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THE RELATIONSHIP BETWEEN THE MANDATORY ADOPTION OF INTERNAL CONTROL REGULATION AND EARNINGS MANAGEMENT: EVIDENCE FROM CHINA

By

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A thesis submitted in partial fulfilment for the requirements for the degree of Doctor of Philosophy at the University of Central Lancashire

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"Stay hungry, Stay foolish."

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Abstract

This thesis focuses on an investigation of the relationship between the mandatory adoption of internal control regulation and earnings management in Chinese listed firms, using data between 2007 and 2016. We used accrual earnings management (AEM_DA) as the main proxy for earnings management. After controlling for firm characteristics, and corporate governance variables, the findings indicate that the mandatory adoption of internal control regulation was significantly and negatively associated with earnings management. To check the robustness of the results, we examine whether the mandatory adoption of internal control regulation had a similar impact on three measures of real earnings management. They are: (i) abnormal cash flow from operations (REM_CFO), (ii) abnormal discretionary expenses (REM_DISX), and (iii) abnormal production costs (REM_PROD). The results show that the impact of mandatory adoption of internal control regulation was generally consistent across all forms of earnings management. However, it had more effect on accrual earnings management than real earnings management. In particular, we found that it had limited effects on constraining real earnings management by manipulating production activities. We also used the propensity score matching (PSM) method to confirm the robustness of our findings. As one of the pioneering studies on the Chinese internal regulatory environment, this thesis contributes to studies on the effectiveness of internal control regulation on the quality of financial information.

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Chapter 1 Introduction

1.1 Background

Since the 1990s, the Chinese government has endeavoured to bring about an economic transition. Some government policies, such as the privatisation of state-owned enterprises and the development of capital markets, have boosted China's economy at incredible speed. A modern business style has helped the Chinese stock market grow into one of the world's largest in under 20 years. Today, more than 2000 firms are listed on the main board of the Chinese stock market. However, critics argue that most Chinese firms lack an effective corporate governance system (e.g., Morck and Yeung, 2014), consistently resulting in pervasive low performance, financial fraud and even business failure. In addition, China continues to gradually open its capital markets to international investors. The rapid processes of globalisation are resulting in fierce competition worldwide. An open market and intense competition encourage firms to flex their business models and enter new business markets, innovating products, providing new services and raising funds from the stock market. However, financial markets are becoming increasingly volatile, with general turbulence characterising the corporate world (Bastia, 2008). For example, the 2008 financial crisis revealed the dramatic failures of corporate governance and risk management systems, which are supposed to safeguard against aggressive risk-taking (Kirkpatrick, 2009; Kumar and Singh, 2013). Thus, how to govern firms has become an increasingly hot topic in China's academic, business and policy circles.

After the major scandals of the early 21st century (e.g. Enron and WorldCom), the internal control of corporations began to attract increasing attention from regulators worldwide. Improving the integrity of firms' financial reporting, strengthening the corporate governance

system, and enhancing managers' and external auditors' ability to monitor firms' financial reporting have become popular topics in academic work and practical applications. Following this trend, in 2005, the State Council of the People's Republic of China required several relevant departments led by the Ministry of Finance to actively study the internal control systems of a comprehensive set of enterprises. In 2008, the Ministry of Finance and four other departments[1] jointly issued the first internal control norms, the *Basic Standard for Enterprise Internal Control*, which became mandatory for Chinese-listed firms to adopt in 2012. These internal control regulations, in line with the Sarbanes–Oxley Act, aim to improve the corporate governance of listed firms and enhance the integrity of financial information in China.

1.2 Internal control in China

High-profile corporate failures and accounting scandals fuelled a debate about how best to regulate corporate governance and the accounting profession. A wave of financial scandals also swept through China in the late 1990s and early 2000s, such as the financial fraud committed by Yin Guangxia and the China Air Oil Holding Company's bankruptcy, due to poor internal control and loose management. With the fading of the old economic system and the development of a market economy in China, the importance of strengthening internal governance and risk management has become more apparent for Chinese enterprises.

In the early 21st century, China's financial institutions began to establish a system of internal control and risk management alongside the proposal of the new Basel Agreement and the

[1] The China Securities Regulatory Commission (CSRC), the China Banking Regulatory Commission, the National Audit Office of the People's Republic of China and the China Insurance Regulatory Commission.

urgent need for China to join the World Trade Organization (WTO). From 2002 to 2006, several Chinese government departments, including the China Securities Regulatory Commission (CSRC), the China Banking Regulatory Commission and the Bank of China, introduced several regulations to develop and strengthen the financial industry's internal control system. Subsequently, regulators began to develop internal control policies for state-owned companies and listed firms in China. In 2006, the Shanghai and Shenzhen stock exchanges issued internal control guidelines requiring listed firms to disclose internal control self-assessments and certified audit reports. However, the abovementioned rules and regulations proved ambiguous. Moreover, because of a lack of understanding of internal control among regulators and managers and weak regulatory enforcement, constructing an internal control system eventually became an encouraged formality rather than a set of mandatory enforcement measures. Before 2008, the Chinese government made efforts to improve the internal control of listed firms by issuing a series of standard documents. However, these regulations and rules on internal control were published by different government departments rather than being unified, which meant they lacked effectiveness and could not be enforced. Yet, these efforts laid a theoretical and practical foundation for introducing unified internal control norms in China.

In 2008, five Chinese government departments jointly issued the country's first internal control regulations, the *Basic Standard for Enterprise Internal Control*, along with supplementary regulations. These Chinese internal control regulations are based on the COSO[2] 1992 Internal

[2] COSO, short for the Committee of Sponsoring Organizations of the Treadway Commission, is responsible for providing leadership through the development of frameworks and guidance on enterprise risk management, internal control and fraud deterrence.

Control–Integrated Framework (the COSO framework) and the COSO 2004 Enterprise Risk Management–Integrated Framework (COSO EMR).

Starting on 1 January 2012, all firms listed on the main board of Chinese stock markets were required to follow the Chinese internal control regulations to construct a comprehensive set of internal controls. The regulations cover all types of risks, addressing fraud, assuring transparency and making reliable financial reporting possible. They are expected to foster an effective internal corporate governance mechanism among Chinese firms. In the past, managers have been found to have manipulated firms' earnings and presented inconsistent financial statements, either to mislead investors or for their own self-interest. The past decade has witnessed several accounting scandals and corporate failures related to earnings management (Cornett et al., 2008). In this context, the mandatory adoption of Chinese internal control regulations provides an excellent opportunity to evaluate the effectiveness of internal control mechanisms in improving the quality of financial information.

1.3 Objectives of the study

This research investigates the relationship between the mandatory adoption of Chinese internal control regulations and earnings management among Chinese listed firms.

To achieve this, we developed two objectives:

- To examine whether the mandatory adoption of Chinese internal control regulations constrains accrual earnings management.

- To examine whether the mandatory adoption of Chinese internal control regulations constrains real earnings management.

1.4 Motivations of the study

Three main factors motivated this dissertation. First, China's remarkable economic transformation and rapid growth have attracted substantial attention from scholars and policymakers worldwide (Nolan, 2002). As the world's second-largest economy, China's sheer size and influence in global markets make it a pivotal area of study (Naughton, 2007). Their unique cultural and historical factors, such as Confucian values and the influence of the Chinese Communist Party, significantly shape its business practices (Redding, 1990). With the development of globalization, Chinese market has received increasing attention from international investors, regulators, and policymakers (Buckley et al., 2007). With regard to its political economy, China's institutional environment differs considerably from that of Western countries. China is currently characterised by high economic growth, a weak legal environment, and strong government intervention but poor investor protection (Chen et al., 2013). Empirical results have shown that performance and governance quality are relatively lower in Chinese listed firms than in firms in the developed countries (Fan et al., 2007). Some scholars argue that corporate governance in China is only 'window dressing', with Chinese companies adopting the form but not the substance of corporate governance (e.g. Morck and Yeung, 2014). With a mixture of state-owned enterprises (SOEs) and private firms, the Chinese market creates a unique opportunity for studying governance practices (Ding & Knight, 2008). As a prevalent issue in China, earnings management is influenced by state ownership, political factors, and unique market dynamics (Chen et al., 2017). By investigating the effects of the mandatory adoption of internal control regulations, this thesis provides evidence on whether

internal control mechanisms represent an effective means of improving the overall corporate governance and operations of listed firms and generating benefits for stakeholders in the unique Chinese context.

Second, the introduction of Chinese internal control regulations provides a suitable setting for examining the influence of the mandatory adoption of specific rules. Many regulations and policies are voluntarily adopted. The agency and legitimate theories suggest that when managers are regulated by rules and regulations formulated by external agencies, they are forced to pursue shareholder interest (DiMaggio & Powell,1983; Jensen & Meckling, 1976). Therefore, they are more likely to publish understandable, reliable and relevant financial reports. Such quality reports allow us to understand the necessity of the mandatory adoption of Chinese internal control regulations and their effectiveness.

Third, the current literature in this field mainly focuses on the relationship between internal control quality and earnings management (for example, Wali and Masmoudi,2020). Earnings management has largely recognised as a practice that have negative effect on reliability and informative of financial information. For example, Li (2019) argued that earnings management has negative impact on earnings persistence and its informativeness about future cash flows. Therefore, China has made efforts to strengthen its regulatory framework to mitigate earnings management (Liu, et al., 2019). However, the effects of mandatory adoption of internal control regulations remain unclear. The literature review in Chapter 2 discusses this in more detail.

1.5 Significance and contributions of the study

First, the present research mainly contributes to the internal control and earnings management literature. By using the Chinese-context data from 2007 to 2016, our research finds that the mandatory adoption of internal control regulation has significant negatively relationship with earnings management. This relationship is more noticeable when we used accrual earnings management as proxy, As noted above, previous studies have primarily examined the relationship between internal control quality and earnings management. Limited attempts have been made to investigate the effects of adopting internal control regulations on earnings management. However, these have provided mixed evidence and have mainly been carried out in non-Chinese settings. Delineating these studies helps us to reconcile the unclear results previously reported in the literature.

Second, most prior studies have used basic regressions, such as ordinary least squares (OLS), to examine the relationship between adopting internal control regulations and earnings management. In contrast, this study uses the quantile regression technique, whose use in earnings management literature is novel. This approach provides a more comprehensive understanding of the effect of adopting internal control regulations on earnings management. To our knowledge, we are the first to use this method in this context. We also address some endogeneity issues in our analysis.

Third, our study provides direct empirical evidence for regulators. It tests the effectiveness of Chinese internal control regulations in improving the quality of financial information. Since these regulations are in the same vein as the COSO internal control framework, our findings also provide evidence regarding the usefulness of this framework, thus providing inspiration for regulators in the development of regulations. Besides, Chinese internal control regulations cover wider scope than the US-based SOX policy. Chinese internal control regulations include

rules on both financial and non-financial perspectives. Our study can also provide evidence regarding the effectiveness of this wider scope internal control regulation.

1.6 Thesis structure

The thesis comprises seven chapters, including the introduction, which has summarised the study's background, aims, motivation and contribution. The remainder of the thesis is structured as follows: Chapter 2 explains the underlying theory and definitions of internal control and earnings management, reviews the current literature on internal control and earnings management, identifies the research gaps and develop our hypotheses. Chapter 3 explains the study's research philosophy, identifies the data sources and describes the data collection process. We also present our empirical models and variable calculations. Chapter 4 discusses the basic empirical results obtained from quantile regression using accrual earnings management as a dependent variable. Chapter 5 reports our robustness test results. We replace accrual earnings management with real-based earnings management as an alternative measure of earnings management. The purpose is to check whether the main results' conclusions remain unchanged when we redefine our measure of accounting malpractice. Secondly, we use propensity score matching (PSM) to mitigate potential endogeneity issues to robust our main findings. Chapter 6 reports the results of additional analysis. We first apply a different model to reperform our regression analysis. Secondly, we create sub-sampling group to perform our analysis. Finally, Chapter 7 summarises our key findings and discusses practical implications, the limitations of our study and recommendations for future research.

Chapter 2 Literature review

Following the introduction of the study in the previous chapter, this chapter explains the concepts of internal controls and earnings management. Relevant theory and main existing literatures are reviewed. Thus, the current research gaps of concern are identified. This chapter is organized into sections as follows: Section 1 discuss relevant theories. Section 2 reviews definitions and the main streams of the extant literature in relation to internal control and earnings management. Section 3 discusses the previous studies that exploring relationship between internal controls and earnings management. This section will also highlight research gaps in the literature (and how this study intent to address them). Section 4 develops the main hypothesis on the association between the adoption of internal control regulation and earnings management. Lastly, Section 5 will summaries the chapter.

2.1 Theoretical framework

Agency theory

This study aims to investigate the relationship between the mandatory adoption of internal control regulation and earnings management in the context of Chinese public companies. Hence, agency theory, which is commonly recognised as the underpinning theory of internal control and earnings management research, is discussed in this section.

Agency theory is a conceptual reflection on the consequences of the separation of ownership and control in modern corporations in which the shareholders possess little or no direct control over management decisions. Modern organisations have widely dispersed ownership in the form of shareholders (principles) who are not normally involved in the day-to-day management of the companies. Hence, a separate group of people (managers) is appointed to manage the company's daily operations. They act as agents on behalf of principles. This separation between

ownership and management may result in conflicts of interest between agents and principals, which in turn creates costs associated with resolving these conflicts (Jensen & Meckling, 1976; Eisenhardt, 1989). Managers are often pursuing their personal gains and working to advance their own interests rather than considering the interests of shareholders and maximising shareholder wealth. While it is expected that managers should work according to shareholders' best interests, controversy exists because principals are unable to monitor the activities of their agents (Jensen & Meckling 1976). Eisenhardt (1989) stated that agency problems occur when 'the goals of the principal and agent conflict and it is difficult and costly for the principal to verify what the agent is actually doing'.

The extant literature argues that the information asymmetry will result in two main issues: moral hazard and adverse selection. The moral hazard describes a situation where a party lacks the incentive to guard against a financial risk due to being protected from any potential consequences. Moral hazard occurs when an individual or a group of people involved in a business transaction are able to observe their own actions, but others cannot (Lasdi, 2013). Information asymmetry gives top managers a dominant position in managing financial information, as it is possible that they might deceive other stakeholders regarding the organisation's financial health. Thus, the use of earnings management implies a moral hazard problem (Zhang et al., 2008). Adverse selection occurs when one party has more information regarding business operations than other parties do (Chung et al., 2009; Abad et al., 2018). Managers hold more superior information than outside investors as they are engaged in the day-to-day operations of the business. They might take advantage of their privileged position to manipulate earnings for pursuing private goals. As discussed, the separation often leads to agency problems, where managers may not always act in the best interests of shareholders. Earnings management, the practice of using accounting discretion to influence reported

earnings, can be viewed as a manifestation of agency problems. Managers, acting as agents, might manipulate earnings to meet certain objectives. Previous studies have shown that managers have numerous incentives to deliberately mismanage earnings. They might want to signal artificially high firm performance to stakeholders, generate personal gains (such as high compensation) and meet or beat market expectations (Noronha et al., 2008; Madhogarhia et al., 2009; Habbash & Alghamdi, 2015). However, the misreported earnings hide the true picture of financial performance and can be identified as an agency cost (Davidson et al. 2005). In order to effectively limit the agency costs caused by the separation of ownership and control, Fama and Jensen (1983) propose that firms utilise a system that can limit agency costs and assure the shareholders' interests are met. Previous studies have suggested that strictly monitoring (DeFond and Jiambalvo, 1994) and lowering information asymmetry can mitigate principal–agency conflicts, constraining the opportunistic behaviour of managers (Klein, 2002). From an agency theory viewpoint, the regulations can be seen as mechanisms that reduce information asymmetry between managers and shareholders. They act as a bonding system, whereby managers are compelled to commit to acting in the best interests of the shareholders. Additionally, these regulations serve as a monitoring tool, reducing the agency costs associated with supervising management actions. Agency theory provides a framework for the governance of firms through both internal and external mechanisms (Weir et al., 2002). These governance mechanisms are designed to ensure alignment between the interests of principals and agents, protect shareholder interests and minimise agency costs (Davis et al., 1997).

The Internal Controls is a process designed to provide reasonable assurance to achieve the effectiveness and efficiency of operations, safeguarding of assets, reliable financial reporting, compliance with applicable laws and regulations, and strategy alignment. The internal controls

system aims to help align the interests of managers with those of shareholders by ensuring that business operations are conducted in a manner that is consistent with the organization's objectives and strategies. An effective internal controls system is expected to reduce information asymmetry between managers and shareholders. For example, a reliable financial reporting provides shareholders with more accurate and timely information which contain less earnings manipulation, that enabling statement users to have better understanding of firms' performance. In addition, internal controls system serves as a monitoring mechanism for shareholders. By establishing more transparent procedure, internal controls system help detect and prevent fraud, errors, and the misuse of resources. Several studies have investigated the relationship between internal control quality and earnings management practices (e.g., Doyle et al, 2007). Generally, it is argued that an effective internal control system can reduce information asymmetry and managers' discretion in the manipulation of earnings. The mandatory adoption of internal control regulation is expected to strengthen the responsibility of managers, auditors and the corporate governance system. Thereby, agency costs and information asymmetry are expected to be reduced. With the introduction of internal control regulation by government, the use of earnings management is expected to be reduced.

Institutional theory

Institutional theory offers a theoretical framework for the study of social, economic and organisation behaviour political dynamics (DiMaggio & Powell, 2000; North, 1991). Institutional theory is based on the premise that all organisations tend to align with accepted norms and social influences since failure to do so would result in losing their legitimacy and might affect their image (Carruthers, 1995; DiMaggio & Powell, 1983). According to Meyer (2009), institutional theory present a view of the world in which a collective cultural understanding of society influences individuals, nation-states and organisations. Carpenter and

Feroz (2001) highlighted that 'institutional theory views organisations as operating within a social framework of norms, values, and taken-for-granted assumptions about what constitutes appropriate or acceptable economic behaviour'. In line with these notions, institutional theory suggests that organisations conform to regulatory changes as they are rewarded for doing so through increased legitimacy, resources and survival capabilities (Scott, 1987). Once the organisational field is structured and powerful forces become present, this eventually leads to organisations within the field becoming very similar (DiMaggio & Powell, 1983). DiMaggio and Powell (1983) argue that it is important for organisations to follow institutionalised rules in order to gain legitimacy and survival capabilities. In line with this notion, Carpenter and Feroz (2001) argue that institutional theory emphasises the importance of affected parties adhering to international accounting standards to gain legitimacy and social acceptability. Firms must follow the external parties' financial reporting standards, including government regulations, professional accounting bodies' guidelines and stock exchange authorities' requirements, to ensure their survival (Habbash & Alghamdi, 2015; Scott, 1987; Vadasi et al., 2019). According to our research, internal control regulations by external agencies (Chinese government) with the force of law are more likely to encourage managers to pursue shareholders' interests and publish reliable financial reports. Adopting internal control regulations not only improves the quality of financial information but also usually boosts the organisation's image.Thus, it is interesting to investigate whether managers in Chinese-listed companies are less likely to engage in earnings manipulation after the mandatory adoption of internal control regulations.

In addition, institutional theory explores how firms legitimise their operations. Organisations largely rely on support from the government, authorities and society to gain the necessary resources, such as finance, technology and labour, to achieve their objectives (Scott, 1987).

DiMaggio and Powell (1983) use the term “isomorphism” to describe the process of homogenisation. They argue that different firms in the same regulatory environment tend to adopt similar business standards because of pressure from authorities, desire for professional recognition, economic benefits and social expectation. Institutional isomorphism makes organisations conscious of what is happening in their industry (Aldrich, 1979; DiMaggio & Powell, 1983). Therefore, isomorphism is a fundamental aspect of institutional theory. In this research, we expect that the growing demand for high-quality financial information and effective internal control systems from regulators, domestic and international investors, and creditors will force firms to reduce earnings management.

2.2 Empirical literature review

2.2.1 Review of internal control

2.2.1.1 What is internal control?

The literature offers several definitions of internal controls. The first formal definition of internal control was developed by the American Institute of Accountants (AIA) in 1949 (Lakis and Giriūnas, 2012). They stated that ‘Internal control comprises the plan of organisation and all the co-ordinate methods and measures adopted within a business to safeguard its assets, check the accuracy and reliability of its accounting data, promote operational efficiency and encourage adherence to prescribed policies’ (AIA, 1949). This definition has been criticised for being too brief and creating a misunderstanding of the auditors’ accountability and legal liability. The American Institute of Certified Public Accountants (AICPA) improved the definition in 1958, classifying internal control as both accounting and administrative controls. Accounting controls refer to using an auditor to safeguard assets and ensure the reliability of financial statements, while administrative controls refer to procedure to ensure operational efficiency and adherence to managerial policies (AICPA, 1958). This definition was revised

by AICPA in 1973, clarifying that internal controls are 'the procedures and records that are concerned with safeguarding assets'. Until this point, definitions of internal control were focused on defining the scope and functions of internal control.

Professional accounting bodies have continued to develop various definitions for internal control, For example, Rutterman (1994) acknowledge that internal control were established in order to provide reasonable assurance of (a) the safeguarding of assets against unauthorised use or disposition; and (b) the maintenance of proper accounting records and the reliability of financial information used within the business or for publication. In addition, COSO (1992) framework define Internal control is as a process, effected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in the following categories: effectiveness and efficiency of operations, reliability of financial reporting and compliance with applicable laws and regulations. In contrast to the earliest definitions of internal control (e.g. those of AIA in 1949 and AICPA in 1958), the above definitions of internal control developed by professional bodies from 1960 to the 1990s were not only focused on the function of internal controls, but also include other organisation-related factors. Personnel, for example, is included in several definitions, as it is an important element in implementing an internal control system.

Outside of professional bodies, academics have also developed definitions of internal control base on different research objectives. First, Romney and Steinbart (2003) define the internal control is 'a plan or method that will be used for the organisations to preserve their assets, provide accurate and reliable information, promote and improve operational efficiency, and encourage adherence to prescribed managerial policies'. Similarly, Hayes et al, (2005) state an

internal control is ‘a procedure that guides the board of directors and management to monitor and achieve all the performance and profitability goals in the firms’. However, Amudo and Inanga (2009) argue internal control should be more financial reporting focused. They state an internal control is ‘a system to monitor and control the manipulation, and accounting scandals in the financial statements in the developed and emerging markets’.

Although the above definitions differ from each other, all highlight that the main aim of internal control is to prevent any potential errors, mistakes or fraud that might occur during the preparation of financial statements. The definitions acknowledge that the significance of an internal control system is in the ‘safeguarding of assets, the integrity and reliability of financial and operational information and compliance with rules and regulations’ (Siwangaza et al., 2014). Strong internal controls are more likely to increase transparency and reliability in financial statements (Doyle et al, 2007). Internal controls cannot be separated from management functions—planning, organizing, staffing, directing, leading, controlling and coordinating—as both are working to achieve firm objectives (Chambers and Rand, 1997).

After the major financial scandals of the early 21st century (e.g., Enron and WorldCom), corporate internal controls have been attracting more scrutiny from investors and regulators around the world. Strengthening corporate governance, monitoring managers and external audits have been given unprecedented attention in both academic work and practical applications. To address investors’ increasing concern about the integrity of firms’ financial reporting and weak corporate governance, regulators in many countries have introduced major reforms expanding the responsibility of managers, auditors and corporate governance. To respond to the accounting scandals, the U.S. government released the Sarbanes-Oxley Act (SOX) to enhance corporate governance, financial transparency and investor protection among

U.S.-listed companies (Sarbanes, 2002). The SOX mainly regulates the composition and accountability of the board. For example, it requires the presence of independent audit committees with financial expertise on the board. Additionally, CEOs and CFOs are required to certify the accuracy of financial statements. Furthermore, the SOX strengthens the roles of internal controls in financial reporting and of external auditors in quality assurance. In particular, the act also legalised protection for whistle-blowers. The implementation of and compliance with the SOX are mainly monitored and enforced by the U.S. Securities and Exchange Commission (SEC) and the Public Company Accounting Oversight Board (PCAOB).

With the successfully passage of the Sarbanes-Oxley Act in the U.S. in 2002, regulators around the world began to enhance the internal control. Since 2005, the Chinese government has gradually developed a set of internal control regulations and implementation guidelines based on the 1992 COSO Internal Control-Integrated Framework (COSO framework) and COSO's 2004 Enterprise Risk Management-Integrated Framework (COSO EMR). COSO is a shorthand for the Committee of Sponsoring Organizations of the Treadway Commission. It is a joint initiative of five private sector organizations in the U.S. and is dedicated to providing thought leadership through the development of frameworks and guidance on enterprise risk management, internal control and fraud deterrence. The Chinese internal control regulations follow the structure of the COSO framework and embody the essentials of COSO EMR in their content (Chen et al 2017). Compared with the U.S. SOX, which focuses mainly on improving financial reporting integrity, Chinese internal control regulations are wider in scope. Firstly, they provide rules on managing financial, operational and compliance risks. Secondly, they contain regulations to guide listed firms on compliance with all applicable laws, regulations and industry standards (e.g. tax laws, environmental regulations, and labour laws). Thirdly,

they also protect an organisation's assets from theft, fraud, misuse or damage, and they ensure that proper controls are in place for asset management. Finally, they aim to optimise business processes and resource allocation to enhance operational efficiency and effectiveness.

For the purpose of this study with its focus on China, we utilise the COSO framework that defines internal control as:

"...a process, effected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in the following categories:

-Effectiveness and efficiency of operations;

-Safeguarding of assets;

-Reliability of financial reporting;

-Compliance with applicable laws and regulations;

-Strategy: high-level goals, aligned with and supporting its mission."

The Chinese internal control regulations include five control components: internal environment, risk assessment, control activities, information and communication, and internal monitoring. These regulations are intended to establish an effective internal corporate governance mechanism in Chinese corporations. The internal control system is expected to cover all types of risk and fraud, assure quality of work, increase transparency among departments and ensure the reliability of financial reporting. The internal control system also addresses the detailed responsibilities of personnel at all levels. This is expected to mitigate agency problems at each level of company - not only limited to senior management, as other corporate governance mechanisms frequently do.

2.2.2.1 Analysis of internal control in the extant literature

This section will discuss the current main streams of research in relation to internal control. Following the lead of the US, many jurisdictions have established regulated internal control systems since 2001. Accordingly, there has been an increase in internal control research in recent decades, with studies primarily focusing on the quality of internal control. However, there is no consensus on measures of internal control quality. The literature proposes various proxies for internal control quality, such as the existence of internal control weakness (e.g. Cheng et al., 2013), the number of internal control weaknesses (e.g., Lu et al., 2011), the existence of the internal control report (e.g., Nakashima and Ziebart , 2015) and a self-construct internal control quality index (e.g., Chen et al.,2016). This section will include: (i) determinants of internal control quality, and (ii) implications of internal control quality.

Determinants of internal control quality

(i) Corporate governance and internal control quality

It is widely accepted that how corporation are governed plays a significant role in formulating internal control systems (Krishnan, 2005). The relationship between internal control quality and board characteristics has been researched widely. Schneider et al. (2009) argue that board independence is positively associated with internal control quality. By contrast, Chen et al. (2017) found a negative relationship between board independence and the disclosure of internal control weaknesses. These opposing conclusions could result from using different data sets. Although both studies are based on the US setting, the former analysed data from 2004 to 2005, whereas the latter covered a longer period from 2004 to 2012. For Japan, the findings by Yazawa (2015) align with those in Schneider et al. (2009). By using Chinese datasets, Hu et al (2014) found that the percentage of independent directors is positively associated with internal

control quality. In Ghana, Agyei-Mensah (2016) observed that board independence was positively associated with disclosures of internal control. In addition, some studies also examined the relationship between internal control quality and the gender of top managers. Parker et al (2017) and Chen et al (2016) found that the percentage of females on the board was significantly related to the probability of reported internal control weakness.

As a key person in the management of the firm, the CEO's characteristics are known to influence the internal control system. Thomas (2004), used ownership of CEO and CEO-chairman's combined role as proxy, argued that the power of the CEO can affect internal control quality. Their research found that a CEO who has strong power can influence the appointment of external and internal directors and thus influence the internal control situation. Lin et al (2014) supported this argument, finding that a powerful CEO has the ability to create a monitoring system in order to achieve their personal interests. Besides, Campbell et al (2016) showed that the duration of the CEO/CFO's joint tenure is significantly negatively associated with internal control weakness. The study suggests that the longer the joint tenure, the lower the likelihood of internal control weakness. Their results suggest that the presence of a joint tenure contributes to a better internal control. Furthermore, He (2015) explored the relationship between internal control deficiencies and the CEO's compensation and pension plans and established that CEOs with larger compensation and pension plans care more about the firm and exhibits a greater commitment to the internal control system, thus they provide high quality of financial reporting. However, Lin et al. (2014) report an opposite result. They document that CEO shareholding, duality (CEO-chairman's combined role), CEO compensation, tenure, and age are all negatively associated with internal control quality. Again, the difference in results could be a result of different measurement techniques. In another study that uses European

datasets, Michelon et al. (2015) also found CEO duality exerts a negative effect on IC disclosures in four European financial markets.

Within the board of directors, audit committees have received particular attention from scholars. A number of studies have investigated the relationship between audit committee characteristics and the quality of internal control. They found that audit committee independence and expertise are positively associated with internal control quality (Schneider et al., 2009; Haislip, Peters, and Richardson, 2016; Lisic, et al, 2016). With respect to the government sector, Rich and Zhang (2014) document that municipalities with audit committees are associated with fewer internal control problems. However, Balsam et al (2014) found that financial expertise and the size of audit committees have an insignificant impact on the disclosure of internal control weaknesses. Using Egyptian datasets, Khlif and Samaha (2016) established that the frequency of audit committee meetings is positively associated with internal control quality. Michelon et al. (2015) also provided evidence that existence of expert committee members is positively associated with internal control quality.

Previous studies have also investigated the relationship between ownership structure and internal control quality. Using the availability of an internal control report as an indicator of the quality of internal control, they found that ownership concentration, institutional ownership, and managerial ownership all significantly affect whether a firm publishes its internal control report (Deumes and Knechel, 2008). Besides, multiple studies have provided evidence that family ownership is significantly associated with internal control quality (Weiss, 2014; Bardhan et al., 2015).

The internal audit department plays a crucial role in monitoring and detecting internal control weaknesses and reporting them to top management so that corrective actions can be taken in a timely manner. Therefore, research has examined whether the quality of internal auditing impacts IC quality in the firm. For example, Hanim et all (2005) and Mazza and Azzali (2015) demonstrated that better internal auditing is associated with better internal control quality in Malaysian and Italian settings, respectively. Their studies suggested that greater internal audit quality is related to a reduction in the severity and persistence of internal control deficiencies.

Besides internal auditors, the literature has also explored the impact of the external auditor's expertise on internal control quality. Some research has found that auditors with diversified expertise and client-specific knowledge are more likely to provide high-quality audit services. They are, therefore, expected to help their clients identify potential risks more effectively, reducing the frequency of internal control failures (Haislip et al., 2016; De Simone et al, 2015). In addition, previous studies have found that the use of Big-Four auditors (Khlif & Samaha, 2016; López, Rich, and Smith, 2013), auditor tenure (Chen et al., 2016), and auditor fees (Albring et al, 2016) are positively associated with internal control quality.

(ii) Other factors related to internal control quality

Alongside corporate governance characteristics, the extant literature has also explored other determinants of internal control quality. Firstly, the financial analysts following is recognised as an extra external monitoring mechanism (Hope, 2003). If more financial analysts study the firm's operation it is more difficult for the management to manipulate the data. Mao and Yu (2015) found that firms have less internal control weakness if analysts follow the cashflow of the firm. This finding can be interpreted as demonstrating that the number of analysts following has a positive impact on internal control quality.

Secondly, previous research has also explored the relationship between corporate culture and internal control quality. Companies with employee-friendly policies are more likely to have fewer employee-related internal control weaknesses. In countries with a prevalent individualistic culture, firms have higher numbers of internal control deficiencies (Kanagaretnam et al., 2016; Hooghiemstra, Hermes, and Emanuels, 2015). The potential reason for this could be that managers in countries characterised by high levels of individualism are more concerned with their own interests than with shareholders' wealth or stakeholders' requirements. They are more likely to use discretionary acts to achieve their own interests (Kanagaretnam et al., 2016).

Thirdly, product diversification of a firm also has impacts on internal control quality. Chen and Keung (2016) argue that corporate diversification is positively related to the disclosure of internal control weaknesses.

Fourthly, the literature also explored the relationship between the regulatory environment and internal control quality. It is widely accepted that a dense regulatory environment places pressure on firms to comply with rules and guidelines in order to survive (DiMaggio and Powell, 1983). In a comparative study, Sarens and Christopher (2010) found that strong corporate governance guidelines can improve internal control quality.

Lastly, market competition has also drawn researcher attention. Intense competition may lead managers to construct a high-quality internal control system to achieve low discretionary costs, improve inventory management, and increase customer satisfaction. Thereby, they can gain competitive advantages. Using a Chinese setting, Zhang and Chen (2016) showed that intense

product market competition is associated with a higher level of internal control quality. However, in a very competitive market, the firm might have high product costs, resulting in lower profitability. The firm might have a decreased capability to establish a high-quality internal control system, as the implementation of quality internal control requires financial resources (Ge and McVay, 2005). Supporting this argument, Kim and Kim (2015) provided evidence that companies operating in highly competitive markets have lower internal control quality.

The implications of internal control quality

(i) Internal control quality and creditor and investor decisions

Studies have suggested that internal control quality can affect creditors' lending decisions. If a firm has low internal control quality creditors are more likely to be concerned with the reliability of financial information as they may suspect that such firms have a higher information asymmetry between managers and lenders (El-Mahdy and Park, 2014), leading to a greater scrutiny of loan applications (Schneider and Church, 2008) and a subsequent negative effect on loan pricing (Costello and Wittenberg-Moerman, 2011). Therefore, creditors tend to link lower internal control quality to a higher rate of credit default (Tang, Tian, and Yan, 2015). Reviewing US studies, Schneider et al. (2009) confirmed a negative effect of lower internal control quality on the cost of debt. In other countries, Park et al (2017) and Guidara et al (2016) also found that internal control weakness results in higher borrowing costs.

Internal control quality affects investors' perception of risk. Ashbaugh-Skaife, et al(2009) suggested that poor internal control indicates impairment in the quality and precision of a firm's accounting information. Based on the theoretical framework developed by Easley and O'Hara

(2004), poor information quality results in investors being less informed. It also increases the variability and failure probability of firms (Ogneva et al, 2007). Studies suggested that lower internal control quality generally leads to a higher cost of equity capital and negative stock price reactions (e.g. Schneider et al., 2009). Importantly, low internal control quality harms the value of firm (Kuhn et al, 2013; Hu et al, 2013).

(ii) Internal control quality, corporate strategy and company performance

The impact of internal control on corporate strategy and performance has been explored in the literature. Regarding the firm's cash holding policies, Huang et al (2015) found that firms with internal control weaknesses hold more precautionary cash and cash equivalents for the "rainy day". A possible explanation is that the presence of internal control weaknesses increases the firm's reliance on internal financing (Pevzner and Gaynor, 2016). However, Gao and Jia (2016) found conflicting results: firms with weak internal control systems has fewer liquid assets than firms with effective internal control systems. In addition, Feng et al. (2015) found that an effective internal control system has a positive effect on inventory management, reducing inventory impairments.

Some studies investigated internal control quality and firms' investment decisions. For example, Cheng et al (2013) found that internal control quality has a significant positive impact on firms' investment efficiency. Similarly, Sun (2016) reported that firms with low internal control quality hold fewer investments. Additionally, studies confirmed that internal control weakness increases the possibility of misstatements in financial information and fraud (Myllymäki, 2014; Donelson et al, 2017), and decrease the timeliness of disclosure (Holder et al, 2016). Focusing on taxation behaviours, Gallemore and Labro (2015) found that firms with internal control weaknesses have lower effective tax rates and are less successful in tax

avoidance. Huang and Chang (2016) found that a firm with ineffective internal control is more likely to have higher deferred tax. In addition, studies have identified that internal control quality has a positive impact on a firm's profitability (Al-Thuneibat et al, 2015), and supervision and documentation process quality (Zakaria et al, 2016).

(iii) Internal control quality and stakeholders

With regard to internal stakeholders, internal control quality has a significant relationship with the tenure and compensation of top managers (CEOs and CFOs). If the quality of internal control is low, the quality and credibility of financial information shared by the firm will be doubted by investors in the stock market. An unfavourable stock market reaction can depress the bonuses of top managers, it even can result in the replacement of executives (Johnstone et al, 2011) or a reduction in their compensation (Hoitash et al, 2012; Hsu and Liao, 2012). Interestingly, Paletta and Alimehmeti (2018) found that executives earn higher compensation in firms with low-quality internal systems. A potential reason could be that managers in those firms are expected to be involved in the improvement of the internal control system. Some studies have focused on information technology (IT) related internal control weaknesses. For example, Kim et al. (2015) learned top managers have a high replacement rate if the firm has low IT internal control quality. Consistent with their study, Haislip et al (2016) report that in replacement hiring, firms are more willing to appoint a CFO with IT expertise.

(iv) Internal control quality and the work of external auditors

Several studies argued that internal control quality is expected to impact the work of external auditors. A weak internal control system indicates a firm might have higher risks, which could therefore increase the audit scope, effort and number of tests. Review papers in the US setting written by Asare et al. (2013), Bedard and Graham (2014) and Schneider et al. (2009) conclude

that internal control quality is negatively associated with audit delays, audit fees and the likelihood of auditor change. In line with these papers, Chen et al. (2014) confirm that low internal control quality significantly increases the percentage of audit delays. Studies in developing countries have found that internal control quality has a negative association with auditor fees (Wan-Hussin and Bamahros, 2013; Mazza and Azzali, 2018) and audit delays (Khlif and Samaha, 2014). Supporting previous studies, Haislip et al. (2016) document a positive association between the existence of material internal control weaknesses and auditor switching. As one of the main financial statement users, a financial analyst is highly reliant on a firm's financial information to formulate their forecasts (Clinton et al. 2014). Low internal control quality increases the presence of unintentional errors or misstatements in financial information and reduces the reliability of financial information (Clinton et al., 2014). Thus, financial analysts will experience more difficulties with forecasts. Clinton et al. (2014) provide evidence that the presence of internal control weakness reduces analysts' forecast accuracy and analysts' coverage, while Arping and Sautner (2013) have found that high internal control quality reduces earnings forecast errors and dispersion.

Summary

This section set out the definition of internal control. The two main streams in current research on internal control were reviewed. One stream of internal control research focuses on exploring the determinants of internal control quality. It was found that corporate governance features affect the formation of the internal control system. Namely, they focus on board independence, CEO characteristics, audit committee characteristics, internal control and external auditor and ownership structure. Research shows that company policy, diversification of products, market competition and regulatory environment have a significant effect on the quality of internal control.

The second stream of research in the field of internal control is devoted to the study of the impact of the quality of internal control. It was found that creditors and investors make strategic decisions based on internal control disclosure, suggesting that low internal control quality leads to high information asymmetry and, as a result, more uncertainty and risk. Studies have also found that there is a significant relationship between internal control quality and a firm's investment efficiency, inventory management, profitability, cash holding policy, taxation behaviours and faithful representation and timeliness of disclosure. In addition, few studies support that internal control quality affects stakeholder (mangers, external auditors and financial analysts) status, actions and performance.

