The Impact of IFRS Adoption on Real Activities Manipulation: Evidence from China

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Abstract

This paper studies the relationship between IFRS adoption and real activities manipulation, and investigates whether IFRS reduces earnings management and improves the quality of accounting information. As China steps into the era of IFRS (International Financial Reporting Standard) adoption, it is important to focus on this issue and its implementation in such emerging markets.

The paper finds that real earnings management is primarily driven by abnormal production costs, and that more companies manipulate earnings through operational transactions after IFRS adoption. Our findings suggest that real activities manipulation is positively related with IFRS implementation, and that such an association is stronger for real estate firms, especially in the case of abnormal cash flows of operations.

Keywords

IFRS Adoption
Real Activities Manipulation
Earnings Management
Abnormal Cash flows
IFRS in China

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Introduction

According to an announcement of the Chinese Ministry of Finance (MOF), China started to mandate IFRS conversion for publicly traded companies from 1st January 2007 (Taub, 2006). The Chinese Accounting Standards System translated the new rules into its own code, rather than offering word-by-word translations. Changing from a rules-based approach to a principles-based approach, the Chinese Accounting Standards System moved to IFRS while maintaining some differences. Peng and Smith (2010) conclude that the revision implemented in 2007 increased the convergence level of Chinese GAAP to IFRS up to 77%.

Although this revolution has brought about sweeping changes, nobody can specify clearly whether this unprecedented shift has strengthened or weakened the Chinese accounting system and whether the effects have been widespread or not. As IFRS adoption has become increasingly prevalent in China, the effects and extent of IFRS adoption have become important research topics. However, many of the academic papers that have investigated IFRS implementation in China are fairly limited. We look at mandatory IFRS adoption in China from the view of earnings management and investigate how these significant changes have influenced earnings management in terms of real activities manipulation.

Earnings management is defined by Leuz et al. (2003) as the alteration of financial statements in order to mislead decision makers or to influence contract outcomes. Previous researchers have classified earnings management into two groups: accruals earnings management and real activities manipulation. From the viewpoint of Dechow and Skinner (2000), accruals management manipulates earnings within GAAP. The true economic performance can be overestimated or underestimated by choosing different accounting methods or estimates. The most common form of accruals management is changing the depreciation methods to accelerate or decelerate the depreciation expenses. In contrast, as Schipper (1989) states, real activities manipulation is “out of GAAP”; in other words, it distorts the figures

of financial statements by changing the optimal operational decisions.
Most of the previous papers related to earnings management associated with IFRS adoption have examined only one earnings management tool (accrual-based earnings) in assessing whether IFRS adoption can reduce earnings smoothing and increase the quality of accounting information (He et al., 2009; Liu et al., 2011; Wang and Campbell, 2012). However, given the portfolio of earnings management strategies, managers are likely to use multiple techniques simultaneously. As well as employing accrual-based earnings management, organizations also tend to use operational transactions to handle earnings (Dechow and Skinner, 2000; Healy and Wahlen, 1999). Thus, focusing solely on accruals prevents researchers from making comprehensive conclusions about the trends of earnings management.

The research questions of our paper are as follows: does IFRS adoption affect real activities manipulation? Does IFRS adoption enhance the accuracy and completeness of accounting information by reducing real activities manipulation? This paper provides direct evidence in response to these questions.

We examine all publicly listed firms in China from 2002 to 2011, constituting 8,886 firm-years. The sample period is divided into pre- and post-IFRS adoption periods. During the pre-IFRS period from 2002 to 2006, all publicly listed firms were encouraged to use IFRS voluntarily as an option in preparing financial statements. In the post-IFRS period (from 2007 to 2011), the voluntary option became mandatory. Our study focuses on non-state-owned firms because state-owned firms were not required to adopt IFRS until 2008, so the time division would contrast with that of the non-state-owned firms. The utilities and financial industries are excluded to avoid trivial results. A crucial aspect of the sample is that the legal environment and corporate governance regulations are assumed to be constant at the firm level, in the sense that a Chinese listed firm is subject to Chinese securities laws across its entire operations.

We find that real activities manipulation has a positive relationship with IFRS implementation. First, the regression results show that overall real earnings are more manageable when the firms follow IFRS. Second, we discover that real earnings management appears to be more prevalent in estimating overproduction than in estimating CFO (cash flows of operations) or discretionary expenses. Third, real estate firms are found to manage real earnings more often than firms in any other industry. All coefficients in the different regression models show significant results. However, the coefficient signs related to corporate governance show conflict among the different regression models. In addition, all the control variables associated with corporate governance are insignificant. Therefore, the evidence supporting the notion that firms with higher corporate governance standards manage real earnings less often is rather weak. We do not investigate the relationship between real activities manipulation and corporate governance. These variables are only used for control purposes. The focus of this paper is the association between IFRS adoption and real earnings management.

To evaluate the robustness of the results, three additional tests are conducted. The first one is rerunning the regression by excluding the observations from the manufacturing industry, which has dominant effects in the sample. Secondly, we substitute the dependent variables with absolute values for CFO, production cost and discretionary expenses, rather than squared values. Lastly, we reclassify the IFRS adoption period and rerun the test. Across these tests, the results are generally in line with the initial findings. One exception is that when investigating absolute value, the signs of the control variables are slightly different than those of the other two results. We would therefore suggest that good corporate governance does not make a significant contribution to real activities manipulation, so the reality does not match with the theory. For instance, the theory implies that the CEO and the chairman have separate roles when it comes to financial reports. However, in practice, the chairman can dominate the decisions of the CEO and then the separation is just like a declaration instead of a function in the company. Therefore, the data on corporate governance do not reflect the real situations of companies.

To our knowledge, few academic studies have investigated the impact of IFRS adoption on real activities manipulation in China. The aim of this paper is to fill the gap by providing

empirical results. This study contributes to the literature by examining a new aspect of IFRS adoption by looking at real activities manipulation. Specifically, we show that the previously documented effect of IFRS adoption on earnings management is actually much more pervasive than originally thought. In addition, we provide further evidence that firms will manipulate earnings through accruals and real operations, illustrating the importance of both accruals earnings management and real activities manipulation.

Finally, accounting regulators will find the results of this study interesting, particularly in consideration of the movement of the Chinese Accounting Standards System towards IFRS. Moreover, the real activities manipulation is closely related with management accounting decision making and budget planning. For example, current period overproduction will increase the inventory holding costs, sales discounts and extending credit terms. This may be accompanied with low profitability and bad debt expense issues. Our finding should remind company of the issue of balancing the short term and long term cost and benefit in the production and selling process.

The rest of this paper is structured as follows. Section 2 reviews previous studies related to our analysis. Section 3 presents the models used to capture real activities manipulation and the data collection process. Section 4 illustrates the descriptive statistical results, the analysis results and the robustness tests. Section 5 concludes and discusses the practical implications of our study.

Real Activities Manipulation

A number of studies have proven the existence of earnings management; i.e. managers manipulating financial earnings to mislead stakeholders and meet predetermined targets (Healy, 1985; Defond and Jiambalvo, 1994; Kothari, 2001). Most of the extant studies have focused on earnings management in the form of accrual manipulation, although some recent studies have indicated the effect of real activities manipulation on earnings management. Both real activities manipulation and accruals manipulation are used as means of earnings management. Roychowdhury (2006) defines real activities manipulation as deviations from the normal course of operations to distort financial statements. Managers utilize real activities manipulation to mislead stakeholders by suggesting that certain financial goals expected by the shareholders have been met by the management. A survey conducted by Graham et al. (2005) shows that if managers have a strong desire to meet earnings targets, they are more willing to manipulate real activities figures than accounting figures in order to meet short-term targets, even though this may result in long-term costs for the company. Consistent with this survey, Gunny (2010) points out that real activities manipulation changes the optimal operational transactions for the purpose of managing earnings in the current period.

In contrast with real activities manipulation, accrual-based earnings management does not involve influencing the underlying operations of the firms, instead influencing the accounting methods or accounting estimates used by firms. However, one type involves operating activities and the other has no impact on operations.

