELT, K. J. & WANG, D. 2010. National and Office-Specific Measures of Auditor Industry Expertise and Effects on Audit Quality. *Journal of Accounting Research,* 48**,** 647-686.

RICHARDSON, V. J. 2000. Information Asymmetry and Earnings Management: Some Evidence. *Review of Quantitative Finance and Accounting,* 15**,** 325-347.

RITTER, J. R. & WELCH, I. 2002. A Review of IPO Activity, Pricing, and Allocations. *The Journal of Finance,* 57, 1795-1828.

RODRÍGUEZ-PÉREZ, G. & HEMMEN, S. V. 2010. Debt, Diversification and Earnings Management. *Journal of Accounting and Public Policy,* 29**,** 138-159.

RONEN, J., TZUR, J. & YAARI, V. 2006. The Effect of Directors' Equity Incentives on Earnings Management. *Journal of Accounting and Public Policy,* 25**,** 359-389.

ROSNER, R. L. 2003. Earnings Manipulation in Failing Firms. *Contemporary Accounting Research,* 20**,** 361-408.

ROOSENBOOM, P., VAN DER GOOT, T. & MERTENS, G. 2003. Earnings Management and Initial Public Offerings: Evidence from the Netherlands. *The International Journal of Accounting,* 38**,** 243-266.

ROYCHOWDHURY, S. 2006. Earnings Management through Real Activities Manipulation. *Journal of Accounting and Economics,* 42**,** 335-370.

SCHIPPER, K. 1989. COMMENTARY on Earnings Management. *Accounting Horizons,* 3**,** 91-102.

SCHULTZ, P. 1993. Unit Initial Public Offerings: A Form of Staged Financing. *Journal of Financial Economics,* 34**,** 199-229.

SCOTT, W. R. 1997. *Financial Reporting Theory, International Edition.* Prentice Hall, New Jersey.

SINGER, Z. & FEDYK, T. 2011. IPO Valuation and Accounting Choices. *SSRN eLibrary*. Available at http://ssrn.com/abstract=1798205

SMITH, C. W. & WATTS, R. L. 1992. The Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies. *Journal of Financial Economics,* 32**,** 263-292.

SOHN, B. C. 2011. Do Auditors Care About Real Earnings Management in Their Audit Fee Decisions? *SSRN eLibrary*. Available at http://ssrn.com/abstract=1899189

SOK-HYON, K. & SIVARAMAKRISHNAN, K. 1995. Issues in Testing Earnings Management and an Instrumental Variable Approach. *Journal of Accounting Research,* 33**,** 353-367.

STATA. 2005. *Base Reference Manual: Stata 9, Volume III*. College Station: Stata Press.

SUBRAMANYAM, K. R. 1996. The Pricing of Discretionary Accruals. *Journal of Accounting and Economics,* 22**,** 249-281.

SWEENEY, A. P. 1994. Debt-Covenant Violations and Managers' Accounting Responses. *Journal of Accounting and Economics,* 17**,** 281-308.

TEACHMAN, J. D. 1983. Analyzing Social Processes: Life Tables and Proportional Hazards Models. *Social Science Research,* 12**,** 263-301.

TEOH, S. H., WELCH, I. & WONG, T. J. 1998a. Earnings Management and the Long-Run Market Performance of Initial Public Offerings. *The Journal of Finance,* 53**,** 1935-1974.

TEOH, S. H., WELCH, I. & WONG, T. J. 1998b. Earnings Management and the Underperformance of Seasoned Equity Offerings. *Journal of Financial Economics,* 50**,** 63-99.

TEOH, S. H., WONG, T. J. & RAO, G. R. 1998c. Are Accruals during Initial Public Offerings Opportunistic? *Review of Accounting Studies,* 3**,** 175-208.

TITMAN, S. & TRUEMAN, B. 1986. Information Quality and the Valuation of New Issues. *Journal of Accounting and Economics,* 8**,** 159-172.

TRUEMAN, B. & TITMAN, S. 1988. An Explanation for Accounting Income Smoothing. *Journal of Accounting Research,* 26**,** 127-139.

VAN TENDELOO, B. & VANSTRAELEN, A. 2005. Earnings Management under German GAAP Versus IFRS. *European Accounting Review,* 14**,** 155 - 180.

VISVANATHAN, G. 2008. Corporate Governance and Real Earnings Management. *Academy of Accounting and Financial Journal* 12.

WATTS, R. & ZIMMERMAN, J. 1986. *Positive Accounting Theory*. Englewood Cliffs, NJ: Prentice-Hall.

WEBER, J. & WILLENBORG, M. 2003. Do Expert Informational Intermediaries Add Value? Evidence from Auditors in Microcap Initial Public Offerings. *Journal of Accounting Research,* 41**,** 681-720.

WHISENANT, S., SANKARAGURUSWAMY, S. & RAGHUNANDAN, K. 2003. Evidence on the Joint Determination of Audit and Non-Audit Fees. *Journal of Accounting Research,* 41**,** 721-744.

WILLENBORG, M. & MCKEOWN, J. C. 2001. Going-Concern Initial Public Offerings. *Journal of Accounting and Economics,* 30**,** 279-313.

WONGSUNWAI, W. 2012. The Effect of External Monitoring on Accrual-Based and Real Earnings Management: Evidence from Venture-Backed Initial Public Offerings. *Contemporary Accounting Research***,** Forthcoming.

XIE, B., DAVIDSON III, W. N. & DADALT, P. J. 2003. Earnings Management and Corporate Governance: The Role of the Board and the Audit Committee. *Journal of Corporate Finance,* 9**,** 295-316.

YANG, J. S. & KRISHNAN, J. 2005. Audit Committees and Quarterly Earnings Management. *International Journal of Auditing,* 9, 201-219.

YU, W. 2008. *Accounting-Based Earnings Management and Real Activities Manipulation.* Dissertation, Georgia Institute of Technology.

YUN, F., BARUA, A., CREADY, W. M. & THOMAS, W. B. 2010. Managing Earnings Using Classification Shifting: Evidence from Quarterly Special Items. *The Accounting Review,* 85**,** 1303-1323.

YUNG, C. & ZENDER, J. F. 2010. Moral Hazard, Asymmetric Information and IPO Lockups. *Journal of Corporate Finance,* 16**,** 320-332.

ZANG, A. Y. 2012. Evidence on the Trade-Off between Real Activities Manipulation and Accrual-Based Earnings Management. *The Accounting Review,* 87**,** 675-703.

ZAROWIN, P. & OSWALD, D. R. 2005. Capitalization vs Expensing of R&D and Earnings Management. *SSRN eLibrary*. Available at http://ssrn.com/abstract=739225

ZHANG, W. 2008. Real Activities Manipulation to Meet Analysts' Cash Flow Forecasts. *SSRN eLibrary*. Available at http://ssrn.com/abstract=1013228