2.2.2 Review of earnings management

2.2.2.1 Overview of Earnings management

Both professionals and academics acknowledge that earnings management has an important impact on the quality of financial reporting and that it can alter firm performance (Persakis and Iatridis, 2015; Vishnani et al., 2019). However, there is no consensus regarding the definition of earnings management (Beneish, 2001).

The prior literature provides broad guidance on the subject of corporate earnings management. Schipper (1989) initially defines earnings management as corporate management that deliberately manipulates numbers in financial statements for private gain. Following Schipper, Healy and Wahlen (1999) conclude that managers intentionally play with different accounting methods, such as the calculation of depreciation and revenue recognition, to alter earnings. They found that earnings management occurs 'when managers use personal judgment in reported earnings and alter transactions either to deceive stakeholders regarding the underlying

economic performance of the firm or to influence contractual outcomes, which are dependent on reported accounting outcomes.' Supporting this argument, Leuz et al. (2003) describe earnings management as the phenomenon whereby management uses GAAP-allowed accounting discretion to adjust their company's reported financial performance and position in an attempt to mislead different stakeholders. McKee (2005), meanwhile, claims that managers usually manipulate financial information by changing estimates and values of bad debts and by altering the assumptions for the calculation of depreciation (method). Seconding this, Piot and Janin (2007) describe earnings management as the practice of manipulating earnings by taking advantage of existing flexibility in GAAP to influence the reporting of key elements in financial statements[3].

It is widely accepted in the literature that accounting standards and policies provide the managers of firms with managerial discretion and flexibility. Thus, managers are able to exercise their judgement and discretion over accounting estimates and policies, enabling them to choose their preferred accounting method to change financial information when measuring and reporting financial performance (e.g. Dechow and Skinner, 2000). Executives might use earnings management to exercise discretion over the accounting numbers (Fields et al., 2001). By manipulating the financial data, managers can achieve certain earnings targets, meet market expectations, secure their jobs, and satisfy self-interests through compensation schemes (Nagar and Sen, 2016). Consistent with this, McVay (2006) claims that earnings management is the practice of concealing, or not displaying, a firm's real economic performance when managers seek to increase their wealth. In line with this, Ronen et al. (2008) describe earnings

[3] For example, the valuation and impairment of depreciation and impairment of non-current assets.

management as ‘taking advantage of the flexibility in the choice of accounting treatment to signal the manager’s private information on future cash flow.’ It involves ‘… choosing an accounting treatment that is either opportunistic (maximizing the utility of management only) or economically efficient.’ Additionally, it ‘… is the practice of using tricks to misrepresent or reduce transparency of the financial reports.’ In addition, Rahman et al. (2013) define earnings management as a process of accounting or controlling discretionary accruals to meet the expected sales revenue for a period.

It should be noted that one stream of studies views earnings management as a negative managerial behaviour. Researchers argue that managers utilise managerial discretion provided by accounting standards to manipulate financial figures (Xiong, 2006) and that the underlying economic performance of firms is misrepresented by managers through earnings management, which in turn reduces the reliability, transparency, and validity of the financial information (Schipper, 1989).

Despite these negative views of earnings management, Scott (2015) argues that the objectives of earnings management can either be negative or positive. Another stream of literature claims that earnings management can be informative, as it helps reduce information asymmetry between firms and external parties (Beneish, 2001). Earnings management is a phenomenon whereby firm management may use accounting discretion to select alternative numbers when preparing financial statements. However, the motivation to engage in earnings management may not solely be for private gain. Holtahusen (1990) argues that accounting choices (one technique in earnings management) increases the efficiency of contracts in terms of monitoring the conflicts of interests among different stakeholders. Jiraporn et al. (2008) argue that earnings management conveys private information to external investors and thus improves the

information value of earnings. This in turn helps users to predict the future cashflows of firms (Beneish, 2001) and reduces stock price volatility (Trueman and Titman, 1988). Previous studies argue that earnings management achieves greater accountability and transparency in company operations, thus helping investors to make better decisions, which should contribute to a more efficient capital market (e.g. Al-Jaifi, 2017). In line with this notion, Parfet (2000) encourages engagement in informative earnings management practices in order to maximise firm owners' value.

Although the purpose of earnings management can vary, earnings management is not prohibited by accounting standards. In other words, accounting standards grant corporate managers the discretion to selectively choose accounting data when preparing financial statements in an attempt to achieve their personal or corporate objectives. Dechow and Skinner (2000) argue that most 'negative' definitions of earnings management fail to differentiate between the practice of earnings management and fraudulent financial reporting. That is, earnings management takes place under an accepted accounting policy and involves a subtle bending of the rules, whereas the fraudulent financial reporting amounts to a clear breach of the rules. Examples of earnings management include delaying sales, accelerating or postponing advertising/research and development expenditures, and understating provision for bad debt, none of which break the accounting policy. Thus, earnings management and fraud are not the same.

Three widely used types of earnings management are:

(i) Accrual-based earnings management

Accrual-based earnings management is the first type of earnings management identified by academics. Accrual refers to revenue that appears in the income statement but has not yet been

received by the firm, as well as expenses that have been incurred but not yet paid. The timing discrepancy between the recognition of revenue and expense creates the difference between the income statement and the statement of cash flow. Accrual-based earnings management uses accounting choices or estimates to manipulate the numbers in the income statement and balance sheet but has no real impact on a firm's cash flow.

The development of methods for measuring accrual-based earnings management has a long history. According to the literature, total accounting accruals comprise non-discretionary accruals, which are economically determined and not subject to adjustment by management, and discretionary accruals, which are determined by management. Discretionary accruals is the part that allows managers to exercise their discretion over accounting choices and estimates to practice earnings management. (Healy, 1985; Jones, 1991; Dechow et al., 1995). Consistent with this notion, Jones (1991) proposed that accrual-based earnings management be measured using unexplained (discretionary) accruals. In this model, the assumption is that earnings accrual is a function of scaled revenue and scaled property, plant and equipment (PPE). Accruals identified using this model are deemed normal accruals, while unexplained accruals are labelled as discretionary accruals subject to earnings management. Subsequently, Dechow et al. (1995) mitigate the measurement error in Jones model, which improves the power of the test and is labelled as the Modified Jones model. After that, Dechow and Dichev (2002) presented a new model that measured earnings quality by examining the relationship between accruals and operating cash flow. Later, Kothari et al. (2005) proposed a model called the performance-matched discretionary accrual approach, which includes an intercept and control for the firm's performance using lag return on assets (ROA) to mitigate the problematic heteroskedasticity and mis-specification issues of the Jones and modified Jones models in estimating accruals.

There are three commonly used techniques based on accrual earnings management accounting principles: income smooth, big bath, and accounting choice. With the income smooth approach, firm managers attempt to smooth earnings in cases where the market reacts negatively to wide earnings fluctuations or when the cost of missing the threshold of debt covenants is high (Sun and Rath, 2010; Li and Richie, 2016). To accomplish this, managers reserve some earnings in good years and release them in bad years. This technique is sometimes called 'cookie jar reserve', with managers reserving 'cookies' (earnings) for rainy days. This technique causes a firm's earnings to be less volatile over time. For example, accounting standards allow managerial discretion in the estimation of provisions for doubtful debt. If the current-year earnings are expected to be high, managers may choose an aggressive allowance or provision for doubtful debt, which leads to a reduction in net profit. Then, in rainy-day periods when earnings are lower, managers reduce the provision to release the hidden earnings. With the second technique, big bath, managers recognise all possible costs in the current year within the discretion of accounting standards, which avoids losses in subsequent years. The big bath technique is often used when new managers are appointed, with the new managers transferring the responsibility for current losses to their predecessors. The basis for the third accrual-based earnings management technique, accounting choice, is that accounting numbers are likely to be different under different accounting policies. For example, managers may switch the assumption of inventory valuation from first-in, first-out (FIFO) to weighted average costing (WAC). When the purchase price of raw materials changes, the cost of goods sold figure will be different under FIFO versus WAC, which leads to different net profit figures. Previous studies have suggested that management's motivation for using the accounting choice technique to manipulate earnings is either self-interest or to maximize shareholders' interest (Francis, 2001).

(ii) Real earnings management

Unlike accrual-based earnings management, which has no impact on firms' cash flow, real earnings management affects cash flows. Roychowdhury (2006, p. 337) defined real earnings management as 'departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations'. Gunny (2010, p. 855) stated that real earnings management happens when 'managers undertake actions that change the timing or structuring of an operation, investment, and/or financing transaction in an effort to influence the output of the accounting system'. Real earnings management involves taking actions that affect a firm's operations rather than adjusting financial numbers as in accrual-based earnings management. For instance, managers could use aggressive discounting to boost revenue in a given year, which leads to losses in potential cash flow.

Real earnings management involves conducting actual operating activities, which are difficult to detect. The following examples discussed in Roychowdhury (2006) could be a signal or warning that managers are engaging in real earnings management: 1) accelerating or postponing Research and development (R&D) fees or advertising expenditures, 2) granting large discounts to credit customers if they pay in cash in advance, 3) overproducing goods to decrease the reported cost of goods sold, and 4) reducing discretionary expenses to improve reported profit. A certain level of these activities is accepted and even recommended in certain economic circumstances. However, a much higher than normal level of these activities would be considered real earnings management.

(iii) Classification shifting

Another type of earnings management is classification shifting, which involves misclassifying income statement components but leaving the bottom-line (net) income unchanged. More precisely, managers may shift some core expenses – such as the cost of goods sold, as well as sales, general, and administrative expenses – to the special item or non-recurring item category, which inflates core operating profit while leaving net income unaffected. This type of earnings management is motivated by the expectation of market participants, as investors and financial analysts show more interest in pro forma earnings (operating earnings) rather than the GAAP earnings (bottom line earnings). McVay (2006) was the first scholar to provide empirical evidence for the misclassification of income statement items. Fan et al. (2010) modified McVay's model by excluding current-year accruals because of the concerning that current-year accruals contains non-recurring items accruals. Extending the study of classification shifting, Malikov et al. (2018) stated that firms engage in classification shifting of non-operating revenues to inflate operating revenues.

In sum, the above three earnings management methods are widely used to manage accounting numbers. However, earnings management does have a cost. For accrual-based earnings management, these costs come in the form of scrutiny from auditors and regulators as well as accounting flexibility. When firms have high-quality auditors reviewing their aggressive accounting choices, earnings management is more likely to be detected. Thus, the cost of conducting accrual-based earnings management would be high. On the other hand, if firms are in a competitive market or have poor financial health, they may not have a significant opportunity to conduct real earnings management that could negatively affect their cash flow. Under this scenario, the cost of real earnings management is high. Zang (2012) found evidence that managers face a trade off in deciding between real earnings management and accrual-based

management. The choice of managers selecting the type of earnings management depends on the comparative cost of each type of earnings management.

Prominent Earnings management in China

As discussed in the previous section, existing studies catalogue three main types of earnings management: accrual earnings management, real earnings management and classification shifting. In the Chinese context, there are several streams of research on earnings management in previous studies. The first stream uses accrual earnings management as a proxy. For example, He et al. (2017) investigated whether dividend policy is associated with earnings management and whether the relationship varies across countries with wide-ranging degrees of institutional strength and transparency. They found that firms may employ dividend policies associated with less accrual manipulation to mitigate agency concerns and establish a credible reputation, thereby facilitating access to external funds. In addition, Lennox et al. (2018) investigated the function of auditors in detecting and correcting accrual earnings management before the stock-financed acquisitions. In the following year, Beuselinck et al. (2019), using a large sample of multinational corporations (MNCs), examined the location of earnings management within the firm. By focusing on accrual earnings management, they found that MNCs manage their consolidated earnings through an orchestrated reporting strategy across subsidiaries over which they exert significant influence. Recent research conducted by Qiu and Zhang (2023) investigates the consequences of earnings management triggered by earnings-based delisting regulations in China. They note that firms engage in more accrual earnings management to avoid delisting by stock exchange subject to delisting regulations.

The second stream of Chinese-context research focuses on real earnings management. Li (2019) investigated the effect of real earnings management on earnings persistence and its

informativeness about future cash flows. They found that real earnings management through the abnormal reduction in discretionary expenses is associated with deteriorated earnings quality. Cai et al. (2020) examined the association between religiosity and real earnings management. They found that real earnings management is more pronounced for firms with lower litigation risk (less religious) and firms with less reputable auditors. Additionally, Dong et al. (2020) examined the relationship between ownership structure and real earnings management in Chinese-listed firms. Subsequently, Chen et al. (2021) examined the relationship between the implementation of new technology and real earnings management. They found that real earnings management increases when firms face the pressure of implementing the new technology of eXtensible Business Reporting Language (XBRL). In the following year, Alkebsee et al. (2022) investigated the association between CEOs' and CFOs' cash compensation and real earnings management. Their main finding was that paying non-equity compensation to the CEO and CFO is negatively associated with real earnings management.

There are also few studies which employed both accrual and real earnings management as their earnings manipulation proxy. For example, Qi et al. (2018) investigated the association between a firm's use of earnings management strategies and the characteristics of its senior management team. They found that demographic characteristics (i.e. age, gender, educational level and financial work experience) of the management team are significantly associated with both accrual-based and real-activities-based earnings management.

The datasets used in the above studies overlap with ours (2007 to 2016) in terms of periods. The existing literature indicates that the most prominent types of earnings management from 2007 to 2016 are accrual earnings management and real earnings management.

2.2.2.2 Research on earnings management

This section will discuss the current main streams of research relating to earnings management. Agency theory suggests that managers have the incentive and space to apply opportunistic behaviour such as earnings management. Previous studies have largely focused on the motivation and constraints of earnings management. thus, this section will review previous studies by 1) motivation earnings management and 2) constraints of earnings management.

Motivations for earnings management

(i) Private benefits and earnings management

Jensen and Meckling (1976) analysed the opportunistic behaviour of managers, in which private benefits are gained at the expense of shareholders. Managers either avoid responsibility or spend excessively to promote these benefits. Healy (1985) presented evidence that indicates that managers engage in earnings management to increase their compensation and bonuses. DeAngelo (1988) provided corroboration by reporting that large profit-related bonuses motivated executives to engage in earnings management. Similarly, Cohen et al. (2008) and Zalata and Robert (2016) found that managers tend to engage in earnings management when their compensation package is performance-based. In addition, other performance-linked compensation such as stock options, bonuses, and equity holdings are incentives for managers to engage in earnings management (Dechow et al., 2012; Cohen et al., 2008; Cheng and Warfield, 2005).

Equity compensation has been criticised for involving a high degree of earnings management. Sloan (1996) found that options and stock compensation for managers are positively correlated

to the level of earnings management. By inflating stock prices in periods surrounding stock sales or option exercises, managers can increase their personal wealth. Consistent with this, Burns and Kedia (2006) found that CEOs who have a large number of option positions are more likely to manipulating the firm's earnings. Similarly, Beneish and Vargus (2002), Bergstresser and Philippon (2006) and Cheng and Warfield (2005) stated that when the compensation of managers is linked to stock value, especially through stock options, the firm has a higher level of earnings management. Moreover, Cornett et al. (2008) found that earnings management, through the use of discretionary accruals, is positively associated with the increase of the options compensation of CEOs. Furthermore, Li and Kuo (2017) found that among the firms with low growth opportunities, equity-based compensation for managers was positively related to earnings management. This positive association becomes weaker in firms which have growth opportunities.

In addition to compensation packages, managers manipulate earnings for job security. Ahmed et al. (2006) suggested that managers may conceal poor performance by manipulate earnings for securing their jobs or better job offers in the future. Beneish (1999) and Zang (2012) found that newly appointed managers often 'take a big bath' (i.e. record losses) in the first period of their appointment. This entails creating a large artificial loss at the beginning of their employment which they attribute to the work of previous managers. This loss then becomes a base for increases in reported earnings in subsequent years.

Results of previous studies largely support the positive relationship between earnings management and compensation, with few studies reporting opposite trends. For example, Cheng et al. (2016) found a negative association between compensation and earnings management in their analysis of US firms between 1993 and 2011. Similarly, Chou and Chan (2018) obtained the same findings in the banking industry.

(ii) Firm benefits and earnings management

Managers might smooth or inflate earnings through the manipulation of financial figures to produce the desired impression for the market. It is generally assumed that stock markets react favourably to firms that have steady and predictable earnings streams, whereas firms with volatile earnings or losses are penalised (Dechow et al., 2012). Therefore, managers strive to avoid negative earnings to prevent an undesirable reaction from the stock market (Jarvinen and Myllymaki, 2016). In addition, firms engage in earnings management to improve their credit rating, influence the market price of their shares or maintain or improve the reputation of management prior to shareholder meetings. Graham et al. (2005) provided empirical evidence that earnings management is undertaken to meet earnings benchmarks, meet or exceed analyst forecasts or build credibility with capital markets. In addition, Jensen (2005) found that substantially over-priced firms are more likely to manipulate earnings to maintain their over-valued position. Supporting this conclusion, Houmes and Skantz (2010) found a high level of earnings management among over-priced firms. Moreover, Badertscher (2011) determined that when firms must restate their financial statements because of financial statement irregularities, reported earnings tend to be managed in an upwards direction using earnings management methods for at least three years after this restatement to create the impression of a 'healthy' financial situation.

Furthermore, managers might engage in earnings management in support of corporate strategy. Louis (2004) found that acquisitional firms are more likely to manipulate their earnings before an acquisition. Similarly, McNichols and Stubben (2008) found that firms are more likely to engage in earnings management when they are intending to secure an investment, while other studies have reported that firms seeking investments may smooth their earnings to reduce the

predicted financial loss of the following year (Dechow et al., 2012). In addition, Bange and De Bondt (1998) found that managers change their research and development costs to reduce taxes or increase free cash flow.

Meeting the expectations of lenders and creditors is an important aim of business, and an incentive for earnings management. Managers may engage in earnings management by increasing reported earnings to ensure that debt covenants are not violated. This strategy was documented by DeFond and Jiambalvo (1994) and Jarvinen and Myllymaki, (2016). In addition, Cohen et al. (2012) found a positive relationship between the use of debt financing and upward earnings management.

Constraints of earnings management

(i) Audit quality and earnings management

The main purpose of financial reporting is to provide useful information to the users of financial statements to help them make informed economic decisions. Firms are required to present timely reliable information to investors and creditors to maintain their participation in capital markets (Chen et al., 2005). Auditing plays a significant role in verifying the accuracy of the stated earnings of firms (Zhou and Elder, 2004). A higher audit quality indicates that the auditor was better able to detect and report material misstatements and earning manipulation in the financial statements, which results in more reliability in the financial reporting process for shareholders and investors.

Previous research has indicated that auditors with industry-specific experience and knowledge can better detect errors in financial information than generalist auditors. Industry-specific auditors are more capable of identifying inherent and control risks associated with a certain

industry (Krishnan, 2003; Komal, et al, 2023; Ezeani, et al, 2023), and the use of these auditors has been found to reduce accounting standard violations and increase earnings quality (Dunn and Mayhew, 2004). Firms dealing with high-quality auditors have been shown to have less earnings management (Balsam et al., 2003; Salem et al, 2021). This indicates that specialist auditors are more capable to identify unusual transactions initiated by management, thereby reducing the room for managerial opportunistic behaviour. Similarly, Cohen and Zarowin (2010) and Chi et al. (2011) found that the use of 'Big' auditors can be negatively associated with earnings management. The findings of those authors indicate that high auditor quality limits the discretion of managers to manipulate financial data. Using audit fees as a proxy of auditor quality, Gul et al. (2007) found a negative relationship between the fees of the auditor and the appearance of manipulation of financial information.

In addition to external auditors, several studies examined the relationship between the characteristics of audit committees (internal auditors) and earnings management (for example, Usman, et al 2022). The findings were mixed. The majority of these studies found no significant relationship between the size of the audit committee and earnings management (e.g. Baxter and Cotter, 2009), whereas the meeting frequency of the auditor committee was negatively associated with earnings management (e.g. Abbott et al., 2004). As discussed above, CEO compensation is positively correlated with earnings management. However, it has been argued that higher compensation relates to greater monitoring efforts of audit committees and other monitors. Laux and Laux (2009) found that with effective audit committees which provide efficient oversight, managers with high compensation are less engaged in earnings management.

(ii) Board of directors composition and earnings management

One responsibility of the Board of Directors is to monitor manager' activities. Previous studies have investigated the function of independent board directors in constraining earnings management, but the findings were contradictory. Several studies used the number of independent directors on the Board as a measure of independence. For example, studies on US data by Dechow et al. (1996) and Klein (2002) reported a negative relationship between Board independence and earnings management. Peasnell et al. (2000) conducted a similar study using UK samples and confirmed these results. However, Sarkar et al. (2008) found that increasing Board independence did not affect earnings management behaviour.

The literature has identified board size and meeting frequency as important factors influencing the effectiveness of the Board; therefore, these may also affect earnings management (Mersni and Othman, 2016; Alqatan et al., 2019; Ezeani, et al 2023). The literature suggests that larger Boards correspond to improved overall monitoring effectiveness, which in turn restrains opportunistic managerial behaviours, including that of earnings mismanagement (Peasnell et al., 2005; González and García-Meca, 2014). However, the findings are inconsistent in relation to meeting frequency, although more active Boards (those with more meetings) tend to better reflect shareholder interests because directors are compelled to invest greater energy and time into understanding the affairs of the firm (Conger et al. 1998). However, empirical evidence provides opposite findings. For example, Metawee (2013) found a significant positive relationship between Board activity and earnings management. These results are consistent with those of Jensen (1993), who stated that the Board might not efficiently monitor the managers because this would take additional time in high-frequency board meetings.

(iii) Ownership structure and earnings management

Previous studies have mainly focused on examining the relationship between earnings management and three types of ownership structure (managerial ownership, institutional ownership and concentrated ownership). The literature argues that a low level of managerial ownership encourages managers to focus on maximising their self-interest over the interests of the firm and shareholders (Fama and Jensen, 1983). In this situation, managers use opportunistic discretion to spend the resources of the firm unfavourably and manipulate earnings (Jensen and Meckling, 1976). The results of previous studies support this argument, whereby increasing managerial ownership was found to correlate to reduced earnings management and greater quality of financial reporting (Gul et al., 2002; Klein, 2002). The findings of these authors indicate that have higher ownership percentages makes the interests of managers highly correlated with those of other shareholders. Hence, these managers are less motivated to manipulate the reported earnings. Conversely, a few studies found a positive relationship between managerial ownership and earnings manipulation (e.g., Klassen 1997). Those authors argued that high managerial ownership results in ineffective management decision-making, as it encourages managers to engage in activities that result in misstated financial information to purse their self-interests.

Institutional ownership refers to stock that is held by investment firms, funds, and other large entities rather than individual, retail investors. It is largely agreed that institutional investors are effective in monitoring manager discretion (Ferreira and Matos, 2008; Ezeani, et al, 2022). Previous studies have found negative relationships between institutional investors and earnings management (e.g., Cornett et al. 2008). These authors suggested that the presence of

institutional shareholders can help control managers by limiting their opportunistic behaviours, thereby reducing associated costs.

Concentrated ownership has been shown to impact the quality of reported earnings. Concentrated ownership refers to shareholdings held by large investors (block-holders). De Miguel et al. (2004) stated that when large block-holders exercise their monitoring powers, they tend to restrain the motives of managers to focus on areas of self-interest which damage shareholder benefits. The empirical evidence suggests that concentrated ownership can increase the transparency of the practises and operations of the firm, thereby reducing the earnings management practise (Kouaib and Jarboui, 2014). In contrast, when block-holders have an excessively high ownership level, they tend to work towards their own interests. Previous research has found a positive association between the presence of concentrated ownership and earnings management (Halioui and Jerbi, 2012). Those findings suggest that the large block-holders intervene in firm management and induce managers towards upward earnings management methods.

Summary

This section provided the definition of earnings management, reviewed the three current main types (accrual earnings management, real earnings management and misclassification shifting), and their practical techniques. Furthermore, this section reviewed the main streams of research in earnings management. One of these mainstream research methods focused on exploring the motivation behind this process. Consistent with agency theory, prior research suggests that private benefits for managers such as compensation and job security are the main incentives for managers to exercise earnings management techniques. In addition, at the firm level, firms might engage in earnings management to achieve a higher credit rating, obtain a favourable

market price for their shares, maintain or improve management's reputation prior to shareholders meetings or meet lender and creditor expectations. Additionally, previous studies have indicated that firms might engage in earnings management to align with their corporate strategy. For example, Louis (2004) found that acquisition firms are more likely to manipulate their earnings before an acquisition.

The second stream of earnings management research concerns the constraints of this strategy. A large amount of research has examined the relationship between corporate governance mechanisms and earnings management. These studies found that audit quality (the use of 'big' external auditors and audit committee experience and expertise), board characteristics (board size, meeting frequency, board independence, gender diversification and duality) and ownership structure (managerial ownership, institutional ownership and concentrated ownership) impact the usage of earnings management. Besides, a more informative disclosure will be the impact of earnings management (Salem,2023). In general, these findings suggest that a stronger governance system will restrain the opportunistic behaviour of managers to manipulate earnings.

2.3 Research Gap

The above two sections have provided a systematic review of the literature on earnings management and internal control, respectively. A strong internal control system has been shown to be associated with preventing earnings management that undermines financial reporting quality. Accordingly, regulators expect the implementation of effective internal controls to improve corporate transparency and increase reliability in financial statements (Doyle et al, 2007). Research exploring the relationship between internal controls and earnings management has gained momentum in recent years.

In the US setting, Doyle et al (2007) used data from 2002 to 2005 to show that the existence of material deficiencies in a firm's internal control system imply weak internal control quality. This translates into a significant risk of material misreporting of financial information, whether intentional or unintentional. Their findings suggest that a poor internal control system will result in an underestimation of expense provisions for bad debt. A similar study conducted by Chan et al (2008) argued that internal control quality affects accrual earnings management. Moreover, Goh and Li (2011) examined the relationship between internal control quality and timely loss recognition. They found that firms with weak internal controls exhibited greater accrual earnings management. Jaggi et al (2015), using data from 2004 to 2008, found that among firms with weak internal controls, having an expert auditor is positively correlated with earnings quality. Using data from 2004 to 2010, Dowdell, Herda, and Notbohm (2014) investigated the association between the existence of internal control disclosures and discretionary accruals. They documented that positive relationship between financial information quality and release of internal control report, suggesting that such disclosures reduced the information asymmetry, thereby mitigate the earnings management. In addition, Järvinen and Myllymäki (2016), using data from 2004 to 2012, and Lenard et al (2016), using data from 2004 to 2010, investigated whether the quality of an internal control system is associated with real earnings management practices. Their findings suggested that firms with material internal control weaknesses engage in more manipulation of real activities (particularly inventory overproduction). This extends the internal control literature by providing positive relationship between internal control quality and real earnings management.

Research on the association between internal control quality and earnings management in non-US settings has also expanded. Earlier research conducted by Lu et al. (2011) used Canadian

data from 2006 to examine the association between internal control weakness and accrual quality. In contrast to similar research in the US, they found no association between the two. Using French data from 2012 to 2018, Boulhaga et al (2022) investigated the relationship between internal control quality and the quality of the information in financial statements. Using both accrual and real earnings management as proxies for the quality of financial information, they found that a strong internal control system can mitigate accrual earnings management whereas it does not reduce real earnings management. Moreover, Van de Poel and Vanstraelen (2011), using Netherlands data, found that a statement of effective internal control is associated with a reduction in discretionary accruals.

As discussed above, most studies primarily focused on examining relationship between the quality of internal control and earnings management. The impact of internal control regulation has been largely neglected. Few studies attempted to investigate the relationship between the adoption of internal control regulations and earnings management and findings are mixed. Using US data, Cohen (2008) documented that since the passage of internal control regulation (the Sarbanes-Oxley Act) in 2002, accrual earnings management has declined significantly while real earnings management have increased significantly, suggesting that firms switched from accrual-based to real earnings management methods after the adoption of internal control regulation. Moreover, Garg (2018) examined the effects of the adoption of internal control regulation (internal control certification requirements) on the earnings management among Australian firms in the period from 2007 to 2015. The results suggested that in the post-adoption period, firms engaged in more real earnings management than accrual earnings management. In the same vein, Brown, Pott, and Wömpener (2014) examined the effect of internal control regulation (Legislation on Control and Transparency of 1998) in Germany on earnings quality. By focusing on accrual earnings management, they found that firms

experienced an increase in timely loss recognition and a decrease in earnings smoothing in the post-adoption period. Subsequently, Nakashima and Ziebart (2015) examined whether internal control regulation in Japan influenced earnings quality and earnings management for Japanese firms. They documented an insignificant change in accruals management and real earnings management.

Academics have also used Chinese data to contribute to internal control and earnings management research. For example, using Chinese listed firms from 2008 to 2009 as datasets, Li et al. (2012) found a positive association between internal control weakness and discretionary accruals. Ji and Lu (2017) used a 2010–2011 sample of 1,059 listed firms that voluntarily provide internal control reports to investigate the relationship between voluntary disclosure of internal control weaknesses and earnings quality in China. They used discretionary accruals as a proxy for earnings quality and found that there is a significant relationship between earnings management and the disclosure of internal control weakness. Similarly, Ji et al (2020) only used data from 2007 in concluding that the existence of internal control weaknesses is negatively associated with accrual quality. Ji et al (2015), using samples from 2010 to 2011, provided evidence that discretionary accruals are significantly associated with reporting internal control weakness. Previous studies explore the impact of the adoption of regulations, but they largely focus on the International Financial Reporting Standards (IFRS). By using the U.S. data, Ipino and Parbonetti (2017) investigated the trade-off between accrual earnings management and real earnings management. Mongrut and Winkelried (2019) and Setiawan et al. (2019) conducted similar studies in Latin America and Indonesia, respectively. In general, these studies conclude that the adoption of stricter accounting regulations will alter managers' approach to earnings management. In addition, Kim et al. (2019) investigated the relationship between earnings management and the implementation of

new technology regulations. They found that implementing new technology regulations reduced accrual earnings management but increased real earnings management. Because these studies used non-Chinese settings, the universality of their findings is uncertain. There are a few Chinese-context studies that explore the impact of adopting a regulation on earnings management. For example, Cang et al. (2014) and Ho et al. (2015) investigated the impact of adopting the International Financial Reporting Standards (IFRS) on the detectability and magnitude of earnings management, respectively. In addition, Chen (2021) investigated the change in real earnings management among Chinese-listed firms after the implementation of new technology regulations. However, the relationship between the adoption of internal control regulation and earnings management in a Chinese context still remains unclear.

Collectively, there are several limitations in existing literatures. There is only a limited number of studies examining the relationship between the adoption of internal control regulation and earnings management, especially in China which the focus of attention of this thesis. Their conclusions are contradictory because findings are mixed. There are at least three reasons that justifies the investigation undertaken in the thesis. One is conceptual and the other two are methodological. First, it could be argued that the available conclusions based on data and circumstances outside of China are likely to be of only limited value as far as the Chinese system is concerned. The effectiveness of Chinese internal control regulations is ambiguous because China's regulatory enforcement is relatively weak (Chen et al, 2020). Second, empirical analysis in previous studies (for example, Cohen, 2008; Garg, 2018) has largely relied on the ordinary least square (OLS) method. They largely ignore the issues with non-normal distributed data, which might result in bias in their analysis. Furthermore, the use of OLS regression only allows previous studies a partial view of the relationship between the

adoption of internal control regulation and earnings management, because the OLS examine the average relationship between the outcome of the variable and the set of regressors based on the conditional mean function (Cameron and Trivedi, 2010). Third, previous studies such as that of Nakashima and Ziebart (2015) have neglected econometrics issues such as heteroskedasticity and endogeneity. Ignoring of these issues will results in bias in their empirical results. The main objective of this research is to investigate the relationship between the mandatory adoption of internal control regulations and earnings management by using Chinese data. Our research aims to overcome the above-mentioned limitations in the literature. More details are provided in subsequent chapters.

2.4 Hypotheses development

Our main hypothesis explores whether the mandatory adoption of internal control regulations affects the magnitude of earnings management among Chinese listed firms. As discussed in the literature, the decision to manipulate earnings could stem from economic, financial, political, or social incentives. Agency theory suggests that managers are responsible for making decisions on behalf of the shareholders and must exercise their duty to increase the shareholders' wealth and meet their expectations (Jensen and Meckling, 1976). However, the separation of ownership and management results in information asymmetry and interest conflicts. Managers are better informed than other stakeholders regarding a firm's prospects because they engage in daily business operations. They might be motivated to engage in opportunistic behaviour to pursue their own interests, such as to gain rewards or to secure their job (Prior et al., 2008; Schipper, 1989). The agency theory predicts that managers may not act in the interests of shareholders as they are motivated to maximise their personal welfare (Lang et al., 1996). In addition to 'traditional' agency conflicts between agent (managers) and

principle (shareholders), agency conflicts between controlling and minority shareholders are also severe in China because of the weak legal and economic infrastructure (Liu and Lu, 2007). Without effective monitoring, controlling shareholders may take advantage of minority shareholders, especially when the listed companies are financially healthy (Liu and Lu, 2007).

Following major financial scandals in 2002, special attention has been paid to internal controls. Internal control is a process established by a company's board of directors, managers, and other employees to ensure that objectives such as the effectiveness and efficiency of operations, financial reporting reliability, and compliance with rules and regulations are met. Previous studies provide evidence regarding firms' internal control quality and financial information quality. Consistent with Kinney and McDaniel (1989), Doyle et al. (2005) argue that a weak internal control system can create more opportunities for intentional earnings management. It is acknowledged that a weak internal control system is positively associated with the probability of fraudulent financial reporting (Bell and Carcello, 2000). Doyle et al. (2005) found that firms with weak internal control system have weaker associations between working capital accruals and cash flows than other firms, and they found that firms with internal control weaknesses have lower earnings quality. Furthermore, Ashbaugh-Skaife et al. (2005) noted that firms with weak internal control system have more abnormal working capital accruals and abnormal total accruals than other firms. In addition, Järvinen and Myllymäki (2016) argued that firms with ineffective internal controls engage in more manipulation of real activities (particularly inventory overproduction).

The main aims of Chinese internal control regulations are (1) to increase the effectiveness of internal controls and (2) to enhance the quality and transparency of information disclosed to stakeholders. It is expected that after the mandatory adoption of the Chinese internal control

regulations (Chinese ICRs), the quality of the internal control system can be increased. This is because Chinese ICRs require firms to establish a comprehensive internal control system over five perspectives, namely Control Environment, Risk Assessment, Control Activities, Information and Communication, and Monitoring systems. As an example, the Chinese ICRs require the listed firms to have a supervisory committee[4] consisting of independent members. Moreover, the committee members must have a wide range of expertise (e.g. company law, accounting, and finance) to enable them to review and monitor firms' key decisions. Another example could be the requirements in terms of preparation of financial statements. The reported earnings can be of poor quality because there are unintentional errors in preparation of financial statements or simply because there is insufficient control in detecting errors (Doyle et al., 2007). The Chinese ICRs clarified accountability in recording the financial information and preparation of financial statements[5].

Strong internal control can limit a manager's ability to manipulate earnings (Jiambalvo,1996). The mandatory adoption of Chinese ICRs will help the listed firm to establish and maintain appropriate internal controls. An effective internal control system provides reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes (COSO, 1994). In addition, it is expected to constrain or mitigate 'unusual' operational decisions (Feng et al., 2015). Regulators expect that implementing effective internal control will improve corporate transparency and increase the quality of financial reporting (COSO, 1994). Prior studies have documented internal control systems' role in reducing information asymmetry and agency problems, with their findings

[4] The key responsibility of a supervisory committee is to monitor the activities of the board and CEO, as well as to monitor financial affairs and business activities on behalf of shareholders.
[5] The Chinese internal control regulations require firms' accounting departments to regularly check (1) whether the accounting information in different statements can be matched; (2) whether the accounting information is correctly adjusted if it relates to previous periods' figures; and (3) whether the accounting information in the main financial statements matches that in supporting disclosure.

suggesting that effective internal controls can enhance financial reporting quality (Ashbaugh-Skaife et al., 2008; Doyle et al., 2007; Goh and Li, 2011). The issues derived from managers' opportunistic behaviour and information asymmetry can be addressed by strengthening the internal control system (Skaife et al., 2013).

As argued by Leuz (2003), the quality of reported financial statements is highly dependent on the power of enforcement. In line with the institutional theory, the adoption of internal control regulations rebuilds the organisational structures. It will empower the shareholder's capability in monitoring manger's performance. Also, it increases the pressure from authority as firms are seeking for survival. Besides, firms are more likely to providing high quality of financial information to respond the demand from potential investors (DiMaggio and Powell, 1983). Furthermore, it motivates organisations facing similar industrial pressures to adopt similar practices (DiMaggio and Powell, 1983). It is reasonable to conjecture that firms will engage in less earnings management due to peer pressure. Previous studies argue that a comprehensive and stricter regulatory environment is a core factor in reduced earnings management and higher quality of reported earnings (Ewert & Wagenhover, 2005). In line with this, Ho et al. (2015) provide empirical evidence to support the claim that adopting stricter regulations reduces discretionary accruals. As explained above, the independent variable, ICR , is our variable of interest. It is an indicator variable that takes the value of 1 for years ending on or after the internal control regulation mandatory adoption date for firms (i.e., the adoption date is the year beginning on or after 1 January 2012) and 0 otherwise. Hence, we propose the following hypothesis:

H1*: The mandatory adoption of Chinese internal control regulations is significantly negatively associated with earnings management among Chinese listed firms*

2.5 Summary

This chapter reviewed current main streams of literature on internal control and earnings management. This research aims to examine the relationship between the mandatory adoption of internal control regulation and earnings management among Chinese listed firms. We began by explaining the underpinning theories, agency theory and institutional theory, on internal control and earnings management research. This chapter then discussed definitions of internal control and reviewed current mainstreams of research on internal control based on determinants and implication of internal control quality. Next, we explained definitions, techniques of three main types of earnings management (accrual earnings management, real earnings management and classification shifting). Base on motivation and constrains of earnings management, existing main studies are reviewed. Then, we reviewed studies include both internal control and earnings management and identified our research gap that relationship between the mandatory adoption of internal control regulation and earnings management in China is ambiguous. Lastly, the main hypothesis for this research is developed. The next chapter will discuss methodology we applied this study. Research philosophy, measurement of key variables, empirical model and the choice research method.

Chapter 3 Methodology

In the previous chapter we defined internal control and earnings management and, in the form of a literature review, considered previous studies that have looked at these subjects and identified the research gap that we want to fill. Turning to this chapter, we begin by discussing the underpinning research philosophy, before indicating that the quantitative research method is an appropriate method for our research. Secondly, this chapter describes the data collection procedure and assesses its validity. Thirdly, it presents the measurement of the proxy of earnings management employed in our empirical analysis in the subsequent chapter. Fourthly, the regression model that will be used in the empirical chapter of this research is explained. The model presented explains the main variable of interest, the dependent variable, and the vectors of control variables. Fifthly, it justifies the selection of control variables and develops the main hypothesis on the association between control variables and earnings management Lastly, it discusses some econometric issues that need to be addressed.

Based on the above, this chapter is organised as follows: Section 3.1 explains the underpinning research philosophy; Section 3.2 outlines the sample selection procedure and distribution; Section 3.3 explains the measurement of our dependent variable – earnings management; Section 3.4 presents the empirical models employed in the study, and briefly describes the variable of interest and vectors of control variables; Section 3.5 develops the set of control variables; Section 3.6 discusses the main econometric issues that need to be considered in this research; and the final section provides a summary of this chapter.

3.1 Research philosophy

This section discusses research philosophy and its influence on the methodology and methods used in this study. The choice of research philosophy and strategy is based on the objectives of the current research.