Several studies have examined how managers manipulate real transactions to distort earnings. Most of the literature examines research and development (R&D) expenditure (Baber et al., 1991; Dechow and Sloan, 1991; Bushee, 1998; Cheng, 2004). Other studies related to real activities manipulation have focused on useful assets (Bartov, 1993; Hermann et al., 2003) and cutting advertising expenditures (Cohen et al., 2010).

Real activities manipulation also seems be related to management accounting, especially in budgeting, Jensen (2001) claims that when managers' compensation is linked with performance, managers tend to set low targets which are easy to achieve, and then they will do whatever they can to manipulate the earnings to hit the target. If the performance is measured by profits, when managers think they can make the minimum hurdle, they are motivated to increase current year's earnings at the expense of the next years by cutting current expense or offering sales discount to increase sales revenue. When managers prepare the annual price study, the primary task is forecast the coming year's expected revenue, costs and return in investment, those forecasts can be distorted and the management accounting system can be manipulated if the

real activities manipulation is used for earnings management purpose. Johnson, et. al., (1991) states that if the management accounting systems can't provide useful signal in measuring efficiency of processes and product profitabilities, senior executives can't manage such organization well.

Companies can use different types of operational transactions to smooth income. It is difficult to capture all abnormal operating decisions to measure real earnings management. Therefore, in this paper, we concentrate on several vital dimensions associated with real earnings management.

In addition, as China has a different institutional, economic, and political environment, several of the measurement methods that have been developed by researchers in English-speaking countries may not suitable for the Chinese market. The improper models have been excluded from our paper.

Finally, the financial statement database in China (CSMAR) has a different system compared to overseas databases; not all the data and information needed could be collected from CSMAR. Due to these constraints, we focus on three manipulation methods (increased sales revenues, lower production costs, and lower discretional expenses) to analyze real activities manipulation.

Increased Sales Revenues

According to the extant literature, managers have attempted to boost reported earnings during the current period by cutting sales prices and/or extending credit terms to accelerate sales revenues. Bartov (1993) finds that managers manipulate earnings through the timing of long-term asset and investment sales to smooth earnings.

The results of Jackson and Wilcox (2000) indicate that firm managers reduce sales prices in the last quarter to accelerate product sales, avoid reporting losses, and meet short-term financial reporting goals. Empirical measures have been developed by Roychowdhury (2006) to proxy sales manipulation.

Lower Production Costs

In order to increase reported profit, managers try to reduce COGS (cost of goods sold) figures during the period under consideration by overproducing to lower the fixed overhead cost per product unit. When the volume of total products increases, the fixed overhead costs will be spread over a mass of units and the COGS will decrease. However, this method should fulfill the premise that the inventory holding costs do not increase higher than the decrease in the fixed overhead cost per unit. There is much empirical evidence showing that managers manipulate earnings through cutting production costs. Thomas and Zhang (2002) find that managers reduce reported COGS through overproducing. Roychowdhury (2006) also provides evidence that managers use overproduction to avoid reporting losses.

Lower Discretionary Expenses

If managers attempt to increase reported profit, they may choose to cut discretionary SG&A (sales general and administration) expenses. For example, employee travel programs may enhance co-ordination among workers and increase their loyalty to the company, which also cultivates the organization's culture and atmosphere. The benefit of such expenses may need a long time to be realized and may not contribute to the company greatly in the short term. Therefore, a manager may cut discretionary expenses to boost income. Bushee (1998) shows that managers are motivated to cut R&D investment to cover earnings declines. Dechow and Sloan (1991) also point out that CEOs invest relatively less in R&D in their last years in the position. The findings of Baber et al. (1991) are also consistent with these results, showing that R&D expenses are substantially lower when spending distorts the financial statements to show positive or increased income.

IFRS Adoption

Not surprisingly, many studies have investigated mandatory IFRS adoption. Most of these have focused on mature markets; only a few have examined emerging markets such as China. In relation to China, He et al. (2009) point out that earnings quality under the old Chinese Accounting Standards System is higher than that under IFRS. The earnings

quality of the firms that operate in provinces with relatively well-developed markets and institutional environments is also higher. The authors also discover that accruals under IFRS that are consistent with operating cash flows in contemporaneous and adjacent periods are lower than accruals under the old Chinese Accounting Standards System. Wang and Campbell (2012) conclude that IFRS adoption does not appear to prevent earnings management once state ownership is considered. They believe that the IFRS system, compared with the old system, discourages earnings management but encourages earnings aggressiveness. However, their evidence supporting the idea that IFRS adoption in China has reduced earnings management is rather weak.

IFRS adoption also may offer opportunities for earnings manipulation, since IFRS is principle based, more judgments are needed by managers on accounting treatment. IFRS is also criticized for lack of implementation guidance, thus the greater flexibility under the new standard may enable managers to manage earnings more easily, and it depends on managers' incentives to manage earning opportunistically or on informative purpose (Burgstahler, et. al., 2006).

In addition, as IFRS introduces more fair value measurements in some accounts compared with domestic GAAP in many countries (Schipper, 2005), managers can influence the fair value estimation through choosing valuation different models. Deloitte Touche Tohmatsu (2006) find that a major change of new CAS are related to the use of fair value for balance sheet accounts and the fair-value changes in earnings. He, et. al., (2012) find that some unintended effects of IFRS adoption in China by finding that firms with negative fair-value change in trading securities are more likely to sell AFS securities for gains. The negative relationship is more pronounced for firms with incentives to meet a zero earnings threshold; as fair value accounting trie to enhance the accounting information transparency by recognizing the fair market value of exchanged nonfinancial assets in debt restructuring and including realized gains in earnings. However, the information on the fair value of exchanged nonfinancial assets is often unavailable and firms and their creditors are often related in China, which in turn give managers opportunity for earnings management to avoid reporting a loss by using gains from debt restructuring.

On the other hand, some studies have provided evidence that IFRS adoption has contributed to the improvement of accounting quality in Chinese publicly listed firms. The empirical results from Liu et al. (2011) generally suggest that IFRS adoption has improved the quality of accounting information in China since 2007; the results indicate that earnings management has decreased and the value relevance of accounting measures has increased. However, such changes have also been affected by changes in accounting standards, rather than solely being a result of changes in economic conditions. The analysis of Zhou et al. (2009) shows that during the period of voluntary IFRS adoption, firms that did not adopt IFRS were more likely to manipulate earnings, more likely to avoid reporting unsatisfactory results by managing earnings, and less likely to recognize losses.

The literature on IFRS adoption in China seems to contain contradictory results. The differences may have been caused by different sample selection processes and empirical methodologies. Zang (2012) concludes that firms may use real activities manipulation as a substitute for accruals in earnings management, and the trade-off between these two methods is constrained by the related costs and outcomes. He et al. (2009) find that accruals increase after the mandatory adoption of IFRS, as managers are incentivized to avoid losses or decreases in earnings. Fields et al. (2001) state that examining only one earnings management tool cannot provide a comprehensive explanation of the overall effect of earnings management activities.

Therefore, based on previous studies, we study whether real activities manipulation has contributed to the earnings management effect after IFRS adoption in China. We presume that if the level of earnings management is equal before and after the adoption of IFRS, then real activities manipulation would decrease. However, if the level of earnings management increases and this increase exceeds the increase in accruals, then real activities manipulation would increase.

Hypothesis: *There is a relationship between the IFRS adoption and the degree of real*

activities manipulation. It may be positive or negative.

Empirical Methodology

Real Activities Manipulation

We examine three measures of real activities manipulation in the analysis: abnormal levels of CFO, abnormal levels of production costs, and abnormal levels of discretionary expenses. These proxies were developed by Roychowdhury (2006), based on the foundations of work by Dechow et al. (1998). Subsequent studies, such as those conducted by Zang (2006) and Gunny (2010), have used the same metrics and have provided further evidence that these measures capture real activities manipulation.