Research philosophy is a set of views about the way studies should be conducted, how data should be collected and how it is then analysed and used. This implies that there are connections among developing knowledge, research philosophy and contributions to knowledge (Eriksson and Kovalainen, 2015). Research philosophy, first, helps the researcher with refining the research design; second, it assists the researcher in verifying the feasibility of a research design; and finally, it guides the researcher in adjusting the research design to possibly fill a current gap in previous studies. All researchers begin their research from a philosophical position. Philosophical underpinnings (Epistemological and Ontology) have been shown to intensively link the research approach (inductive or deductive) with the research strategy (qualitative or quantitative) (Easterby-Smith et al., 2012). The Interactions between research philosophies and research strategies are listed in Table 3.1.

Table 3.1 Philosophical Underpinning of Research

Philosophical underpinning	Epistemological orientation	Positivism	Interpretivism
	Ontological orientation	Objectivism	Constructionism
Research Approach		Deductive; testing of theory	Inductive; generation of theory
Research Strategy		Quantitative	Qualitative

Source: Bryman and Bell, 2015.

Every researcher has to choose his epistemological and ontological position (Bryman and Bell, 2015). The main concern of epistemology is the essence of knowledge, which concerns what is (or should be) recognised as acceptable knowledge in a discipline, and whether the social world can or should be explored according to the same or similar principles, procedures and methods. Based on these concerns, two positions emerge: positivism and interpretivism.

The positivism believer advocates that the study of social reality could be observed or studied through methods used in natural sciences (Bryman and Bell, 2015). This position suggests that observation is the essence of science; therefore, objective truth exists that can be identified as knowledge through rational investigation (Eriksson and Kovalainen, 2015; Bryman and Bell, 2015). Moreover, the role of theory is to help generate hypotheses which can be examined to discover relationships among facts; this relates to the principle of deductivism. By contrast, interpretivism suggests that research should respect the differences between people and the

subjects of natural sciences (Bryman and Bell, 2015) and that social realities differ from physical phenomena as they involve unique meanings (Denzin and Lincoln, 2011). Interpretivists believe that realities are socially constructed. The objective of the interpretive study is to explore richer, deeper and newer knowledge and provide clarity in terms of realities. This position encourages academic researchers to gather and interpret the subjective understandings of reality to understand the subjective meaning of social action (Easterby-Smith et al., 2012; Bryman and Bell, 2015).

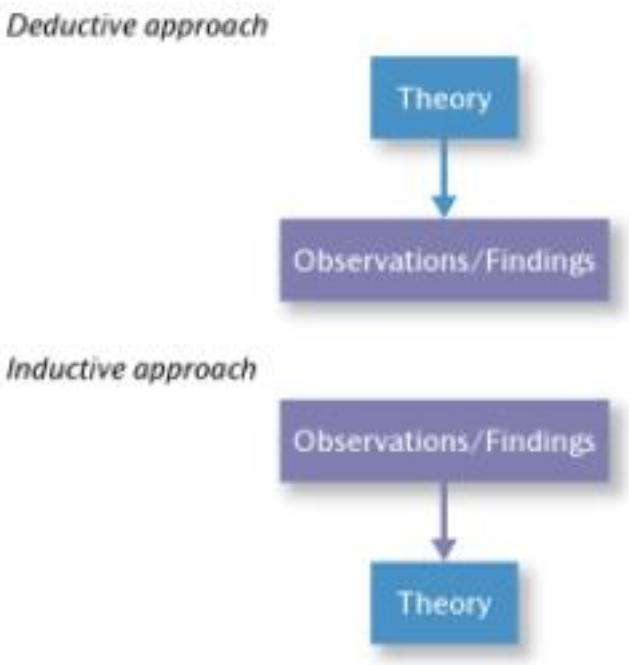
Ontology concerns the nature of social entities. The central question of ontology is whether social entities can and should be considered objective entities with realities that are external to the social actors or social constructions created by the perceptions and actions of social actors (Bryman and Bell, 2015). This consideration takes two philosophical positions: objectivism and constructionism. Objectivism suggests that the existence and meaning of social phenomena are independent of social factors (Bryman and Bell, 2015) and that valid knowledge can only be acknowledged when it is measurable and observable (Saunders, 2015). In contrast, constructionism refers to the position that social phenomena and their values are continually being completed or adjusted by social actors. This viewpoint advocates that social phenomena and categories are created and continually adjusted through social interaction. In business research, the assumption of ontology has a large impact on research question formulation and the manner in which research is performed (Bryman and Bell, 2015).

Different philosophical positions impact the choice of research strategies. Prior literature (Babbie, 2015; Burns, 2000; Collis & Hussey, 2013; Kumar, 2005; Punch, 2013) has shown that there are two kinds of strategy, qualitative and quantitative. The qualitative approach is a

non- numeric descriptive method for collecting related data to assist in realising the phenomenon. Babbie (2015) argued that the qualitative approach is beneficial for studying slight nuances in both behaviour and attitude and can be used to flexibly examine changes in social processes over time. However, the qualitative method has several disadvantages: (1) it does not explain the entire population (study sample) and generally uses a small sample size (Hakim, 1987); (2) its absence of reliability and transparency (Berg et al., 2004) complicates the generalisation of the results; and (3) it might not be efficient for obtaining satisfactory explanations since it is time-consuming (Berg et al., 2004). In contrast, quantitative analysis covers several statistical analysis forms which improve accuracy and reliability during measurements of research variables and the ability to generalise the research findings (Berg et al., 2004; Bryman, 2015; Collis & Hussey, 2013). In addition, Berg et al., (2004) stated that using the quantitative method enhances the generalisability of the study results by employing a longer period and larger sample size and allows for the production of causality statements through the use of controlled experiments.

The quantitative research strategy links with the positivism and objectivism positions. Quantitative research has a deductive relationship between theory and research. Therefore, it focuses on building hypotheses based on prior studies or theory and then testing the single reality or phenomenon through statistical techniques. Such a strategy allows for a generalisation from specific to broad populations (Bryman and Bell, 2015). Quantitative research focuses on quantifiable data collection and analysis. The amount of data could be immense and this information could be used to test a hypothesis using statistical techniques. The attributes of the social phenomenon can then be summarised to increase the contribution to the current knowledge. The quantitative research strategy normally provides numerical

information to the researcher to test the correlations between variables (Easterby-Smith et al., 2012; Bryman, 2015). In contrast, the qualitative research strategy relies on interpretivism and constructionism by linking to the inductive approach. This strategy helps the researcher conduct their research by assuming that realities are socially constructed. The qualitative strategy allows the researcher to begin with an unclear circumstance. The researcher then collects information in a cumulative manner and focuses on words rather than quantifications in the data analysis, thereby conducting an in-depth explanation of the phenomenon, followed by a final summary of the theory or pattern (Olsen, 2011; Bryman and Bell, 2015). Typically, qualitative research has a comparatively small dataset as it requires a large amount of time to collect the data (Hong and Easterby-Smith, 2002). The qualitative research strategy could provide better insights into a phenomenon compared to quantitative research because participant opinion data could reveal information which cannot be quantifiable (Hong and Easterby-Smith, 2002; Wilson, 2014). Furthermore, this method is more flexible than quantitative research as a structured or semi-structured procedure (Bryman and Bell, 2015). The deductive and inductive approaches to the relationships between theory and research are described as follows:



Source: Bryman (2015)

This research aims to examine the relationship between the mandatory adoption of internal control regulation on earnings management in Chinese listed firms. In line with prior studies, the researcher believes that the study aim relies on existing theories such as agency theory. Therefore, the researcher believes in the objectivism and positivism approach, whereby deductive quantitative research is the appropriate choice.

3.2 Sample selection and distribution

This section discusses the nature of our study sample, our data collection sources, and the steps taken to validate the data's authenticity in the subsequent empirical analysis.

3.2.1 Selection procedure

To facilitate data collection procedures, this research uses primarily secondary data. By definition, secondary data are the information that has been gathered by someone other than the researcher and/or for some other purpose than the project at hand. Moreover, the amount of secondary data available is often overwhelming, and therefore researchers have to locate and use only the data relevant to their research (Black, 1999). Schmidt and Hollensen (2006) highlight some advantages of using secondary data in conducting research: low cost, less effort expended, less time taken, and sometime more accurate than primary data.

All the relevant data used in this research is sourced from the GTA China Stock Market & Accounting Research (CSMAR), which is a leading finance and accounting database for Chinese listed firms. The use of the databases in the academic literature for information on listed companies is well established (Chen et al., 2011; Liu and Lu, 2007; He et al., 2020; Piperopoulos et al., 2018). To ensure the reliability and accuracy of the data, the published annual reports were randomly selected and cross-checked over the course of the study period. The electronic annual reports of listed firms were manually downloaded from www.cninfo.com.cn, which is a website certified by the China Securities Regulatory Commission (CSRC).

We chose A-share listed firms on both the Shanghai Stock Exchange and Shenzhen Stock Exchange as our initial population. There are four major reasons why the A-share listed firms

on the Shanghai and Shenzhen Stock Exchange were chosen as the initial population for our statistical analysis. Firstly, this population represents the largest collection of Chinese listed firms in mainland China by market capitalisation[6]. Secondly, it consists of a wide range of companies operating in key Chinese industries that make an associated contribution to economic activities. Thirdly, data from A-share listed firms on both the Shanghai and Shenzhen Stock Exchange have already been widely utilised by earnings management studies in the Chinese context (e.g., Haw et al., 2005) allowing for comparative analysis. Lastly, it is expected that including all A-share listed firms on both the Shanghai and Shenzhen Stock Exchange should increase the size of the dataset used in our study, which will provide sufficient data to facilitate the sophisticated econometric modelling planned in later chapters.

This research covers data for the period from 2007 to 2016. The year 2007 was chosen because Chinese listed firms have been required to follow the new accounting standard since 1st January 2007 for the first time. The Chinese accounting standard, *The Accounting Standards for Business Entities (ASBE)*, aims to align business accounting with Western practice (Xu et al., 2018). In 2007, the updated ASBE, which converged with the International Financial Reporting Standards (IFRS), became mandatory for all listed companies (including all central government-owned enterprises) in China. Therefore, to avoid the effects from changes of Chinese accounting standards, this research selects a sample period from 2007. In addition, this research aims to investigate the mandatory adoption of internal control regulations and earnings management. The internal control regulations became mandatory on 1st January 2012. From this point onwards, Chinese listed firms were mandatorily required to construct their internal control system by following the Chinese Internal Control Regulations. The main objective of such regulation is primarily to improve the quality of reported financial information. Such

[6] For example, by 5 June 2023, there was a total market capitalization of A-share listed firms on the Shenzhen Stock Exchange of 428,957.46 million RMB (approximately, 48542.38 million British pounds).

newly adopted regulations are expected to help mitigate problems arising from information asymmetry and exploitative earnings management (Leventis et al., 2011, Karampinis and Hevas, 2013, Elbakry et al., 2017). For example, in Zang's (2012) US study, it was found that the accrual earnings management is reduced due to a higher level of scrutiny of accounting practice in post Sarbanes–Oxley Act (SOX)[7] periods. Such internal control regulations represent an attempt by the regulatory authorities to promote transparency and integrity in business operations, thus limiting opportunities for exploitative managerial behaviour, including earnings management. Hence, it is expected that using 1st January 2012 as the midpoint between the datasets from 2007 to 2016 to have a balanced data period will enable us to capture the impact of mandatory adoption of Chinese internal control regulations on earnings management. In addition, within this study period, Chinese government implemented a massive polices to boost domestic demand and economic growth. In 2010, China becomes the world's second-largest economy by ranking in GDP (World Bank, 2023). It is interesting to investigate whether the internal control regulation is functional in this economic booming era.

The selection of our final sample of firms is presented in Table 3.2. To determine this sample of firms, we start with all the firms listed on the A-share Shanghai and Shenzhen Stock Exchange from 2007 to 2016. We then exclude the cross-listing firms because they have different firm-level characteristics (Xu et al., 2021; Xu and Fang, 2002; Cui et al., 2021) and different regulatory environment and risk levels (Lisic et al., 2015). We keep the firms that have been continually listed for 10 years on the A-share Shanghai and Shenzhen Stock Exchange market, i.e., we exclude firms that have been listed for fewer than 10 years in the study period. Furthermore, we exclude the firms from the finance and utility industries. Firstly, we exclude financial institutions because the leverage of financial companies is implicitly or

[7] The Sarbanes–Oxley Act (SOX) refers to the American internal control regulation, which became mandatory in the US in 2002.

explicitly affected by investor insurance schemes, and the debt issued by non-financial firms is incomparable with the debt-like liabilities of financial firms. In addition, they have different regulatory framework and financial statements disclosure requirements. Secondly, we exclude firms from the utility industry because it is difficult to detect utility firms' earnings mismanagement as they use conservative accounting regulations to defer their income recognition (DeFond & Jiambalvo, 1994; Klein, 2002; Arun et al., 2015). Lastly, the firms labelled 'special treatment' (ST) were also removed from the initial sample because they are subject to a stricter regulatory environment (Chen et al., 2008; Bai et al., 2002). Moreover, any industry with fewer than 6 firms was removed because this research is primarily focused on earnings management, and previous research indicates that it is necessary to include industries with sufficient observations to ensure unbiased outcomes and valid generalisations (DeFond and Jiambalvo, 1994; Subramanyam, 1996). After removing firms with key missing data. We have our final sample of 963 firms. Table 3.2 shows the process of sample selection for the period 2007–2016.

Table 3.2. The Sample

All listed companies on A-share Chinese Stock Exchange market from 2007–2016	2428
Less	
Cross-listed firms	(172)
Firms listed for fewer than 10 years	(967)
Firms from the finance and utility industries	(44)
ST* firms and firms with significant missing data	(282)
	963

3.2.2 Sample distribution

Table 3.3 shows the distribution of samples. The industry classification is based on the New China Securities Regulatory Commission (CSRC) Industry Classification. The 963 firms in the final sample are distributed across 27 industries. Among the identified industries, Real Estate represents the largest proportion of the sample (9.14%) followed by Pharmaceutical Manufacturing (8.62%), Computer, Communication and Other Electronical Device Manufacturing (8.62%), and Raw Chemical Materials and Chemical Products (7.68%). The least industries are Mining and Dressing of Nonferrous Metals (1.56%), Farm Products Processing (1.56%), Textile (1.56%), and Metal Products (1.56%).

Table 3.3 Sample Distribution

Industry Name	**Industry Code**	**NO. of Firms**	**Frequency**
Coal Mining and Processing	B06	16	1.66%
Mining and Dressing of Nonferrous Metals	B09	15	1.56%
Farm Products Processing	C13	15	1.56%
Food Manufacturing	C14	16	1.66%
Wine, Drinks, and Refined Tea Manufacturing	C15	26	2.70%
Textile	C17	15	1.56%
Raw Chemical Materials and Chemical Products	C26	74	7.68%
Pharmaceutical Manufacturing	C27	83	8.62%
Non-metallic Mineral Products	C30	29	3.01%
Smelting and Pressing of Ferrous Metals	C31	21	2.18%
Smelting and Pressing of Nonferrous Metals	C32	34	3.53%
Metal Products	C33	15	1.56%
General Equipment Manufacturing	C34	23	2.39%
Special Equipment Manufacturing	C35	40	4.15%
Automobile Manufacturing	C36	35	3.63%
Railway, Shipbuilding, Aerospace, and Other Transportation Equipment Manufacturing	C37	22	2.28%
Electric Machines and Apparatuses Manufacturing	C38	52	5.40%
Computer, Communication, and Other Electronical Device Manufacturing	C39	83	8.62%

Production and Supply of Electric Power and Thermal Power	D44	52	5.40%
Civil Engineering Construction	E48	28	2.91%
Wholesale	F51	43	4.47%
Retail Trade	F52	47	4.88%
Highway Transport	G54	17	1.77%
Internet and Related Services	I64	17	1.77%
Software and IT Services	I65	34	3.53%
Real Estate	K70	88	9.14%
Business Service	L72	23	2.39%
Total		963	100.00%

3.3 Measuring earnings management

The aim of this research is to investigate the relationship between the mandatory adoption of internal control regulations and earnings management (EM). EM is opportunistic behaviour whereby management manipulates earnings to achieve personal or company objectives. This section presents the models employed in formulating the proxies for EM used in the empirical analysis. To capture the differences in the level of sophistication in EM practices for our sample of Chinese listed firms during the different cycles of economic and financial conditions, we estimated two individual measures: accrual earnings management (AEM) and real earnings management (REM).

3.3.1 Accrual earnings management

Accrual earnings management (AEM) refers to practices whereby managers manipulate earnings by changing their accounting methods. For example, they might use a different depreciation method for non-current assets in order to present favourable financial information in the published financial statements. It is acknowledged that AEM is an effective way for managers to misreport earnings because it has no clear effect on business cashflows (Peasnell et al., 2000; Peasnell et al., 2005). Previous research has provided various models for measuring AEM (Jones, 1991; Dechow et al., 1995; Guay et al., 1996; Kothari et al., 2005; Patro and Pattanayak, 2014; Persakis and Iatridis, 2015;); for the purposes of our research, though, to capture AEM, we employ the modified Jones model.

This model was developed by Dechow et al. (1995) by building on the Jones model. To do this, they improved on the treatment of accounts receivable and gave greater consideration to whether firms manage earnings in the period of estimation (i.e., in which no systematic earnings management is hypothesised). Plus, they managed accounts receivable in the period

of event (i.e., during periods in which earnings management is hypothesised) and determined whether accruals of credit sales are normal in the estimation period and abnormal in the event period (Ronen et al, 2008). In their cross-sectional analysis, the accounts receivable change is subtracted from the change in revenues in order to estimate the parameters of normal accruals (Subramanyan, 1996; DeFond and Park, 1997; Dechow et al., 2003; Kothari et al., 2005).

There are two reasons to employ the modified Jones model. Firstly, this model has been proved to be effective by prior research (McNichols, 2000; Stubben, 2010). Its cross-sectional approach automatically adjusts for the effects of fluctuating industry-wide economic conditions that influence accruals independent of any earnings management in each year (Teoh et al., 1998; Kasznik, 1990; DeFond, 1994) and it provides a stronger earnings management measurement than the original Jones model (Dechow et al., 1996; Guay et al., 1996) . Secondly, previous research also suggests that the modified Jones model has stronger explanatory power than other models in the context of China (Xinyuan and Lijun, 2006).

The modified Jones (1995) model extract discretionary accruals (abnormal accruals) by subtracting the non-discretionary (normal level accruals) from total accruals. Following previous research (Zang, 2012; Lee and Masulis, 2011), we proxy for AEM using the level of a firm's discretionary accruals (abnormal accruals) and the residual from a modified Jones accrual model (Equation 1):

$$\frac{TACC_{it}}{TA_{it-1}} = \beta_0 \frac{1}{TA_{it-1}} + \beta_1 \frac{(\Delta REV_{it} - \Delta AREC_{it})}{TA_{it-1}} + \beta_2 \frac{PEE_{it}}{TA_{it-1}} + \varepsilon_t \text{ (Equation 1)}$$

where $TACC_{it}$e = total accruals, calculated as firm *i*'s earnings before extraordinary and abnormal items minus cash flow from operations in year *t*, TA_{it-1} = Total assets at the beginning of year *t*. ΔREV_{it} = change in firm i's revenue from year *t-1* to year *t*. $\Delta AREC_{it}$

change in accounts receivable for firm *i* from year *t-1* to year *t*, PEE_{it} = gross property, and plant and equipment firm *i* in year *t*. ε_t is the residual in year t.

We measure the total accruals ($TACC_{it}$) by using the cash flow approach (total accruals = earnings before extraordinary and abnormal items - the cash flow from operations). The previous literature has proposed two methods for measuring total accruals: the cash flow approach and the traditional balance sheet approach (Becker et al., 1998; Ball et al., 2016). However, it has been argued that the balance sheet approach leads to a high number of errors as compared to the cash flow approach (Hribar and Collins, 2002). Therefore, the cash flow approach is applied to measure total accruals. We also include a lag of total assets (TA_{it-1}) in the model as a deflator (Dechow et al., 1995; Kothari et al., 2005; Kuo et al., 2014; Arun et al., 2015). The use of one period lagged asset value can mitigate the impact of omitted variables (Brown et al., 1999) and reduce the heteroscedasticity in residuals (White, 1980; Kothari et al., 2005).

As noted above, the residual from Equation 1 will be used as a proxy of AEM (discretionary accruals). We use the absolute value of the discretionary accruals (Labelled as AEM_DA) as the proxy for AEM, since the goal of this research is to capture the magnitude of AEM rather than the direction (Mouselli et al., 2012).

Jones et al. (2007) discuss several accruals models used in the context of fraudulent and restated earnings and evaluate the empirical results. They recommend that researchers consider using multiple accruals models to detect accrual-based earnings management. Therefore, this study also employs alternative measures of discretionary accruals, Kothari et al.'s (2005)

performance-matching accrual model, to measure the discretionary accruals[8]. As Kothari et al.'s (2005) argued, accrual models should control for the effect of performance on measured discretionary accruals. Therefore, their model includes current return on assets (*ROA*) as a control variable to mitigate bias and misspecification.

$$\frac{TACC_{it}}{TA_{it-1}} = \beta_0 \frac{1}{TA_{it-1}} + \beta_1 \frac{(\Delta REV_{it} - \Delta AREC_{it})}{TA_{it-1}} + \beta_2 \frac{PEE_{it}}{TA_{it-1}} + ROA_{it} + \varepsilon_t \text{ (Equation 2)}$$

where $TACC_{it}$ = total accruals, calculated as firm *i*'s earnings before extraordinary and abnormal items minus cash flow from operations in year *t*, TA_{it-1} = Total assets at the beginning of year *t*. ΔREV_{it} = change in the firm i's revenue from year *t-1* to year *t*. $\Delta AREC_{it}$ change in accounts receivable for firm *i* from year *t-1* to year *t*, PEE_{it} = gross property, and plant and equipment firm *i* in year *t*. ROA_{it}= Calculated by net income divided by lagged total assets. All other variables are as previously defined. ε_t is the residual in year t.

As noted above, we use the residual of this equation as a proxy for discretionary accruals, while the absolute value of discretionary accruals is taken as a proxy for AEM (labelled as AEM_KDA).

3.3.2 Real earnings management

In the previous section, we explained the measurement of the main proxy of earnings management: discretionary accrual. However, alongside accrual-based accounting estimates and methods, executives are also likely to play with firms' day-to-day operational activities in order to manipulate reported earnings (Healy and Wahlen, 1999; Dechow and Skinner, 2000).

[8] The reason for using this model is to account for the companies that were missing data in the study sample.

More specifically, firms may use REM to misrepresent their earnings when accrual earnings management (AEM) is constrained by auditors and regulators (Cohen and Zarowin, 2008; Gunny, 2010; Zang, 2012). Graham et al. (2005) report that '… we find strong evidence that managers take real economic actions to maintain accounting appearances. In particular, 80% of survey participants report that they would decrease discretionary spending on R&D, advertising, and maintenance to meet an earnings target. More than half (55.3%) state that they would delay starting a new project to meet an earnings target, even if such a delay entailed a small sacrifice in value …' Thus, to provide a more complete study of the trend in earnings management activities in the periods before and after internal control regulations, we also look at real earnings management activities during the sample periods.

Previous research (e.g. Roychowdhury, 2006) suggests that managers can artificially inflate reported earnings by doing the following: (1) using aggressive price discounts and or more lenient credit terms to accelerate sales, thereby resulting in abnormally low cash flow from operations; (2) increasing production to reduce the cost of sales. With higher production levels, fixed overhead costs are spread over a larger number of units, lowering fixed costs per unit. Then total cost per unit declines. This implies that reported COGS is lower, and the firm reports better operating margins, and (3) deliberately reducing the amount of discretionary expenses on research and development, advertising, and selling general and administrative expenses, which will result in abnormally low discretionary expenses. Collectively, unusual cash flow from operations, abnormal discretionary expenses, and abnormal production costs evidence instances of real earnings management. In this study, we applied all three REM metrics to investigate the relationship between the mandatory adoption of internal control regulation and earnings management: abnormal cash flow from operations, abnormal production costs, and abnormal discretionary expenses. These three REM metrics has been largely used by academic

research (e.g. Cohen, 2008; Gunny, 2010), which increases confidence in the empirical validity of these proxies.

1) *Abnormal cashflow from operation*

Firms can offer aggressive sales discounts or lenient credit terms to boost their sales volume, which will in turn result in lower cash inflow in the current period. Following previous studies, we used the below model (Equation 3) to measure the abnormal cashflow from operations (Cohen et al., 2008; Kim and Sohn, 2013):

$$\frac{CFO_{it}}{TA_{it-1}} = \beta_0 + \beta_1 \frac{1}{TA_{it-1}} + \beta_2 \frac{REV_{it}}{TA_{it-1}} + \beta_3 \frac{\Delta REV_{it}}{TA_{it-1}} + \varepsilon_{it} \text{ (Equation 3)}$$

where CFO_{it} = the operating cash flow in year *t*, TA_{it-1} = Total assets at the beginning of year *t*. REV_{it} = the firm i's revenue in year *t*. ΔREV_{it} = change in the firm i's revenue from year *t-1* to year *t*. ε_t is the residual in year t. As we mentioned earlier, the lag of total assets (TA_{t-1}) is included in the model to manage heteroscedasticity. The residual from this model captures the deviations from the estimated cash flows (normal level) in year t of firm i and is used as a proxy for the abnormal cash flow from operations (defined as REM_CFO).

2) *Abnormal production costs*

Managers can deliberately produce more products to spread the fixed costs over a larger number of units. This purposeful overproduction will reduce the fixed costs per unit. Consequently, this reduces the cost of goods sold (COGS) for the firm and thereby increases the reported earnings. Following previous studies, we used the model (Equation 4) below to measure the abnormal production costs (Roychowdhury, 2006):

$$\frac{PROD_{it}}{TA_{it-1}} = \beta_0 + \beta_1 \frac{1}{TA_{it-1}} + \beta_2 \frac{REV_{it}}{TA_{it-1}} + \beta_3 \frac{\Delta REV_{it}}{TA_{it-1}} + \beta_4 \frac{\Delta REV_{it-1}}{TA_{it-1}} + \varepsilon_{it} \text{ (Equation 4)}$$

where $PROD_{it}$ = the production costs for firm i, defined as the sum of the cost of sales and the change in inventory in year *t*, TA_{it-1} = Total assets at the beginning of year *t*. REV_{it} = the firm i's revenue in year *t*. ΔREV_{it} = change in the firm i's revenue from year *t-1* to year *t*. ΔREV_{it-1} = the lag value of ΔREV_{it}. ε_t is the residual in year t. Just as in the previous equation, the lag of total assets (TA_{t-1}) is included in the model in order to manage heteroscedasticity. The residual from this model represents abnormal production costs (defined as REM_PRO).

3) Abnormal discretionary expenses

Firms can also reduce discretionary expenses, such as advertising, research and development, and general, selling, and administrative expenses, to boost earnings in the current periodic. In line with prior studies (Roychowdhury, 2006; Chen and Zarowin, 2010), we use the below model (Equation 5) to create the proxy for abnormal discretionary expenses:

$$\frac{DISX_{it}}{A_{it-1}} = \beta_0 + \beta_1 \frac{1}{A_{it-1}} + \beta_2 \frac{REV_{it-1}}{A_{it-1}} + \varepsilon_{it} \text{ (Equation 5)}$$

where $DISX_{it}$ = sum of SG&A, R&D, and advertising expenses in the year t. It is the sum of advertising, R&D, and selling, general, and administrative expenditures. REV_{it} = firm i's revenue from year *t*. As was the case with the previous equation, the lag of total assets (TA_{t-1}) is included in the model to manage heteroscedasticity. The residual from this model represents abnormal discretionary expenses (defined as REM_DISX).

As is the case of AEM, we use the absolute value of the REM_CFO, REM_PRO and REM_DISX in our research in order to investigate earnings management's magnitude rather than its direction (Francis et al., 2016). In addition, in line with previous research (Roychowdhury, 2006; Zang, 2012; Commerford et al., 2018; Francis et al., 2014), we also

combined three individual real earnings management proxies to form an aggregate measure of real earnings management to capture the total amount of real earnings management engaged in by the firm in a particular fiscal year (defined as REM_ALL). However, we acknowledge that the three individual variables have different implications for earnings that may dilute any result using REM_ALL alone. We thus report results corresponding to the single real earnings management proxy as well as the three individual real earnings management proxies (Cohen et al., 2008).

3.4 Model specification

This research aims to examine the relationship between the mandatory adoption of internal control regulation and earnings management among Chinese listed firms. Following the previous earnings management empirical literature, this research constructs and employ the following regression model (without firm and time subscripts):

$$EM_{it} = \alpha_0 + \alpha_1 ICR_t + \beta_2 Controls + FixedEffects + \varepsilon_{it}$$

The dependent variable, Earnings Management (EM), denotes both the accrual earnings management (AEM) and the real earnings management (REM) proxies. The AEM is our main proxy for EM, while REM is used as an alternative measurement for EM. The independent variable, ICR , is our variable of interest. It is an indicator variable that takes the value of 1 for years ending on or after the internal control regulation mandatory adoption date for firms (i.e. the adoption date is the year beginning on or after 1 January 2012) and 0 otherwise. Here, coefficients α_1 is our main interested coefficients. This indicates the impacts of mandatory adoption of internal control regulation on earnings management among Chinese listed firms.

We include a vector of control variables($Controls$), which we expected to influence earnings management activities. The choice of these control variables is based on previous studies (Banderlipe and Mc Reynald, 2009; Cohen and Zarowin, 2010; Habbash et al., 2014; Zalata and Roberts, 2016; Zalata and Roberts, 2017). They are firm performance control variables: Firm size, Leverage, Profitability, Operating cash flow, Firm growth, and corporate governance control variables, which include Auditor quality, Independence of board, Compensation of top managers, Ownership structure, CEO duality and CEO gender (a more detailed explanation of control variables can be found in Section 3.5.2).

$FixedEffects$ denotes industry fixed effects and year fixed effects. This research uses a fixed-effect model to investigate our research objectives. Omitted variable bias is the main statistical challenge in nonexperimental research (Allison, 2009; DeMaris, 2014; Wooldridge, 2010). The failure to control variables that are strongly correlated with dependent and independent variables will lead to a biased coefficient because the error term is correlated with the independent variables. The fixed-effect model is largely used in the analysis of the panel to address the issue of omitted variable bias in nonexperimental research (Allison, 2009; Fox, 2016; Treiman, 2009; Wooldridge, 2010). The feature of fixed-effect models is their ability to control unobserved variables that may vary across entities but are constant over time. The fixed-effect model assumes that each entity has unique characteristics that do not change over time. These characteristics might influence the dependent variable, but since they are constant for each entity, they are not directly observable (Wooldridge, 2010). The fixed-effect model makes it possible to 'purge the estimating equation of all characteristics, measured or unmeasured, that are constant over time or constant within groups' (Treiman, 2009). Therefore, we employ fixed-effect models to ensure variation is contained within units to minimise the potential for unobserved heterogeneity and omitted variable bias. We controlled industry fixed

effects as it is argued that the industry type is a crucial influence on managers' earnings management activities. Meyer et al. (2000) find that the pharmaceutical industry practices reduce earnings management in order to avoid the pressures of political cost. Erickson and Wang (1999) find clear evidence that manufacturing firms tend to manipulate earnings using their inventory, while non-manufacturing firms prefer to manipulate earnings by postponing the accounts payable. Therefore, following previous research (Kothari et al., 2005; Hutchinson et al., 2008), we include industry dummies to control for industry effects, given that firms in the same industry are normally homogenous in terms of firm characteristics, including assets and liability. Industry dummies were classified based on the China Securities Regulatory Commission industry classification code, which has been widely used in previous research. Since the fixed-effects model effectively controls for all time-invariant characteristics of the data both observed and unobserved, thus dealing with the issue of omitted variable bias (Wooldridge 2010). We follow Lapointe-Antunes et al (2006) to control for year effects. Year dummies are also included in the model.

We used panel data in our research, which has several advantages. Firstly, panel regression allows researchers to remove any unobservable heterogeneity in the sample (Himmelberg et al., 1999). Furthermore, panel data regression has considerable advantages in terms of measuring non-observable individual effects. It decreases the reliability problem of independent variables to explain the dependent variable. Moreover, prior research has argued that panel data regression covers a high number of observations, which enhances the efficiency of the statistics and boosts the degree of freedom (Haniffa and Cooke, 2002). Moreover, the coefficients are estimated with panel data, which improves estimation efficiency through variability over time and across firms (Wooldridge, 2002). In addition, panel data regression provides diverse procedures that may assist in examining variations over time when

considering certain cross-sectional unit types. And panel data regression concerns extra variability of data so that it is able to provide more instructive information. It provides a greater degree of effectiveness and flexibility and decreases co-linearity between variables. Lastly, it is capable of measuring and distinguishing non- observable effects when utilizing the analysis of time-series or cross-sectional data.

3.5 Explanation of Variables

Following the previous section on model specification, which describes the interconnections between the dependent variable, variable of interest, and control variables, this section develops the hypotheses. It comprises two main sections: (i) the variable of primary interest and (ii) control variables.

3.5.1 Variable of interest

Our main aim to explore whether the mandatory adoption of internal control regulations affects the magnitude of earnings management among Chinese listed firms. As explained in previous section, the independent variable, ICR , is our variable of interest. It is an indicator variable that takes the value of 1 for years ending on or after the internal control regulation mandatory adoption date for firms (i.e. the adoption date is the year beginning on or after 1 January 2012) and 0 otherwise.

3.5.2 Control variables

As explained in Section 3.4, we include several control variables that have a considerable influence on earnings management (EM). This section will explain the measurement of each control variable and the development of the hypothesis for control variables. a vector of control

variables are included. They are: (1) Firm size, (2) Leverage, (3) Profitability, (4) Operating cash flow, (5) Firm growth, (6) Auditor quality, (7) Independence of board, (8) Compensation of top managers, (9) Ownership structure, (10) CEO duality and (11) CEO gender.

1) Firm size

Previous research provides mixed evidence regarding the relationship between firm size and earnings management. Firm size can be negatively or positively associated with EM. According to Watts and Zimmerman (1990), the political cost and government scrutiny are high for larger firms; hence, these firms are more likely to engage in income-decreasing EM. Jo and Kim's (2007) research also suggests that large firms engage in a higher level of earnings management. The complexity of the information in large firms increases information asymmetry, thereby reducing the monitoring functions of the investors. Moreover, Richardson (2000) argues that market pressure is greater for larger companies because they are subject to close scrutiny by investors; thus, they are more likely to adopt aggressive accounting policies, which in turn causes them to engage in income-increasing EM. By contrast, several recent empirical studies have supported the notion that there is a negative relationship between firm size and EM (Pyo and Lee, 2013; Hong and Andersen, 2011; Gargouri et al., 2010). For example, Lobo and Zhou (2006) suggest that large firms are under high scrutiny from investors, which may mitigate managers' propensity to manipulate earnings. They argue that larger firms are often required to disclose their financial information and are thus less likely to manipulate earnings. Consistent with previous studies (Dimitropoulos and Asteriou, 2010; Jaggi et al., 2009), firm size is measured as the natural logarithm of total assets at the year-end and we label it as Size. We propose a non-directional hypothesis:

H2: *Firm size is significantly associated with EM among Chinese listed firms.*

2) Leverage

Debt hypothesis, in the context of positive accounting theory, argues that highly leveraged firms may aggressively manipulate earnings in order to mitigate and alleviate their large debt in the eyes of shareholders (Watt and Zimmerman, 1990). A firm's leverage ratio influences both risk management and accrual management (Smith and Stulz, 1985). Prior studies have found that highly leveraged firms may aggressively manipulate earnings to mitigate and alleviate their large debt in the eyes of the shareholders (Watts and Zimmerman, 1990; DeFond and Jiambalvo, 1994; Sweeney, 1994). Their evidence indicates that firms with high financial leverage are more likely to engage in EM. Firms in financial distress or experiencing financial difficulties have an incentive to manipulate reported earnings upwards in order to avoid debt covenant valuation and increased financing costs (Watts and Zimmerman, 1990). As suggested by Chen et al. (2006), firms with high leverage typically face financial problems and are more likely to be involved in fraud. By following former studies (e.g., Bauer and Boritz, 2009), the current study includes leverage (labelled as Leverage) as a control variable to control its effects on EM. It is measured as total debt divided by total assets, and leads us to propose the following hypothesis:

H3: *Leverage is positively and significantly associated with EM among Chinese listed firms.*

3) Profitability

One incentive that managers have to manipulate reported earnings is to conceal their poor financial performance and showcase financial strength (Alexander, 2017). Thus, previous studies have reported that companies with high probability are less likely to misrepresent their earnings. In other words, empirical evidence indicates that there is a negative relationship between profitability and EM (e.g. Habbash et al., 2014). However, some empirical evidence points to the opposite conclusion – that is, firms with high profitability are inclined to

participate in earnings management. For example, Ashbaugh et al. (2003) and Jo and Kim (2007) find that high profitability is positively and significantly related to discretionary accruals. Following previous studies (Zang, 2012; Abbott and Parker, 2000), we use return on assets (ROA) as a proxy for profitability (labelled as ROA) and measure it as earnings before taxes and interests divided by lag total assets. This is because ROA indicates management's ability to productively utilise the corporate resources (assets) that belong to shareholders. It is largely used as a measurement for profitability in EM studies (e.g. Zalata and Roberts, 2016,). We propose the following non-directional hypothesis:

H4: *Profitability (ROA) is significantly associated with EM among Chinese listed firms.*

4) Operating cash flow

We include cash flow from operations as a control variable in order to capture the variations in financial performance across companies involved in different industrial and economic activities and how such dissimilarities may influence the practice of earnings mismanagement. Previous studies have found that firms with relatively high operating cash flows are less likely to manipulate earnings (Jiang, 2008, Gul et al., 2009, Astami et al., 2017, Yung and Root, 2019). They argue that these firms are less likely to employ income-increasing earnings management to boost earnings because they are already performing well (Lobo and Zhou, 2006). Consistent with Gul et al. (2009) and Lobo and Zhou (2006), the present study predicts a negative relationship between net operating cash flow and earnings management. Following previous studies by Peasnell et al. (2005), we measure the operating cash flow (Label as CFO) as net cash flow from operations divided by lagged total assets, and we predict that firms with stable operating cash flows are less likely to engage in earnings management. Thus, we propose that:

H5: *Operating cash flow is negatively and significantly associated with EM among Chinese listed firms.*

5) Growth (Tobin's Q)

Firms with greater growth tend to intentionally over-invest in current assets in order to generate higher future sales growth (Park and Shin, 2004). However, over-investment practices might encourage managers to engage in deceitful activities such as earnings misrepresentation so that they can create the impression of successful investment. According to Skinner and Sloan (2002), a rapidly growing company is more likely to engage in EM to avoid negative earnings surprises. Empirical evidence suggests that firms with higher market-to-book ratios tend to manipulate earnings upwards because they are under the greatest pressure to adopt aggressive accounting policies to report increased earnings (Chih et al., 2008). Thiruvadi and Huang (2011) and Peni and Vähämaa (2010) also find there to be a positive relationship between firm's growth and EM. In addition, the pressure of achieving certain target growth outcomes for a company may create an incentive to manipulate accounting earnings (Carcello and Nagy, 2004). We use Tobin′sQ as proxy of growth and propose the following hypothesis:

H6: *Firm growth (Tobin's Q) is significantly positively associated with EM among Chinese listed firms.*

6) Auditor quality

Independent audits are among the external governance mechanisms that are essential in aligning managers' and shareholders' interests and reducing agency costs by playing a role in monitoring and control (Jensen and Meckling, 1976). An auditing process that is carried out by independent and credible audit firms is able to hamper 'aggressive, potentially opportunistic reporting of accruals', thus reducing managers' incentives to manipulate earnings (Francis et

al., 1999). This underlying assumption illustrates the inverse relationship between audit quality and earnings management. Moreover, several studies provide evidence that auditor firms recognised as Big 4 or Big 10 firms have a positive effect on limiting controlling shareholders' earnings manipulation, and improve corporate transparency and accounting quality (e.g. Gul et al., 2010). In this research, large audit firms (Big 10 in China) are viewed as more credible because they are expected to have more experience and better financial knowledge (Velury, 2003). They are also expected to be equipped with high-end technology and resources and to possess greater manpower than their counterparts. Therefore, we create a dummy variable $Big10$ as a proxy for auditor quality (labelled as $Big10$). It is set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise. Accordingly, we propose the following hypothesis:

H7: *Auditor quality ($Big10$) is significantly negatively associated with EM among Chinese listed firms.*

7) Independence of the Board of Directors

One of the major responsibilities of boards is to monitor managers, thus reducing agency costs and ensuring that managers fulfil their duties in a manner that serves the best interests of shareholders (Fama 1980; Brennan and McDermott, 2004). In line with this concept, Fama (1980) states that boards with a majority of insider directors engage in weak monitoring of managers and are subject to self-monitoring. By contrast, Finegold et al. (2007) indicate that the presence of independent directors on a board enhances its monitoring function. Corporate governance and earnings management studies provide evidence that the independence of board members is positively correlated with the effectiveness of a company's governance, and negatively associated with financial statement fraud (Waweru and Riro, 2013; Zalata and Roberts, 2016, El Diri et al., 2020). Therefore, we employ the independence of the board of

directors (labelled as INDB) as a control variable, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors. On this basis, we propose the following hypothesis:

H8: Independence of board is significantly negatively associated with EM among Chinese listed firms.

8) Compensation of top managers

Previous research provides mixed evidence on the relationship between the compensation of top managers and earnings management. Firth et al. (2006) consider the compensation of CEOs in China's listed firms. The results reveal a positive relationship between CEO pay and earnings management. Furthermore, by following previous research (e.g., Choe and Yin, 2000), this study includes CEO and top management compensation as a control variable that may affect EM. This is labelled as Pay, which is the natural logarithm of the total cash compensation received by the top three executives. Option-based compensation is not considered in this study because it is rarely used by Chinese listed firms (Aharony et al., 2000). We label this variable as Pay. The following hypothesis is proposed:

H9: *Compensation of top (Pay) managers is significantly positively associated with EM among Chinese listed firms.*

9) Ownership structure

The association between state-ownership and earnings management in China is mixed. Prior studies conducted in the Chinese context also provide evidence that some government bodies help Chinese state-owned-enterprises engaged in earnings management to circumvent the central government's regulation. Chen and Yuan (2004) reveal that local government provides

subsidies to help firms boost their earnings above the regulatory threshold of rights offering and delisting. Moreover, this collusion between officials and listed firms in earnings management exists primarily among firms controlled by local governments. Similarly, Chen and Yuan (2004) state that local governments have alternative ways to support listed firms, such as granting taxation preference or favouring listed firms in the project approval process. However, Ding et al. (2007) suggested that state-owned-enterprise are less engaged in earnings management because they have greater opportunities to obtain more government support compared with privately listed firms. Therefore, consistent with former literature, this study considers whether firms are state-owned enterprises as a control variable (labelled as SOE), which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise. Thus, we propose the following non-directional hypothesis:

H10: *SOE is significantly associated with EM among Chinese listed firms.*

10) CEO Duality

CEO/Chairman duality increase the power in the CEO's position, potentially allowing for greater management discretion. The agency theory suggests that the CEO-chairman's combined role damages directors' monitoring function by discouraging autonomy in the boardroom, further entrenching CEOs, and establishing dependency (Daily and Dalton, 1997; Daily et al., 2003). Moreover, the monopoly of CEO is linked with the risk of bankruptcy, outperformance, and overly exceptional financial reports, thus encouraging the practice of earnings misrepresentation to maintain their status quo (Daily and Dalton, 1994; Ishak et al., 2016). Hence, Baker et al. (2019) reported that the magnitude of earnings manipulation is higher among US firms where the CEO is also the chairman. Also, they found that the separation of roles reduces the usage of accrual earnings management. Similarly, prior studies have found that CEO duality is negatively associated with firm performance and financial reporting quality

(Sandhu and Singh, 2019; Bouaziz et al., 2020). However, other studies have indicated that CEO duality has no significant impact on earnings misrepresentation (Ebrahim, 2007; Marra et al., 2011). Thus, this study uses a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise (labelled as Duality). On this basis, we propose the following hypothesis:

H11: CEO duality is significantly negatively associated with EM among Chinese listed firms

11) CEO Gender

Krishnan & Parsons (2008) argue that female is unlikely in engage in opportunistic behaviour in decisions makings. Their findings implies that woman are place less importance on their self-interests. Further, they are more likely to be risk averse than men (Barber and Odean, 2001). It is widely accepted that women are more cautious and less aggressive and more likely to be risk averse than men (Barber and Odean, 2001, Powell and Ansic, 1997). Comparing with male executive, female executive tends to act more cautious in decision making to enhance earnings quality (Srinidhi et al., 2011). It is therefore generally considered that women will adopt a restrained approach towards earnings management (Gul, et al, 2009). We use a dummy variable where a value of 1 is given if the CEO is a female and 0 otherwise (labelled as Gender). On this basis, we propose the following hypothesis:

H12: CEO Gender *is significantly negatively associated with EM among Chinese listed firms.*

3.6 Econometric issues concerned

In this section, we will discuss various econometric issues. First of all, we test the normality of our datasets. Using the ordinary least squares (OLS) method, we estimate the unknown parameter coefficients in a standard regression model and test the significance of the relationship between the dependent and explanatory variables (Dismuke and Lindrooth, 2006).

This method is mathematically simpler and intuitively appealing. However, one of the key assumptions for the OLS regression technique is that the data need to be normally distributed (Asteriou and Hall, 2007). To test the normality, we conducted skewness and kurtosis tests to test the normality of the dependent variables– the proxies for earnings management[9]. Our finding shows that the P-values of both the skewness and kurtosis for all dependent variables are less than 0.05 (the results can be found in the Appendix). Thus, we can reject the null hypothesis that assumes the distribution is normal. In other words, we can embrace the alternative hypothesis that our distribution is skewed and exhibits kurtosis, which indicates that our data is non-distributed with outliers. Therefore, we employ quantile regression to test our research aim. Unlike the standard linear regression[10], quantile regression is a median regression (also called least absolute-deviations regression). It allows the researcher to estimate covariate effects at different points of the distribution while controlling for individual factors that may be affecting the response and are correlated with the independent variables (Harding and Lamarche, 2009). This makes estimation is more robust to outliers than a mean regression. Quantile regression can help to investigate the impact of policy changes at different segments of a sample (Koenker,2005). As explained above, ordinary least squares (OLS) assumes that data and error terms are distributed normally whereas the quantile regression technique is not based on the same normal distribution assumption. Therefore, the technique enables us to assess the impact of mandatory adoption of internal control regulations on earnings management with particular emphasis on highest- and lowest- earnings manipulation in Chinese listed firms. In essence, with quantile regression, parameter estimates are derived at

[9] We test the normality for absolute value of discretionary accrual (AEM_DA – the main proxy accrual earnings management) and absolute value of abnormal cashflow, abnormal production costs, and abnormal discretionary expenses (REM_CFO REM_PRO and REM_DISX – the Main proxies for real earnings management).

[10] Standard linear regression, such as OLS, is used to summarise the average relationship between the dependent variable and variable of interest, based on the conditional mean function.

multiple points of the conditional distributions of earnings management. This will allow us to observe the impacts of mandatory adoption of internal control regulations at different quantiles. In addition, quantile regression models will allow us to account for unobserved heterogeneity and heterogeneous covariates effects (Canay,2011). This technique is increasingly being used in recent literatures (for example, Asogu, et al, 2018; Asogu, et al, 2019). The application of quantile regression in this study can not only overcome problems associated with non-normality but also provide a more complete picture of the relationship between the dependent variable and the variable of interest at different points in the conditional distribution of the dependent variable (Cameron and Trivedi, 2010).

Secondly, we also consider the multicollinearity. This refers to a linear relationship between two or more variables. It might pose serious difficulties relating to the model parameter coefficient estimates (Kim, 2019). To determine the degree of correlation between variables in this research, the Spearman correlation matrix is applied. Previous empirical studies emphasised that the higher the level of correlation coefficients between explanatory variables, the greater the multicollinearity problem (Grewal et al., 2004). A small correlation coefficient indicates the absence of multicollinearity and vice versa. Although different measures to study multicollinearity have been suggested by several studies, Harris and Raviv (2008) have indicated that ± 80% is the cut-off point of a serious multicollinearity problem that would influence the regression outcomes. The results of the Spearman correlation matrix will be explained in Chapter 4.

Thirdly, we considered heteroskedasticity. One of the assumptions of regression is that the error term has constant variance. if this assumption is violated then it is known as heteroskedasticity (Cameron and Trivedi, 2010). Baltagi et al, (2010) argues that the presence of heteroskedasticity will produce inefficient estimates of the regression coefficients and that

the standard error of these estimates would be biased. As noted above, this research applied quantile regression but the coefficients differing across quantiles could be a result of the presence of a heteroskedastic error (Cameron and Trivedi, 2010), which will invalidate statistical inference. The result of the Machado-Santos Silva test for heteroskedasticity (P-value = 0.000) indicates that there is heteroskedasticity issues. Therefore, we addressed this heteroskedasticity issue when we ran the quantile regression.

Lastly, we also considered potential endogeneity in the regression. Endogeneity issues refer to when one or more independent variables correlate with error terms. Endogeneity can arise from simultaneity, measurement error, or omitted variables. We recognise that our analyses might be subject to endogeneity concerns because the mandatory adoption of internal control regulations is arguably endogenously determined. The omitted factors might affect decisions regarding the mandatory adoption of internal control regulations. When it occurs, the causal effect from the omitted variable becomes tangled up in the coefficient on the variable with which it is correlated. This, in turn, undermines our ability to infer causality and thus severely impacts our results. We address this endogeneity concern by adopting two approaches. First, we use the lagged values of control variables in all our regression analyses to address reverse causality and selection issues (Kelley and Simmons, 2015). Secondly, we applied the PSM method (the details of which can be found in Chapter 6).

3.7 Summary

This chapter explained the methodology of the research. We began by discussing the underpinning research philosophy. This research aims to examine the relationship between the mandatory adoption of internal control regulation and earnings management among Chinese listed firms. In line with previous studies, we apply agency theory as a conceptual foundation

of our research. In the spirit of objectivism and positivism, we chose a deductive quantitative research approach. This chapter then explained the sampling process and assessed the validity of the dataset. After the data selection, our final sample included 963 firms distributed across 27 industries. Next, we explained the measurement for our dependent variable – earnings management. The vast majority of the previous earnings management literature only used one proxy for earnings management (Fan et al., 2010; Hong and Andersen, 2011;Yasser and Soliman, 2018, Harakeh et al., 2019). However, managers might use different forms of earnings management. Thus, in order to develop a better understanding of the topic, this study employs both accrual earnings management and real earnings management.

Moreover, this chapter discussed the regression model used in this study to investigate the relationship between the mandatory adoption of internal control regulation and earnings management in Chinese listed firms. The variable of interest and control variables are identified. The choice of control variables is justified. Lastly, key econometric issues are addressed in this research. Normality, multicollinearity, heteroskedasticity, and endogeneity and their corresponding solutions are all discussed. Based on the findings from the normality test, we will use quantile regression to overcome the issue of non-distributed data. The next chapter will discuss the descriptive statistics of the key variables underlying this study. The results obtained from the quantile regression model will also be discussed to determine whether they conform to the hypotheses developed in this chapter.

Chapter 4 Results of the basic empirical analysis

In the previous chapter, we discussed a baseline regression model and developed hypotheses. Our primary objective is to investigate the relationship between the mandatory internal control regulation and earnings management among China's listed firms. Hence, our dependent variable is earnings management, while the variable of interest is a dummy variable, namely, the mandatory adoption of internal control regulation. A vector of control variables is included, comprising firm size, leverage, operating cash flow, profitability, firm growth, independence of the board, payment of top managers, auditor quality, ownership structure, chief executive officer (CEO) duality and CEO gender. Year- and industry-fixed effects are also considered.

In this chapter, we use accrual earnings management as the main dependent variable to investigate the relationship between the mandatory adoption of internal control regulation and earnings management among Chinese listed firms. The real earnings management proxies will be used in the subsequent chapter (Chapter 5) to provide robust results. As mentioned in Chapter 3, we employ the quantile regression technique to perform our regression. In the present chapter, Section 4.1 explains the descriptive statistics of the variables and presents the results of the Spearman correlation matrix. Section 4.2 reports the results of the quantile regression by using accrual earnings management as the dependent variable. The results of the additional analysis are described in Section 4.3. Lastly, Section 4.5 summarizes the chapter.

4.1 Descriptive statistics and Spearman's correlation matrix

4.1.1 Descriptive statistics

Descriptive statistics provide information summarising the variables' characteristics. We create two descriptive statistics tables to present values for the mean, median, maximum, minimum and standard deviation of all of the variables we used in the main analysis. Thus, Table 4.1 reports the descriptive statistics with full samples, while Table 4.2 shows our dataset's division into two subgroups and reports the descriptive statistics for pre- and post-adoption periods. Table 4.1 and Table 4.2 are presented in next pages.

Table 4.1: Descriptive Statistics						
Variable	**Observations**	**Mean**	**Median**	**Std.Dev.**	**Min**	**Max**
AEM_DA	8565	0.074	0.046	0.146	0	7.494
REM_CFO	8574	0.061	0.044	0.059	0	0.49
REM_DISX	8564	0.039	0.023	0.049	0	0.482
REM_PROD	8417	0.084	0.052	0.114	0	3.523
Size	8665	21.982	21.906	1.303	14.108	27.104
Leverage	8427	0.065	0.021	0.099	0	0.846
ROA	8593	0.037	0.034	0.138	-7.344	1.226
CFO	8591	-0.047	0.048	9.181	-807.989	151.216
Tobin's Q	9296	2.068	1.414	2.676	0.094	78.105
Big10	8667	0.431	0	0.495	0	1
INDB	8591	0.367	0.333	0.053	0.091	0.714
Pay	8643	13.965	13.991	0.808	10.094	17.352
SOE	8667	0.551	1	0.497	0	1
Duality	8667	0.2	0	0.4	0	1
Gender	9586	0.052	0	0.222	0	1

Variable Definitions:
AEM_DA = absolutely value of discretionary accruals computed using the Modified Jones model (Dechow et al.,1995); *REM_CFO* = absolutely value of abnormal cash flows from operations computed using the Roychowdhury's model (2006); *REM_DISX* = absolutely value of abnormal discretionary expenses computed using the Roychowdhury's model (2006); *REM_PROD* = absolutely value of abnormal production costs computed using the Roychowdhury's model (2006); *Size* = firm size is measured as the natural logarithm of total assets at the year-end;

Leverage = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise.

Table 4.2 Comparison of Descriptive Statistics in Pre- and Post – mandatory adoption periods						
	Observations in Pre- period	**Observations in Post- period**	**Mean in Pre-mandatory adoption period**	**Mean in Post-mandatory adoption period**	**Difference**	**P-value**
AEM_DA	4485	4080	0.090	0.057	0.033	0.000
REM_CFO	4488	4086	0.067	0.056	0.011	0.000
REM_DISX	4491	4073	0.039	0.038	0.002	0.220
REM_PROD	4344	4073	0.091	0.076	0.016	0.000
Size	4576	4089	21.637	22.368	-0.732	0.000
Leverage	4551	3876	0.064	0.066	-0.002	0.350
ROA	4505	4088	0.038	0.035	0.004	0.270
CFO	4503	4088	-0.142	0.057	-0.200	0.320
Tobin's Q	4667	4629	2.195	1.942	0.253	0.000
Big10	4578	4089	0.335	0.538	-0.203	0.000
INDB	4503	4088	0.363	0.371	-0.009	0.000
Pay	4559	4084	13.708	14.253	-0.546	0.000
SOE	4578	4089	0.560	0.541	0.020	0.070
Duality	4578	4089	0.178	0.225	-0.048	0.000
Gender	4791	4795	0.051	0.053	-0.002	0.653
Variable Definitions: All variables are defined in Table 4.1						

Table 4.1 shows our dependent variable in this chapter; accrual earnings management (AEM_DA) has a mean value of 0.074, indicating that managers in our study samples manipulate financial information by using accrual earnings management. The maximum and minimum values of 7.494 and 0.000, respectively, suggest that accrual earnings management behaviour has considerable dispersion across Chinese listed firms. Moreover, the standard deviation of AEM_DA is 0.146, which indicates that the variation is relatively large. Despite the differences in the sample period, the median and mean of the majority of variables we examined are broadly similar to those reported by prior studies in Chinese context (e.g., Firth et al., 2007; Gul et al., 2010; Hou et al., 2012). However, the mean that we found for AEM_DA (0.074) is much higher than the findings generated by some studies focusing on other countries (e.g., Klein 2002). For example, Cohen's (2008) US-based research concluded that the mean of the absolute value of accrual earnings management is 0.01. This difference implies that the magnitude of accruals base earnings management in China's listed companies is higher than that of companies listed in the stock markets of other countries. This might be a result of China's weak investor protection environment as compared with that of more developed countries. Empirical studies by Allen et al. (2005) and Firth et al. (2007) both conclude that the system of investor protection in China lags far behind that of most countries in the sample used in the studies by Porta et al. (1997, 1998). Although the Chinese government is taking measures to improve the market environment and regulate business practices, overall market transparency remains low, and disclosure quality remains substandard; thus, managers have significant latitude in manipulating earnings.

Regarding control variables, our surprising finding is that the mean of Leverage is 0.065. This value implies that on average, China's listed firms do not rely heavily on debt finance. However, the maximum value of 0.846 is significantly higher than the mean (0.065) and

median (0.021) values for leverage, indicating that some Chinese listed firms are highly dependent on debt finance. Moreover, at 9.181, cash flow from operations (*CFO*) has the highest standard deviation among the variables. The mean value (-0.047) for cash flow from operations indicates that, in average, Chinese listed firms generates a negative cash flow from their operations. Notably, with a minimum value of -807.989 and a maximum value of 151.216, cash flow from operations (CFO) shows considerable dispersion across Chinese listed firms during the study periods. Similarly, firm growth (Tobin's Q) has the second-highest standard deviation: 2.676. Given the concern that the maximum value of 78.105 is much higher than the mean (2.068) and median (1.414), we found that some listed firms have extremely high growth opportunities as compared with others. The mean of the Big10 (0.431) indicates that our samples consist of 43.1% of audits conducted by the Big10. Additionally, the mean of SOE (0.551) shows that 55.1% of observations are state-owned enterprises. Furthermore, the mean of Duality is 0.2. This indicates that 20 % of the observations have a combined CEO-chairman role. Gender has a mean of 0.052, indicating that only 5% of the sampled firms have a female CEO. In addition, The Chinese Corporate Governance Code requires that at least one-third of listed firms' board members be independent (Cumming et al, 2013). The median ratio of independent directors on the board (INDB) is 0.333 and the mean is 0.367, indicating that, in general, Chinese listed firms meet the requirement. The mean is slightly higher than the median, which indicates that few firms have more than the required number of independent directors on the board. Lastly, the mean values for firm size (Size), profitability (ROA) and compensation of managers (Pay) are 21.982, 0.037 and 13.965, respectively. In general, the mean and median values for the variables in our datasets are similar to those of other studies of Chinese contexts (e.g. Chen et al., 2020). This indicates that there are no identical errors among our datasets. High maximum and low minimum values are present because we did not exclude outliers. These statistics support the results we obtained from skewness and kurtosis

tests (see Chapter 3, Section 6), which indicate that quantile regression is appropriate for this study.

To reiterate, our study investigates the relationship between the mandatory adoption of internal control regulation and earnings management. Since the Chinese listed firms that we included in our study sample have been required to follow the internal control regulations since it became mandatory on 1 January 2012, we use the mandatory adoption date (1 January 2012) as a cut-off point to divide our datasets into pre- and post-adoption period subgroups (pre-period is 2007-2011 and post period is 2012-2016) Additionally, we performed a T-test to examine the significance of the differences between the two periods. Descriptive statistics are presented in Table 4.2.

Table 4.2 shows that the mean of our main dependent variable in this Chapter, AEM_DA (a proxy for accrual earnings management), is lower for the post-adoption periods. The mean of AEM_DA for the pre-adoption period is 0.0.90, whereas it becomes 0.057 after the mandatory adoption of the regulations. Our results also show that accrual earnings management significantly decreased – by 0.033 (P-value = 0.000), on average. This constitutes preliminary evidence that the mandatory adoption of internal control regulation reduces the magnitude of earnings management. It supports our main hypothesis (H1, which was presented in Chapter 3): the mandatory adoption of internal control regulation is significantly and negatively associated with earnings management among Chinese listed firms. Regarding the control variables, we found that the mean of firm size (Size) increased by 0.732 in the post-adoption period (P-value = 0.000), This reflects the growth of China's economy over the past decade. However, it is surprising that a firm's average growth (Tobin's Q) dropped by 0.253 in the post-adoption period (P-value = 0.000). A potential explanation is the rampant corruption in

China during the study period, which negatively affected firm growth (Ayaydın, and Hayaloglu, 2014). Moreover, the use of the Big 10 and independent director ratio (INDB) during this period increased by 20.3% (the mean values increasing by 0.203, with P-value = 0.000, and 0.009, with P-value = 0.000, respectively). Since improved auditor quality (Big 10) and greater independence of the board (INDB) are widely recognised as enhancements of a corporate governance system (e.g., Tulung and Ramdani, 2018), our findings suggest that the mandatory adoption of internal control regulation has positively affected corporate governance systems. Furthermore, managers' compensation (Pay) increased during the post-adoption period (the mean increasing by 0.546, with P-value = 0.000), which reflects the increases in managers' compensations in past years. Lastly, the combined CEO-chairman role (Duality) became more common during the post-adoption period (the mean increasing by 0.048, with P-value = 0.000), which indicates that CEOs expanded the scope of their authority.

4.1.2 Spearman's correlation matrix

Because our data included outliers, we used Spearman's correlation matrix test to identify any multicollinearity issues in the set of independent variables. Previous studies suggested that a correlation coefficient of 80% or higher reveals a serious issue of multicollinearity (Gujarati, 2009; Gujarati and Porter, 2011; Altawalbeh, 2020; Salem et al., 2020b), whereas others argue that 70% should be the benchmark (Tabachnick and Fidell, 2001; Alqatan et al., 2019). Our results are unaffected by this disagreement because potential multicollinearity among our variables is low; the highest correlation coefficient is lower than 60% (specifically, the correlation coefficient between Size and Tobin's Q is 58.88%). Table 4.3 (See next page) presents Spearman's correlation matrix.

Our main objective is to investigate the relationship between the mandatory adoption of internal control regulation and earnings management. The correlation coefficient between this chapter's primary dependent variable, AEM_DA, and the variable of interest, ICR, is -0.1393, which is significant with a level of 5%. This finding also provides preliminary evidence to support our main hypothesis, once again, that the mandatory adoption of internal control regulation is significantly and negatively associated with earnings management by China's listed firms.

Table 4.3 Spearman's Correlation Matrix								
Panel A: Correlation variables *AEM_DA* to *ROA*								
	AEM_DA	*REM_CFO*	*REM_DISX*	*REM_PROD*	*ICR*	*Size*	*Leverage*	*ROA*
AEM_DA	1.0000							
REM_CFO	0.4524*	1.0000						
REM_DISX	0.0311*	0.0785*	1.0000					
REM_PROD	0.1681*	0.2651*	0.2482*	1.0000				
ICR	-0.1393*	-0.0819*	-0.0393*	-0.0702*	1.0000			
Size	-0.1070*	-0.0431*	-0.2101*	-0.0477*	0.2726*	1.0000		
Leverage	-0.0310*	-0.0201	-0.2522*	-0.0195	0.0198	0.4600*	1.0000	
ROA	0.0076	0.1238*	0.1065*	0.1648*	-0.1144*	0.1037*	-0.0967*	1.0000
CFO	-0.0628*	0.0082	0.0680*	0.0085	-0.0525*	0.0225*	-0.0594*	0.3924*
Tobin's Q	0.0648*	0.0629*	0.2524*	0.1065*	-0.1305*	-0.5888*	-0.4479*	0.2752*
Big10	-0.0686*	-0.0454*	-0.0224*	-0.0217	0.2034*	0.1196*	-0.0046	0.0294*
INDB	0.0167	-0.0128	0.0024	-0.0006	0.0729*	0.0605*	0.0353*	-0.0620*
Pay	-0.0625*	0.0266*	-0.0536*	0.0495*	0.3206*	0.4864*	0.1374*	0.2893*
SOE	-0.0537*	-0.0555*	-0.0964*	-0.0638*	-0.0282*	0.1873*	0.1001*	-0.0479*
Duality	0.0306*	0.0438*	0.0573*	0.0598*	0.0670*	-0.0937*	-0.0873*	-0.0113
Gender	0.0340*	0.0505*	-0.0163	0.0109	0.0004	0.0068	-0.0103	0.0466*
Panel B: Correlation variables *CFO* to *Gender*								

	CFO	*Tobin's Q*	*Big10*	*INDB*	*Pay*	*SOE*	*Duality*	*Gender*
CFO	1.0000							
Tobin's Q	0.1529*	1.0000						
Big10	0.0188	-0.0393*	1.0000					
INDB	-0.0440*	-0.0312*	0.0211	1.0000				
Pay	0.0735*	-0.1431*	0.1765*	0.0480*	1.0000			
SOE	0.0032	-0.1867*	-0.0323*	-0.0334*	-0.0041	1.0000		
Duality	-0.0209	0.1088*	0.0249*	0.0437*	0.0421*	-0.1869*	1.0000	
Gender	0.0201	-0.0002	0.0159	-0.0017	0.0338*	-0.0726*	0.0157	1.0000

Notes: Coefficients with star are statistically significant at the 5% level. *ICR* is our variable of interests. It is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise. Rest of variables are defined in Table 4.1. All variable definition are also presented in Appendix.

4.2 Quantile regression results

As explained in the chapter on methodology (see Section 3.4), we built the following regression model to test our hypotheses.

$$EM_{it} = \alpha_0 + \alpha_1 ICR_t + \beta_2 Controls + FixedEffects + \varepsilon_{it}$$

In this chapter, we use accrual earnings management as a proxy for earnings management, which is the main dependent variable. Firstly, therefore, EM = AEM_DA, which is the absolute value of the discretionary accruals computed by the modified Jones model (Dechow et al., 1995). Secondly, the independent variable, ICR, is our variable of interest. It is an indicator variable that takes the value of 1 for years ending on or after the adoption date of mandatory internal control regulation for firms (the adoption date being the year beginning on or after 1 January 2012) and 0 otherwise. Here, α_1 is our coefficient of primary interest. This coefficient indicates the impacts of the mandatory adoption of internal control regulation on earnings management among Chinese listed firms. Thirdly, Controls denotes a vectors of control variables. They are firm level characteristics variables [firm size (Size), Leverage (Leverage), Profitability (ROA), Operating cash flow (CFO), Firm growth (Tobin's Q)], external monitoring [Auditor quality (Big10)], and corporate governance characteristics variables [Independence of board (INDB), Compensation of top managers (Pay), Ownership structure (SOE), CEO duality (Duality) and CEO gender (Gender)]. Definitions of control variables can be found in Table 4.4 (See Notes) or Appendix. Lastly, FixedEffects refers to industry fixed effects and year fixed effects. As mentioned previously, we used the lag value of control variables to mitigate potential endogeneity.

Table 4.4 (see next pages) presents the results of the quantile regression. Supporting preliminary finding in previous sections, our quantile regression results show the ICR is negatively and significantly associated with AEM_DA in most of percentiles (from 25th to

95th). One percentile in the lower band (25th) shows significance at the level of 10%, while the significance in the remaining percentiles shows a level of either 5% or 1%. In general, by using accrual earnings management as a proxy, our quantile regression supports our main hypothesis (H1), namely: The mandatory adoption of Chinese internal control regulation is significantly and negatively associated with earnings management among Chinese listed firms. This indicates that after the adoption of internal control regulation, the magnitude of accrual earnings management is reduced. The Chinese internal control regulation is designed to increase the effectiveness of internal controls and enhance the quality and transparency of the information disclosed to stakeholders. It requires firms to construct an effective internal control system over their control environment, risk assessment, control activities, information and communication, and monitoring systems. Some mechanisms under internal control regulations – such as the quality of financial statements assurance procedure, budgeting reviewing, contracts management, internal commutation system and internal control disclosure – are expected to mitigate managerial discretion granted from accounting standards. According to agency theory, a more transparent and regulated corporate environment can be expected to reduce information asymmetry and agency costs. Our results support this.

Table 4.4 Internal Control Regulation and Accrual Earnings Management (AEM_DA)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	0.000	-0.001	-0.002	-0.002	-0.004*	-0.005**	-0.007***	-0.007***	-0.007**	-0.007**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Size	-0.005	-0.012	-0.029***	-0.035***	-0.053***	-0.065***	-0.080***	-0.081***	-0.091***	-0.097***
	(0.007)	(0.008)	(0.009)	(0.011)	(0.012)	(0.013)	(0.016)	(0.014)	(0.018)	(0.018)
Leverage	-0.002	-0.001	-0.006	-0.003	-0.002	-0.006	-0.009	-0.009	-0.014**	-0.017**
	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)
ROA	0.006	0.010*	0.013**	0.016**	0.022***	0.023***	0.021*	0.016	0.017	0.013
	(0.004)	(0.005)	(0.006)	(0.007)	(0.008)	(0.008)	(0.011)	(0.010)	(0.011)	(0.016)
CFO	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tobin's Q	-0.000	-0.000*	-0.000**	-0.000*	-0.000*	-0.001**	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)
Big10	-0.000	-0.001	-0.002**	-0.001	-0.001	-0.002**	-0.003***	-0.004***	-0.004***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
INDB	0.002	0.003	0.010	0.008	0.012	0.011	0.017*	0.016	0.019	0.026**
	(0.005)	(0.006)	(0.007)	(0.008)	(0.010)	(0.010)	(0.010)	(0.011)	(0.012)	(0.012)
Pay	-0.004	-0.013*	-0.002	-0.010	-0.006	-0.005	-0.005	-0.003	-0.011	-0.021
	(0.007)	(0.007)	(0.009)	(0.010)	(0.011)	(0.011)	(0.012)	(0.013)	(0.018)	(0.017)
SOE	-0.000	-0.000	-0.001	-0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Duality	0.000	0.000	-0.001	0.000	0.001	0.000	0.000	0.000	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Gender	-0.000	-0.000	0.000	0.001	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)
Constant	0.030	0.077***	0.103***	0.147***	0.198***	0.241***	0.291***	0.294***	0.351***	0.393***
	(0.023)	(0.026)	(0.028)	(0.034)	(0.040)	(0.040)	(0.048)	(0.046)	(0.056)	(0.058)

N	6823	6823	6823	6823	6823	6823	6823	6823	6823	6823
R-sq	0.017	0.043	0.058	0.073	0.082	0.088	0.094	0.096	0.097	0.100
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.009***	-0.010***	-0.011***	-0.011**	-0.013**	-0.017***	-0.020***	-0.031***	-0.055***	
	(0.003)	(0.003)	(0.004)	(0.005)	(0.005)	(0.006)	(0.007)	(0.010)	(0.013)	
Size	-0.112***	-0.109***	-0.109***	-0.109***	-0.114***	-0.150***	-0.183***	-0.194***	-0.241***	
	(0.020)	(0.023)	(0.022)	(0.024)	(0.028)	(0.035)	(0.047)	(0.058)	(0.090)	
Leverage	-0.023***	-0.025***	-0.029***	-0.035***	-0.043***	-0.044***	-0.035**	-0.060**	-0.082***	
	(0.007)	(0.008)	(0.008)	(0.009)	(0.011)	(0.011)	(0.016)	(0.028)	(0.031)	
ROA	0.012	0.011	0.012	0.019	0.009	0.010	-0.034	-0.058	-0.078	
	(0.015)	(0.015)	(0.023)	(0.020)	(0.026)	(0.033)	(0.043)	(0.046)	(0.061)	
CFO	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000	0.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
Tobin's Q	-0.000	0.001	0.001	0.001	0.002	0.003*	0.005*	0.007***	0.008**	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)	(0.004)	
Big10	-0.004***	-0.004**	-0.003	-0.004*	-0.005**	-0.005*	-0.003	-0.006	-0.009	
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.008)	
INDB	0.022*	0.021	0.015	0.017	0.011	0.015	0.025	0.028	0.043	
	(0.012)	(0.013)	(0.013)	(0.021)	(0.022)	(0.025)	(0.026)	(0.040)	(0.069)	
Pay	-0.030*	-0.044**	-0.053***	-0.069***	-0.071***	-0.078**	-0.082**	-0.071	-0.075	
	(0.017)	(0.020)	(0.020)	(0.025)	(0.025)	(0.033)	(0.037)	(0.052)	(0.064)	
SOE	-0.002	-0.004**	-0.005**	-0.006***	-0.005**	-0.004	-0.003	-0.004	-0.001	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.005)	(0.008)	
Duality	-0.000	0.000	0.001	-0.000	0.002	0.003	0.007	0.008	0.011	
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.005)	(0.006)	(0.009)	
Gender	-0.000	-0.001	0.001	0.003	0.011	0.014*	0.018**	0.010	0.026	
	(0.003)	(0.004)	(0.005)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.022)	

Constant	0.472***	0.507***	0.534***	0.582***	0.609***	0.748***	0.865***	0.885***	1.087***	
	(0.060)	(0.065)	(0.073)	(0.082)	(0.101)	(0.127)	(0.171)	(0.190)	(0.273)	
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	
R-sq	0.102	0.103	0.103	0.103	0.105	0.105	0.105	0.106	0.104	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes:

The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.

This table present the relationship of mandatory adoption of internal control regulation and accrual earnings management. The dependent variable *AEM_DA* = absolutely value of discretionary accruals computed using the Modified Jones model (Dechow et al.,1995); Variable of interests, *ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise.

Our results are generally consistent with previous research (for example, Cohen, 2008), which has found that the adoption of internal control regulation has a negative relationship with the magnitude of the accrual earnings management. Different from other study which largely investigate the impact of adoption of IFRS on earnings management (Ipino and Parbonetti,2017; Mongrut and Winkelried, 2019; Azzali et, al., 2021), our research focus on investigates the relationship between adoption of internal control regulation and earnings management. Yet, we still can conclude the similar findings that the adoption of a stricter regulation can reduce the magnitude of the accrual earnings management. This finding can be also supported by Institutional theory. It suggests that the adoption of the internal control regulation will form a new regulatory environment. In order to gain the legitimacy and survival capabilities, firms are more like to engage in less earnings management, thereby provide higher quality of financial information. In contrast to previous studies which focus on average effects on earnings management (for example, Ho, et al, 2015), however, we generated more comprehensive results by using quantile regression. First, we found that the significant negative relationship exists in only the middle and higher band percentiles (from 25^{th} to 95^{th}). At the lower band percentiles (from 5^{th} to 20^{th}), there are no significant results. This indicates that there is no evidence showing that the adoption of internal control regulation affects firms with lower earnings management. Second, in observing the coefficient of ICR from 25^{th} to 95^{th} percentiles, we notice an increasing trend in the absolute value of coefficients over the percentiles. For example, the coefficient at 55th percentile is - 0.009 but it becomes -0.011 at 65th percentile; then, it gradually becomes - 0.055 at the highest percentile (95th). This indicates that after internal control regulations were adopted, firms with greater earnings management experienced a greater reduction in their earnings manipulation. It is reasonable to conclude that internal control regulation has stronger effects on firms with a higher incidence of earnings management. This finding is consistent with institutional theory, firms have

conscious of what is going on in their industry and intend to adopt similar business standards (Aldrich, 1979; DiMaggio and Powell, 1983). The firms with greater earnings management noticed that higher quality of financial report is desirable by authority requirement, professional recognition, economic advantages, and social influence. They reduced larger proportion of earnings manipulation compare with the firms with smaller earnings management.

The effects of control variables on earnings are as follows. First, firm size (Size) has a significant negative association with earnings management in most percentiles (15^{th} to 95^{th}; H2[11] is supported). We use the firm size to measure the size of company. Consistent with previous studies (Dimitropoulos and Asteriou, 2010; Jaggi et al., 2009), firm size is measured as the natural logarithm of total assets at the year-end. Previous research provides mixed evidence regarding the relationship between firm size and earnings management (Pyo and Lee, 2013; Hong and Andersen, 2011; Gargouri et al., 2010; Nalarreason et al, 2019; Ruwanti et, al, 2019). Our findings are consistent with previous studies (for example, Lobo and Zhou, 2006). They imply that larger firms, which are often required to disclose their financial information and are subject to greater external monitoring and scrutiny, are less likely to manipulate their earnings.

Second, leverage (Leverage) has a negative relationship with earnings management among all quantiles. This becomes statistically significant from 45^{th} percentiles (H3 is rejected at these quantiles). Leverage is measured as total debt divided by total assets. Previous research are conclude that there is a positive relationship between Leverage and earnings management (Anagnostopoulou and Tsekrekos, 2017; Ruwanti et, al, 2019). This indicate that leverage increases the likelihood that financial information will be manipulated because the penalties

[11] H2 refers to Hypothesis 2. Same as H3 – H12

for violating debt covenants motivate executives to maintain good relationships with creditors or signal favourable information (Sweeney, 1994; Beatty and Weber, 2003; Barkhordar and Tehrani, 2015; Lazzem and Jilani, 2018). Our negative results indicate that higher leverage leads to lower earnings management, which is unexpected. We surmise that firms with higher debt finance are more willing to provide high-quality financial statements, engaging less in earnings management. Such statements provide more information to stakeholders, notably creditors and investors, and signal how efficiently they are utilising borrowing.

Third, the profitability of firm (ROA) is significantly and positively related to earnings management at the lower band percentiles (from 10^{th} to 35^{th}; thus, H5 is supported). We measure the ROA (return on assets) by using earnings before interest and tax divided by average total assets (Zalata and Roberts, 2016). Previous study showed mix evidence on the relationship between ROA and earnings management (Ashbaugh et al. ,2003; Alexander, 2017 Kalbuana et al, 2021). This finding is consistent with Ashbaugh et al. (2003) and Jo and Kim (2007), who found that high profitability is positively and significantly related to discretionary accruals.

The fourth result is that operating cash flow is negatively associated with earnings management among all quantiles. The statistically significant relationship exists at 5^{th} percentile to 85^{th} (H4 is supported). Previous studies have found that firms with relatively high operating cash flows are less likely to manipulate earnings (Jiang, 2008, Gul et al., 2009, Astami et al., 2017, Yung and Root, 2019). By following Peasnell et al. (2005), we measure the operating cash flow (Label as CFO) as net cash flow from operations divided by lagged total assets. Our finding is consistent with previous studies (Becker et al., 1998; Bauer and Boritz, 2009, Gul et al., 2009

Nallareddy et al, 2020). It implies that firms with healthy performance (i.e. strong cash inflow) have fewer incentives to engage in earnings management.