First, we use Roychowdhury (2006)'s model to identify normal levels of CFO. Normal CFO is measured by the sales and the change in sales during the year. The linear function is run for each industry and year as follows:

$$\frac{CFO_{it}}{Assets_{i,t-1}} = k_{1t}\frac{1}{Assets_{i,t-1}} + k_2\frac{Sales_{it}}{Assets_{i,t-1}} + k_3\frac{\Delta Sales_{it}}{Assets_{i,t-1}} + \varepsilon_{it*} \quad (1)$$

Using the estimated coefficients of Equation 1 (lagged assets, sales, and change in sales) we get the predicted CFO. Then, the abnormal CFO can be obtained by subtracting the normal CFO from the actual CFO.

In the extant literature, abnormal production costs are used as a tool to capture real activities manipulation through overproduction. The production costs equal the total COGS and the change in inventory in the current period. The normal COGS can be estimated by using the following model:

$$\frac{\mathrm{COGS_{it}}}{\mathrm{Assets_{i,t-1}}} = \mathrm{k_{1t}}\frac{1}{\mathrm{Assets_{i,t-1}}} + \mathrm{k_2}\frac{\mathrm{Sales_{it}}}{\mathrm{Assets_{i,t-1}}} + \varepsilon_{\mathrm{it*}} \quad (2)$$

Similarly, as per Roychowdhury (2006), the regression model used to estimate normal inventory growth is as follows:

$$\frac{\Delta\mathrm{INV_{it}}}{\mathrm{Assets_{i,t-1}}} = \mathrm{k_{1t}}\frac{1}{\mathrm{Assets_{i,t-1}}} + \mathrm{k_2}\frac{\Delta\mathrm{Sales_{it}}}{\mathrm{Assets_{i,t-1}}} + \mathrm{k_3}\frac{\Delta\mathrm{Sales_{i,t-1}}}{\mathrm{Assets_{i,t-1}}} + \varepsilon_{\mathrm{it*}} \quad (3)$$

Using Equations 2 and 3, the industry-year regression model used to estimate normal production costs would then be presented as:

$$\frac{\mathrm{Prod_{it}}}{\mathrm{Assets_{i,t-1}}} = \mathrm{k_{1t}}\frac{1}{\mathrm{Assets_{i,t-1}}} + \mathrm{k_2}\frac{\mathrm{Sales_{it}}}{\mathrm{Assets_{i,t-1}}} + \mathrm{k_3}\frac{\Delta\mathrm{Sales_{it}}}{\mathrm{Assets_{i,t-1}}} + \mathrm{k_4}\frac{\Delta\mathrm{Sales_{i,t-1}}}{\mathrm{Assets_{i,t-1}}} + \varepsilon_{\mathrm{it*}} \quad (4)$$

Using Equation 4, we can predict the normal level of production costs and calculate the abnormal production costs by subtracting the predicted production costs from the actual production costs. Roychowdhury (2006) states that discretionary expenses (e.g. COGS) are also strongly correlated with contemporaneous sales and can be estimated using the current year's sales. Under this simplifying assumption, the relevant regression equation is as follows:

$$\frac{\mathrm{DisExp_{it}}}{\mathrm{Assets_{i,t-1}}} = \mathrm{k_{1t}}\frac{1}{\mathrm{Assets_{i,t-1}}} + \mathrm{k_2}\frac{\mathrm{Sales_{it}}}{\mathrm{Assets_{i,t-1}}} + \varepsilon_{\mathrm{it*}} \quad (5)$$

There is a mechanical problem when we use current sales to assume discretionary expenses. The reason is that the residuals of Equation 5 would be unusually low if firms manipulate sales increases to boost profit in the current year. To address this issue, the contemporaneous sales are replaced by lagged sales to generate predicted levels of discretionary expenses. The modified regression model can be presented as follows:

$$\frac{\mathrm{DisExp_{it}}}{\mathrm{Assets_{i,t-1}}} = \mathrm{k_{1t}}\frac{1}{\mathrm{Assets_{i,t-1}}} + \mathrm{k_2}\frac{\mathrm{Sales_{i,t-1}}}{\mathrm{Assets_{i,t-1}}} + \varepsilon_{\mathrm{it*}} \quad (6)$$

Where CFO_{it} is cash flow from operations in period t for company i (CSMAR Data – C001000000); $Assets_{i,t-1}$ represents the lagged total assets in period t for company i (CSMAR Data - A001000000); $Sales_{it}$ represents the sales revenue in period t for company i (CSMAR Data – B001101000); $\Delta Sales_{it}$ is the change in sales from the prior year to the current year for company i; $\Delta Sales_{i,t-1}$ represents the change in sales in period t-1 for company i; ΔINV_{it} is the change in inventories (CSMAR Data – A001123000) from the prior year to the current year for company i; $DisExp_{it}$ represents the discretionary expenses in period, defined as

the sum of selling expenses[1] (CSMAR Data – B001209000) and general and administrative expenses[2] (CSMAR Data – B001210000) for company i.

As a result, the normal discretionary expenses are subtracted from the actual discretionary expenses to get the abnormal discretionary expenses. Increased sales revenues, lower production costs, and lower discretionary expenses are the three main types of real earnings management. Abnormal levels of CFO, production costs, and discretionary expenses are used to capture and quantify those activities. We use these variables to capture real earnings management in our analysis. However, these three variables simply express different aspects of real earnings management and cannot provide a comprehensive picture of real activities manipulation. To capture the overall effect, we combine these three variables into a single variable to quantify the influence: real activities manipulation (RAM). This is done by adding up the abnormal CFO, production costs, and discretionary expenses.

According to prior papers, when managers manipulate earnings, one or all of these will occur: when CFO is low, the production costs and discretionary expenses will be high; when CFO is high, the production costs and discretionary expenses will be low. This is because abnormal levels of CFO, production costs, and discretionary expenses represent the difference between estimated and actual values. After subtracting the normal values from the actual values, the direction of abnormal CFO may contradict the directions of abnormal production costs and discretionary expenses, and the variables may show different signs. Simply adding them together may cause the variables to offset one another. Reflecting both positive and negative real activities manipulation, the squares of unnatural CFO, unnatural production costs, and unnatural discretionary expenses can represent activities such as increasing CFO and decreasing production costs and discretionary expenses.

Independent Variable – IFRS

The variable IFRS is measured according to whether the firm-year under observation adopted IFRS or not. As a dummy variable, IFRS equals 1 if the firm-year adopted IFRS; otherwise, IFRS equals 0.

The years under investigation are classified into pre- and post-IFRS periods. The classification depends on the mandatory implementation of IFRS for all non-state-owned publicly listed firms in 2007[3]. The pre-IFRS period ran from 2002 to 2006, and the post-IFRS period ran from 2007 to 2011. Figure 1 depicts these different time periods analyzed. For the observations from 2002–2006, IFRS equals 0; for the observations from 2007–2011, IFRS equals 1.

During the pre-IFRS period (2002–2006), publicly listed firms could voluntarily adopt IFRS. If the firms adopted IFRS in the period 2002–2006, the comparison between the pre- and post-IFRS periods would be meaningless and the criteria we used would be unreasonable. An important point to note is that all publicly listed firms in China are required to prepare a full set of financial statements[4] under the Chinese Accounting Standards System. Even though some companies adopted IFRS during the pre-IFRS period (2002–2006), they also needed to prepare financial statements under the old system (see Figure 1). If the data collected from the pre-IFRS period were prepared under the old system, the judgment about IFRS adoption would still reasonable. This solves the problem about some firms adopting IFRS in the pre-IFRS period.