As a fifth result, firm growth (Tobin's Q) provides mixed evidence. We used Tobin's Q as proxy of firm growth. Previous studies suggest that managers in firms with high growth more likely to engage in deceitful activities such as earnings misrepresentation in order to maintain the growth status (for example, Skinner and Sloan, 2002). However, our finding suggests that there is a negative relationship between Tobin's Q and earnings management in the first half percentiles (from 5^{th} to 55^{th}), while a statistically significant relationship exists from 10^{th} to 30^{th} percentiles (H6 is rejected). A potential explanation is that high-growth firms can perform very well by taking advantages from growing opportunities, and consequently, they do not need to create artificial healthy performance by misreporting earnings. On the contrary, our results show a relationship that is positive between Tobin's Q and earnings management in the second half quantiles (from 60^{th} to 95^{th} percentiles) and becomes significant from 80^{th} to 95^{th} (H6 is supported). The findings in these percentiles are consist with previous research (Park and Shin, 2004; Lara, et al., 2020). It suggests that high-growth firms are more likely to engage in earnings management because of the pressure to meet target growth outcomes (Carcello and Nagy, 2004).

Sixth, we find auditor quality (Big 10) has a negative relationship with earnings management among all quantiles. Additionally, there is a significant relationship for several quantiles (for example, 35^{th} percentile; H9 is supported). We set Big 10 as 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise. Our findings are consistent with those of previous studies (e.g. Velury, 2003 Sitanggang et al, 2020); the use of the Big 10's

highly trained auditors improved the auditing process. Thereby the stricter monitoring reduces opportunistic managerial behaviour.

The seventh result is surprising; the independence of the board (INDB) is positively related to earnings management (and therefore, H6 is rejected). We measure the independence of the board of directors as the number of independent non-executive directors divided by the total number of boards of directors. A statistically significant relationship exists at.35^{th}, 50^{th} and 55^{th} percentile. Corporate governance and earnings management studies provide evidence that the independence of board members is positively correlated with the effectiveness of a company's governance, and negatively associated with financial statement fraud (Waweru and Riro, 2013; Zalata and Roberts, 2016, El Diri et al., 2020). However, our findings conflict with previous arguments that the independence of board members is positively correlated with the effectiveness of a company's governance and negatively associated with financial statement fraud (Abdelsalam et al., 2008).

The eighth result is that the compensation of top managers (Pay) shows a significant negative association with earnings management in most of percentile (H8 is rejected). We measure the compensation of top managers as the natural logarithm of the total cash compensation received by the top three executives. The finding of Harris et al (2019) suggest that higher compensation result in a higher earnings manipulation. It indicates that mangers may engage in more earnings management to obtain higher performance-related salary. However, our finding is inconsistent with previous research findings that compensation is positively related to earnings management (Firth et al., 2006). This might be a result of different way to calculation compensation. We argue that managers with high compensation prefer to stay in their position for longer periods to keep earning high compensation. Earnings management arguably damages long-term

benefits for firms and shareholders; therefore, managers with high compensation, who typically want to secure their jobs for long-term, are unlikely to engage in the practice.

The ninth result is that SOE (state-owned enterprise) has a significant negative association with earnings management from 60^{th} to 75^{th} percentile (and H10 is supported). Previous studies show the association between state-ownership and earnings management in China is mixed (Chen and Yuan 2004; Ding et al. ,2007). We consider the firm is a state-owned enterprise if the largest shareholder is government, and not otherwise. Our results are inconsistent with previous studies (e.g. Chen and Yuan, 2004). They imply that state-owned enterprises are less likely to engage in earnings management because they receive more government support than non-state-owned enterprises.

The tenth finding is that CEO duality (Duality) has no significant relationship with earnings management among all quantiles (and therefore, H11 is rejected). This study uses a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise. Previous study provides significant but mix relationship between CEO duality and earnings management (Baker et al. 2019; Sandhu and Singh, 2019; Bouaziz et al., 2020). The reason we concluded significant relationship could be we used different datasets.

Lastly, CEO gender (Gender) is positively and significantly associated with earnings management at the higher band of percentiles (at 80^{th} and 85^{th}), and accordingly, H12 is rejected. We use a dummy variable where a value of 1 is given if the CEO is a female and 0 otherwise (labelled as Gender). Our result is inconsistent with previous research, which found that female board directors engage in less earnings management (Krishnan and Parsons, 2008; Harakeh et al., 2019; Zalata et al., 2019; Zahra et al., 2007).

4.3 An alternative measure of accrual earnings management

To check the robustness of our main finding in Section 4.2, we use an alternative measure to compute discretionary accruals. We adopted Kothari et al.'s (2005) performance-matching accrual model (explained in Chapter 3) to create the proxy form accrual earnings management. As with the main proxy (AEM_DA) for accrual earnings management, we used the absolute value of discretionary accruals computed by Kothari et al.'s (2005) performance-matching accrual model (labelled as AEM_KDA) because this research focuses on the magnitude of earnings management.

We used AEM_KDA as a proxy of accrual earnings management and tested our hypotheses by employing our regression model:

$$EM_{it} = \alpha_0 + \alpha_1 ICR_t + \beta_2 Controls + FixedEffects + \varepsilon_{it}$$

Here, EM = AEM_KDA, the absolute value of discretionary accruals computed by Kothari et al.'s (2005) performance-matching accrual model. Secondly, the independent variable, ICR, is our variable of interest. It is an indicator variable that takes the value of 1 for years ending on or after the adoption date of mandatory internal control regulation for firms (the adoption date being the year beginning on or after 1 January 2012) and 0 otherwise. Here, α_1 is our coefficient of primary interest. This coefficient indicates the impacts of the mandatory adoption of internal control regulation on earnings management among Chinese listed firms. Thirdly, Controls denotes a vectors of control variables. They are firm size (Size), Leverage (Leverage), Profitability (ROA), Operating cash flow (CFO), Firm growth (Tobin's Q), Auditor quality (Big10), Independence of board (INDB), Compensation of top managers (Pay), Ownership structure (SOE), CEO duality (Duality) and CEO gender (Gender). Definitions of control

variables can be found in Table 4.4 (See Notes) or Appendix. Kothari's (2005) model includes ROA in the computation of discretionary accruals, arguing that accrual models should control for the effect of performance on measured discretionary accruals. Therefore, to avoid potential multicollinearity, we do not include profitability (ROA) as one of our control variables. Lastly, the FixedEffects variable refers to industry-fixed effects and year-fixed effects. As noted earlier, we used a lag value of control variables to mitigate potential endogeneity. Lastly, FixedEffects refers to industry fixed effects and year fixed effects. As mentioned previously, we used the lag value of control variables to mitigate potential endogeneity. To simplify the presentation here, descriptive statistics and correlation matrix for this section are presented in Appendix.

Table 4.5 (see next page) presents the results of quantile regression. Our results show that the ICR is negatively and significantly associated with AEM_KDA at most of the percentiles (only 5^{th} to 15^{th} percentiles show insignificant results). A few percentiles (20^{th}, 85^{th} and 95^{th}) present significance at the level of 10%, whereas significance at the remaining percentiles shows levels of either 5% or 1%. In general, by using an accrual earnings management proxy that was generated by an alternative measure, we found that our quantile regression generally supports the results presented in Section 4.2 and that our findings are robust. This gives us confidence that by using accrual earnings management as a proxy for earnings management, we can accept our main hypothesis.

Table 4.5 Internal Control Regulation and Accrual Earnings Management (AEM_KDA)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001	-0.003***	-0.002	-0.003*	-0.005***	-0.007***	-0.007***	-0.009***	-0.008***	-0.008***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Size	-0.001	-0.006	-0.015*	-0.018*	-0.030***	-0.041***	-0.054***	-0.058***	-0.052***	-0.058***
	(0.006)	(0.007)	(0.008)	(0.009)	(0.011)	(0.012)	(0.014)	(0.015)	(0.016)	(0.017)
Leverage	-0.005*	-0.008**	-0.008*	-0.007*	-0.010**	-0.013***	-0.014***	-0.017***	-0.016***	-0.022***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)
CFO	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tobin's Q	-0.000	-0.000	-0.000	-0.000	-0.000*	-0.000	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Big10	-0.001**	-0.001*	-0.002**	-0.002**	-0.002***	-0.003***	-0.004***	-0.005***	-0.004***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
INDB	0.005	0.005	0.003	0.008	0.001	-0.001	0.001	0.001	0.003	0.005
	(0.005)	(0.006)	(0.007)	(0.007)	(0.007)	(0.008)	(0.009)	(0.011)	(0.011)	(0.012)
Pay	0.007	0.011*	0.009	0.005	0.014	0.018*	0.021*	0.019	0.013	0.004
	(0.006)	(0.006)	(0.008)	(0.009)	(0.010)	(0.010)	(0.011)	(0.012)	(0.015)	(0.016)
SOE	0.000	0.000	0.000	-0.000	0.000	0.000	-0.000	-0.001	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Duality	-0.000	-0.000	-0.000	-0.001	-0.001	-0.001	-0.001	0.000	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Gender	0.001	0.001	0.002	0.001	0.001	0.003	0.002	0.002	0.003	0.006
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.005)
Constant	-0.014	-0.005	0.032	0.055*	0.077**	0.107***	0.144***	0.166***	0.164***	0.209***

	(0.018)	(0.021)	(0.026)	(0.028)	(0.032)	(0.037)	(0.041)	(0.044)	(0.046)	(0.053)
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	6823
R-sq	0.021	0.048	0.076	0.087	0.093	0.097	0.103	0.107	0.106	0.108
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.009***	-0.008**	-0.010***	-0.010***	-0.010**	-0.012**	-0.013*	-0.018**	-0.025*	
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.007)	(0.008)	(0.014)	
Size	-0.081***	-0.067***	-0.079***	-0.093***	-0.120***	-0.134***	-0.164***	-0.196***	-0.256***	
	(0.017)	(0.018)	(0.018)	(0.021)	(0.026)	(0.039)	(0.040)	(0.051)	(0.093)	
Leverage	-0.029***	-0.032***	-0.037***	-0.040***	-0.049***	-0.050***	-0.045***	-0.040**	-0.038	
	(0.007)	(0.007)	(0.008)	(0.008)	(0.012)	(0.012)	(0.015)	(0.020)	(0.044)	
CFO	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000	0.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
Tobin's Q	-0.000	0.001	0.000	0.001	0.001	0.002**	0.002*	0.003**	0.006*	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	
Big10	-0.005***	-0.005***	-0.005***	-0.004**	-0.004*	-0.004	-0.003	-0.004	-0.010	
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.007)	
INDB	0.002	0.017	0.022*	0.020	0.018	0.025	0.016	0.024	0.025	
	(0.013)	(0.014)	(0.013)	(0.014)	(0.017)	(0.027)	(0.029)	(0.033)	(0.057)	
Pay	-0.008	-0.017	-0.019	-0.017	-0.010	-0.018	-0.037	-0.051	-0.084	
	(0.017)	(0.018)	(0.017)	(0.019)	(0.022)	(0.033)	(0.035)	(0.034)	(0.061)	
SOE	-0.003**	-0.004***	-0.006***	-0.007***	-0.005**	-0.005*	-0.005	-0.002	-0.002	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)	(0.008)	
Duality	-0.000	-0.001	-0.000	0.001	0.001	0.000	0.005	0.013***	0.012	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.005)	(0.011)	
Gender	0.007**	0.004	0.004	0.008*	0.008*	0.011	0.013*	0.010	0.019	

	(0.003)	(0.003)	(0.006)	(0.005)	(0.005)	(0.007)	(0.008)	(0.008)	(0.016)	
Constant	0.322***	0.300***	0.347***	0.395***	0.463***	0.530***	0.682***	0.823***	1.140***	
	(0.051)	(0.057)	(0.058)	(0.073)	(0.085)	(0.128)	(0.133)	(0.138)	(0.288)	
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	
R-sq	0.111	0.112	0.112	0.113	0.115	0.116	0.116	0.114	0.112	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes:

The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.

This table present the relationship of mandatory adoption of internal control regulation and accrual earnings management. The dependent variable *AEM_KDA* = absolutely value of discretionary accruals computed using the Kothari's (2005) Performance Matched model. Variable of interests, *ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise.

4.4 Summary

This chapter reports the results of a quantile regression analysing the relationship between the mandatory adoption of internal control regulations and earnings management in Chinese listed firms. The benefit of using quantile regression is that it allowed us to divide the study sample into different quantiles, which enabled us to capture the degree to which managers exploit accounting policies and investigate the effectiveness of internal control regulation in mitigating aggressive manipulation. By using accrual earnings management as a proxy for earnings management, we found that for most quantiles, there is a significantly negative relationship between the mandatory adoption of internal control regulations and earnings management. To evaluate the robustness of our findings, we employed a different measure to compute the magnitude of accrual earnings management. Results remain similar. Overall, our findings suggest that adopting internal control regulation leads to a reduction in the magnitude of earnings management. However, it has no significant effects on firms with low earnings management.

This study also used several control variables to capture the impact of different factors on earnings management. Our results suggest that firm size, leverage, operating cash flow, growth, auditor quality and compensation of managers have negative relationships with earnings management at various percentiles. Additionally, we found that state-owned enterprises engage in less earnings management. Interestingly, firm growth has various effects on earnings management at different percentiles. Also, we found evidence that female CEOs are more likely to engage in earnings management and that increasing the number of independent directors increased earnings management. These controversial results could inspire future research. In the next chapter, we replace accrual earnings management with real earnings

management as the proxy of earnings management to check the robustness of the findings reported here.

Chapter 5 Robustness check

In the previous chapter, we used a quantile regression technique to investigate the relationship between the mandatory adoption of internal control regulation and earnings management using accrual earnings management. Our key finding is that mandatory adoption of internal control regulation had a significant negatively impact earnings management in the studied samples. Only lower band quantiles show insignificant results. This could be a result of managers in lower band firms tending to be conservative: changes to the regulatory environment have no effect on them as they already barely engage in earnings manipulation.

This chapter aims to confirm the robustness of the findings discussed in the previous chapter by changing the definition of earnings management. Consequently, we replace accrual earnings management with real earnings management. Real earnings management involves taking actions that affect a firm's operations rather than adjusting financial numbers (Roychowdhury, 2006). There are three key proxies for real earnings management: abnormal cash flow from operations, abnormal discretionary expenses, and abnormal production costs. This chapter will consider all three proxies in quantile regression analysis to achieve our research aim. This chapter is organised as follows: Section 5.1 explains the descriptive statistics of real earnings management proxies, the results of a Spearman correlation matrix; Section 5.2 reports the results of quantile regression by using real earnings management as dependent variable; Section 5.3 presents the results of additional analysis; and section 5.4 summarizes the chapter.

5.1 Descriptive statistics and Correlation matrix

5.1.1 Descriptive statistics

Descriptive statistics for accrual earning management proxy and control variables were discussed in Chapter 4. Therefore, this section will concentrate primarily on the three proxies of real earnings management (data is presented in Tables 4.1 and 4.2 in Chapter 4), i.e., the abnormal cash flow from operations (REM_CFO), abnormal discretionary expenses (REM_DIXS) and abnormal production costs (REM_PRO). All three of these proxies are absolute values because we focus on the magnitude of financial misrepresentation rather than the direction of the misreporting.

The mean value of REM_CFO, REM_DIXS and REM_PRO within the full samples is 0.061, 0.039 and 0.084, respectively. This indicates that within the study sample, Chinese listed firms do engage in real earnings management. Particularly, REM_PRO has the highest mean value among three proxies (0.084), which indicates that Chinese listed firms mostly engage in real earnings management by altering their production costs. As discussed in Chapter 3, managers might deliberately increase production to reduce the cost of sales. With higher production levels, fixed overhead costs are spread over a larger number of units, lowering fixed costs per unit. Then total cost per unit declines. This implies that reported cost of sales is lower, and the firm reports better operating margins. The high mean value REM_PRO value reflects the fact that the Chinese economy is dominated by the manufacturing industry. The manufacturer is easier to engage in real earnings management because production costs are one of the major costs to the company.

The median of REM_CFO, REM_DIXS and REM_PRO is 0.044, 0.023 and 0.052, respectively. Each proxy's mean is noticeably higher than the median. This indicates that at least half of the sample firms are in the higher quantile band, which suggests that most firms engage in considerably high real earnings management. Despite the differences in the sample period, the medians and means of these proxies are broadly consistent with previous Chinese studies (e.g. Kuo et al., 2014; Liu et al., 2014). It indicates that our data do not have identical errors.

Like AEM_DA (proxy of accrual earnings management), Table 4.2 shows that the means of our main dependent variables in this Chapter, REM_CFO and REM_DIXS, are lower in the post-adoption periods. First, the mean of REM_CFO is 0.067 in pre-adoption period but drops to 0.056 (a decrease of 0.011) in the post-mandatory adoption period. Second, the mean of REM_DIXS drops by 0.002 between pre- and post-adoption periods. The differences for both proxies are statistically significant at 1% (p-value = 0.000). However, the REM_PRO mean did not significantly change post-adoption. The data suggest that the adoption of internal control regulation reduced REM_CFO and REM_DIXS, but did not affect REM_PRO. Thus, our main hypothesis[12] can be supported when we consider REM_CFO and REM_DIXS as proxies to represent real earnings management, whereas it is rejected when we consider REM_PRO.

[12] H1: the mandatory adoption of Chinese internal control regulations is significantly negatively associated with earnings management among Chinese listed firms (presented in Chapter 3).

5.1.2 Correlation matrix

The Spearman's Correlation Matrix test presented in Table 4.3 shows that there are no potential multicollinearity issues among our data. The correlation coefficient between the three main dependent variables (REM_CFO, REM_DIXS and REM_PRO) in this chapter and variable of interest, ICR, are -0.0819*, -0.0393*, and -0.0702* respectively, with a significance level of 5%. Our preliminary results suggest that real earnings management is negatively correlated with the adoption of internal control regulation. However, our finding in terms of REM_PRO is different to the results from descriptive statistics. The quantile regression in next section will provide us with a more comprehensive result.

5.2 Quantile regression results

As defined in the methodology chapter (see Section 3.4), we built the following regression model to test our hypotheses.

$$EM_{it} = \alpha_0 + \alpha_1 ICR_t + \beta_2 Controls + FixedEffects + \varepsilon_{it}$$

In this chapter, we use real earnings management as a proxy for earnings management (main dependent variable). As EM = REM_CFO, REM_DIXS and REM_PRO, there are three key proxies for real earnings management: absolute value of abnormal cash flow from operations, abnormal discretionary expenses and abnormal production costs computed by Roychowdhury's (2006) model.

Secondly, the independent variable, ICR, is our variable of interest. It is an indicator variable that takes the value of 1 for years ending on or after the internal control regulation mandatory adoption date for firms (i.e. the adoption date is the year beginning on or after 1 January 2012) and 0 otherwise. Here, coefficient α_1 was our main interested coefficients, as it indicates the

impacts of mandatory adoption of internal control regulation on earnings management among listed Chinese firms. Thirdly, ′Controls′ denotes vectors of control variables. These are: firm size (size), leverage (leverage), profitability (ROA), firm growth (Tobin's Q), auditor quality (Big10), independence of board (INDB), compensation of top managers (pay), ownership structure (SOE), CEO duality (duality) and CEO gender (gender). Definitions of control variables can be found in Table 5.1 (See Notes) or the Appendix. Given that real earnings management techniques influence firms' cash flow (Cohen and Zarowin, 2010), we do not include operating cash flow (CFO) as a control variable to avoid potential multicollinearity. Lastly, ′FixedEffects′ refers to industry fixed effects and year fixed effects. As mentioned before, we used the lag value of control variables to mitigate the potential endogeneity.

Since we used three metrics (REM_CFO, REM_DIXS and REM_PRO) as dependent variables, three quantile regressions were performed individually. The results of these are presented in Table 5.1, Table 5.2 and Table 5.3 (Next pages), respectively. Our results show that ICR was negatively and significantly associated with REM_CFO at the 5% level at two percentiles (40th and 55^{th}) and at the 10% level at seven percentiles (20^{th}, 25^{th}, 30^{th}, 45^{th}, 50^{th}, 60^{th} and 65^{th}). Furthermore, it was negatively and significantly associated with REM_DIXS at the 5% level only at the 75^{th} percentile and at the 10% level at four percentiles (30^{th}, 55^{th}, 65^{th} and 80^{th}). Thirdly, ICR was only negatively and significantly associated with REM_PRO at the 45^{th} and 95^{th} percentiles at the 10% level. These findings suggest that, after adoption of internal control regulation, firms reduced engagement at several percentiles of real earnings management. This implies that the adoption of internal control regulation had significant and negative effects on real earnings management (REM_CFO, REM_DIXS, REM_PRO). In general, these findings support the conclusion in Chapter 4 and allow us to accept our main

hypothesis, H1: the mandatory adoption of Chinese internal control regulations is significantly and negatively associated with earnings management among Chinese listed firms[13].

[13] Our study periods are from 2007 to 2016. Given the consideration of impact of financial crisis on firm's performance (Lakhal, N. and Dedaj,2020), we generate a dummy variable *Financial Crisis* as proxy for financial crisis and included in the regression model as a control variable (Türegün 2020) then performed our regression. The results are remained same in general (See tables G1 to G4 in Appendix – Appendix for Chapter 5)

Table 5.1 Internal Control Regulation and Real Earnings Management (REM_CFO)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001	-0.002	-0.003	-0.003*	-0.004*	-0.004*	-0.004	-0.006**	-0.005*	-0.005*
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Size	-0.005	-0.013	-0.017*	-0.012	-0.020*	-0.016	-0.013	-0.012	-0.015	-0.017
	(0.007)	(0.008)	(0.009)	(0.011)	(0.012)	(0.012)	(0.013)	(0.016)	(0.017)	(0.019)
Leverage	0.001	-0.005	-0.006	-0.006	-0.006	-0.007	-0.009*	-0.014**	-0.017***	-0.014**
	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)
ROA	0.006	0.010*	0.009	0.008	0.018**	0.021**	0.026***	0.032***	0.039***	0.046***
	(0.005)	(0.006)	(0.006)	(0.007)	(0.008)	(0.009)	(0.009)	(0.010)	(0.012)	(0.011)
Tobin's Q	-0.000	-0.000	-0.000	0.000*	0.000	0.000	0.001	0.001	0.001	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Big10	0.000	0.000	0.000	-0.001	-0.002*	-0.002*	-0.002**	-0.003**	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
INDB	0.006	-0.000	0.002	-0.001	-0.000	-0.002	-0.004	-0.008	-0.008	-0.010
	(0.005)	(0.006)	(0.007)	(0.007)	(0.008)	(0.009)	(0.010)	(0.012)	(0.012)	(0.014)
Pay	0.007	0.006	0.013	0.010	0.014	0.013	0.017	0.016	0.004	-0.002
	(0.006)	(0.007)	(0.009)	(0.010)	(0.011)	(0.012)	(0.012)	(0.015)	(0.016)	(0.017)
SOE	0.000	0.000	0.000	0.000	-0.000	0.000	-0.000	-0.001	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Duality	0.001	0.002**	0.002**	0.002**	0.002	0.003**	0.002	0.001	0.002	0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Gender	0.004**	0.005***	0.006***	0.006***	0.005***	0.004*	0.003	0.002	0.001	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
Constant	-0.004	0.029	0.027	0.022	0.038	0.031	0.014	0.017	0.061	0.087
	(0.021)	(0.025)	(0.027)	(0.033)	(0.035)	(0.038)	(0.044)	(0.051)	(0.055)	(0.060)
N	6831	6831	6831	6831	6831	6831	6831	6831	6831	6831

R-sq	0.031	0.053	0.058	0.068	0.073	0.075	0.078	0.079	0.080	0.082
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.006**	-0.006*	-0.007*	-0.005	-0.006	-0.003	-0.003	-0.000	-0.003	
	(0.003)	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)	(0.007)	(0.008)	(0.010)	
Size	-0.022	-0.034	-0.030	-0.047*	-0.078***	-0.090***	-0.107**	-0.173***	-0.245**	
	(0.020)	(0.021)	(0.025)	(0.026)	(0.029)	(0.029)	(0.047)	(0.044)	(0.107)	
Leverage	-0.016**	-0.013	-0.009	-0.006	-0.017	-0.019	-0.014	-0.019	-0.068**	
	(0.007)	(0.010)	(0.011)	(0.011)	(0.011)	(0.014)	(0.019)	(0.019)	(0.028)	
ROA	0.064***	0.079***	0.087***	0.092***	0.102***	0.114***	0.125***	0.118***	0.090***	
	(0.010)	(0.011)	(0.011)	(0.015)	(0.014)	(0.021)	(0.028)	(0.042)	(0.028)	
Tobin's Q	0.002**	0.002***	0.003***	0.003***	0.003***	0.003***	0.004***	0.005**	0.005***	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.002)	(0.002)	(0.001)	
Big10	-0.003**	-0.003**	-0.004**	-0.005**	-0.006***	-0.006***	-0.006	-0.006	-0.008	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)	(0.006)	
INDB	-0.011	-0.005	0.003	0.011	0.007	0.023	0.013	0.022	0.081	
	(0.013)	(0.014)	(0.016)	(0.018)	(0.023)	(0.024)	(0.027)	(0.031)	(0.068)	
Pay	-0.012	-0.025	-0.030	-0.032	-0.025	-0.030	-0.038	-0.050	0.036	
	(0.017)	(0.017)	(0.019)	(0.023)	(0.022)	(0.029)	(0.034)	(0.036)	(0.058)	
SOE	-0.001	-0.002	-0.003	-0.003	-0.004*	-0.003	-0.005	-0.005	-0.004	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.006)	
Duality	0.004**	0.004*	0.004*	0.003	0.006**	0.008**	0.006	0.009**	0.008	
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.008)	
Gender	0.002	0.003	0.005	0.012	0.009*	0.013	0.019	0.016***	0.027	
	(0.005)	(0.004)	(0.008)	(0.007)	(0.006)	(0.008)	(0.016)	(0.006)	(0.017)	
Constant	0.136**	0.207***	0.209***	0.268***	0.357***	0.405***	0.492***	0.739***	0.750**	

	(0.067)	(0.065)	(0.075)	(0.084)	(0.088)	(0.085)	(0.134)	(0.136)	(0.305)	
N	6831	6831	6831	6831	6831	6831	6831	6831	6831	
R-sq	0.083	0.083	0.083	0.083	0.085	0.086	0.084	0.083	0.078	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes:

The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.

The dependent variable *REM_CFO* = absolutely value of abnormal cashflow; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise.

Table 5.2 Internal Control Regulation and Real Earnings Management (REM_DISX)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002*	-0.001	-0.001	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Size	-0.005	-0.014***	-0.016***	-0.020***	-0.020***	-0.023***	-0.027***	-0.027***	-0.024***	-0.028***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)	(0.008)
Leverage	0.000	-0.002	-0.002	-0.003*	-0.005**	-0.006***	-0.007***	-0.008***	-0.010***	-0.011***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
ROA	0.005**	0.005*	0.007**	0.010***	0.014***	0.015***	0.017***	0.014**	0.015**	0.013*
	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.006)	(0.006)	(0.008)
Tobin's Q	-0.000	-0.000*	-0.000***	-0.000**	-0.000**	-0.000***	-0.000***	-0.000**	-0.000***	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Big10	-0.000	0.000	0.000	0.000	0.000	0.000	-0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
INDB	0.002	0.004	0.006*	0.004	0.006	0.006	0.008*	0.009*	0.007	0.012*
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.007)
Pay	-0.000	-0.002	-0.004	-0.004	-0.007	-0.004	-0.004	-0.006	-0.004	-0.003
	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)	(0.006)	(0.008)
SOE	-0.000	-0.000	-0.000	-0.001*	-0.001*	-0.001**	-0.001**	-0.001**	-0.001**	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Duality	-0.000	-0.000	-0.000	-0.001	-0.001	-0.000	-0.000	-0.001	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gender	-0.000	0.001	0.000	0.000	0.000	-0.000	-0.001	-0.001	-0.002*	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.017	0.052***	0.065***	0.081***	0.088***	0.096***	0.113***	0.118***	0.110***	0.120***
	(0.012)	(0.013)	(0.014)	(0.016)	(0.018)	(0.020)	(0.022)	(0.022)	(0.023)	(0.026)

N	6823	6823	6823	6823	6823	6823	6823	6823	6823	6823
R-sq	0.175	0.186	0.198	0.200	0.201	0.202	0.204	0.204	0.204	0.204
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.003*	-0.003*	-0.003*	-0.003	-0.004**	-0.004*	-0.005	-0.005	-0.003	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.006)	(0.006)	
Size	-0.035***	-0.040***	-0.053***	-0.059***	-0.072***	-0.070***	-0.086***	-0.105***	-0.128***	
	(0.009)	(0.010)	(0.010)	(0.012)	(0.013)	(0.015)	(0.017)	(0.027)	(0.034)	
Leverage	-0.011***	-0.013***	-0.016***	-0.019***	-0.024***	-0.030***	-0.038***	-0.053***	-0.079***	
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.008)	(0.009)	
ROA	0.014**	0.012*	0.011*	0.011	0.009	0.013**	0.026***	0.037***	0.037	
	(0.006)	(0.007)	(0.006)	(0.007)	(0.007)	(0.006)	(0.009)	(0.013)	(0.027)	
Tobin's Q	-0.000	-0.000	0.000	0.001	0.001	0.001	0.002***	0.004**	0.006**	
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)	
Big10	-0.000	0.000	0.000	-0.000	-0.001	-0.001	-0.001	-0.000	0.000	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	
INDB	0.015**	0.018**	0.018**	0.023**	0.025**	0.029**	0.045***	0.059***	0.037	
	(0.006)	(0.007)	(0.009)	(0.009)	(0.012)	(0.013)	(0.016)	(0.022)	(0.025)	
Pay	0.001	0.004	0.006	0.011	0.024**	0.023	0.047***	0.044*	0.051	
	(0.008)	(0.008)	(0.009)	(0.011)	(0.012)	(0.014)	(0.016)	(0.026)	(0.039)	
SOE	-0.000	-0.001	0.000	0.001	0.002*	0.003***	0.004***	0.002	-0.004	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	
Duality	0.001	0.001	0.000	0.001	-0.000	-0.000	-0.001	0.000	-0.001	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.005)	(0.005)	
Gender	-0.001	-0.002	-0.003	-0.002	-0.003	-0.004*	-0.005*	0.000	0.005	
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.006)	(0.006)	

Constant	0.137***	0.144***	0.181***	0.187***	0.195***	0.194***	0.181***	0.252***	0.328***	
	(0.027)	(0.032)	(0.034)	(0.037)	(0.039)	(0.047)	(0.058)	(0.090)	(0.117)	
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	
R-sq	0.204	0.206	0.209	0.211	0.211	0.211	0.203	0.197	0.203	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes:

The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.

The dependent variable *REM_DISX* = absolutely value of discretionary expense ; Variable of interests is *ICR*Duality*. *ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise.

Table 5.3 Internal Control Regulation and Real Earnings Management (REM_PRO)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	0.002	0.002	0.003	0.002	0.002	0.001	-0.002	-0.004	-0.006*	-0.006
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)
Size	-0.007	-0.012	-0.015	-0.015	-0.024	-0.039**	-0.042**	-0.054***	-0.057***	-0.066***
	(0.008)	(0.010)	(0.011)	(0.014)	(0.015)	(0.016)	(0.018)	(0.017)	(0.017)	(0.018)
Leverage	0.001	-0.000	0.004	0.002	0.002	-0.001	-0.003	0.001	-0.001	-0.006
	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)
ROA	0.007	0.009*	0.017**	0.019**	0.031***	0.037***	0.048***	0.054***	0.055***	0.055***
	(0.006)	(0.005)	(0.007)	(0.009)	(0.009)	(0.008)	(0.011)	(0.010)	(0.013)	(0.012)
Tobin's Q	-0.000	-0.000	-0.000	0.000	0.000	0.000	0.000	0.001*	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Big10	-0.000	-0.000	-0.001	-0.001	-0.002	-0.002	-0.001	-0.001	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
INDB	-0.001	-0.004	-0.004	-0.005	-0.003	0.002	0.007	0.008	0.005	0.006
	(0.006)	(0.007)	(0.008)	(0.010)	(0.011)	(0.012)	(0.013)	(0.012)	(0.013)	(0.013)
Pay	-0.001	0.007	0.010	0.017	0.013	0.016	0.020	0.032*	0.032*	0.041**
	(0.007)	(0.008)	(0.010)	(0.011)	(0.013)	(0.014)	(0.016)	(0.017)	(0.019)	(0.019)
SOE	-0.000	-0.001	-0.001	-0.001	-0.001	0.000	0.001	0.001	-0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Duality	0.001	0.004***	0.005***	0.005***	0.004***	0.004**	0.004**	0.004**	0.004*	0.006**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Gender	-0.001	-0.002	-0.003	-0.004	-0.002	-0.002	-0.001	-0.001	-0.002	-0.005
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Constant	0.028	0.027	0.030	0.018	0.060	0.099*	0.098	0.105*	0.122**	0.128*
	(0.026)	(0.031)	(0.037)	(0.044)	(0.047)	(0.053)	(0.061)	(0.055)	(0.062)	(0.066)

N	6822	6822	6822	6822	6822	6822	6822	6822	6822	6822
R-sq	0.065	0.090	0.100	0.106	0.113	0.116	0.117	0.117	0.118	0.117
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.003	-0.004	-0.004	-0.007	-0.008	-0.004	-0.008	-0.011	-0.028*	
	(0.004)	(0.004)	(0.004)	(0.005)	(0.007)	(0.008)	(0.008)	(0.014)	(0.017)	
Size	-0.056**	-0.068***	-0.076***	-0.089***	-0.098***	-0.100**	-0.099*	-0.125	-0.082	
	(0.023)	(0.023)	(0.025)	(0.029)	(0.036)	(0.047)	(0.055)	(0.088)	(0.073)	
Leverage	-0.011	-0.012	-0.008	-0.018	-0.017	-0.032**	-0.045***	-0.042	-0.072**	
	(0.007)	(0.008)	(0.010)	(0.011)	(0.013)	(0.015)	(0.017)	(0.028)	(0.031)	
ROA	0.060***	0.075***	0.089***	0.109***	0.132***	0.146***	0.171***	0.184***	0.149***	
	(0.013)	(0.012)	(0.012)	(0.015)	(0.018)	(0.019)	(0.023)	(0.038)	(0.028)	
Tobin's Q	0.001	0.001	0.001	0.002*	0.002	0.002***	0.002	0.003	0.015***	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.005)	(0.003)	
Big10	0.001	0.001	0.001	0.000	0.001	0.002	0.004	0.002	-0.002	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.005)	(0.007)	
INDB	0.001	0.005	0.012	0.025	0.003	0.015	-0.035	-0.029	0.064	
	(0.015)	(0.019)	(0.021)	(0.025)	(0.026)	(0.028)	(0.036)	(0.085)	(0.054)	
Pay	0.038*	0.050**	0.052**	0.052**	0.066**	0.071**	0.069	0.078	0.053	
	(0.020)	(0.020)	(0.022)	(0.026)	(0.030)	(0.036)	(0.044)	(0.058)	(0.057)	
SOE	-0.001	-0.002	-0.001	-0.001	-0.004	-0.004	-0.004	-0.005	-0.007	
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.006)	(0.007)	
Duality	0.005**	0.007**	0.007**	0.008**	0.008*	0.011**	0.012*	0.009	0.013	
	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.005)	(0.006)	(0.008)	(0.009)	
Gender	-0.004	-0.004	-0.008**	-0.010**	-0.014**	-0.011	-0.009	-0.015	-0.005	
	(0.005)	(0.005)	(0.004)	(0.005)	(0.006)	(0.009)	(0.010)	(0.019)	(0.019)	

Constant	0.114	0.119	0.138*	0.180**	0.180	0.180	0.208	0.274	0.181	
	(0.075)	(0.073)	(0.080)	(0.090)	(0.114)	(0.152)	(0.167)	(0.265)	(0.246)	
N	6822	6822	6822	6822	6822	6822	6822	6822	6822	
R-sq	0.118	0.118	0.118	0.118	0.117	0.117	0.115	0.115	0.113	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes:

The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.

The dependent variable *REM_PRO* = absolutely value of abnormal production costs; Variable of interests is *ICR*Duality. ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise.

As with accrual earnings management (AEM_DA), ICR had no significant relationship with real earnings management (REM_CFO, REM_DIXS, REM_PRO) in lower band percentiles (from 0-20th). This result supports our findings from Chapter 4, which show that the mandatory adoption of internal control regulation had no effects on firms with less earnings management. It also supports our conjecture in Chapter 4 that the change of regulatory environment does not affect conservative managers. However, unlike accrual earnings management, the effects of mandatory adoption of internal control regulation on real earnings management are less noticeable. AEM_DA was significantly negatively related with ICR at the 1% level across most percentiles, whereas REM_CFO, REM_DIXS and REM_PRO were only significantly (either at the 5% or 10% level) negatively related with ICR at a few percentiles. This indicates that, after mandatory adoption of internal control regulation, most of firms among our study samples were less engaged in accrual earnings management, although a smaller number of firms reduced real earnings management. In addition, unlike accrual earnings management, ICR had an insignificant relationship with all three real earnings management proxies at the 85th and 90th percentiles. In the higher quantile band (from 75th to 100$^{th)}$, firms' managers aggressively take advantage of managerial discretion to pursue their interests (Jones, 2010). Considering that the use of accrual earnings management has been constrained by the introduction of internal control regulation, we propose that firms at the 85th and 90th percentiles may engage in more real earnings management to supplement firm's performance (Zang, 2012). However, our findings imply that this cannot be constrained by the current internal control regulation.

Using different data settings, previous studies have used standard regression techniques, arguing that the adoption of internal control has insignificant effects on real earnings management (Nakashima and Ziebart, 2015), or that mangers are more likely to engage in real earnings management in the post-adoption period (Garg,2018). We used quantile regression

and found different evidence, which suggests that, in general, the adoption of internal control regulation has significantly negative effects on REM_CFO and REM_DIXS at several percentiles. Managers can manipulate selling or promotion strategy or accelerate or postpone research and development (R&D) fees or advertising expenditures to achieve favourable financial performance. Chinese internal control regulations require firms to construct internal control systems in relation to sales and R&D. For example, firms are required to construct a system to review sales contracts and monitor sale processes to mitigate potential risk. Our finding suggests that, to a certain extent, such requirements reduce managerial discretion in manipulation of real business activities, such as unreasonable sales promotion and manipulating expenses, to achieve their personal goals. In addition, managers may deliberately increase production to reduce the cost of sales and boost profits. We found that adoption of internal control regulation has negligible effects on REM_PRO (having only marginally significant negative coefficients at the 45^{th} and 95^{th} percentiles). Although, Chinese internal control regulations have requirements regarding inventory management, our findings suggest that ambiguous rules are not functional in constraining of manipulation of productions activities. Our results do not fully meet our expectation as the agency theory imply that internal control regulation will largely reduce the magnitude of real earnings management. Different with SOX, Chinese internal control regulation has wider scope (For example, it regulated procedure of contacts management). Based on the agency theory, we were expecting the real earnings management can be constrained as much as accrual earnings management because the information asymmetry has been reduced by the adoption of internal control. However, the weaker results suggest that the adoption of Chinese internal control regulation had fewer effects on real earnings management. This may be because Chinese internal control regulation is in accordance with The Sarbanes–Oxley Act (the US internal control regulation), which is inherently designed to improve financial reporting quality rather than detection of the usual

real business activities of firms. From the institutional theory view, organisations intent to follow the rules to generate the support from government, authorities, and society to gain the essential resources, such as finance, technology and labor, to achieve their objectives (Scott,1987; DiMaggio and Powell, 1983). Our results in Chapter 5, suggest that there are few firms changed their real earnings management behaviour to cope the new regulatory environment. As mentioned above, we conjecture that the reason is clauses or rules in relation to real business activities in Chinese internal control regulations are ambiguous.