[1] Selling Expenses – The expenses incurred by an enterprise in the sales of products, including expenses involved in transportation, loading and unloading, packaging, insurance, exhibition and advertising, etc

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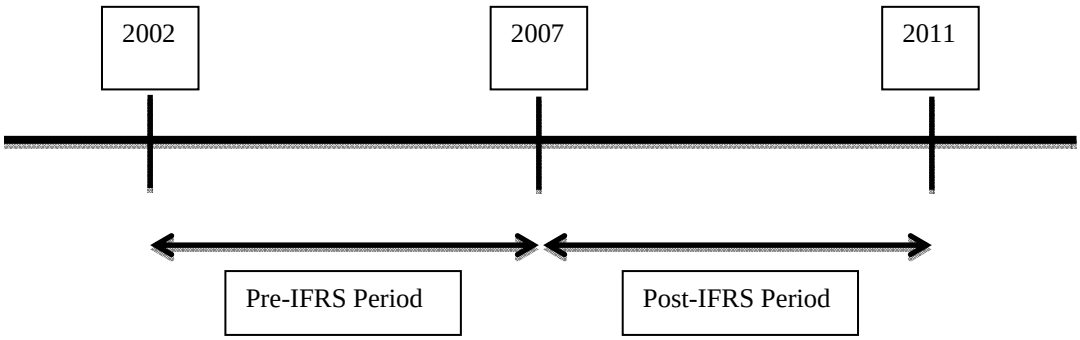
[2] General and Administrative Expenses - The expenses incurred by an enterprise in organizing and managing its production and operation. The impairment loss in general and administrative will be reported in impairment loss of assets after 2007

[3] China mandated IFRS conversion for publicly traded companies starting from 1st January 2007.

[4] A full set of financial statements includes a balance sheet, an income statement, a statement of cash flow, a statement of changes in equity, and notes.

Figure 1: Time periods analyzed



Control Variables

Four main corporate governance factors[5] are included to control the real activities manipulation in this study. BOD measures the non-executive directors on the board; non-executive directors should monitor the operational decisions made by the management. It is likely that the management will have fewer chances to distort operational decisions when the proportion of independent directors is higher.

The dummy variable Auditor is noted as 1 if the listed firms are audited by a high-quality audit firm, and 0 if not. Chen et al. (2011) find that non-state-owned enterprises exhibit a reduction in earnings management (accrual-based earnings management) when they employ high-quality auditors. To distinguish the high-quality audit firms, a list of the 'best eight' audit firms[6] is used as the classification criterion.

For the variable relating to the audit committee ('Committee'), it would be 1 if the firm has established an audit committee and 0 otherwise. An audit committee could monitor the managers' operational decisions, which may reduce real activities manipulation.

CEO is a dummy variable that reflects whether the positions of board chairman and CEO are fulfilled by the same person. CEO would be 1 if the role of CEO and chairman separate, and 0 if not. The independence of the BOD could enhance its scrutinizing role and lower agency problems in the firm. Therefore, the separation of these two posts could be seen as a good factor that influences the control of real activities manipulation.

In addition, financial leverage and sales growth are used to reflect the operating volatility of the firm. The leverage ratio Leverage measures the financial situation of the firm, which is calculated by dividing the total liabilities by the total assets. If the financial status of the firm is terrible, managers will probably be more motivated to hide the true financial result. Sales Growth reflects the growth rate of sales revenue, measured by the change in sales scaled by the lagged sales. Managers are less likely to manipulate earnings if the firm has significant sales growth.

Regression Model

To mitigate concerns that there could be industry-based differences in our data, dummy variables are added to classify the observed firms into different industries. We use the Guidelines for the Industry Classification of

[5] The FEE and CESR frameworks of enforcement mechanisms include board independence, audit committee presence, the separation of CEO and chairman, and auditor quality as the key indicators of corporate governance.

[6] PricewaterhouseCoopers; Deloitte Touche Tohmatsu; KPMG; Ernst & Young; RSM China; BDO China Shu Lun Pan Certified Public Accountants; ShineWing Certified Public Accountants; and Pan-China Certified Public Accountants., If the firm-years observed are audited by these best eight audit firms, the quality of auditing is identified as 'good', and the value for Auditor would be 1. Otherwise, the quality of auditing is identified as 'not very good', and the value for Auditor would be 0.

Listed Companies (2001), as shown in Table 2, to implement this procedure. While this limits the sample to just 11 clusters on the industry dimension, it might be expected that our conclusions are more accurate and convincible as a result of performing this procedure.

As the focus of this paper is on the association between IFRS adoption and real activities manipulation, the empirical regression model is set as follows:

$$RAM_{it} = \beta_1 * \text{IFRS}_{it} + \beta_2 * \text{Board}_{it} + \beta_3 * \text{Auditor}_{it} + \beta_4 * \text{Committee}_{it} + \beta_5 * \text{CEO}_{it} + \beta_6 * \text{Leverage}_{it} + \beta_7 * \text{Sales Growth}_{it} + \beta_i * Industry\ Dummy_i + \varepsilon_{it} \quad (7)$$

Using RAM alone may dilute the results, as unnatural CFO, unnatural production costs, and unnatural discretionary expenses have different implications for real earnings management. The squares of unnatural CFO, unnatural production costs, and unnatural discretionary expenses are useful as dependent variables to capture both increasing and decreasing real activities manipulation when there is reason to expect both types of real activities manipulations in the sample. We rerun the model using the square of unnatural CFO, the square of unnatural production costs, and the square of unnatural discretionary expenses in our analysis. The other three regression models are as follows:

$$CFO^2_{it} = \beta_1 * \text{IFRS}_{it} + \beta_2 * \text{Board}_{it} + \beta_3 * \text{Auditor}_{it} + \beta_4 * \text{Committee}_{it} + \beta_5 * \text{CEO}_{it} + \beta_6 * \text{Leverage}_{it} + \beta_7 * \text{Sales Growth}_{it} + \beta_i * Industry\ Dummy_i + \varepsilon_{it} \quad (8)$$

$$Prod^2_{it} = \beta_1 * \text{IFRS}_{it} + \beta_2 * \text{Board}_{it} + \beta_3 * \text{Auditor}_{it} + \beta_4 * \text{Committee}_{it} + \beta_5 * \text{CEO}_{it} + \beta_6 * \text{Leverage}_{it} + \beta_7 * \text{Sales Growth}_{it} + \beta_i * Industry\ Dummy_i + \varepsilon_{it} \quad (9)$$

$$DisExp^2_{it} = \beta_1 * \text{IFRS}_{it} + \beta_2 * \text{Board}_{it} + \beta_3 * \text{Auditor}_{it} + \beta_4 * \text{Committee}_{it} + \beta_5 * \text{CEO}_{it} + \beta_6 * \text{Leverage}_{it} + \beta_7 * \text{Sales Growth}_{it} + \beta_i * Industry\ Dummy_i + \varepsilon_{it} \quad (10)$$

Data Collection

Our sample selection criteria are described in Table 1. We start with all Chinese publicly listed firm-years listed in the China Stock Market Financial Statements Database[7] for the period 2002–2011. The MOF issued a new set of Chinese GAAP in 2001, and these changes were implemented in 2002. Therefore, financial statements prepared under the old Chinese Account Standards System in 2001 would be different from those prepared in 2002, which may distort the results. Consequently, we exclude the observations before 2001.

The data collected had non-missing values for assets, liability, CFO, sales, COGS, inventory, selling costs, and general and administrative expenses. Firms in the utility industry (Industrial Code D) and the financial industry (Industrial Code I[8]) are excluded from our sample because of their unique nature of accounting. In addition, state-owned firms adopted the IFRS system in 2008; this adoption date differs from that for non-state-owned firms. To exclude this influential factor, we do not include state-owned firms in our sample. This generated an initial sample of 9,815 firm-years.

To calculate the natural levels of CFO, production costs, and discretionary expense, we required the firms to have lagged assets for the scalar and data for at least four successive years of sales revenue to calculate the change in sales of the current and preceding years. Firm-years without industry codes or belonging to firm-years with fewer than six observations are excluded. Following this process generated a reduced sample of 9,647 firm-years.

Most of the control variables, as described below, are extracted from CSMAR. They are the number of NEDs, the number of directors on the board, the name of the CEO and the chairman, the audit firm, and the audit committee. After applying these criteria, the sample has 8,886 firm-years from 1,233 firms. Table 2 presents a breakdown of the sample across the Guidelines for the Industry

[7] The China Stock Market Financial Statements Database is a sub-database of the China Corporate Research Series in CSMAR.

[8] The industry code is based on the Guidelines for the Industry Classification of Listed Companies (2001) released by the CSRC and the industry acronym list released by the SZSE.