In comparison to Chapter 4, we found mixed results regarding control variables. In line with AEM_DA, we found that all three real earnings management metrics (REM_CFO, REM_DIXS and REM_PRO) were significantly negatively related to firm size (size), leverage (leverage) and significantly negatively related to profitability (ROA) at some of percentiles (H2[14] and H5 were supported, whereas H3 is rejected). Also, we found significant positive relationship between firm growth (Tobin's Q) and all three real earnings management proxies at some percentiles (H6 is supported). This is consistent with the argument that high growth firms are likely to engage in earnings management because of the high-pressure growth target (Carcello and Nagy, 2004).

As with AEM_DA, auditor quality (Big10) was significantly negatively associated with REM_CFO at most percentiles (from 25^{th} to 80^{th}; H8 is supported), whereas it has no significant association with REM_DIXS or REM_PRO. These findings suggest that the use of Big 10 can constrain real earnings management by altering promotion strategy (REM_CFO). Furthermore, we found that independence of boards were significantly positively related with REM_DIXS at upper band percentiles (from 50^{th} to 90^{th}; H8 is supported). This finding is consistent with

[14] H2 refers to Hypothesis 2. Same as H3 – H12.

our results from Chapter 4, but conflicts with the widely accepted opinion that higher numbers of independent directors on the board is associated with the lower earnings management (e.g., Abdelsalam et al., 2008).

In contrast to the findings of Chapter 4, we found that compensation of top managers (Pay) had a significant positive relationship with REM_DIXS and REM_PRO at some percentiles (H10 is supported). This is consistent with previous studies (e.g., Burns and Kedia, 2006) which argue that higher-remunerated managers are more likely to manipulate firm earnings. Additionally, we found positive significant relationship between SOE and REM_DIXS in higher band quantiles (from 75^{th} to 85^{th} percentiles; H10 is supported); this differs from previous results as well. Consistent with previous studies (e.g., Chen et al. 2008), we found that state-owned firms may receive help from authorities to boost their earnings to meet regulatory requirements.

Furthermore, we found different results regarding AEM_DA in terms of CEO duality (Duality). AEM_DA is insignificant related with Duality, but we note that duality was significantly positively related with REM_CFO and REM_PRO at some percentiles (H11 is supported). Consistent with previous studies (e.g., Ishak et al., 2016), our findings suggest that monopoly by a CEO encourages earnings misrepresentation in order to maintain CEO's authority.

Lastly, we found the CEO's gender (gender) was positively significantly related to the abnormal operating cash flow (REM_CFO) at several percentiles (H12 is rejected), whereas it was negatively related with abnormal production costs (REM_PRO) at some percentiles (H12 is supported). This negative relationship is in contrast with AEM's finding, but in line with

previous studies (e.g., Gull, 2018), which show that female CEOs are inclined to reduce earnings management.

5.3 An alternative measure of real earnings management

To support our main finding from Section 5.2, we used an alternative measure to generate the proxy for real earnings management. As explained in Chapter 3, we follow Roychowdhury (2006) and Zang (2012) in combining three individual real earnings management proxies to form an aggregate measure of real earnings management and capture the total amount of real earnings management engaged in by the firm in a particular fiscal year (defined as REM_ALL).

We used REM_ALL as a proxy of real earnings management and tested our hypotheses by employing the following regression model:

$$EM_{it} = \alpha_0 + \alpha_1 ICR_t + \beta_2 Controls + FixedEffects + \varepsilon_{it}$$

Here, EM = REM_ALL, and is a combination of REM_CFO, REM_DIXS and REM_PRO. Secondly, the independent variable, ICR, is our variable of interest. It is an indicator variable that takes the value of 1 for years ending on or after the adoption date of mandatory internal control regulation for firms (1 January 2012) and 0 otherwise. Here, α_1 was our coefficient of primary interest. This coefficient indicates the impacts of the mandatory adoption of internal control regulation on earnings management among listed Chinese firms. Thirdly, we include the same control variables as in Section 5.2. As noted earlier, we used the lag value of the control variables to mitigate potential endogeneity. Lastly, FixedEffects refers to industry fixed effects and year fixed effects. As mentioned previously, we used the lag value of control variables to mitigate potential endogeneity. Descriptive statistics and the correlation matrix for this section are presented in the Appendix.

Table 5.4 (Next page) shows the results of the quantile regression. Our results show that the ICR was negatively and significantly associated with REM_ALL at several of the percentiles. Only one percentile (20^{th}) presented significance at the level of 1%, whereas significance at the remaining percentiles shows levels of either 5% or 10%. In general, by using the aggregate proxy of real earnings management (REM_ALL), we found that our quantile regression generally supported the results presented in Section 5.1 and that our findings were robust. Overall, the mandatory adoption of internal control regulation had significantly negative effects on real earnings management. However, compared with accrual earnings management, it only affected firms at a few quantiles.

Table 5.4 Internal Control Regulation and Real Earnings Management (REM_ALL)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.003	-0.006	-0.010**	-0.012***	-0.009**	-0.009*	-0.008	-0.010**	-0.014**	-0.011*
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Size	-0.033	-0.037	-0.040	-0.063***	-0.077***	-0.098***	-0.111***	-0.118***	-0.139***	-0.145***
	(0.027)	(0.024)	(0.025)	(0.024)	(0.027)	(0.027)	(0.033)	(0.030)	(0.034)	(0.034)
Leverage	-0.017*	-0.008	-0.014	-0.018*	-0.023**	-0.025**	-0.033***	-0.029**	-0.028**	-0.037***
	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.012)	(0.011)	(0.011)	(0.012)
ROA	0.046**	0.051***	0.066***	0.074***	0.071***	0.104***	0.113***	0.105***	0.126***	0.153***
	(0.019)	(0.017)	(0.018)	(0.019)	(0.022)	(0.020)	(0.022)	(0.022)	(0.022)	(0.022)
Tobin's Q	-0.000	0.001	0.002***	0.001**	0.002	0.002	0.002	0.002***	0.003*	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Big10	-0.003*	-0.004**	-0.005**	-0.004**	-0.004*	-0.003	-0.002	-0.005**	-0.003	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
INDB	-0.007	0.007	0.016	0.012	0.019	0.021	0.032	0.033	0.033	0.043
	(0.017)	(0.021)	(0.018)	(0.018)	(0.020)	(0.020)	(0.023)	(0.025)	(0.028)	(0.032)
Pay	0.004	0.006	0.012	0.010	0.000	-0.011	-0.004	0.002	0.013	0.013
	(0.024)	(0.024)	(0.023)	(0.025)	(0.027)	(0.026)	(0.026)	(0.026)	(0.028)	(0.031)
SOE	-0.001	-0.001	-0.001	-0.001	-0.005*	-0.006**	-0.004	-0.005**	-0.004	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Duality	0.003	0.003	0.006**	0.007***	0.004	0.003	0.005	0.005*	0.005	0.004
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Gender	0.006	0.004	0.003	-0.001	0.002	0.001	-0.000	0.003	0.003	-0.002
	(0.004)	(0.004)	(0.004)	(0.005)	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)
Constant	0.137*	0.150*	0.145*	0.230***	0.303***	0.403***	0.426***	0.438***	0.473***	0.493***

	(0.082)	(0.077)	(0.081)	(0.081)	(0.094)	(0.094)	(0.107)	(0.098)	(0.112)	(0.105)
N	6813	6813	6813	6813	6813	6813	6813	6813	6813	6813
R-sq	0.118	0.141	0.146	0.149	0.151	0.151	0.152	0.153	0.154	0.153
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.014*	-0.014**	-0.016**	-0.015*	-0.013	-0.012	-0.020	-0.019	-0.019	
	(0.007)	(0.006)	(0.007)	(0.008)	(0.011)	(0.012)	(0.013)	(0.020)	(0.025)	
Size	-0.145***	-0.155***	-0.215***	-0.221***	-0.222***	-0.263***	-0.281***	-0.265**	-0.192	
	(0.041)	(0.041)	(0.045)	(0.047)	(0.059)	(0.074)	(0.086)	(0.133)	(0.207)	
Leverage	-0.049***	-0.059***	-0.064***	-0.068***	-0.070***	-0.089***	-0.104***	-0.136***	-0.183***	
	(0.015)	(0.015)	(0.017)	(0.019)	(0.025)	(0.025)	(0.033)	(0.042)	(0.067)	
ROA	0.155***	0.166***	0.172***	0.193***	0.207***	0.239***	0.241***	0.259***	0.196***	
	(0.025)	(0.032)	(0.036)	(0.026)	(0.026)	(0.026)	(0.037)	(0.066)	(0.068)	
Tobin's Q	0.004***	0.004***	0.004**	0.004***	0.005***	0.004**	0.008**	0.012	0.022***	
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.004)	(0.008)	(0.003)	
Big10	-0.003	-0.006*	-0.006	-0.006	-0.006	-0.004	0.000	0.008	0.009	
	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.007)	(0.009)	(0.014)	
INDB	0.054	0.075**	0.095**	0.096***	0.072**	0.047	0.054	0.048	0.048	
	(0.034)	(0.036)	(0.038)	(0.031)	(0.034)	(0.047)	(0.067)	(0.072)	(0.071)	
Pay	0.006	0.044	0.091**	0.117***	0.124**	0.175***	0.195***	0.149	0.115	
	(0.039)	(0.037)	(0.044)	(0.043)	(0.052)	(0.058)	(0.065)	(0.115)	(0.200)	
SOE	0.000	-0.000	-0.001	-0.003	-0.004	-0.005	-0.003	-0.011	-0.018	
	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.006)	(0.008)	(0.008)	(0.015)	
Duality	0.011**	0.016***	0.016***	0.017***	0.020***	0.023***	0.020**	0.018	0.016	
	(0.005)	(0.005)	(0.005)	(0.006)	(0.007)	(0.009)	(0.008)	(0.011)	(0.023)	

Gender	-0.005	-0.008	-0.002	-0.004	-0.009	-0.010	0.009	0.012	0.015	
	(0.008)	(0.008)	(0.011)	(0.008)	(0.010)	(0.023)	(0.018)	(0.020)	(0.037)	
Constant	0.510***	0.438***	0.501***	0.462***	0.474**	0.497**	0.503**	0.614	0.512	
	(0.131)	(0.137)	(0.161)	(0.155)	(0.190)	(0.210)	(0.239)	(0.490)	(0.533)	
N	6813	6813	6813	6813	6813	6813	6813	6813	6813	
R-sq	0.153	0.153	0.152	0.152	0.152	0.151	0.152	0.150	0.147	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes:

The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.

The dependent variable *REM_ALL* = sum value of REM_CFO, REM_DISX and REM_PRO; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise.

5.4 Addressing potential endogeneity

Our main aim is to investigate the impact of the mandatory adoption of internal control regulations on earnings management in Chinese listed firms. We hypothesise that the adoption of internal control regulations will reduce earnings management; the main analyses in Chapters 4 and 5 support this. However, there may be valid concerns regarding endogeneity because the mandatory adoption of internal control regulations is endogenously determined – this happens when one or more independent variables correlate with error terms. We argue that there are unobserved factors that affect decisions on the mandatory adoption of internal control regulations. Therefore, the propensity score matching (PSM) method in this section was adopted to mitigate potential endogeneity issues.

PSM is commonly used for impact analyses (Heckman et al., 1998). It has a history of use for estimating causal effects in many accounting studies (Bowen et al., 2010; Broche et al., 2014; Chen et al., 2012). The PSM method estimates the propensity score based on observable characteristics (control variables) for subjects in different groups (control and treatment). Our datasets were classified into two sub-groups: the pre- mandatory adoption dataset is the control group and the after- mandatory adoption dataset is the treatment group. The control group and treatment group are comprised of the same companies; however, we argue that the companies cannot be exactly the same in different groups, as their characteristics will change over time. For example, the size of company A will be different in the control group and treatment group. Therefore, company A in the treatment group is not comparable with company A in the control group. By using PSM, two subjects with similar propensity scores, one in the treatment group and one control, will be matched. Based on the earnings management of the subjects in the control group, PSM allows a counterfactual earnings management value to be generated for the

subjects in the treatment group. This counterfactual earnings management represents the earnings management of the subjects in the treatment group if they do not receive the treatment (before the adoption of the internal control regulation). Comparing the actual value and counterfactual value of earnings management for the subjects in the treatment group, we will identify the impact of adopting the internal control regulations.

There are two data assumptions in the PSM method. First, all the observable characteristics that are suspected to affect the outcome variables should be included in the analysis. Second, both the control and treatment groups should be derived from the same sources. Consequently, the observable characteristics can be used to create an appropriate propensity score, thereby the outcome variables can be identical or similarly constructed (Heinrich et al., 2010).

The choice of control variables (observable characteristics) is guided by theory or empirical evidence and includes as many variables as possible; however, unnecessary variables may also increase the variance of estimation and, thus, reduce the result's reliability (Shahriar et al., 2018). We used the Stata command *pstest* to assess the validity of our chosen control variables for generating match units in two different samples (result are presented in Appendix). The results demonstrated that all control variables can be used. Therefore, the following control variables were employed in our PSM analysis: firm size (Size), leverage (Leverage), CEO duality (Duality) structure ownership (SOE), profitability (ROA), operating cash flow (CFO), firm growth (Tobin's Q), auditor quality (Big10), independence of board (INDB), compensation of top managers (Pay) and CEO gender (Gender). Regarding the second assumption, we report on the data itself. The units from both the control and treatment groups

are from the Chinese stock market. This indicates that the information for the treated and non-treated subjects is likely to be the same, as the data arrives from the same source. Although our datasets are satisfactory for the purposes of using PSM, we acknowledge that the method does not completely remove the bias estimation, as it cannot control for unobservable characteristics that may affect the outcome variable (earnings management). However, Heckman et al. (1998a; 1998b) stated that the bias from unobservable characteristics is small. Diaz and Handa (2006) also suggested that the bias arising from PSM is negligible.

Based on the chosen control variables, we used the nearest neighbour matching method to calculate the propensity scores. Two subjects (one from the treatment group, one from the control group) with similar propensity scores were matched. The kernel matching (KM) method was also used to increase the result's robustness. We used both accrual earnings management (AEM_DA) and real earnings management proxies (REM_CFO, REM_DIXS and REM_PRO) as outcome variables to examine the effects of the internal control regulations. Tables 5.5 and 5.6 (next page) depict the propensity score matching method results.

Tables 5.5 PSM (Accrual earnings management)		
	AEM_DA	
Matching method	Nearest Neighbour Matching	Kernel Matching
ATT	-0.035	- 0.034
Std. Error	0.005	0.004
t-statistics	-7.06	-8.2
Notes: ATT: Average treatment effect on the treated		

Tables 5.6 PSM (Real earnings management)						
	REM_CFO		REM_DIXS		REM_PRO	
Matching method	Nearest Neighbour Matching	Kernel Matching	Nearest Neighbour Matching	Kernel Matching	Nearest Neighbour Matching	Kernel Matching
ATT	-0.010	-0.010	-0.003	-0.003	-0.016	-0.015
Std. Error	0.002	0.002	0.001	0.001	0.004	0.003
t-statistics	-5.49	-5.87	-1.97	-1.92	-4.29	-4.4
Notes: ATT: Average treatment effect on the treated						

The average treatment effect on the treated (ATT) value of AEM_DA was −0.035 (nearest neighbour matching) and the T value is −7.06[15]. This indicates that the accrual earnings management of subjects in the treatment group reduced by an average of 0.035 after the adoption of the internal control regulations. The results suggest that the mandatory adoption of internal control regulations has significantly negative effects on accrual earnings management. Likewise, the ATT for real EM proxies was negative (REM_CFO = −0.010, REM_DIXS = −0.003 and REM_PRO = −0.003) and significant (REM_CFO: t-value = −5.49; REM_DIXS: t-value = −1.97 and REM_PRO: t-value −4.29). Averagely, the real earnings management reduced among subjects in the treatment group after they adopted the internal control regulation. The kernel matching method generated similar results.

To summarise, the mandatory adoption of internal control regulations has significant negative effects on earnings management, which supports the findings given in Chapters 4 and 5. However, the absolute value coefficient of ATT for accrual earnings management is much higher than with the real earnings management (AEM_DA = − 0.035; whereas REM_CFO = −0.010, REM_DIXS = −0.003 and REM_PRO = −0.003). This suggests that the adoption of the regulations has a greater effect on accrual earnings management than real earnings management. The finding that the mandatory adoption of internal control regulation has more noticeable effects on accrual earnings management are also consistent with our findings in Chapters 4 and 5. Our findings suggest that, on average, the mandatory adoption of internal control regulation has significant negative effects on both accrual and real earnings management. This is consistent with agency theory: internal control regulation reduced information asymmetry and managers' discretion, thereby lowering the magnitude of earnings

[15] The absolute T-value (-7.06) was higher than 1.96, indicating that the P-value was < 0.05.

management. In line with institutional theory, our findings suggest that Chinese-listed firms conform to the changes in internal control regulation because they may be seeking legitimacy, social acceptability and survival capabilities (Carpenter & Feroz, 2001; Scott, 1987). Since, as in previous studies, the internal control regulation aims to improve the quality of financial reporting, we found that the adoption of stricter regulations reduced accrual earnings management (Cohen, 2008; Ho et al., 2015; Ipino & Parbonetti, 2017) and real earnings management (Chen, 2021), on average.

5.5 Summary

This chapter aims to conduct a robustness test on the relationship between the mandatory adoption of internal control regulation and earnings management. Accrual earnings management was replaced by three real earnings management proxies, namely, abnormal cash flow from operations (REM_CFO), abnormal discretionary expense (REM_DIXS) and abnormal production costs (REM_PRO). The results show that the impacts of the mandatory adoption of internal control regulation persisted across different definitions of earnings management. However, we also found that the adoption affected a smaller number of firms in terms of real earnings management. The reason for this could be the ambiguous rules in internal control regulations as they relate to real business activities. Additionally, manipulation of earnings through real earnings management involves complex procedures. Thus, it is more difficult for board members, auditors and regulators to monitor this as compared to accrual earnings management (Cohen and Zarowin, 2010; Zang, 2012). This indicates a need for improvement of internal control regulation to ensure that control of managers' manipulation of real business activities. In addition, we performed propensity score matching (PSM) to provide robust support for our key findings in Chapter 4 and Chapter 5. The results support previous

findings. The next chapter provides additional analysis; we first we reclassified industry and perform the regression analysis. Secondly, we perform a sub-sampling analysis.

Chapter 6 Additional analysis

In the previous chapter, we used quantile regression to investigate the relationship between the mandatory adoption of internal control regulation and real earnings management. The findings of the previous chapter support those of Chapter 4, indicating that, in general, mandatory adoption of internal control regulation is significantly and negatively related with earnings management among Chinese listed firms. Our results show that the impact of the mandatory adoption of internal control regulations is persistent across different definitions of earnings management. However, it has no significant effects on firms in lower band percentiles. In addition, we employed the propensity score matching (PSM) method to robust our key findings by addressing endogeneity.

This chapter aims to provide additional analysis to generate a broader understanding of the impact of the mandatory adoption of internal control regulation on earnings management. We perform two additional analyses in this section. First, we reclassify industry to perform the regressions. Second, we conduct sub-sampling analysis. This chapter is organised as follows: Section 6.1 reports the results of regressions when we reclassify industry. Section 6.2 presents the results of the sub-sampling analysis, and Section 6.3 summarises the chapter.

6.1 Reclassification of industry

As explained in Chapter 3 – Methodology, in this research, we employ fixed-effects models to contain variation within units (in this research, within industry and year) to minimize the potential for unobserved heterogeneity and omitted variable bias. Omitted variable bias is the result of failure in controlling for variables that are strongly associated with our independent and dependent variables. The coefficient of estimation will be biased when the error term is correlated with the independent variables, Fixed-effects models for panel data is a popular tool to address the issue of omitted variable bias in nonexperimental research (Allison 2009; DeMaris 2014; Fox 2016; Treiman 2009; Wooldridge 2010). However, given the concerns that our dataset firms are from 27 industries and span 10 years, the application of fixed-effects models will automatically include 26 industry and 9 year dummy variable in our regression model. This large number of dummy variables might result in a small variation in observations and create an intolerable standard of error. To address these concerns, we have modified our main regression model and built the following model to perform our regression:

$$EM_{it} = \alpha_0 + \alpha_1 ICR_t + \alpha_2 Controls_t + \beta_3 Industry + \varepsilon_{it}$$

In this modified model, we have removed fixed effects indicators ($FixedEffects$) from our main regression model and added a new industry dummy variable. We add this as a new industry dummy variable because the industry type is a crucial influence on managers' earnings management activities (Erickson and Wang, 1999; Meyer et al., 2000). Based on the nature of the industry, we re-classified our samples as Manufacturer and non-Manufacturer. After reclassification, the Manufacturer industry and the non-Manufacturer industry have similar size groups. They have 5265 and 4365 observations, respectively. Here, EM = accrual earnings management (AEM_DA) or real earnings management (REM_CFO, REM_DIXS and

REM_PRO). The independent variable, ICR, is our variable of interest. It is an indicator variable that takes the value of 1 for years ending on or after the adoption date of mandatory internal control regulation for firms (the adoption date being the year beginning on or after 1 January 2012) and 0 otherwise. This will indicate whether the adoption of internal control regulation reduces the magnitude of earnings management. Here "Controls" denotes a vector of control variables: firm size (Size), leverage (Leverage), profitability (ROA), operating cash flow (CFO), firm growth (Tobin's Q), auditor quality (Big10), independence of board (INDB), compensation of top managers (Pay), ownership structure (SOE), CEO duality (Duality) and CEO gender (Gender). Definitions of all variables can be found in the Appendix. As in previous chapters, we used the lag value of the control variables to mitigate the potential endogeneity, and we do not include operating cash flow (CFO) as a control variable in real earnings management analysis to avoid potential multicollinearity. $Industry$, as mentioned above, is an indicator variable that takes the value of 1 for firms classified as Manufacturer and 0 otherwise.

Tables 6.1 to 6.4 (see next pages – extract tables presented here; full tables are in the Appendix) report the results of our quantile regression. The results in Table 6.1 show that our variable of interest in this section, ICR, has a significant and negative relationship with AEM_DA at all percentiles. This indicates that internal control regulation effectively reduced managerial discretion in accrual earnings management. With the increase of percentiles, the value of the coefficient increases. This indicates that the mandatory adoption of internal control regulation has more effects on firms with higher levels of accrual earnings management. the coefficient of 0.048 and 0.060 in the higher band percentiles (90^{th} and 95^{th}) imply that the adoption of internal control regulation economically significantly reduced the accrual earnings management among firms with very aggressive earnings manipulation (Jones, 2010).

Regarding real earnings management, Tables 6.2 to 6.4 show that ICR has a significant negative relationship with REM_CFO and REM_PRO at all quantiles, whereas it has a significant positive relationship with REM_DISX at the 75th quantile. In general, when compared with accrual earnings management, the coefficients of ICR on real earnings management is smaller. For example, the coefficient of ICR on accrual earnings management is -0.024 at the 75th percentile whereas it is only -0.010 on REM_CFO. Overall, our results suggest that the adoption of internal control regulation has less effect on a firm's real earnings management. This finding is consistent with our main findings in Chapters 4 and 5, that internal control regulation is less effective at constraining real earnings management.

Interestingly, we find that at the 75th percentile, ICR is significantly negatively related to AEM_DA and significantly positively related to REM_DISX. This indicates that the adoption of internal control regulation will reduce AEM_DA and increase REM_PRO. We can cautiously conjecture that higher-band firms trade off their earnings management techniques with the adoptionof internal control regulation. This could be because the internal control regulation strengthens the regulatory environment. More accounting information monitoring procedures are implemented, which results in an increased cost of accrual earnings management. Therefore, managers tend to implement more difficult-to-detect methods to manipulate financial performance: real earnings management (here, discretionary expenses). This finding is in line with previous trade-off earnings management studies (Zang, 2012). Account preparers in higher band quantiles aggressively take advantage of the inherent discretion among accounting standards to pursue their self-interest (Jones, 2010). Consistent with previous research (Chen, 2021; Ho et al. 2015;), our findings suggest that the mandatory adoption of internal control regulation might change the pattern of managers' opportunistic

behaviour. This is also in line with agency theory: managers' discretion in earnings manipulation is reduced because of a stricter regulatory environment (DeFond & Jiambalvo, 1994).

In terms of differential industrial sector characteristics (*Industry*), the coefficients are strongly negative in all percentiles for accrual earnings management (AEM_DA), abnormal cash flow (REM_CFO) and abnormal production costs (REM_PRO). This indicates that these types of earning management for manufacturer sectors are significantly lower than for non-manufacturer firms. By contrast, manufacturer industry's coefficients are significantly positive across most of the quantiles in relation to abnormal discretionary expenses (REM_DISX). The earnings management literature gives the following reasons for the reported differences: level of debts, power of enforcement, stringency of regulations and the accounting policies employed by the various industrial sectors.

Table 6.1 Internal Control Regulation and Accrual Earnings Management (AEM_DA)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001**	-0.002***	-0.003***	-0.004***	-0.006***	-0.007***	-0.009***	-0.011***	-0.013***	-0.013***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Industry	-0.001	-0.001	-0.002**	-0.002***	-0.003***	-0.005***	-0.006***	-0.007***	-0.009***	-0.011***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.015***	-0.015***	-0.017***	-0.020***	-0.024***	-0.027***	-0.037***	-0.048***	-0.060***	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)	(0.008)	
Industry	-0.012***	-0.013***	-0.015***	-0.019***	-0.025***	-0.033***	-0.039***	-0.048***	-0.080***	
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.009)	

Notes:
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *AEM_DA* = absolutely value of discretionary accruals computed using the Modified Jones model (Dechow et al.,1995); Variable of interests is *ICR. ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise*; Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise

Table 6.2 Internal Control Regulation and Real Earnings Management (REM_CFO)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001*	-0.002***	-0.003***	-0.004***	-0.004***	-0.004***	-0.006***	-0.007***	-0.007***	-0.007***
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002
Industry	-0.001*	-0.001*	-0.001*	-0.001	-0.002**	-0.003***	-0.004***	-0.005***	-0.006***	-0.006***
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.008***	-0.008***	-0.009***	-0.009***	-0.010***	-0.011***	-0.013***	-0.017***	-0.029***	
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004	-0.008	
Industry	-0.007***	-0.008***	-0.010***	-0.011***	-0.015***	-0.020***	-0.024***	-0.032***	-0.045***	
	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.005	-0.01	

Notes:
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_CFO* = absolutely value of abnormal cashflow; Variable of interests is *ICR. ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise*; Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise

Table 6.3 Internal Control Regulation and Real Earnings Management (REM_DISX)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.000	0.000	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Industry	0.000	0.001**	0.001***	0.002***	0.002***	0.002***	0.003***	0.003***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	0.001	0.001	0.001	0.002	0.003**	0.003	0.003	0.004	0.009*	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	-0.002	(0.002)	(0.003)	(0.005)	
Industry	0.004***	0.005***	0.005***	0.004***	0.005***	0.006***	0.008***	0.010***	0.012***	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	-0.002	(0.002)	(0.003)	(0.004)	

Notes:
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_DISX* = absolutely value of discretionary expense. Variable of interests is *ICR*. *ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise*; Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise

Table 6.4 Internal Control Regulation and Accrual Earnings Management (REM_PRO)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001**	-0.001*	-0.002**	-0.003***	-0.004***	-0.001**	-0.005***	-0.007***	-0.007***	-0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Industry	-0.002**	-0.002***	-0.003***	-0.004***	-0.004***	-0.002**	-0.004***	-0.005***	-0.006***	-0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.010***	-0.011***	-0.013***	-0.014***	-0.016***	-0.016***	-0.019***	-0.026***	-0.040***	
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.005)	(0.007)	(0.009)	
Industry	-0.013***	-0.014***	-0.016***	-0.020***	-0.025***	-0.032***	-0.044***	-0.059***	-0.069***	
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.005)	(0.006)	(0.007)	(0.010)	

Notes:

The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.

The dependent variable *REM_PRO* = absolutely value of abnormal production costs; Variable of interests is *ICR. ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise*; Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise

6.2 Suspect firms

Our main findings in Chapters 4 and 5 suggest that the mandatory adoption of internal control regulations has a significantly negative relationship with earnings management in Chinese-listed firms in general. However, prior research argues that changes in the magnitude of earnings management do not necessarily imply intentional earnings management (Ugrin et al., 2017). That is, changes in earnings management could be the result of unforeseen circumstances, such as economic downturns, which are not the result of mismanagement. Additionally, research has suggested that earnings management could be mis-specified because of the limitations of the model (McNichols, 2000). Following previous studies (Doukakis, 2014; Ho et al., 2015; Makarem & Roberts, 2020; Ugrin, et al., 2017;), we examine whether our hypotheses hold with firms that are most likely to manage earnings – in other words, suspect firms. Research has shown that firms will manage earnings to mitigate and alleviate large debt (Watt & Zimmerman, 1990). Firms in financial difficulty have an incentive to manipulate reported earnings upwards to avoid debt covenant valuation and increased financing costs (Watts & Zimmerman 1990). According to Gavious et al. (2012), a firm's manager is more likely to understate liabilities or overstate assets to avoid debt covenant violations. Chen et al. (2006) conclude that firms with high leverage typically face financial problems and are more likely to be involved in fraud. Empirical studies have provided evidence that firms with higher levels of leverage are more likely to engage in earnings manipulation practices (e.g. Vakilifard & Mortazavi, 2016; Wasiuzzaman et al., 2015). Following Doukakis (2014), we use high-debt firms to construct a sub-sample as these firms have strong incentives to engage in earnings management (Anagnostopoulou & Tsekrekos, 2017; Ruwanti et al., 2019). The high-debt sub-sample includes firm-years observations that fall above the median value of leverage of the full sample.

To perform our analysis, we use the high debts sub-sample and our main regression model as below:

$$EM_{it} = \alpha_0 + \alpha_1 ICR_t + \beta_2 Controls + FixedEffects + \varepsilon_{it}$$

Here, EM = accrual earnings management (AEM_DA) or real earnings management (REM_CFO, REM_DIXS and REM_PRO). The independent variable, ICR, is our variable of interest. It is an indicator variable that takes the value of 1 for years ending on or after the adoption date of mandatory internal control regulation for firms (the adoption date being the year beginning on or after 1 January 2012) and 0 otherwise. This will indicate whether the adoption of internal control regulation will reduce the magnitude of earnings management. Here 'Controls' denotes a vector of control variables: firm size (Size), leverage (Leverage), profitability (ROA), operating cash flow (CFO), firm growth (Tobin's Q), auditor quality (Big10), independence of board (INDB), compensation of top managers (Pay), ownership structure (SOE), CEO duality (Duality) and CEO gender (Gender). Definitions of all variables can be found in the Appendix. As in previous chapters, we used the lag value of the control variables to mitigate the potential endogeneity, and we do not include operating cash flow (CFO) as a control variable in real earnings management analysis to avoid potential multicollinearity. Lastly, FixedEffects refers to industry-fixed effects and year-fixed effects.

Tables 6.5 to 6.8 (see next pages – extract tables presented here; full tables are in Appendix) report the results of our quantile regression using suspect firms. Results in Table 6.1 show that our variable of interest in this section, ICR, has a significantly negative relationship with AEM_DA at the majority of percentiles. In particular, the coefficient of ICR in the higher band of quantile has the highest value – namely, it is -0.040 at 90th and -0.044 at 95th. These indicate that the mandatory adoption of internal control regulation is economically in a significantly

negative relationship with accrual earnings management. However, this relationship is negligible when we use real earnings metrics as proxies of earnings management. Tables 6.7 to 6.9 show that the ICR only has a significantly negative relationship with abnormal cash flow at the 35th percentile, with abnormal discretionary expense at the 75th and 80th percentiles, and with abnormal production costs at the 90th percentile. These results are generally consistent with our main results from Chapters 4 and 5. They suggest that mandatory adoption of internal control regulation has reduced earnings management in general. Its impact on accrual earnings management is much more noticeable than its impact of on real earnings management.

Table 6.5 Internal Control Regulation and Accrual Earnings Management (AEM_DA)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	0	-0.005***	-0.004*	-0.004	-0.006**	-0.008***	-0.008***	-0.008***	-0.007**	-0.006
	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.004	-0.004
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.007*	-0.006	-0.008*	-0.008	-0.014**	-0.013*	-0.024**	-0.040***	-0.044**	
	-0.004	-0.004	-0.005	-0.006	-0.006	-0.007	-0.01	-0.012	-0.02	

Notes:

The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.

The dependent variable *AEM_DA* = absolutely value of discretionary accruals computed using the Modified Jones model (Dechow et al.,1995); Variable of interests is *ICR. ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise*;*

Table 6.6 Internal Control Regulation and Real Earnings Management (REM_CFO)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001	-0.002	-0.003	-0.001	-0.003	-0.004	-0.005*	-0.005	-0.005	-0.004
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004	-0.004	-0.004
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.003	-0.003	-0.005	-0.002	-0.005	-0.003	-0.001	0.005	0.003	
	-0.004	-0.004	-0.005	-0.005	-0.007	-0.01	-0.008	-0.01	-0.013	

Notes:
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_CFO* = absolutely value of abnormal cashflow; Variable of interests is *ICR. ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise*;*

Table 6.7 Internal Control Regulation and Real Earnings Management (REM_DISX)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001	-0.001	-0.001	0	0	-0.001	0	-0.001	-0.001	-0.002
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.001	-0.002	-0.002	-0.003	-0.003*	-0.004*	-0.004	-0.004	-0.001	
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.004	-0.004	-0.006	

Notes:
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_DISX* = absolutely value of discretionary expense. Variable of interests is *ICR. ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise*;*

Table 6.8 Internal Control Regulation and Accrual Earnings Management (REM_PRO)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	0.001	0.002	0.003	0.002	0.001	0	0	-0.002	-0.004	-0.003
	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.004	-0.003	0.001	-0.007	-0.008	-0.009	-0.007	-0.021*	-0.02	
	-0.004	-0.005	-0.005	-0.006	-0.007	-0.009	-0.011	-0.013	-0.018	

Notes:
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_PRO* = absolutely value of abnormal production costs; Variable of interests is *ICR. ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise*;*

6.3 Summary

This chapter reports the results of two additional analyses. First, after removing year fix effects and industry fixed effects from original model, we reclassified industry and performed the regression analysis. In general, our findings are in line with main findings in previous chapters. Second, we performed regression by focusing on sub-sampled datasets, to robust support for our key findings in Chapter 4 and Chapter 5. The results support previous findings.

The next chapter provides the conclusion, including a summary of the thesis and an explanation of the limitations of the study. Recommendations for future research are also presented.

Chapter 7 Conclusions

The purpose of this research was to examine the relationship between the mandatory adoption of internal control regulations and earnings management in Chinese listed firms from 2007 to 2016. We applied both accrual earnings management and real earnings management as proxies for earnings management and included a vector of control variables that might affect earnings management in the regression. This chapter summarises the key findings of our work in Section 7.1, explains the practical implications of those findings in Section 7.2 and addresses the limitations of this study and provides future recommendations in Section 7.3.

7.1 Summary

We reviewed the main literature views on internal controls and earnings management in Chapter 2. We began by explaining the underpinning theory (agency theory and institutional theory) of internal controls and earnings management research, then discussed the definitions of both internal control and earnings management. Reviewing the main lines of existing research on internal control and earnings management, we found a limited number of studies investigating the relationship between the mandatory adoption of internal control rules and earnings management. Chapter 3 describes the quantitative research methodology used to achieve the objectives of our study, as well as the variables that are measured. Our main dependent variables were accrual earnings management and real earnings management. The proxies of accrual earnings management was estimated using the modified Jones model and the performance-matching model. Real earnings management (REM) consisted of three proxies, including abnormal cash flow from operations, abnormal discretionary expenses and abnormal production costs. Using these measures, we then constructed an aggregate proxy for real earnings management. A gap in the literature was identified and, having considered the

characteristics of our data, we employed the quantile regression method to perform our empirical analysis.

Chapters 4, 5 and 6 provide the empirical findings of our analysis. By using the Chinese-context data from 2007 to 2016, our research found that the mandatory adoption of internal control regulation has significant negatively relationship with earnings management. This relationship is more noticeable when we used accrual earnings management as proxy. Our research contributes to agency theory, institutional theory and internal control and earnings management literatures. To our best knowledge, we are the first one to use quantile regression to examine the relationship between mandatory adoption of internal control regulations and earnings management. By using quantile regression, we conclude that mandatory adoption of internal control regulations has different effects on earnings management at different quantile in different level.

In Chapter 4, by using accrual earnings management as a proxy for earnings management, we found that, in general, the mandatory adoption of internal control regulations in China has a significant negative impact on earnings management, implying that after the mandatory adoption of internal controls, firms are less likely to engage in earnings management. However, this significant effect did not appeared in the lower band quantile. We also found that firms that initially had a greater involvement in earnings management experienced a higher reduction of these practices.

In Chapter 5, we replaced the accrual earnings management proxy with three real earnings management metrics (i.e. abnormal cash flow from operations, abnormal production costs and abnormal discretionary expenses) to advance our research. The robust results obtained showed

that the impacts of the mandatory adoption of internal control regulations persist across different definitions of earnings management. In general, earnings management among Chinese listed firms is reduced in the mandatory adoption period, though no reductions occur among firms in lower band quantile. This difference could signal that the changes in the regulatory environment do not affect firms which has conservative managers as they do not engage in the misrepresentation of earnings.

When compared to accrual earnings management, we found that the effect of internal control regulations on real earnings management is less noticeable. It has especially limited effects on the manipulation of discretionary expenses and production costs. This may be due to the relationship between ambiguous rules of internal control regulations and the reality of business activities. Additionally, manipulating earnings through real earnings management involves complex procedures, which are harder to constrain through the current regulation.

In order to gather a broader understanding of our results, we performed an additional analysis in Chapter 6. We first tested the moderating effects of internal control regulations on earnings management among duality firms, the findings of which were primarily consistent with our main findings.[16] Interestingly, we noticed that at higher quantile bands, a group of firms trade off their earnings management strategy with the introduction of internal control regulation. Second, to address the concern for potential endogeneity, we used propensity score matching (PSM) to test our results. The findings were consistent with those in Chapters 4 and 5.

[16] If the CEO and the chairman of the board are the same person, we defined the firm as a duality firm.

7.2 Practical implications

Our findings allow to better evaluate the effectiveness of internal control regulations after the introduction of mandatory internal control regulations. They suggest that the Chinese internal control regulations have effectively constrained earnings management in general. However, they limited effects on the manipulation of real earnings management metrics, especially production manipulation. By comparing the coefficient, we found that the mandatory internal control regulations have more economically significant impact on accrual earnings management than real earnings management. For example, in Table 5.2, the coefficient of ICR is -0.004 at 80^{th} percentile. It indicates that after mandatory adoption of internal control regulations, the magnitude of real earnings management (discretionary expenses) reduced by 0.004. However, this coefficient is -0.017 in Table 4.4, which is more than 4 times higher. Our finding suggests that a need for improvement of internal control regulation to ensure that managers are constrained against manipulating real business activities. Our findings could be beneficial for regulators developing new regulations to enhance the quality of financial reporting and improve the structure of internal controls. Since we utilised quantile regression techniques, we are able to observe the impact of adoption of internal control regulation at different points. Based on our findings, the adoption of internal control regulations had no significant effects on firms which locate at lower band of earnings management. These firms had low level of earning management but they are still mandatory required to follow regulation, we argue that the adoption internal control regulations could create unnecessary cost for these "behaved" firms. The findings of this study may help the regulators to develop new regulation to enhance the quality of financial reporting and improve the internal control system.