Classification of Listed Companies (2001) issued by the CSRC (China Securities Regulatory Commission) and the industry acronym list issued by the SZSE (Shenzhen Stock Exchange[9]). The sample is well spread across industries, with no industry accounting for more than 10% of the firms except for manufacturing, which accounts for 60.76%. As the manufacturing industry may dominate the results and lead to a distortion of our conclusions, we rerun the regression model without manufacturing in the robustness test to prove our summary to be reliable.

Empirical Results

Descriptive Statistics

The summary statistics for all the non-dummy variables are provided in Table 4 panel A. All items extracted from the financial statements are gauged by lagged assets from 2002 to 2011. The main variable of interest is real activities manipulation (RAM). The mean of RAM is 0.291882 and the standard deviation is 8.85871. The average CFO is 0.021821: less than 10% of RAM. The standard deviation of CFO (0.334184) is less than 4% of RAM. Conversely, production costs have a mean of 0.209195 and a median of 7.77495 in the sample. This is larger than the 0.060866 mean and 3.64289 median squares of abnormal discretionary expenses. We can see that the standard deviations of these four variables are unusually high. As the means of these four variables are different, it would be appropriate to use the coefficient of variation to explain this situation. The coefficients of variation for RAM, squared CFO, squared production costs, and squared discretionary expenses are 30.35, 15.31, 37.16, and 59.85, respectively. The observations are widely dispersed are hidden behind these large coefficients of variation. This indicates that each real activities manipulation points are spread out across a large range of values.

There may be two reasons behind such large standard deviations. First of all, in each year, the use of operational transactions to manipulate earnings would be significantly different among the companies. Some firms may manipulate real earnings slightly while others may smooth earnings depending on operational transactions. Under this assumption, the standard deviation in each year would be very large and lead to the standard deviation of the total sample becoming unusually high too. The second reason is that the use of operational transactions to manipulate earnings would be similar across different companies; however, this situation would change as time passes.

Therefore, the standard deviations in each year would not be very high, but the standard deviations across the years would be significantly different, leading to high standard deviation. Based on Figure 2, we would prefer the second assumption rather than the first one. The mean of BOD is 0.347282 in the sample, which fulfills the requirement of the Code of Corporate Governance for Listed Companies in China[10] (henceforth "the Code"). The Code states that the proportion of NEDs has to be larger than one third. The mean of 0.691089 and the median of 0.509362 for Leverage indicate that a large percentage of the assets of the firms in the sample come from liabilities rather than equity. In addition, the average sales growth is 29.5759%. However, the observations in the lowest quartile of sales growth have a negative sales increase: 50% of the firm-years show an increase of just 15.3821% in sales, and the highest quartile of firm-years show an increase of more than 34.1329%.

The descriptive statistics for the dummy variables are presented in Table 4 Panel B. As shown in the table, the firm-years in the sample are classified into two groups: pre-IFRS adoption (3,789, approximately 42.64% of the observations) and post-IFRS adoption (5,097, approximately 57.36% of the observations). Noticeably, only 2,832 firm-years were audited by the big eight auditors, just 31.87% of the observations.

In terms of the Code[11], the separation of the roles of CEO and chairman is regarded as a good corporate governance practice. Even though the separation of the roles is not compulsory, approximately 84.82% of the firms followed this requirement. Only 30.42%

[9] As the utility and financial industries are removed from the sample, we include a breakdown of 11 (not 13) industries in Table 2.

[10] Issued on 30th June 2003.

[11] Code of Corporate Governance for Listed Companies in China.

of the firm-years had audit committees under the voluntary establishment.

Table 5 reports the Pearson correlations among these variables. The table shows that IFRS adoption has a positive correlation with the real activities manipulation proxies and all the control variables, except for Leverage. The real activities manipulation proxies are also positively correlated with the control variables.

We analyze the trends of these four real activities manipulation proxies over the period under consideration. Figure 2 shows the means for each of the proxies from 2002 to 2011. During the pre-IFRS adoption period, all real activities manipulation proxies are within the range of 0 to 0.05, remaining fairly constant. However, the line of CFO records a slight increase of about 0.1 in 2006 and then falls back to its previous level in 2007. As RAM is the total of squared unnatural CFO, squared production costs, and squared discretionary expenses, RAM follows the increase of production costs and rises to 0.12 in 2006 and then returns to the preceding level in 2007.

As shown in Figure 2, over the post-IFRS period, the lines of all the proxies throw new light on the situation. The line of squared abnormal CFO stays stable during the post-IFRS period. The trend is positive but the increase does not exceed 0.05. It seems that IFRS adoption does not have any impact on abnormal CFO.

The plot line of squared abnormal discretionary expenses generally shows great resemblance to the line of squared abnormal CFO, with the exception of 2009. The square of abnormal discretionary expenses climbs to a peak of 0.41 in 2009 before falling (by about 0.38) in 2010. During the period under consideration, the square of discretionary expenses remains fairly constant with abnormal CFO. The curve of squared abnormal production costs increases slightly in 2008 and then falls gradually between 2008 and 2010. There is a sharp increase in 2011, reaching a peak of 1.15.

As RAM is the combined variable, it will be influenced by all the individual proxies. The trend of RAM is the combined trend of the individual proxies. Between 2007 and 2009, the level of real activities manipulation rises gradually from 0.2 to 0.6, resulting from the increases in unnatural production costs and discretionary expenses in 2008 and 2009. In 2010, both unnatural production costs and discretionary expenses decline steeply, causing real activities manipulation to suffer a dramatic fall of approximately 0.5. In 2011, matching the increase in production costs, real activities manipulation increases significantly from approximately 0.05 to approximately 1.3.

In general, real activities manipulation became more serious after the mandatory implementation of IFRS. Attention should be paid to abnormal production costs, as this is the main factor contributing to real activities manipulation. Whether these increases were generated from the adoption of IFRS or other events occurring at the same time (e.g. corporate taxation reform) cannot be specified clearly from this analysis. Firms tended to use more operational transactions, rather than accruals, to manipulate earnings after IFRS. The reason why this change occurred is that it is harder to detect manipulation though real transactions.

The first column of Table 6 presents the results of the regression models when RAM is used as the measurement for real activities manipulation. The other three columns of the tables describe the results of the regression models when RAM is substituted by CFO, production costs, and discretionary expenses.

The adjusted R-square is 46.11% in this regression model. When Equation 2 is applied and CFO is used as the dependent variable, the explanatory power becomes weaker (adjusted R-square = 8.57%). The adjusted R-square is highest in the production costs column; over half of the observations can be explained by the regression model. Discretionary expenses, with an adjusted R-square value of only 0.46%, is presented in the rightmost column labeled “DisExp”. It can be seen that RAM and production costs provide more reliable evidence than the other two regression models. Therefore, we focus on the results presented in the leftmost and third columns when using the measurements to make conclusions.

The coefficient of IFRS is strongly positive and highly significant in all specifications where it appears (42.75 in RAM, 2.12 in CFO, 24.94 in production costs, and 15.69 in discretionary expenses). The discretionary expenses variable has a statistical significance

of 10%, whereas the other variables have significances of 5%. This indicates that IFRS implementation contributed to the increase in the real earnings management. This is compliant with the prediction that firms in the post-IFRS period managed their earnings through operational transactions more than firms in the pre-IFRS period did.

The coefficients of the control variables, except for sales growth, do not make substantial contributions to the increase in real activities manipulation. This conclusion is proven by the statistical significance. Table 6 shows that the coefficients of BOD and CEO are all negative and positive related across all regression models. The result for BOD is consistent with our expectations, but the result for CEO indicates the opposite. It cannot be said that increasing the proportion of independent directors lowers the degree of real activities manipulation by about 31.48% of the starting total assets, as the coefficient is not significantly related to real activities manipulation. In addition, we do not believe that independent non-executive directors in China are truly independent. It would be inappropriate to draw this conclusion from this study's findings.

There is evidence that the separation of the positions of CEO and chairman does not reduce real activities manipulation. The CEO and chairman can influence one another, so the separation of the role is generally merely in name, not function. This may be the reason why the coefficients are positive related to real activities manipulation.

The coefficients of Auditor for RAM and for production costs are -6.74487 and 2.55605, respectively. The results are not consistent with the assumption that auditing by the big eight audit firms would reduce earnings management through real operational transactions. We cannot fully explain why the empirical results of Auditor are contradictory among these four variables.

The coefficients of Committee are -15.8121 for RAM, 1.29653 for CFO, -7.79785 for production costs, and -8.868078 for discretionary expenses. Setting up an audit committee seems to contribute to the reduction of real activities manipulation.

When we consider the impact of corporate governance on real activities manipulation, the result does not specify that good corporate governance decreases real activities manipulation, as the control variables related to corporate governance among these four regression models are not consistent with one another. We cannot make the conclusion that good corporate governance reduces real earnings management. Deeper investigation is needed. While we do not have strong evidence that good corporate governance lowers real activities manipulation, neither did we find that it increases real activities manipulation.

Leverage shows a consistently negative though insignificant coefficient. The coefficients for Sales Growth are significantly positive across all specifications.

As stated in the previous section, for the purpose of controlling the unnecessary influence of industry differences, we classified the observations into different industries and added all the variables into the regression model. All the coefficients related to the industries, except for Industry J, are not statistically significant. Industry J, which represents the real estate industry, is positively associated with real activities manipulation, with coefficients of 143.2833, 9.24784, and 80.24415 for RAM, CFO, and production costs, respectively. The significance levels are different in the different regression models. The highest is for CFO, at a significance level above 99%. Conversely, the coefficient in that model is the lowest one. The second highest significance level is for RAM, at 95% confidence. This coefficient is the highest one among the regression models. In the production cost regression model, the coefficient is 80.24415, at a 10% significant level. A possible reason may be that real estate firms need a large amount of cash flow to maintain normal operations. Real activities manipulation is an effective way to manage earnings.

Robustness Test

Without Manufacturing

To evaluate the robustness of the results, we perform three tests. Industry C (manufacturing) accounts for more than 60% of the observations. It is possible that manufacturing may dominate the results. To

avoid this problem and make our summary more reliable, we rerun the regression model without the observations from manufacturing.

Table 7 is similar to Table 6 but uses fewer observations: just 3,487 observations are used in this regression model. Despite excluding the manufacturing industry, the results are not far from the original results. The IFRS variable is still significant at different levels (1%, 5%, and 10%) and positively related to real activities manipulation. This means that IFRS adoption triggered the firms to smooth earnings through operational transactions. Even though manufacturing dominates China's economy, it does not dominate the present study's empirical results. Using operational transactions to manipulate earnings is a widespread practice among all industries and firms.

Absolute Value of Real Activities Manipulation

We substituted squared CFO, squared production costs, and squared discretionary expenses with the absolute values of these three items. Therefore, RAM would become the sum of the absolute values of CFO, production costs, and discretionary expenses, rather than the sum of the squared values.

Table 8 is similar to Table 6 but uses the absolute values discussed above as the dependent variables. As in the earlier analysis, IFRS is positively related to real activities manipulation, with coefficients of 9.81934 for RAM, 2.06336 for CFO, 5.40864 for production costs and 2.34734 for discretionary expenses. All the coefficients are significant at 1%. This indicates that firms tend to distort optimal operational decisions as a means to smooth earnings after IFRS adoption.

Alternative Classification of IFRS Periods

We reclassify 2006 as part of the post-IFRS period and rerun the regression model. The firms' management teams may have considered the effect of IFRS prior to the official adoption date, therefore using more operational transactions rather than accruals to manipulate earnings since 2006. This notion is consistent with our previous results.

Table 9 is similar to Table 6 but with the observations in 2006 reclassified as part of the post-IFRS period rather than as part of the pre-IFRS period. Unlike in Table 6, the coefficient of IFRS is insignificant (as predicted) for production costs and discretionary expenses. It may summarize those real activities manipulation, except CFO, occurring after IFRS adoption in 2007. The coefficients of the control variables, except for BOD for production costs, are generally consistent between Tables 6 and 9 in terms of sign and significance. BOD is negative in Table 6 but is positive in Table 9.

Overall, the robustness tests suggest that IFRS implementation is related to increased real activities manipulation.

Conclusions

This study investigated the effect of IFRS adoption on real activities manipulation across pre- and post-IFRS periods with a sample of 1,223 Chinese publicly listed firms (8,886 firm-years) during the period 2002–2011.

This study makes a contribution to the long line of research on earnings management by providing initial evidence on whether IFRS adoption reduces real activities manipulation: a question that, for the most part, has remained unexplored. We report three main findings. First, companies are more likely to manage earnings through real operational transactions after IFRS adoption than before IFRS adoption. Second, we find that firms mainly manipulate real earnings management in relation to production costs. Finally, the real estate industry is more likely to engage in real activities manipulation than any other industry.

The findings are consistent with those of other studies, subject to caveats. First, previous studies have not agreed on the best method to quantify real activities manipulation, preventing these studies from identifying all the methods that firms use to manipulate earnings through real operational transactions. To counter this, we employed three proxies of real activities manipulation. Second, some of our tests assumed a linear relation between sales and abnormal CFO, production costs, and discretionary expenses, which is a simplification. Third, in an ideal experiment, we would identify firms randomly from different industries and then observe how their real activities manipulation changed relative to their operations pre- and post-IFRS adoption.

Like most researchers using archival data, we do not have the luxury of random assignment; thus, we have the limitations that come with observing data as they naturally occur, including self-selection concerns.

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Figure 2: Real Activities Manipulation Proxies over Time, 2002-2011

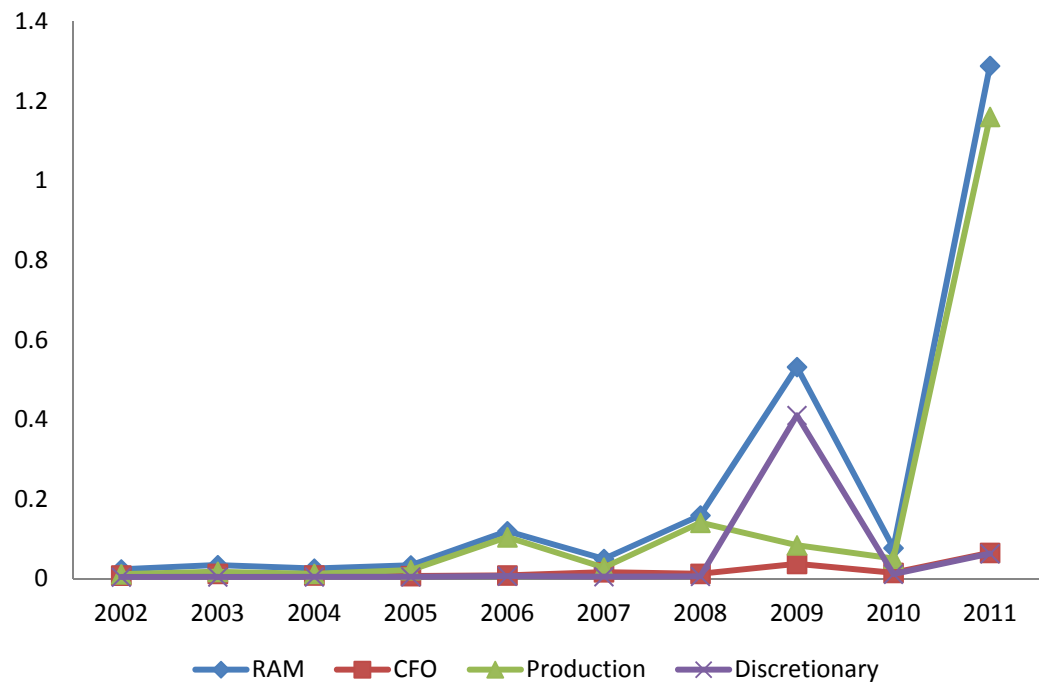

Figure 2 plots squares of abnormal cash from operations, abnormal production costs, abnormal discretionary expenses, and the sum of the squared three real earnings management proxies, RAM over the 2002- 2011 sample period.