7.3 Limitations and future research

First, our data set only included those Chinese listed firms that had been continuously listed for 10 years. Although, this group of firms represents the healthiest firms in the Chinese economy, the exclusion of other firms limits the generalisability of our study's results. Further, we only used data from 2007 to 2016 to create a balanced period dataset. Future studies should include more up-to-date data to capture more comprehensive findings. We could extend our data sets to 2021 to generate 3 data periods. Namely, data from 2007 to 2011, data from 2012 to 2016 and data from 2017 to 2021. By using such data sets, we will be able to exam whether the impact of internal control regulations start fading and when. Besides, our current research has not considered the moderator effect of ownership structure. Since state-own-enterprise (SOE) play important role in Chinese economy (Dong, et al. 2020), future research could explore the role of SOE in relationship between internal control and earnings management.

Second, we used the CSMAR (GTA China Stock Market & Accounting Research) as our data source. Although it has been widely used in other research, we acknowledge that any errors in the data will negatively impact the validity of the findings. Therefore, we suggest future studies utilise different databases or collect primary data to confirm our findings.

Third, we only employed two proxies of earnings management (i.e. accrual earnings management and real earnings management) in our research. The effects of internal control regulations on classification shifting are unclear, due to its neglect in our study. Future research may consider using classification shifting as a proxy for earnings management.

Fourth, although we mitigated potential endogeneity in our analysis, we are still cautious on summarising the causal relationship between the mandatory adoption of internal control regulations and changes in earnings management. Future studies might use instrumental

variables (IV) regression, such as the generalised method of moments (GMM), to address endogeneity, since instrumental variables regression concerns all sources of endogeneity (i.e. simultaneity, measurement error and omitted variables).

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Appendix

Table A – List of Abbreviations	
AEM_DA	*AEM_DA* = absolutely value of discretionary accruals computed using the Modified Jones model (Dechow et al.,1995);
REM_CFO	*REM_CFO* = absolutely value of abnormal cash flows from operations computed using the Roychowdhury's model (2006);
REM_DISX	*REM_DISX* = absolutely value of abnormal discretionary expenses computed using the Roychowdhury's model (2006);
REM_PROD	*REM_PROD* = absolutely value of abnormal production costs computed using the Roychowdhury's model (2006);
Size	*Size* = firm size is measured as the natural logarithm of total assets at the year-end;
Leverage	*Leverage* = leverage is measured as total debt divided by total assets.
ROA	*ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets
CFO	*CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets
Tobin's Q	*Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets.
Big10	*Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise;
INDB	*INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors;
Pay	*Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives.
SOE	*SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise;
Duality	*Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise;
Gender	*Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise.

ICR	*ICR* is our variable of interests. It is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise
AEM_KDA	absolutely value of discretionary accruals computed using the Kothari's (2005) Performance Matched model.
REM_ALL	aggregate proxy for real earnings management. It is measured as the sum of *REM_CFO*, *REM_DISX* and *REM_PROD*.

Table – B : Skewness/Kurtosis tests for Normality

Variable	Observations	Pr(Skewness)	Pr(Kurtosis)
AEM_DA	8,565	0.000	0.000
REM_CFO	8,574	0.000	0.000
REM_DISX	8,564	0.000	0.000
REM_PROD	8,417	0.000	0.000

Variable Definitions

AEM_DA = absolutely value of discretionary accruals computed using the Modified Jones model (Dechow et al.,1995); *REM_CFO* = absolutely value of abnormal cash flows from operations computed using the Roychowdhury's model (2006); *REM_DISX* = absolutely value of abnormal discretionary expenses computed using the Roychowdhury's model (2006); *REM_PROD* = absolutely value of abnormal production costs computed using the Roychowdhury's model (2006);

Table - C: Descriptive Statistics *AEM_KDA* and *REM_ALL*

Variable	Observations	Mean	Median	Std.Dev.	Min	Max
AEM_KDA	8565	0.069	0.043	0.133	0	7.293
REM_ALL	8402	0.183	0.139	0.167	0.005	3.876

Variable Definitions:

AEM_KDA = absolutely value of discretionary accruals computed using the Kothari's (2005) Performance Matched model. *REM_ALL* = aggregate proxy for real earnings management. It is measured as the sum of *REM_CFO*, *REM_DISX* and *REM_PROD*. *REM_CFO* = absolutely value of abnormal cash flows from operations computed using the Roychowdhury's model (2006); *REM_DISX* = absolutely value of abnormal discretionary expenses computed using the Roychowdhury's model (2006); *REM_PROD* = absolutely value of abnormal production costs computed using the Roychowdhury's model (2006).

Table D - Spearman's Correlation Matrix for Section 4.3						
Panel A: Correlation variables *AEM_KDA* to *Tobin's Q*						
	AEM_KDA	*ICR*	*Size*	*Leverage*	*CFO*	*Tobin's Q*
AEM_KDA	1.0000					
ICR	-0.1260*	1.0000				
Size	-0.0756*	0.2835*	1.0000			
Leverage	-0.0196	0.0273*	0.4630*	1.0000		
CFO	-0.0392*	-0.0519*	0.0219	-0.0577*	1.0000	
Tobin's Q	0.0514*	-0.1380*	-0.5897*	-0.4474*	0.1509*	1.0000
Big10	-0.0740*	0.2034*	0.1203*	-0.0039	0.0171	-0.0436*
INDB	0.0102	0.0740*	0.0610*	0.0375*	-0.0427*	-0.0317*
Pay	-0.0195	0.3249*	0.4895*	0.1403*	0.0755*	-0.1464*
SOE	-0.0526*	-0.0210	0.1952*	0.1062*	0.0036	-0.1893*
Duality	0.0173	0.0627*	-0.0976*	-0.0904*	-0.0184	0.1092*
Gender	0.0519*	-0.0009	0.0059	-0.0120	0.0191	0.0005
Panel B: Correlation variables *Big10* to *Gender*						
	Big10	*INDB*	*Pay*	*SOE*	*Duality*	*Gender*
Big10	1.0000					
INDB	0.0195	1.0000				
Pay	0.1754*	0.0473*	1.0000			
SOE	-0.0322*	-0.0327*	0.0017	1.0000		
Duality	0.0268*	0.0414*	0.0405*	-0.1884*	1.0000	
Gender	0.0144	-0.0011	0.0346*	-0.0715*	0.0118	1.000

Notes: Coefficients with star are statistically significant at the 5% level.

AEM_KDA = absolutely value of discretionary accruals computed using the Kothari's (2005) Performance Matched model. Variable of interests, *ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is

measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise.

Table E: Spearman's Correlation Matrix for Section 5.3						
Panel A: Correlation variables *REM_ALL* to *Tobin's Q*						
	REM_All	*ICR*	*Size*	*Leverage*	*ROA*	*Tobin's Q*
REM_All	1.0000					
ICR	-0.0930*	1.0000				
Size	-0.1047*	0.2729*	1.0000			
Leverage	-0.0918*	0.0201	0.4602*	1.0000		
ROA	0.1968*	-0.1141*	0.1043*	-0.0962*	1.0000	
Tobin's Q	0.1704*	-0.1307*	-0.5889*	-0.4480*	0.2747*	1.0000
Big10	-0.0471*	0.2034*	0.1198*	-0.0043	0.0298*	-0.0395*
INDB	0.0019	0.0730*	0.0607*	0.0356*	-0.0616*	-0.0314*
Pay	0.0387*	0.3206*	0.4864*	0.1375*	0.2894*	-0.1432*
SOE	-0.0996*	-0.0283*	0.1869*	0.0998*	-0.0483*	-0.1865*
Duality	0.0799*	0.0667*	-0.0939*	-0.0875*	-0.0116	0.1088*
Gender	0.0313*	0.0004	0.0069	-0.0103	0.0467*	-0.0002
Panel B: Correlation variables *Big10* to *Gender*						
	Big10	*INDB*	*Pay*	*SOE*	*Duality*	*Gender*
Big10	1.0000					
INDB	0.0214	1.0000				
Pay	0.1766*	0.0481*	1.0000			
SOE	-0.0326*	-0.0336*	-0.0042	1.0000		
Duality	0.0248*	0.0435*	0.0419*	-0.1867*	1.0000	
Gender	0.0160	-0.0016	0.0338*	-0.0727*	0.0157	1.0000
The dependent variable *REM_ALL* = sum value of REM_CFO, REM_DISX and REM_PRO; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year is or >2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of						

total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise.

Table F - PSM – Matching Quality Check					
Panel A - Outcome variable AEM_DA					
Variable	**Treated**	**Control**	**%bias**	**t**	**p>t**
Size	22.416	22.375	3.4	1.34	0.179
Leverage	.0669	.06384	3.1	1.39	0.165
ROA	.03489	.03288	2.6	0.97	0.331
CFO	.05595	.053	0.0	0.36	0.717
Tobin's Q	1.8282	1.8444	-0.7	-0.28	0.782
Big10	.5384	.53148	1.4	0.60	0.550
INDB	.37101	.37091	0.2	0.08	0.939
Pay	14.252	14.256	-0.6	-0.27	0.783
SOE	.54619	.55646	-2.1	-0.89	0.373
Duality	.21805	.22818	-2.6	-1.05	0.293
Gender	.04941	.04874	0.3	0.13	0.893
Panel B - Outcome variable REM_CFO					
Variable	**Treated**	**Control**	**%bias**	**t**	**p>t V(C)**
Size	22.415	22.376	3.3	1.31	0.191
Leverage	.06689	.06483	2.0	0.93	0.354
ROA	.03489	.03274	2.7	1.04	0.297
CFO	.05593	.05169	0.0	0.53	0.593
Tobin's Q	1.828	1.8307	-0.1	-0.05	0.964
Big10	.53826	.52946	1.8	0.76	0.447
INDB	.371	.37096	0.1	0.03	0.979
Pay	14.251	14.258	-0.8	-0.36	0.721
SOE	.54631	.55228	-1.2	-0.52	0.604
Duality	.21799	.23456	-4.2	-1.71	0.087
Gender	.0494	.05114	-0.8	-0.34	0.730
Panel C - Outcome variable REM_DISX					
Variable	**Treated**	**Control**	**%bias**	**t**	**p>t**
Size	22.412	22.411	0.1	0.03	0.974
Leverage	0.06612	0.06526	0.9	0.39	0.697
ROA	0.03493	0.03387	1.3	0.51	0.611
CFO	0.05664	0.05822	0	-0.19	0.851
Tobin's Q	1.8379	1.8216	0.7	0.28	0.783
Big10	0.53809	0.52019	3.7	1.55	0.122
INDB	0.37098	0.37084	0.3	0.11	0.916
Pay	14.251	14.258	-0.9	-0.41	0.681
SOE	0.54509	0.56447	-3.9	-1.68	0.093
Duality	0.21803	0.22948	-2.9	-1.18	0.237
Gender	0.04926	0.04805	0.6	0.24	0.808
Panel D - Outcome variable REM_PRO					
Variable	**Treated**	**Control**	**%bias**	**t**	**p>t V(C)**
Size	22.416	22.4	1.4	0.55	0.585

Leverage	.06688	.06514	1.7	0.79	0.432
ROA	.03477	.03285	2.4	0.93	0.352
CFO	.05617	.04822	0.1	0.98	0.327
Tobin's Q	1.8241	1.8107	0.6	0.23	0.815
Big10	.5378	.53605	0.4	0.15	0.880
INDB	.371	.37083	0.3	0.13	0.900
Pay	14.252	14.252	-0.0	-0.00	0.997
SOE	.54641	.56289	-3.3	-1.43	0.153
Duality	.21792	.21879	-0.2	-0.09	0.927
Gender	.04923	.04708	1.0	0.43	0.665

Table G1 –Internal Control Regulation and Accrual Earnings Management (AEM_DA) - Financial Crisis as control variable										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	0.000	-0.001	-0.002	-0.002	-0.004*	-0.005**	-0.007***	-0.007***	-0.007**	-0.007**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Financial Crisis	-0.002*	-0.001	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Size	-0.005	-0.012	-0.029***	-0.035***	-0.053***	-0.065***	-0.080***	-0.081***	-0.091***	-0.097***
	(0.007)	(0.008)	(0.009)	(0.011)	(0.012)	(0.013)	(0.016)	(0.014)	(0.018)	(0.018)
Leverage	-0.002	-0.001	-0.006	-0.003	-0.002	-0.006	-0.009	-0.009	-0.014**	-0.017**
	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)
ROA	0.006	0.010*	0.013**	0.016**	0.022***	0.023***	0.021*	0.016	0.017	0.013
	(0.004)	(0.005)	(0.006)	(0.007)	(0.008)	(0.008)	(0.011)	(0.010)	(0.011)	(0.016)
CFO	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tobin's Q	-0.000	-0.000*	-0.000**	-0.000*	-0.000*	-0.001**	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)
Big10	-0.000	-0.001	-0.002**	-0.001	-0.001	-0.002**	-0.003***	-0.004***	-0.004***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
INDB	0.002	0.003	0.010	0.008	0.012	0.011	0.017*	0.016	0.019	0.026**
	(0.005)	(0.006)	(0.007)	(0.008)	(0.010)	(0.010)	(0.010)	(0.011)	(0.012)	(0.012)
Pay	-0.004	-0.013*	-0.002	-0.010	-0.006	-0.005	-0.005	-0.003	-0.011	-0.021
	(0.007)	(0.007)	(0.009)	(0.010)	(0.011)	(0.011)	(0.012)	(0.013)	(0.018)	(0.017)
SOE	-0.000	-0.000	-0.001	-0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Duality	0.000	0.000	-0.001	0.000	0.001	0.000	0.000	0.000	-0.000	0.000

	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Gender	-0.000	-0.000	0.000	0.001	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)
Constant	0.032	0.078***	0.105***	0.149***	0.199***	0.241***	0.292***	0.295***	0.353***	0.396***
	(0.022)	(0.026)	(0.028)	(0.034)	(0.039)	(0.039)	(0.049)	(0.046)	(0.056)	(0.058)
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	6823
R-sq	0.017	0.043	0.058	0.073	0.082	0.088	0.094	0.096	0.097	0.100
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.009***	-0.010***	-0.011***	-0.011**	-0.013**	-0.017***	-0.020***	-0.031***	-0.055***	
	(0.003)	(0.003)	(0.004)	(0.005)	(0.005)	(0.006)	(0.007)	(0.010)	(0.013)	
Financial Crisis	-0.001	-0.003	-0.005	-0.004	-0.002	0.001	-0.002	0.001	0.015	
	(0.003)	(0.004)	(0.004)	(0.005)	(0.006)	(0.006)	(0.009)	(0.012)	(0.019)	
Size	-0.112***	-0.109***	-0.109***	-0.109***	-0.114***	-0.150***	-0.183***	-0.194***	-0.241***	
	(0.020)	(0.023)	(0.022)	(0.024)	(0.028)	(0.035)	(0.047)	(0.058)	(0.090)	
Leverage	-0.023***	-0.025***	-0.029***	-0.035***	-0.043***	-0.044***	-0.035**	-0.060**	-0.082***	
	(0.007)	(0.008)	(0.008)	(0.009)	(0.011)	(0.011)	(0.016)	(0.028)	(0.031)	
ROA	0.012	0.011	0.012	0.019	0.009	0.010	-0.034	-0.058	-0.078	
	(0.015)	(0.015)	(0.023)	(0.020)	(0.026)	(0.033)	(0.043)	(0.046)	(0.061)	
CFO	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000	0.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
Tobin's Q	-0.000	0.001	0.001	0.001	0.002	0.003*	0.005*	0.007***	0.008**	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)	(0.004)	
Big10	-0.004***	-0.004**	-0.003	-0.004*	-0.005**	-0.005*	-0.003	-0.006	-0.009	

	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.008)	
INDB	0.022*	0.021	0.015	0.017	0.011	0.015	0.025	0.028	0.043	
	(0.012)	(0.013)	(0.013)	(0.021)	(0.022)	(0.025)	(0.026)	(0.040)	(0.069)	
Pay	-0.030*	-0.044**	-0.053***	-0.069***	-0.071***	-0.078**	-0.082**	-0.071	-0.075	
	(0.017)	(0.020)	(0.020)	(0.025)	(0.025)	(0.033)	(0.037)	(0.052)	(0.064)	
SOE	-0.002	-0.004**	-0.005**	-0.006***	-0.005**	-0.004	-0.003	-0.004	-0.001	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.005)	(0.008)	
Duality	-0.000	0.000	0.001	-0.000	0.002	0.003	0.007	0.008	0.011	
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.005)	(0.006)	(0.009)	
Gender	-0.000	-0.001	0.001	0.003	0.011	0.014*	0.018**	0.010	0.026	
	(0.003)	(0.004)	(0.005)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.022)	
Constant	0.473***	0.510***	0.539***	0.586***	0.611***	0.747***	0.867***	0.884***	1.072***	
	(0.060)	(0.065)	(0.072)	(0.081)	(0.101)	(0.126)	(0.169)	(0.187)	(0.266)	
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	
R-sq	0.102	0.103	0.103	0.103	0.105	0.105	0.105	0.106	0.104	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes: **Notes:**
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *AEM_DA* = absolutely value of discretionary accruals computed using the Modified Jones model (Dechow et al.,1995); Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is

measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Financial Crisis* = a dummy variable, which is 1 if year >=2009 and 0 otherwise

Table G2 - Internal Control Regulation and Real Earnings Management (Abnormal_CFO) - Financial Crisis as control variable

Panel A: 5% to 50%

	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001	-0.002	-0.003	-0.003*	-0.004*	-0.004*	-0.004	-0.006**	-0.005*	-0.005*
	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003
Financial Crisis	0	0.001	0.001	0.001	0	-0.001	-0.001	0.002	0.003	0.002
	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003
Size	-0.005	-0.013	-0.017*	-0.012	-0.020*	-0.016	-0.013	-0.012	-0.015	-0.017
	-0.007	-0.008	-0.009	-0.011	-0.012	-0.012	-0.013	-0.016	-0.017	-0.019
Leverage	0.001	-0.005	-0.006	-0.006	-0.006	-0.007	-0.009*	-0.014**	-0.017***	-0.014**
	-0.003	-0.004	-0.004	-0.005	-0.005	-0.005	-0.005	-0.006	-0.006	-0.006
ROA	0.006	0.010*	0.009	0.008	0.018**	0.021**	0.026***	0.032***	0.039***	0.046***
	-0.005	-0.006	-0.006	-0.007	-0.008	-0.009	-0.009	-0.01	-0.012	-0.011
Tobin's Q	0	0	0	0.000*	0	0	0.001	0.001	0.001	0.001**
	0	0	0	0	0	0	0	-0.001	-0.001	-0.001
Big10	0	0	0	-0.001	-0.002*	-0.002*	-0.002**	-0.003**	-0.004***	-0.004***
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
INDB	0.006	0	0.002	-0.001	0	-0.002	-0.004	-0.008	-0.008	-0.01

	-0.005	-0.006	-0.007	-0.007	-0.008	-0.009	-0.01	-0.012	-0.012	-0.013
Pay	0.007	0.006	0.013	0.01	0.014	0.013	0.017	0.016	0.004	-0.002
	-0.006	-0.007	-0.009	-0.01	-0.011	-0.012	-0.012	-0.015	-0.016	-0.017
SOE	0	0	0	0	0	0	0	-0.001	-0.001	-0.002
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Duality	0.001	0.002**	0.002**	0.002**	0.002	0.003**	0.002	0.001	0.002	0.003
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002
Gender	0.004**	0.005***	0.006***	0.006***	0.005***	0.004*	0.003	0.002	0.001	0.002
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004
Constant	-0.004	0.028	0.026	0.021	0.038	0.032	0.014	0.015	0.058	0.084
	-0.021	-0.025	-0.027	-0.032	-0.035	-0.038	-0.044	-0.051	-0.055	-0.06
N	6831	6831	6831	6831	6831	6831	6831	6831	6831	6831
R-sq	0.031	0.053	0.058	0.068	0.073	0.075	0.078	0.079	0.08	0.082
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.006**	-0.006*	-0.007*	-0.005	-0.006	-0.003	-0.003	0	-0.003	
	-0.003	-0.003	-0.004	-0.005	-0.005	-0.005	-0.007	-0.008	-0.01	
Financial Crisis	0.001	0.001	0.002	0	0.003	0.004	0.006	0.006	0.007	
	-0.003	-0.003	-0.004	-0.004	-0.004	-0.005	-0.007	-0.008	-0.009	
Size	-0.022	-0.034	-0.03	-0.047*	-0.078***	-0.090***	-0.107**	-0.173***	-0.245**	
	-0.02	-0.021	-0.025	-0.026	-0.029	-0.029	-0.046	-0.044	-0.107	
Leverage	-0.016**	-0.013	-0.009	-0.006	-0.017	-0.019	-0.014	-0.019	-0.068**	
	-0.007	-0.01	-0.011	-0.011	-0.011	-0.014	-0.019	-0.019	-0.028	
ROA	0.064***	0.079***	0.087***	0.092***	0.102***	0.114***	0.125***	0.118***	0.090***	

	-0.01	-0.011	-0.011	-0.015	-0.014	-0.021	-0.028	-0.042	-0.028	
Tobin's Q	0.002**	0.002***	0.003***	0.003***	0.003***	0.003***	0.004***	0.005**	0.005***	
	-0.001	-0.001	-0.001	-0.001	-0.001	0	-0.002	-0.002	-0.001	
Big10	-0.003**	-0.003**	-0.004**	-0.005**	-0.006***	-0.006***	-0.006	-0.006	-0.008	
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.004	-0.003	-0.006	
INDB	-0.011	-0.005	0.003	0.011	0.007	0.023	0.013	0.022	0.081	
	-0.013	-0.014	-0.016	-0.018	-0.023	-0.024	-0.027	-0.031	-0.068	
Pay	-0.012	-0.025	-0.03	-0.032	-0.025	-0.03	-0.038	-0.05	0.036	
	-0.017	-0.017	-0.019	-0.023	-0.022	-0.029	-0.034	-0.036	-0.058	
SOE	-0.001	-0.002	-0.003	-0.003	-0.004*	-0.003	-0.005*	-0.005	-0.004	
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004	-0.006	
Duality	0.004**	0.004*	0.004*	0.003	0.006**	0.008**	0.006	0.009**	0.008	
	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.004	-0.004	-0.008	
Gender	0.002	0.003	0.005	0.012	0.009*	0.013	0.019	0.016***	0.027	
	-0.005	-0.004	-0.008	-0.007	-0.006	-0.008	-0.016	-0.006	-0.017	
Constant	0.135**	0.205***	0.207***	0.268***	0.354***	0.401***	0.486***	0.733***	0.743**	
	-0.067	-0.065	-0.075	-0.084	-0.088	-0.084	-0.129	-0.135	-0.305	
N	6831	6831	6831	6831	6831	6831	6831	6831	6831	
R-sq	0.083	0.083	0.083	0.083	0.085	0.086	0.084	0.083	0.078	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes: **Notes:**
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_CFO* = absolutely value of abnormal cashflow; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged

total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Financial Crisis* = a dummy variable, which is 1 if year >=2009 and 0 otherwise

Table G3 - Internal Control Regulation and Real Earnings Management (REM_DISX) - Financial Crisis as control variable

Panel A: 5% to 50%

	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002*	-0.001	-0.001	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Financial Crisis	0.001	0.000	0.001	0.001	0.000	-0.000	-0.001	-0.001	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Size	-0.005	-0.014***	-0.016***	-0.020***	-0.020***	-0.023***	-0.027***	-0.027***	-0.024***	-0.028***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)	(0.008)
Leverage	0.000	-0.002	-0.002	-0.003*	-0.005**	-0.006***	-0.007***	-0.008***	-0.010***	-0.011***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
ROA	0.005**	0.005*	0.007**	0.010***	0.014***	0.015***	0.017***	0.014**	0.015**	0.013*
	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.006)	(0.006)	(0.008)
Tobin's Q	-0.000	-0.000*	-0.000***	-0.000**	-0.000**	-0.000***	-0.000***	-0.000**	-0.000***	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Big10	-0.000	0.000	0.000	0.000	0.000	0.000	-0.000	-0.000	0.000	0.000

	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
INDB	0.002	0.004	0.006*	0.004	0.006	0.006	0.008*	0.009*	0.007	0.012*
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.007)
Pay	-0.000	-0.002	-0.004	-0.004	-0.007	-0.004	-0.004	-0.006	-0.004	-0.003
	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)	(0.006)	(0.008)
SOE	-0.000	-0.000	-0.000	-0.001*	-0.001*	-0.001**	-0.001**	-0.001**	-0.001**	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Duality	-0.000	-0.000	-0.000	-0.001	-0.001	-0.000	-0.000	-0.001	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gender	-0.000	0.001	0.000	0.000	0.000	-0.000	-0.001	-0.001	-0.002*	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.017	0.052***	0.064***	0.081***	0.087***	0.096***	0.114***	0.119***	0.111***	0.121***
	(0.012)	(0.013)	(0.014)	(0.016)	(0.018)	(0.020)	(0.021)	(0.022)	(0.023)	(0.026)
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	6823
R-sq	0.175	0.186	0.198	0.200	0.201	0.202	0.204	0.204	0.204	0.204
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.003*	-0.003*	-0.003*	-0.003	-0.004**	-0.004*	-0.005	-0.005	-0.003	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.006)	(0.006)	
Financial Crisis	0.001	0.001	0.001	0.002	0.003*	0.003	0.004	0.007*	0.009	
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.006)	
Size	-0.035***	-0.040***	-0.053***	-0.059***	-0.072***	-0.070***	-0.086***	-0.105***	-0.128***	
	(0.009)	(0.010)	(0.010)	(0.012)	(0.013)	(0.015)	(0.017)	(0.027)	(0.034)	
Leverage	-0.011***	-0.013***	-0.016***	-0.019***	-0.024***	-0.030***	-0.038***	-0.053***	-0.079***	

	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.008)	(0.009)	
ROA	0.014**	0.012*	0.011*	0.011	0.009	0.013**	0.026***	0.037***	0.037	
	(0.006)	(0.007)	(0.006)	(0.007)	(0.007)	(0.006)	(0.009)	(0.013)	(0.027)	
Tobin's Q	-0.000	-0.000	0.000	0.001	0.001	0.001	0.002***	0.004**	0.006**	
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)	
Big10	-0.000	0.000	0.000	-0.000	-0.001	-0.001	-0.001	-0.000	0.000	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	
INDB	0.015**	0.018**	0.018**	0.023**	0.025**	0.029**	0.045***	0.059***	0.037	
	(0.006)	(0.007)	(0.009)	(0.009)	(0.012)	(0.013)	(0.016)	(0.022)	(0.025)	
Pay	0.001	0.004	0.006	0.011	0.024**	0.023	0.047***	0.044*	0.051	
	(0.008)	(0.008)	(0.009)	(0.011)	(0.012)	(0.014)	(0.016)	(0.026)	(0.039)	
SOE	-0.000	-0.001	0.000	0.001	0.002*	0.003***	0.004***	0.002	-0.004	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	
Duality	0.001	0.001	0.000	0.001	-0.000	-0.000	-0.001	0.000	-0.001	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.005)	(0.005)	
Gender	-0.001	-0.002	-0.003	-0.002	-0.003	-0.004*	-0.005*	0.000	0.005	
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.006)	(0.006)	
Constant	0.136***	0.143***	0.180***	0.185***	0.191***	0.191***	0.176***	0.245***	0.320***	
	(0.027)	(0.032)	(0.033)	(0.036)	(0.038)	(0.047)	(0.058)	(0.090)	(0.116)	
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	
R-sq	0.204	0.206	0.209	0.211	0.211	0.211	0.203	0.197	0.203	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes: **Notes:**
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.

The dependent variable *REM_DISX* = absolutely value of discretionary expense; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Financial Crisis* = a dummy variable, which is 1 if year >=2009 and 0 otherwise

Table G4 Internal Control Regulation and Real Earnings Management (REM_PRO) - Financial Crisis as control variable

Panel A: 5% to 50%

	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	0.002	0.002	0.003	0.002	0.002	0.001	-0.002	-0.004	-0.006*	-0.006
	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.004
Financial Crisis	-0.002*	-0.002*	-0.003	-0.003	-0.002	-0.003	-0.003	-0.004	-0.005	-0.007**
	-0.001	-0.001	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003
Size	-0.007	-0.012	-0.015	-0.015	-0.024	-0.039**	-0.042**	-0.054***	-0.057***	-0.066***
	-0.008	-0.01	-0.011	-0.014	-0.015	-0.016	-0.018	-0.017	-0.017	-0.018
Leverage	0.001	0	0.004	0.002	0.002	-0.001	-0.003	0.001	-0.001	-0.006
	-0.004	-0.004	-0.004	-0.005	-0.005	-0.006	-0.007	-0.007	-0.007	-0.007
ROA	0.007	0.009*	0.017**	0.019**	0.031***	0.037***	0.048***	0.054***	0.055***	0.055***
	-0.006	-0.005	-0.007	-0.009	-0.009	-0.008	-0.011	-0.01	-0.013	-0.012
Tobin's Q	0	0	0	0	0	0	0	0.001*	0.001	0.001

	0	0	0	-0.001	-0.001	0	-0.001	0	0	0
Big10	0	0	-0.001	-0.001	-0.002	-0.002	-0.001	-0.001	-0.001	0
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002
INDB	-0.001	-0.004	-0.004	-0.005	-0.003	0.002	0.007	0.008	0.005	0.006
	-0.006	-0.007	-0.008	-0.01	-0.011	-0.012	-0.013	-0.012	-0.013	-0.013
Pay	-0.001	0.007	0.01	0.017	0.013	0.016	0.02	0.032*	0.032*	0.041**
	-0.007	-0.008	-0.01	-0.011	-0.013	-0.014	-0.016	-0.017	-0.019	-0.019
SOE	0	-0.001	-0.001	-0.001	-0.001	0	0.001	0.001	0	-0.001
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002
Duality	0.001	0.004***	0.005***	0.005***	0.004***	0.004**	0.004**	0.004**	0.004*	0.006**
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002
Gender	-0.001	-0.002	-0.003	-0.004	-0.002	-0.002	-0.001	-0.001	-0.002	-0.005
	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004	-0.004
Constant	0.03	0.029	0.033	0.021	0.063	0.102*	0.102*	0.109**	0.127**	0.135**
	-0.026	-0.031	-0.036	-0.043	-0.047	-0.053	-0.061	-0.055	-0.062	-0.066
N	6822	6822	6822	6822	6822	6822	6822	6822	6822	6822
R-sq	0.065	0.09	0.1	0.106	0.113	0.116	0.117	0.117	0.118	0.117
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.003	-0.004	-0.004	-0.007	-0.008	-0.004	-0.008	-0.011	-0.028*	
	-0.004	-0.004	-0.004	-0.005	-0.007	-0.008	-0.008	-0.014	-0.017	
Financial Crisis	-0.009**	-0.011**	-0.012***	-0.011*	-0.013**	-0.018**	-0.012	-0.012	-0.002	
	-0.004	-0.004	-0.005	-0.006	-0.007	-0.007	-0.007	-0.013	-0.015	
Size	-0.056**	-0.068***	-0.076***	-0.089***	-0.098***	-0.100**	-0.099*	-0.125	-0.082	

	-0.023	-0.023	-0.025	-0.029	-0.036	-0.048	-0.055	-0.088	-0.073	
Leverage	-0.011	-0.012	-0.008	-0.018	-0.017	-0.032**	-0.045***	-0.042	-0.072**	
	-0.007	-0.008	-0.01	-0.011	-0.013	-0.015	-0.017	-0.028	-0.031	
ROA	0.060***	0.075***	0.089***	0.109***	0.132***	0.146***	0.171***	0.184***	0.149***	
	-0.013	-0.012	-0.012	-0.015	-0.018	-0.019	-0.023	-0.038	-0.028	
Tobin's Q	0.001	0.001	0.001	0.002*	0.002	0.002***	0.002	0.003	0.015***	
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.005	-0.003	
Big10	0.001	0.001	0.001	0	0.001	0.002	0.004	0.002	-0.002	
	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004	-0.005	-0.007	
INDB	0.001	0.005	0.012	0.025	0.003	0.015	-0.035	-0.029	0.064	
	-0.015	-0.019	-0.021	-0.025	-0.025	-0.028	-0.036	-0.085	-0.054	
Pay	0.038*	0.050**	0.052**	0.052**	0.066**	0.071**	0.069	0.078	0.053	
	-0.02	-0.02	-0.022	-0.026	-0.029	-0.036	-0.044	-0.058	-0.057	
SOE	-0.001	-0.002	-0.001	-0.001	-0.004	-0.004	-0.004	-0.005	-0.007	
	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004	-0.004	-0.006	-0.007	
Duality	0.005**	0.007**	0.007**	0.008**	0.008*	0.011**	0.012*	0.009	0.013	
	-0.002	-0.003	-0.003	-0.003	-0.004	-0.005	-0.006	-0.008	-0.009	
Gender	-0.004	-0.004	-0.008**	-0.010**	-0.014**	-0.011	-0.009	-0.015	-0.005	
	-0.005	-0.005	-0.004	-0.005	-0.006	-0.009	-0.01	-0.019	-0.019	
Constant	0.123	0.130*	0.150*	0.190**	0.194*	0.198	0.219	0.287	0.184	
	-0.075	-0.073	-0.08	-0.088	-0.111	-0.152	-0.167	-0.263	-0.247	
N	6822	6822	6822	6822	6822	6822	6822	6822	6822	
R-sq	0.118	0.118	0.118	0.118	0.117	0.117	0.115	0.115	0.113	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Notes: **Notes:**										

The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_PRO* = absolutely value of abnormal production costs; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Financial Crisis* = a dummy variable, which is 1 if year >=2009 and 0 otherwise

Table 6.1 Internal Control Regulation and Accrual Earnings Management (AEM_DA)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001**	-0.002***	-0.003***	-0.004***	-0.006***	-0.007***	-0.009***	-0.011***	-0.013***	-0.013***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Size	0.000	-0.009	-0.023***	-0.036***	-0.047***	-0.054***	-0.064***	-0.058***	-0.055***	-0.065***
	(0.007)	(0.007)	(0.009)	(0.010)	(0.011)	(0.011)	(0.012)	(0.014)	(0.017)	(0.018)
Leverage	-0.003	-0.004	-0.008**	-0.009**	-0.009*	-0.012**	-0.014***	-0.019***	-0.023***	-0.025***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.007)
ROA	0.005	0.005	0.005	0.013*	0.014**	0.012	0.006	-0.002	0.000	-0.001
	(0.004)	(0.004)	(0.006)	(0.007)	(0.007)	(0.008)	(0.009)	(0.010)	(0.010)	(0.011)
CFO	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tobin's Q	-0.000	-0.000*	-0.000***	-0.000*	-0.000*	-0.001**	-0.001**	-0.001	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Big10	-0.000	-0.001	-0.001*	-0.001	-0.002**	-0.003***	-0.003***	-0.004***	-0.004***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
INDB	0.003	0.005	0.010	0.015*	0.016*	0.015*	0.016*	0.018*	0.022*	0.022
	(0.005)	(0.006)	(0.007)	(0.008)	(0.009)	(0.009)	(0.009)	(0.010)	(0.012)	(0.013)
Pay	-0.004	-0.006	0.001	0.004	0.009	0.005	0.007	0.010	0.010	0.003
	(0.006)	(0.007)	(0.008)	(0.010)	(0.010)	(0.010)	(0.011)	(0.012)	(0.014)	(0.017)
SOE	-0.000	-0.001	-0.001*	-0.001*	-0.001	-0.002	-0.002**	-0.002*	-0.003**	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Duality	0.000	0.000	-0.000	-0.000	0.001	-0.000	-0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)

Gender	-0.000	0.001	0.002	0.001	0.003	0.001	-0.000	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)
Industry	-0.001	-0.001	-0.002**	-0.002***	-0.003***	-0.005***	-0.006***	-0.007***	-0.009***	-0.011***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Constant	0.014	0.052**	0.082***	0.115***	0.143***	0.184***	0.216***	0.197***	0.195***	0.250***
	(0.020)	(0.022)	(0.026)	(0.029)	(0.035)	(0.034)	(0.037)	(0.041)	(0.050)	(0.053)
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	6823
R-sq	0.003	0.010	0.015	0.018	0.026	0.031	0.034	0.037	0.038	0.040
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.015***	-0.015***	-0.017***	-0.020***	-0.024***	-0.027***	-0.037***	-0.048***	-0.060***	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)	(0.008)	
Size	-0.071***	-0.093***	-0.100***	-0.087***	-0.102***	-0.114***	-0.137***	-0.217***	-0.296***	
	(0.019)	(0.021)	(0.023)	(0.027)	(0.026)	(0.035)	(0.038)	(0.045)	(0.068)	
Leverage	-0.032***	-0.035***	-0.039***	-0.043***	-0.026	-0.032*	-0.024	-0.029	-0.043	
	(0.007)	(0.009)	(0.012)	(0.013)	(0.017)	(0.018)	(0.019)	(0.023)	(0.047)	
ROA	-0.000	-0.005	-0.004	-0.017	-0.013	-0.020	-0.019	-0.046	-0.057	
	(0.015)	(0.015)	(0.017)	(0.020)	(0.019)	(0.028)	(0.028)	(0.051)	(0.037)	
CFO	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
Tobin's Q	-0.000	-0.000	-0.000	0.001	0.001***	0.002	0.002**	0.002	0.005*	
	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.002)	(0.001)	(0.003)	(0.003)	
Big10	-0.005***	-0.005***	-0.006***	-0.006***	-0.006***	-0.005*	-0.007*	-0.004	-0.012	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.008)	
INDB	0.024	0.031*	0.045***	0.031*	0.011	0.018	0.031	0.077**	0.079	
	(0.015)	(0.016)	(0.017)	(0.017)	(0.019)	(0.028)	(0.040)	(0.037)	(0.063)	
Pay	0.006	0.002	-0.011	-0.009	-0.033	-0.046	-0.047	-0.036	-0.047	

	(0.019)	(0.019)	(0.021)	(0.021)	(0.025)	(0.036)	(0.036)	(0.033)	(0.061)	
SOE	-0.005***	-0.005***	-0.006***	-0.008***	-0.007***	-0.009***	-0.009**	-0.005	0.000	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.008)	
Duality	-0.000	0.002	0.002	0.000	0.003	0.007*	0.007	0.006	0.012	
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.005)	(0.005)	(0.009)	
Gender	0.003	0.007	0.007	0.006	0.006	0.012	0.014	0.027**	0.031***	
	(0.005)	(0.006)	(0.004)	(0.006)	(0.006)	(0.009)	(0.010)	(0.013)	(0.012)	
Industry	-0.012***	-0.013***	-0.015***	-0.019***	-0.025***	-0.033***	-0.039***	-0.048***	-0.080***	
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.009)	
Constant	0.268***	0.354***	0.415***	0.389***	0.517***	0.606***	0.702***	0.937***	1.278***	
	(0.059)	(0.065)	(0.072)	(0.087)	(0.079)	(0.130)	(0.121)	(0.143)	(0.230)	
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	
R-sq	0.040	0.041	0.042	0.044	0.045	0.045	0.045	0.045	0.044	