Table 1: Sample Selection

This table explains the sample selection criteria used in the study.

Criteria	Firms	Firm-years
Chinese non-state-owned public listed firms covered by CSMAR between 2002 and 2011 excluding utility industry and financial industry and missing values of the following variables: Assets, Liability, CFO, Sales, COGS, Inventory, Selling costs, General and Administrative expenses	1362	9815
With data necessary to compute normal level of CFO, production cost and discretion cost (including lagged assets for the scalar, change in sales in current and last years, industry code for classification and 10 industry-year observations to estimate the equation)	1339	9647
With non-missing data of audit firm, number of independent non-executive directors, number of directors in board, audit committee, CEO and Chairman in board of the corporations	1233	8886

Table 2: Sample Frequency by Industry

This table presents the industry composition of the sample, which is classified according to the Industry Classifying Guideline of Listed Companies (2001).The utilities and financials industries are dropped because we eliminate regulated industries from the sample. Of the firms in the oil processing and refining industries (Industry Code C41) are the state-owned companies, so the industry is dropped from the table. Thus, the table has data on 11 industries

Industry name	Industry code	Sample firms	Sample firms (%)
Agriculture, forestry, livestock farming, fishery	A	205	2.31%
Mining	B	238	2.68%
Manufacturing	C	5399	60.76%
Construction	E	164	1.85%
Transport and storage	F	373	4.20%
Information Technology	G	481	5.41%
Wholesale and retail trade	H	581	6.54%
Real estate	J	806	9.07%
Social service	K	292	3.29%
Communication and culture	L	88	0.99%
Comprehensive	M	259	2.91%
Total		8886	100%

Table 3: Definition of Variables

Variable	Description
Non-dummy variables	
RAM	The sum of the squared CFO, squared production cost and squared discretion cost.
CFO^2	The square of abnormal CFO.
$Prod^2$	The square of abnormal production cost.
$DisExp^2$	The square of abnormal discretion cost.
BOD	The number of independent non-executive directors divided by the total number of directors in the board.
Leverage	The gearing ratio, calculated as total liabilities divided by total assets.
Sales Growth	The change of sales divided by the sales in last year
Dummy variables	
IFRS	"IFRS" represents whether the company adopted IFRS. 1 means post-IFRS period and 0 means pre-IFRS period
Auditor	"Auditor" means whether the firms are audited by the "big 8" audit firms. 1 means yes and 0 means no.
CEO	"CEO" equals 1 if the role of CEO and chairman is separate, and otherwise 0.
Audit Committee	Audit Committee represent whether the firms have set up an audit committee. 1 means yes, 0 means no.

Table 4 Descriptive Statistics

Panel A: Descriptive Statics –Non-dummy variables

This table contains descriptive statistics for non-dummy variables used in our study, including dependent variables and control variables, N indicates the number of firm-year observations in the sample period of 2002-2011. All variables are defined in Table 3.

Variable	N	Mean	STD	P25	P50	P75
RAM	8886	0.291882	8.85871	0.004555	0.011623	0.032269
CFO^2	8886	0.021821	0.334184	0.000473	0.002254	0.008366
$Prod^2$	8886	0.209195	7.77495	0.000713	0.003734	0.014562
$DisExp^2$	8886	0.060866	3.64289	0.000305	0.001327	0.003869
BOD	8886	0.347282	0.63368	0.333333	0.333333	0.375
$Leverage$	8886	0.691089	9.54915	0.362284	0.509362	0.643548
$Sales\ Growth$	8886	2.95759	164.205	-0.00501	0.153821	0.341329

Panel B: Descriptive Statistics- Dummy variables

This table contains descriptive statistics for dummy variables used in our study, including explanatory variable and control variables. All variables are defined in Table 3.

Variable	N	1	0	1/N	0/N
IFRS	8886	5097	3789	57.36%	42.64%
Auditor	8886	2832	6054	31.87%	68.13%
CEO	8886	7537	1349	84.82%	15.18%
Audit Committee	8886	2703	6183	30.42%	69.58%

Table 5: Correlations

	CFO	Prod	DisExp	IFRS	BOD	CEO	Auditor	Committee	Leverage	Sales Growth
RAM	0.6048*	0.9111*	0.4318*	0.0236*	0.0031	0.0150	0.0079	0.0086	0.0002	0.6777*
CFO		0.6382*	0.0170	0.0334*	0.0062	-0.0013	0.0084	0.0293*	0.0002	0.2792*
Prod			0.0227*	0.0192	0.0028	0.0160	0.0128	0.0111	0.0003	0.7295*
DisExp				0.0132	0.0010	0.0024	-0.0090	-0.0055	-0.0000	0.0656*
IFRS					0.3124*	0.0743*	0.2181*	0.2931*	-0.0095	0.0082
BOD						0.0722*	0.0662*	0.1409*	0.0054	-0.0013
CEO							-0.0020	0.0202	0.0244*	0.0309*
Auditor								0.0638*	-0.0087	0.0117
Committee									-0.0058	0.0161
Leverage										0.0001

This table presents the bivariate Pearson (above the diagonal) correlations. All variables are defined in Table 3. Sample selection criteria are in Table 1. * Significance at the 5% level or better.

Table 6: Real Activities Manipulation as a Function of IFRS Adoption and Controls

This table presents estimates from Equation (7): RAM_{it} = β_1*IFRS$_{it}$ + β_2*Board$_{it}$ + β_3*Auditor$_{it}$ + β_4*AudCom$_{it}$ +β_5*CEO$_{it}$ +β_6*Leverage $_{it}$+ β_7* Salesgrowth$_{it}$ +β_i*$Industry\ dummy_i$+ε_{it}. Each of the variables show in the table is defined in Table 3. The dependent variable, RAM^2,CFO^2, $Prod^2$ and $DisExp^2$ have been multiplied by 100 to ease interpretation of the coefficients. T statistics, shown in parentheses below the coefficient estimates, are based on standard errors that are clustered by firm and year. One tailed tests of significance are used where a signed prediction has been made. ***,**, and * present statistical significance at the 1,5, and 10% levels, respectively

Variables	RAM	CFO^2	$Prod^2$	$DisExp^2$
Intercept	25.20556 (-0.38)	-0.70598 (-0.21)	-8.57876 （-0.16）	4.60785 (0.13)
IFRS	42.74947** (2.74)	2.11945** (2.76)	24.93545** (1.96)	15.69457* (1.80)
BOD	-31.47604 (-0.27)	-3.18587 (-0.56)	-7.73027 (-0.08)	-20.55991 (-0.32)
Auditor	-6.74487 (-0.44)	0.01063 (0.01)	2.55605 (0.20)	-9.31155 (-1.09)
CEO	21.85724 (1.13)	1.32857 (1.39)	19.24393 (1.21)	1.28474 (0.12)
Committee	-15.1821 (-0.97)	1.29653* (1.68)	-7.79785 (-0.61)	-8.68078 (-0.99)
Leverage	-0.12476 (-0.17)	-0.00757 (-0.21)	-0.06126 (0.10)	-0.05592 (-0.14)
Sales growth	3.6468*** (86.64)	0.0561*** (27.10)	3.44908*** (100.26)	0.14162*** (6.02)
Industry A	-24.69736 (-0.36)	-0.73354 (-0.22)	-21.19054 (-0.38)	-2.77328 (-0.07)
Industry B	5.38467 (0.08)	0.17294 (0.05)	1.40905 (0.03)	3.80267 (0.10)
Industry C	2.16534 (0.04)	0.19309 (0.08)	2.0373 (0.05)	-0.06505 (-0.00)
Industry F	-0.31716 (-0.01)	-0.45108 (-0.15)	-1.03612 (-0.02)	1.17004 (0.03)
Industry G	73.42182 (1.25)	2.94888 (1.02)	68.35532 (1.42)	2.11762 (0.06)
Industry H	3.60803 (0.06)	0.21516 (0.08)	2.542 (0.05)	0.85087 (0.03)
Industry J	143.2833*** (2.57)	9.24784*** (3.37)	80.24415* (1.76)	53.79134* (1.72)
Industry K	5.51986 (0.09)	-0.30243 (-0.10)	6.44725 (0.12)	-0.62497 (-0.02)
Industry L	1.87636 (0.02)	-0.23089 (-0.05)	1.82338 (0.03)	0.28388 (0.01)
Industry M	1.70195 (0.03)	0.24289 (0.08)	2.82032 (0.05)	-1.36125 (-0.04)
Observations	8886	8886	8886	8886
F (17, 8868)	448.14	48.89	596.64	3.43
R-squared	0.4621	0.0857	0.5335	0.0065
Adjusted R^2	0.4611	0.0839	0.5326	0.0046

Table 7: Without Manufacturing

This table presents the robustness test results of Equation7, by excluding Industry C-Manufacturing .All variables show in the table are defined in Table 3. The dependent variable, RAM^2,CFO^2, $Prod^2$ and $DisExp^2$ have been multiplied by 100 to ease interpretation of the coefficients. T statistics, shown in parentheses below the coefficient estimates, are based on standard errors that are clustered by firm and year. One tailed tests of significance are used where a signed prediction has been made. ***,**, and * present statistical significance at the 1,5, and 10% levels, respectively.