Notes: **Notes:**
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *AEM_DA* = absolutely value of discretionary accruals computed using the Modified Jones model (Dechow et al.,1995); Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise

Table 6.2 Internal Control Regulation and Real Earnings Management (Abnormal_CFO)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001*	-0.002***	-0.003***	-0.004***	-0.004***	-0.004***	-0.006***	-0.007***	-0.007***	-0.007***
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002
Size	-0.008	-0.013*	-0.018**	-0.014	-0.022**	-0.034***	-0.027**	-0.024*	-0.026	-0.032
	-0.006	-0.007	-0.009	-0.01	-0.011	-0.012	-0.014	-0.015	-0.016	-0.02
Leverage	-0.004*	-0.007**	-0.007**	-0.007	-0.009**	-0.011**	-0.014***	-0.018***	-0.019***	-0.018***
	-0.003	-0.003	-0.003	-0.004	-0.005	-0.005	-0.005	-0.005	-0.006	-0.007
ROA	0.004	0.009**	0.008	0.011*	0.011	0.016*	0.022**	0.030***	0.042***	0.055***
	-0.005	-0.004	-0.005	-0.006	-0.008	-0.009	-0.011	-0.011	-0.012	-0.015
Tobin's Q	0	0	0	0	0	0	0	0	0.001	0.001
	0	0	0	0	0	0	0	0	-0.001	-0.001
Big10	0	0	0	-0.001	-0.002**	-0.002**	-0.002*	-0.002**	-0.003**	-0.003**
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
INDB	0.004	-0.003	0.001	-0.002	-0.003	0.002	-0.005	-0.001	-0.001	0
	-0.005	-0.005	-0.007	-0.007	-0.008	-0.008	-0.011	-0.011	-0.012	-0.013
Pay	0.009*	0.011*	0.015*	0.023***	0.028***	0.030***	0.037***	0.029**	0.028*	0.02
	-0.006	-0.006	-0.008	-0.009	-0.01	-0.011	-0.012	-0.013	-0.014	-0.016
SOE	0	0	0	-0.001	-0.001	-0.001	-0.001	-0.002	-0.001	-0.003**
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Duality	0.001	0.002***	0.003***	0.002**	0.002*	0.002	0.002*	0.003*	0.002	0.002
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002
Gender	0.004**	0.005***	0.005**	0.008***	0.007***	0.006***	0.006**	0.005*	0.005	0.005
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003
Industry	-0.001*	-0.001*	-0.001*	-0.001	-0.002**	-0.003***	-0.004***	-0.005***	-0.006***	-0.006***

	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Constant	0.005	0.021	0.03	0.002	0.021	0.056	0.024	0.042	0.054	0.097
	-0.018	-0.023	-0.027	-0.029	-0.032	-0.036	-0.042	-0.047	-0.055	-0.062
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	6823
R-sq	0.022	0.024	0.031	0.032	0.035	0.037	0.037	0.039	0.04	0.04
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.008***	-0.008***	-0.009***	-0.009***	-0.010***	-0.011***	-0.013***	-0.017***	-0.029***	
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004	-0.008	
Size	-0.025	-0.03	-0.040*	-0.051**	-0.058**	-0.084***	-0.130***	-0.154***	-0.185***	
	-0.019	-0.021	-0.021	-0.025	-0.028	-0.032	-0.039	-0.047	-0.055	
Leverage	-0.020**	-0.022**	-0.015	-0.008	-0.004	-0.003	0.01	0.01	-0.01	
	-0.008	-0.009	-0.011	-0.011	-0.012	-0.016	-0.018	-0.024	-0.043	
ROA	0.060***	0.078***	0.090***	0.096***	0.094***	0.111***	0.108***	0.136***	0.075***	
	-0.013	-0.015	-0.014	-0.019	-0.015	-0.014	-0.023	-0.02	-0.028	
Tobin's Q	0.001**	0.002*	0.003***	0.003***	0.003***	0.003***	0.003***	0.004***	0.005***	
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	
Big10	-0.004***	-0.004***	-0.006***	-0.007***	-0.007***	-0.008***	-0.007**	-0.007*	0.001	
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004	-0.007	
INDB	-0.002	0.008	0.014	0.023	0.025	0.023	0.036	0.045	0.053	
	-0.014	-0.018	-0.015	-0.016	-0.021	-0.02	-0.028	-0.051	-0.069	
Pay	0.015	0.002	0.006	0.003	0.011	0.012	0.009	-0.015	0.051	
	-0.018	-0.02	-0.019	-0.022	-0.022	-0.026	-0.032	-0.044	-0.062	
SOE	-0.003**	-0.003*	-0.003*	-0.005**	-0.005**	-0.006**	-0.010***	-0.008**	-0.008	
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004	-0.007	
Duality	0.003	0.005**	0.006**	0.005**	0.006**	0.007*	0.007**	0.007	0.012	
	-0.002	-0.003	-0.002	-0.002	-0.003	-0.004	-0.004	-0.005	-0.01	

Gender	0.005	0.009	0.011*	0.017***	0.018**	0.024	0.025***	0.032	0.032**	
	-0.004	-0.006	-0.006	-0.005	-0.007	-0.016	-0.006	-0.025	-0.013	
Industry	-0.007***	-0.008***	-0.010***	-0.011***	-0.015***	-0.020***	-0.024***	-0.032***	-0.045***	
	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.005	-0.01	
Constant	0.094*	0.149**	0.172**	0.222***	0.234***	0.328***	0.494***	0.649***	0.619***	
	-0.057	-0.064	-0.069	-0.081	-0.09	-0.1	-0.119	-0.138	-0.195	
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	
R-sq	0.04	0.041	0.041	0.041	0.042	0.043	0.043	0.042	0.039	

Notes: **Notes:**
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_CFO* = absolutely value of abnormal cashflow; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise

Table 6.3 Internal Control Regulation and Real Earnings Management (REM_DISX)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.000	0.000	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Size	-0.009***	-0.021***	-0.026***	-0.037***	-0.043***	-0.053***	-0.056***	-0.064***	-0.069***	-0.085***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.006)	(0.007)	(0.008)	(0.008)	(0.010)
Leverage	-0.002*	-0.005***	-0.008***	-0.009***	-0.011***	-0.014***	-0.017***	-0.019***	-0.021***	-0.022***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
ROA	0.003*	0.007***	0.010***	0.013***	0.017***	0.019***	0.022***	0.022***	0.027***	0.029***
	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)	(0.007)
Tobin's Q	-0.000	-0.000**	-0.000	-0.000	-0.000	-0.000	0.000	0.000	0.000**	0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Big10	-0.000	-0.000	-0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
INDB	0.001	0.004	0.006*	0.002	0.001	0.005	0.010*	0.015**	0.016**	0.015*
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.007)	(0.007)	(0.008)
Pay	0.002	0.003	0.001	-0.000	0.002	0.004	0.009	0.015**	0.011	0.020**
	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)	(0.008)
SOE	-0.000	-0.000	-0.001*	-0.001*	-0.001**	-0.001**	-0.002***	-0.002***	-0.002**	-0.002*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Duality	0.000	-0.000	-0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gender	-0.000	-0.000	0.000	0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Industry	0.000	0.001**	0.001***	0.002***	0.002***	0.002***	0.003***	0.003***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.025***	0.060***	0.083***	0.123***	0.137***	0.165***	0.161***	0.169***	0.197***	0.225***

	(0.009)	(0.011)	(0.012)	(0.014)	(0.017)	(0.017)	(0.019)	(0.022)	(0.025)	(0.030)
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	6823
R-sq	0.061	0.056	0.061	0.060	0.064	0.064	0.068	0.069	0.068	0.068
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	0.001	0.001	0.001	0.002	0.003**	0.003	0.003	0.004	0.009*	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	-0.002	(0.002)	(0.003)	(0.005)	
Size	-0.096***	-0.114***	-0.119***	-0.134***	-0.158***	-0.179***	-0.173***	-0.162***	-0.187**	
	(0.012)	(0.012)	(0.013)	(0.015)	(0.016)	-0.018	(0.023)	(0.035)	(0.081)	
Leverage	-0.024***	-0.027***	-0.032***	-0.043***	-0.051***	-0.066***	-0.084***	-0.107***	-0.120***	
	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	-0.006	(0.006)	(0.010)	(0.011)	
ROA	0.034***	0.035***	0.033***	0.038***	0.050***	0.054***	0.051***	0.058***	0.114***	
	(0.010)	(0.009)	(0.009)	(0.009)	(0.012)	-0.013	(0.012)	(0.013)	(0.034)	
Tobin's Q	0.001	0.001***	0.002***	0.002***	0.002***	0.002***	0.003***	0.004**	0.011*	
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	-0.001	(0.001)	(0.001)	(0.006)	
Big10	-0.001	-0.001	-0.001	-0.002*	-0.002	-0.003*	-0.002	-0.001	0.008*	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	-0.002	(0.002)	(0.003)	(0.005)	
INDB	0.019**	0.025**	0.025***	0.031***	0.036**	0.043**	0.080***	0.102***	0.080***	
	(0.009)	(0.010)	(0.009)	(0.012)	(0.015)	-0.02	(0.026)	(0.034)	(0.020)	
Pay	0.023**	0.027**	0.030**	0.033**	0.034**	0.056***	0.076***	0.079**	0.086	
	(0.009)	(0.011)	(0.013)	(0.015)	(0.014)	-0.021	(0.020)	(0.033)	(0.056)	
SOE	-0.001	0.000	-0.000	0.000	-0.001	-0.002	-0.005**	-0.007**	-0.012***	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	-0.002	(0.002)	(0.003)	(0.004)	
Duality	0.001	0.002	0.001	0.001	0.001	0.001	-0.000	0.006	0.014*	
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	-0.002	(0.003)	(0.005)	(0.008)	
Gender	-0.003*	-0.003	-0.004**	-0.005**	-0.006**	-0.010***	-0.015***	-0.022***	-0.023**	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	-0.002	(0.003)	(0.004)	(0.010)	

Industry	0.004***	0.005***	0.005***	0.004***	0.005***	0.006***	0.008***	0.010***	0.012***	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	-0.002	(0.002)	(0.003)	(0.004)	
Constant	0.252***	0.296***	0.310***	0.352***	0.428***	0.442***	0.369***	0.335***	0.416**	
	(0.038)	(0.033)	(0.038)	(0.045)	(0.050)	-0.061	(0.074)	(0.115)	(0.187)	
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	
R-sq	0.067	0.065	0.064	0.063	0.065	0.066	0.065	0.065	0.059	

Notes: **Notes:**
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_DISX* = absolutely value of discretionary expense; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise

Table 6.4 Internal Control Regulation and Real Earnings Management (REM_PRO)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001**	-0.001*	-0.002**	-0.003***	-0.004***	-0.001**	-0.005***	-0.007***	-0.007***	-0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Size	-0.005	-0.016*	-0.029***	-0.033***	-0.041***	-0.005	-0.047***	-0.055***	-0.078***	-0.080***
	(0.008)	(0.009)	(0.010)	(0.012)	(0.014)	(0.008)	(0.015)	(0.015)	(0.017)	(0.020)
Leverage	-0.002	-0.002	-0.007*	-0.007	-0.007	-0.002	-0.009	-0.010	-0.008	-0.014**
	(0.003)	(0.003)	(0.004)	(0.005)	(0.005)	(0.003)	(0.006)	(0.006)	(0.007)	(0.007)
ROA	0.004	0.015**	0.019***	0.030***	0.035***	0.004	0.042***	0.049***	0.052***	0.050***
	(0.005)	(0.006)	(0.007)	(0.007)	(0.008)	(0.005)	(0.009)	(0.011)	(0.011)	(0.011)
Tobin's Q	-0.000	-0.000	-0.000	0.000	0.000	-0.000	0.001	0.001*	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Big10	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002*	-0.002	-0.002	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
INDB	-0.001	-0.001	-0.002	-0.000	-0.000	-0.001	0.003	0.013	0.014	0.014
	(0.006)	(0.006)	(0.008)	(0.008)	(0.010)	(0.006)	(0.012)	(0.014)	(0.014)	(0.015)
Pay	0.005	0.003	0.021**	0.029***	0.034***	0.005	0.043***	0.054***	0.068***	0.067***
	(0.007)	(0.008)	(0.009)	(0.010)	(0.011)	(0.007)	(0.013)	(0.015)	(0.016)	(0.019)
SOE	-0.000	-0.001	-0.001	-0.002**	-0.002*	-0.000	-0.002*	-0.004***	-0.004**	-0.004**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Duality	0.002*	0.004***	0.004***	0.006***	0.005***	0.002*	0.006***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Gender	-0.001	0.000	-0.000	-0.001	-0.001	-0.001	0.002	0.001	0.003	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.003)	(0.003)
Industry	-0.002**	-0.002***	-0.003***	-0.004***	-0.004***	-0.002**	-0.004***	-0.005***	-0.006***	-0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Constant	0.010	0.053*	0.055*	0.049	0.065	0.010	0.062	0.065	0.104**	0.120*

	(0.025)	(0.028)	(0.031)	(0.036)	(0.043)	(0.025)	(0.047)	(0.049)	(0.053)	(0.062)
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	6823
R-sq	0.020	0.024	0.029	0.029	0.031	0.032	0.033	0.033	0.034	0.034
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.010***	-0.011***	-0.013***	-0.014***	-0.016***	-0.016***	-0.019***	-0.026***	-0.040***	
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.005)	(0.007)	(0.009)	
Size	-0.103***	-0.118***	-0.141***	-0.157***	-0.148***	-0.132**	-0.177***	-0.186**	-0.268	
	(0.025)	(0.023)	(0.026)	(0.029)	(0.037)	(0.052)	(0.054)	(0.081)	(0.192)	
Leverage	-0.026***	-0.023**	-0.023*	-0.013	-0.018	-0.022	-0.038	-0.018	0.087	
	(0.010)	(0.012)	(0.012)	(0.016)	(0.016)	(0.020)	(0.029)	(0.038)	(0.072)	
ROA	0.072***	0.080***	0.104***	0.124***	0.145***	0.169***	0.224***	0.223***	0.223***	
	(0.014)	(0.015)	(0.016)	(0.015)	(0.014)	(0.023)	(0.025)	(0.039)	(0.074)	
Tobin's Q	0.001	0.002***	0.002*	0.002***	0.003***	0.004	0.004***	0.010**	0.019**	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)	(0.004)	(0.010)	
Big10	-0.002	-0.004**	-0.004	0.000	-0.000	-0.003	-0.004	-0.010	-0.003	
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.005)	(0.007)	(0.010)	
INDB	0.013	0.014	0.036	0.044*	0.059**	0.048	0.069	0.085	0.076	
	(0.020)	(0.021)	(0.026)	(0.025)	(0.026)	(0.032)	(0.043)	(0.065)	(0.057)	
Pay	0.088***	0.117***	0.125***	0.131***	0.125***	0.113**	0.114**	0.154**	0.173	
	(0.020)	(0.019)	(0.024)	(0.026)	(0.030)	(0.045)	(0.051)	(0.070)	(0.117)	
SOE	-0.004*	-0.006***	-0.007***	-0.007**	-0.009***	-0.013***	-0.014***	-0.019***	-0.037***	
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.005)	(0.006)	(0.013)	
Duality	0.007***	0.007***	0.006**	0.010**	0.009**	0.013**	0.016**	0.018*	0.042***	
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.006)	(0.010)	(0.013)	
Gender	0.001	-0.003	-0.001	-0.002	-0.002	0.002	-0.006	-0.001	0.004	
	(0.004)	(0.004)	(0.007)	(0.007)	(0.009)	(0.009)	(0.011)	(0.028)	(0.025)	

Industry	-0.013***	-0.014***	-0.016***	-0.020***	-0.025***	-0.032***	-0.044***	-0.059***	-0.069***	
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.005)	(0.006)	(0.007)	(0.010)	
Constant	0.155**	0.133*	0.188**	0.230**	0.228**	0.235	0.399**	0.356	0.615	
	(0.079)	(0.072)	(0.084)	(0.097)	(0.109)	(0.161)	(0.162)	(0.262)	(0.486)	
N	6823	6823	6823	6823	6823	6823	6823	6823	6823	
R-sq	0.034	0.033	0.034	0.035	0.035	0.036	0.035	0.035	0.032	

Notes: **Notes:**
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_PRO* = absolutely value of abnormal production costs; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise

Table 6.5 Internal Control Regulation and Accrual Earnings Management (AEM_DA)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	0	-0.005***	-0.004*	-0.004	-0.006**	-0.008***	-0.008***	-0.008***	-0.007**	-0.006
	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.004	-0.004
Size	-0.002	-0.013	-0.018	-0.037**	-0.052***	-0.075***	-0.091***	-0.096***	-0.123***	-0.128***
	-0.011	-0.012	-0.013	-0.015	-0.017	-0.017	-0.018	-0.019	-0.021	-0.024
Leverage	-0.003	-0.007	-0.009	-0.003	-0.002	-0.005	-0.008	-0.013*	-0.012	-0.011
	-0.004	-0.005	-0.005	-0.005	-0.006	-0.006	-0.006	-0.007	-0.008	-0.008
ROA	0.004	0.007	0.01	0.022**	0.030***	0.033***	0.027*	0.029**	0.028*	0.012
	-0.009	-0.009	-0.011	-0.011	-0.011	-0.012	-0.015	-0.013	-0.015	-0.018
CFO	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	0	0	0	0	0	0	0	0	0	0
Tobin's Q	0	0	0	0	0	-0.001*	-0.001**	-0.001***	-0.001***	-0.001**
	0	0	0	0	0	0	0	0	0	0
Big10	0	-0.002*	-0.002*	-0.001	-0.002	-0.003**	-0.004***	-0.005***	-0.006***	-0.006***
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002
INDB	0.005	0.005	0.006	0.004	0.006	0.015	0.021	0.028**	0.028**	0.027*
	-0.007	-0.009	-0.009	-0.011	-0.013	-0.015	-0.015	-0.013	-0.014	-0.014
Pay	0.001	0.002	-0.001	-0.002	0.001	0.005	0.007	-0.004	-0.009	-0.021
	-0.011	-0.011	-0.013	-0.014	-0.017	-0.017	-0.017	-0.02	-0.022	-0.023
SOE	0	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002
Duality	0	0.002	0.001	0.002	0.001	0.001	0.002	0.001	0.002	0.003
	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Gender	0.001	0	0	0.001	0.003	0.002	0.003	0.003	0.002	0
	-0.002	-0.002	-0.003	-0.004	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004
Constant	0.004	0.044	0.070*	0.128***	0.177***	0.238***	0.286***	0.334***	0.441***	0.490***

	-0.034	-0.038	-0.042	-0.046	-0.055	-0.054	-0.057	-0.064	-0.071	-0.075
N	3583	3583	3583	3583	3583	3583	3583	3583	3583	3583
R-sq	0.013	0.037	0.057	0.074	0.086	0.093	0.098	0.1	0.102	0.104
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.007*	-0.006	-0.008*	-0.008	-0.014**	-0.013*	-0.024**	-0.040***	-0.044**	
	-0.004	-0.004	-0.005	-0.006	-0.006	-0.007	-0.01	-0.012	-0.02	
Size	-0.133***	-0.139***	-0.131***	-0.114***	-0.123***	-0.175***	-0.194***	-0.225***	-0.370***	
	-0.026	-0.029	-0.035	-0.034	-0.041	-0.04	-0.055	-0.061	-0.114	
Leverage	-0.019**	-0.020**	-0.027***	-0.037***	-0.040***	-0.037**	-0.041**	-0.056***	-0.086***	
	-0.008	-0.009	-0.009	-0.01	-0.012	-0.014	-0.017	-0.021	-0.032	
ROA	0.007	0.006	0.004	0.002	0.007	0.008	-0.034	-0.051	0.055	
	-0.017	-0.019	-0.03	-0.025	-0.039	-0.047	-0.041	-0.056	-0.07	
CFO	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	0	0.000**	
	0	0	0	0	0	0	0	0	0	
Tobin's Q	-0.001***	-0.001	0	0.001	0.002	0.004	0.007**	0.007***	0.006	
	0	-0.001	-0.002	-0.003	-0.004	-0.003	-0.003	-0.003	-0.005	
Big10	-0.005***	-0.005**	-0.005*	-0.006**	-0.006**	-0.009***	-0.012***	-0.008	-0.009	
	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.004	-0.006	-0.009	
INDB	0.033**	0.022	0.022	0.017	0.015	0.01	-0.008	-0.032	-0.157***	
	-0.014	-0.014	-0.017	-0.018	-0.021	-0.028	-0.036	-0.047	-0.055	
Pay	-0.03	-0.049*	-0.044	-0.064*	-0.079***	-0.063	-0.074	-0.061	-0.077	
	-0.023	-0.026	-0.029	-0.034	-0.03	-0.039	-0.057	-0.07	-0.117	
SOE	0	0	-0.001	-0.001	-0.001	0	0.002	-0.004	0.005	
	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004	-0.004	-0.006	-0.009	

Duality	0.001	0.001	0.002	0.002	0.003	0.004	0.005	0.003	-0.009	
	-0.003	-0.003	-0.003	-0.004	-0.004	-0.005	-0.006	-0.007	-0.014	
Gender	0.004	0.003	0.003	0.002	0.008	0.014	0.009	-0.006	0.039	
	-0.005	-0.005	-0.007	-0.008	-0.018	-0.008	-0.011	-0.023	-0.03	
Constant	0.536***	0.612***	0.577***	0.584***	0.657***	0.784***	0.896***	0.988***	1.554***	
	-0.079	-0.085	-0.109	-0.119	-0.132	-0.137	-0.168	-0.211	-0.36	
N	3583	3583	3583	3583	3583	3583	3583	3583	3583	
R-sq	0.105	0.105	0.107	0.11	0.111	0.111	0.111	0.113	0.106	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes: **Notes:**
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *AEM_DA* = absolutely value of discretionary accruals computed using the Modified Jones model (Dechow et al.,1995); Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise

Table 6.6 Internal Control Regulation and Real Earnings Management (Abnormal_CFO)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001	-0.002	-0.003	-0.001	-0.003	-0.004	-0.005*	-0.005	-0.005	-0.004
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004	-0.004	-0.004
Size	-0.011	-0.024**	-0.026**	-0.031**	-0.030**	-0.030**	-0.035**	-0.044**	-0.048**	-0.055**
	-0.012	-0.012	-0.013	-0.013	-0.014	-0.015	-0.017	-0.018	-0.019	-0.028
Leverage	0.002	-0.003	-0.002	0.001	0.001	-0.001	-0.005	-0.003	-0.006	-0.008
	-0.004	-0.004	-0.005	-0.005	-0.005	-0.006	-0.006	-0.007	-0.007	-0.008
ROA	0.006	0.01	0.005	0.007	0.015	0.025**	0.024	0.038**	0.038**	0.058*
	-0.007	-0.007	-0.009	-0.01	-0.012	-0.012	-0.017	-0.016	-0.018	-0.03
Tobin's Q	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	-0.002
Big10	0	-0.001	-0.001	-0.001	-0.002*	-0.002	-0.003*	-0.004**	-0.005***	-0.005**
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002
INDB	0.007	0.007	0.005	0.001	0.003	0.005	0	0.007	0.01	0.011
	-0.007	-0.008	-0.009	-0.01	-0.011	-0.012	-0.014	-0.016	-0.016	-0.017
Pay	0.007	0.01	0.014	0.018	0.017	0.011	0.013	0.011	0.004	-0.005
	-0.01	-0.01	-0.012	-0.013	-0.014	-0.016	-0.018	-0.02	-0.023	-0.024
SOE	0	0	0.001	0.001	0	0	0	0.001	0	0
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002
Duality	0.001	0.003**	0.003*	0.004**	0.004**	0.004**	0.005**	0.003	0.003	0.004
	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003
Gender	0.004	0.004	0.009**	0.009***	0.010***	0.008***	0.006**	0.005	0.002	0.003
	-0.002	-0.003	-0.004	-0.003	-0.003	-0.003	-0.003	-0.003	-0.004	-0.006
Constant	0.017	0.054	0.052	0.058	0.059	0.076	0.092*	0.124**	0.156**	0.201**
	-0.034	-0.036	-0.04	-0.04	-0.043	-0.049	-0.055	-0.063	-0.072	-0.096

N	3588	3588	3588	3588	3588	3588	3588	3588	3588	3588
R-sq	0.026	0.054	0.07	0.074	0.082	0.094	0.095	0.099	0.099	0.101
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.003	-0.003	-0.005	-0.002	-0.005	-0.003	-0.001	0.005	0.003	
	-0.004	-0.004	-0.005	-0.005	-0.007	-0.01	-0.008	-0.01	-0.013	
Size	-0.083***	-0.095***	-0.100**	-0.125***	-0.164***	-0.203***	-0.198***	-0.173***	-0.350***	
	-0.027	-0.027	-0.039	-0.038	-0.039	-0.046	-0.056	-0.058	-0.116	
Leverage	-0.009	-0.015	-0.009	-0.014	-0.018	-0.031	-0.018	-0.041**	-0.069***	
	-0.008	-0.01	-0.013	-0.013	-0.015	-0.02	-0.018	-0.019	-0.021	
ROA	0.070***	0.075***	0.066*	0.076*	0.093***	0.096***	0.106***	0.051	0.052	
	-0.019	-0.022	-0.035	-0.044	-0.03	-0.033	-0.032	-0.032	-0.045	
Tobin's Q	0	0	0.001	0.003*	0.002	0.003	0.005*	0.007***	0.008**	
	-0.001	-0.001	-0.003	-0.001	-0.001	-0.003	-0.003	-0.002	-0.004	
Big10	-0.003	-0.003	-0.002	-0.005*	-0.007**	-0.007**	-0.010**	-0.010*	-0.009	
	-0.002	-0.002	-0.002	-0.003	-0.003	-0.004	-0.004	-0.005	-0.007	
INDB	0.007	0.001	0.015	0.023	0.032	0.024	0.018	-0.007	0.073	
	-0.018	-0.018	-0.024	-0.026	-0.026	-0.03	-0.034	-0.033	-0.09	
Pay	-0.003	-0.009	-0.009	-0.01	0.012	0.031	-0.019	-0.035	0.049	
	-0.024	-0.027	-0.028	-0.029	-0.039	-0.049	-0.047	-0.044	-0.086	
SOE	-0.001	-0.001	-0.002	-0.004	-0.005	-0.006	-0.008	-0.011**	-0.006	
	-0.002	-0.002	-0.003	-0.003	-0.003	-0.005	-0.006	-0.005	-0.006	
Duality	0.004	0.003	0.003	0.001	0.001	0	0.001	0.005	0	
	-0.003	-0.003	-0.003	-0.004	-0.005	-0.005	-0.006	-0.006	-0.01	
Gender	0.006	0.008	0.018	0.018**	0.017***	0.013	0.017	0.012	0.013	
	-0.007	-0.009	-0.012	-0.007	-0.006	-0.01	-0.012	-0.009	-0.013	

Constant	0.292***	0.355***	0.369***	0.455***	0.528***	0.612***	0.733***	0.721***	1.040***	
	-0.092	-0.089	-0.125	-0.127	-0.126	-0.151	-0.174	-0.168	-0.355	
N	3588	3588	3588	3588	3588	3588	3588	3588	3588	
R-sq	0.102	0.103	0.104	0.108	0.109	0.11	0.107	0.103	0.096	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes: **Notes:**
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_CFO* = absolutely value of abnormal cashflow; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise

Table 6.7 Internal Control Regulation and Real Earnings Management (REM_DISX)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	-0.001	-0.001	-0.001	0	0	-0.001	0	-0.001	-0.001	-0.002
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Size	-0.004	-0.011**	-0.012**	-0.022***	-0.023***	-0.019***	-0.025***	-0.031***	-0.025***	-0.021**
	-0.005	-0.005	-0.005	-0.006	-0.006	-0.007	-0.008	-0.008	-0.009	-0.01
Leverage	0	-0.001	-0.001	-0.001	-0.001	-0.003	-0.002	-0.004*	-0.004*	-0.004
	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003
ROA	0.002	0.002	0.002	0.009	0.011*	0.009	0.01	0.009	0.007	0.008
	-0.004	-0.005	-0.005	-0.006	-0.006	-0.007	-0.007	-0.007	-0.008	-0.007
Tobin's Q	0	0	0	0	-0.000***	-0.000**	-0.000***	-0.000***	0	0
	0	0	0	0	0	0	0	0	0	0
Big10	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	-0.001	-0.001	-0.001	-0.001	-0.001
INDB	0	0.001	0.004	0.007*	0.005	0.009*	0.009*	0.010*	0.012*	0.016**
	-0.003	-0.003	-0.004	-0.004	-0.005	-0.005	-0.005	-0.006	-0.006	-0.007
Pay	0	-0.005	-0.005	-0.005	-0.004	-0.004	-0.003	-0.001	-0.002	-0.005
	-0.004	-0.005	-0.005	-0.006	-0.006	-0.006	-0.006	-0.006	-0.008	-0.009
SOE	0	0	0	-0.001	-0.001**	-0.001*	-0.001*	-0.001**	-0.002***	-0.002**
	0	0	0	0	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Duality	0	0	0	0	0	0	-0.001	-0.001	0	0
	0	0	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Gender	0	0	0.001	0.001	0.001	0	0	0	-0.001	-0.001
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Constant	0.014	0.051***	0.056***	0.086***	0.090***	0.083***	0.102***	0.119***	0.102***	0.098***
	-0.014	-0.015	-0.017	-0.018	-0.021	-0.022	-0.024	-0.026	-0.027	-0.03

N	3578	3578	3578	3578	3578	3578	3578	3578	3578	3578
R-sq	0.17	0.203	0.259	0.273	0.27	0.275	0.276	0.272	0.27	0.27
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.001	-0.002	-0.002	-0.003	-0.003*	-0.004*	-0.004	-0.004	-0.001	
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.004	-0.004	-0.006	
Size	-0.024**	-0.031**	-0.036***	-0.037***	-0.040***	-0.046***	-0.060***	-0.089***	-0.137***	
	-0.01	-0.013	-0.013	-0.013	-0.014	-0.014	-0.017	-0.024	-0.027	
Leverage	-0.005	-0.004	-0.009***	-0.012***	-0.016***	-0.019***	-0.025***	-0.040***	-0.061***	
	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004	-0.006	-0.006	-0.009	
ROA	0.008	0.007	0.004	0.003	-0.003	-0.012*	-0.012	-0.03	-0.048***	
	-0.007	-0.009	-0.007	-0.006	-0.007	-0.007	-0.008	-0.019	-0.014	
Tobin's Q	0	0	0	0.001**	0.001	0.002***	0.003***	0.003	0.005***	
	0	-0.001	-0.001	-0.001	-0.001	-0.001	0	-0.003	-0.001	
Big10	0	0	0	0	0	-0.001	-0.001	0	0.001	
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.003	
INDB	0.016**	0.016*	0.014*	0.020**	0.031***	0.041***	0.048**	0.065***	0.062**	
	-0.008	-0.008	-0.008	-0.01	-0.011	-0.013	-0.019	-0.02	-0.024	
Pay	-0.003	-0.001	-0.004	0.006	0.005	0.011	0.022	0.027	0.034	
	-0.009	-0.01	-0.01	-0.011	-0.012	-0.016	-0.017	-0.023	-0.033	
SOE	-0.001	-0.001	-0.001	0	0	0.001	0	0	0.001	
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	
Duality	0.001	0.001	0.001	0.001	0.001	0	-0.001	-0.002	-0.003	
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.003	-0.006	
Gender	-0.002	-0.001	-0.001	-0.002	-0.001	-0.001	-0.001	0	0.004	
	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.004	-0.005	

Constant	0.105***	0.128***	0.154***	0.130***	0.144***	0.142***	0.170***	0.256***	0.393***	
	-0.031	-0.039	-0.039	-0.038	-0.038	-0.041	-0.052	-0.079	-0.098	
N	3578	3578	3578	3578	3578	3578	3578	3578	3578	
R-sq	0.272	0.272	0.277	0.284	0.288	0.287	0.283	0.257	0.258	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes: **Notes:**
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_DISX* = absolutely value of discretionary expense; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise

Table 6.8 Internal Control Regulation and Real Earnings Management (REM_PRO)										
Panel A: 5% to 50%										
	0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**
ICR	0.001	0.002	0.003	0.002	0.001	0	0	-0.002	-0.004	-0.003
	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004
Size	-0.01	-0.025*	-0.034**	-0.046***	-0.034*	-0.057***	-0.063***	-0.073**	-0.078**	-0.082***
	-0.012	-0.015	-0.016	-0.017	-0.018	-0.02	-0.021	-0.031	-0.032	-0.026
Leverage	0.002	-0.001	0.002	0.002	-0.003	-0.004	-0.002	-0.003	-0.006	-0.009
	-0.005	-0.006	-0.006	-0.006	-0.007	-0.007	-0.007	-0.008	-0.008	-0.008
ROA	0.01	0.025**	0.023**	0.029**	0.038***	0.036**	0.036**	0.035*	0.038*	0.035
	-0.009	-0.01	-0.012	-0.013	-0.013	-0.016	-0.016	-0.021	-0.023	-0.025
Tobin's Q	0	0	0	0	-0.001	-0.001**	-0.001**	0	0	0
	0	0	0	0	0	0	0	-0.002	-0.002	-0.001
Big10	0.001	0.001	0	0	0	0.002	0.002	0.001	0.002	0.002
	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
INDB	0.002	0.007	0.01	0.017	0.025	0.027	0.039**	0.036**	0.032	0.035*
	-0.009	-0.013	-0.013	-0.014	-0.017	-0.018	-0.018	-0.018	-0.019	-0.02
Pay	-0.008	-0.015	-0.009	-0.012	-0.027	-0.02	-0.026	-0.021	-0.01	0.012
	-0.012	-0.013	-0.014	-0.017	-0.019	-0.022	-0.023	-0.025	-0.027	-0.028
SOE	0	-0.001	-0.002	-0.002	-0.003*	-0.002	-0.002	-0.002	-0.002	-0.003
	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Duality	0.002	0.005***	0.006***	0.006***	0.007***	0.007***	0.008***	0.009***	0.008**	0.010***
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003
Gender	0.001	0.003	-0.002	-0.003	-0.004	-0.002	-0.002	-0.002	-0.004	-0.004
	-0.003	-0.003	-0.003	-0.003	-0.004	-0.004	-0.005	-0.005	-0.006	-0.008
Constant	0.054	0.121**	0.138***	0.187***	0.191***	0.249***	0.279***	0.298***	0.289***	0.246***
	-0.042	-0.049	-0.052	-0.056	-0.059	-0.066	-0.07	-0.092	-0.095	-0.088

N	3582	3582	3582	3582	3582	3582	3582	3582	3582	3582
R-sq	0.07	0.104	0.12	0.124	0.12	0.125	0.126	0.13	0.129	0.128
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: 55% to 95%										
	0.55	**0.60**	**0.65**	**0.70**	**0.75**	**0.80**	**0.85**	**0.90**	**0.95**	
ICR	-0.004	-0.003	0.001	-0.007	-0.008	-0.009	-0.007	-0.021*	-0.02	
	-0.004	-0.005	-0.005	-0.006	-0.007	-0.009	-0.011	-0.013	-0.018	
Size	-0.093***	-0.115***	-0.113***	-0.128***	-0.136***	-0.182***	-0.207***	-0.212***	-0.298**	
	-0.027	-0.03	-0.033	-0.041	-0.047	-0.051	-0.079	-0.076	-0.119	
Leverage	-0.013	-0.017*	-0.013	-0.027**	-0.023	-0.022	-0.036	-0.064***	-0.086***	
	-0.009	-0.01	-0.011	-0.013	-0.017	-0.02	-0.023	-0.022	-0.029	
ROA	0.043	0.063**	0.077***	0.063**	0.085*	0.111**	0.113**	0.091**	-0.013	
	-0.027	-0.028	-0.023	-0.029	-0.045	-0.05	-0.055	-0.039	-0.097	
Tobin's Q	0	0	0	0.001	0.002***	0.002***	0.003	0.003	0.016	
	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001	-0.004	-0.004	-0.011	
Big10	0.002	0.003	0.003	0.002	-0.001	0.002	0	0.001	0.006	
	-0.002	-0.003	-0.003	-0.003	-0.004	-0.004	-0.005	-0.005	-0.007	
INDB	0.040*	0.049**	0.032	0.035	0.031	0.001	-0.021	-0.045	0.045	
	-0.02	-0.024	-0.028	-0.031	-0.033	-0.028	-0.047	-0.048	-0.083	
Pay	0.007	0.01	0.012	0.02	0.026	0.031	0.016	0.065	0.07	
	-0.027	-0.029	-0.032	-0.035	-0.044	-0.051	-0.102	-0.088	-0.119	
SOE	-0.004	-0.004	-0.006**	-0.007**	-0.010**	-0.009*	-0.012	-0.017**	-0.014	
	-0.003	-0.003	-0.003	-0.003	-0.004	-0.005	-0.007	-0.007	-0.009	
Duality	0.010***	0.011***	0.008**	0.009**	0.007	0.013**	0.012	0.015	0.021	
	-0.003	-0.003	-0.003	-0.004	-0.006	-0.007	-0.011	-0.01	-0.016	
Gender	0.001	0.002	-0.003	-0.005	-0.005	-0.004	0.01	0.005	0.054	
	-0.008	-0.007	-0.007	-0.006	-0.01	-0.012	-0.026	-0.02	-0.088	

Constant	0.302***	0.366***	0.359***	0.396***	0.416***	0.559***	0.696***	0.615**	0.850*	
	-0.093	-0.102	-0.102	-0.12	-0.149	-0.169	-0.223	-0.245	-0.495	
N	3582	3582	3582	3582	3582	3582	3582	3582	3582	
R-sq	0.129	0.13	0.128	0.128	0.129	0.128	0.128	0.131	0.13	
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes: **Notes:**
The stars indicate significance at 1 percent, 5 percent and 10 percent levels, respectively (i.e., *** p<0.01, ** p<0.05, * p<0.1). The t-statistics in parentheses are based on the robust standard errors.
The dependent variable *REM_PRO* = absolutely value of abnormal production costs; Variable of interests is *ICR* is measured as dummy variable, which is 1 if year >=2012 and 0 otherwise. Control variables are: *Size* = firm size is measured as the natural logarithm of total assets at the year-end; *Leverage* = leverage is measured as total debt divided by total assets. *ROA* = the proxy of profitability. The ROA (return on assets) is measured as earnings before interest and tax divided by average total assets; *CFO* = cash from operation is measured as net cash flow from operations divided by lagged total assets; *Tobin's Q* = the proxy of firm growth. It is measured as market value divided by total assets. *Big10* = the proxy of auditor quality. It is a dummy variable that set to 1 if the annual report is audited by Big 10 auditors or their joint ventures, and 0 otherwise; *INDB* = independence of the board of directors, which is calculated as the number of independent non-executive directors divided by the total number of boards of directors; *Pay* = the proxy of compensation of top managers. It is measured as the natural logarithm of the total cash compensation received by the top three executives. *SOE* = considers whether firms are state-owned enterprises, which is measured as a dummy variable that take the value of 1 if the largest shareholder is government, and 0 otherwise; *Duality* = a dummy variable where a value of 1 is given if the CEO is also the chairman of the board and 0 otherwise; *Gender* = CEO gender. It is = a dummy variable where a value of 1 is given if the CEO is female. and 0 otherwise. *Industry* =Industry. It is = a dummy variable where a value of 1 is given if the firm is classified as manufacturer. and 0 otherwise