Variables	**RAM**	$\boldsymbol{CFO^2}$	$\boldsymbol{Prod^2}$	$\boldsymbol{DisExp^2}$
Intercept	-56.40299 (-0.37)	-2.83036 (-0.40)	-63.74618 (-0.51)	10.17355 (0.12)
IFRS	104.7963*** (2.65)	4.28733** (2.39)	61.31949* (1.89)	39.18944* (1.77)
BOD	-87.70497 (-0.32)	-6.5631 (-0.52)	-24.89713 (-0.11)	-56.24473 (-0.36)
Auditor	-13.71399 (-0.35)	0.94558 (0.53)	8.37335 (0.26)	-23.03292 (-1.04)
CEO	57.15269 (1.12)	2.99673 (1.29)	50.29403 (1.20)	3.86193 (0.14)
Committee	-44.095 (-1.08)	1.88153 (1.02)	-22.3638 (-0.67)	23.61273 (-1.04)
Leverage	-0.07563 (-0.07)	-0.00475 (-0.09)	-0.0206 (-0.02)	-0.05028 (-0.08)
Sales growth	3.6494 (54.24)	0.05595*** (18.31)	3.415131*** (62.71)	0.14223*** (3.78)
Industry A	-30.12485 (-0.23)	-0.41608 (-0.07)	-23.67155 (-0.22)	-6.03723 (-0.08)
Industry B	0.93162 (0.01)	0.40007 (0.07)	-1.42214 (-0.01)	1.95369 (0.03)
Industry E	-7.74381 (-0.06)	-0.25056 (-0.04)	-7.24442 (-0.06)	-0.24883 (-0.00)
Industry F	-5.71801 (-0.05)	-0.57024 (-0.10)	-7.3538 (-0.07)	2.20604 (0.03)
Industry G	70.14553 (0.58)	3.111 (0.57)	6.588157 (0.67)	1.15296 (0.02)
Industry H	2.54301 (0.02)	0.45445 (0.08)	1.30067 (0.01)	0.78789 (0.01)
Industry J	142.7509 (1.22)	9.63759* (1.82)	80.12929 (0.84)	52.98402 (0.81)
Industry K	0.51642 (0.00)	-0.13468 (-0.02)	3.53042 (0.03)	-2.87932 (-0.04)
Industry M	-2.47449 (-0.02)	0.57433 (0.10)	0.97943 (0.01)	-4.02825 (-0.06)
N	3487	3487	3487	3487
F (16, 3470)	186.65	23.65	248.23	1.51
R-squared	0.4625	0.0983	0.5337	0.0069
Adjusted R^2	0.4601	0.0942	0.5316	0.0023

Table 8: Absolute Value of Real activities Manipulation

This table presents the robustness test results of Equation7, by taking absolute value of squared CFO, production cost and discretionary expenses. All variables show in the table are defined in Table 3. The dependent variable, RAM,$|CFO|$, $|Prod|$ and $|DisExp|$ have been multiplied by 100 to ease interpretation of the coefficients. T statistics, shown in parentheses below the coefficient estimates, are based on standard errors that are clustered by firm and year. One tailed tests of significance are used where a signed prediction has been made. ***, **, and * present statistical significance at the 1,5, and 10% levels, respectively.

Variables	**RAM**	$\|CFO\|$	$\|Prod\|$	$\|DisExp\|$
Intercept	8.08117	4.41999***	3.17668	0.4835
	(1.49)	(3.56)	(0.87)	(0.20)
IFRS	9.81934***	2.06336***	5.40864***	2.34734***
	(7.76)	(7.12)	(6.35)	(4.14)
BOD	7.54171	0.86674	3.96569	2.70928
	(0.81)	(0.40)	(0.63)	(0.65)
Auditor	-0.61843	0.09434	-0.12645	-0.58632
	(-0.50)	(1.70)	(-0.15)	(-1.05)
CEO	-0.55998	0.06891	0.01779	-0.64669
	(-0.36)	(0.19)	(0.02)	(-0.92)
Committee	1.14666	0.49788*	0.84812	-0.19935
	(0.90)	(1.70)	(0.99)	(-0.35)
Leverage	-0.2925	-0.01119	-0.02584	0.00778
	(-0.50)	(-0.83)	(-0.65)	(0.30)
Sales growth	0.18651***	0.01795***	0.15047***	0.01808***
	(54.62)	(22.94)	(65.48)	(11.82)
Industry A	0.15856	-1.00377	0.00643	1.1559
	(0.03)	(-0.79)	(0.00)	(0.47)
Industry B	7.46074	1.79061	1.92291	3.74722
	(1.39)	(1.46)	(0.53)	(1.56)
Industry C	4.08641	0.33487	0.49016	3.26138*
	(0.98)	(0.35)	(0.17)	(1.74)
Industry F	-2.74536	-0.59796	-2.70443	0.55703
	(-0.56)	(-0.53)	(-0.81)	(0.20)
Industry G	16.53022***	1.75774	10.06343***	4.70906**
	(3.46)	(1.61)	(3.13)	(2.20)
Industry H	8.27545	1.62857	1.87224	4.77464**
	(1.77)	(1.52)	(0.60)	(2.28)
Industry J	46.54789***	9.04905***	26.70001***	10.79883***
	(10.27)	(8.75)	(8.76)	(5.32)
Industry K	9.47267*	-0.01248	5.25426	4.23089
	(1.84)	(-0.01)	(1.51)	(1.83)
Industry L	-1.62121	0.37005	-3.4399	1.44863
	(-0.23)	(0.23)	(-0.73)	(0.46)
Industry M	2.05214	0.96525	0.09245	0.99444
	(0.39)	(0.80)	(0.03)	(0.42)
N	8886	8886	8886	8886
F (17, 8868)	216.71	60.36	288.26	15.70
R-squared	0.2935	0.1037	0.3559	0.0292
Adjusted R^2	0.2922	0.1020	0.3547	0.0274

Table 9: Reclassified 2006 as the Post-IFRS Period

This table presents the robustness test results of Equation7, rerun the model by reclassifying 2006 as the post-IFRS period Each of the variables show in the table is defined in Table 3. The dependent variable, RAM^2,CFO^2, $Prod^2$ and $DisExp^2$ have been multiplied by 100 to ease interpretation of the coefficients. T statistics, shown in parentheses below the coefficient estimates, are based on standard errors that are clustered by firm and year. One tailed tests of significance are used where a signed prediction has been made. ***,**, and * present statistical significance at the 1,5, and 10% levels, respectively.

Variables	**RAM**	$\boldsymbol{CFO^2}$	$\boldsymbol{Prod^2}$	$\boldsymbol{DisExp^2}$
Intercept	-28.80734 (-0.43)	-0.88467 (-0.27)	-300.8618 (-0.55)	2.1635 (0.06)
IFRS	33.31068** (2.04)	1.65066** (2.06)	18.24481 (1.37)	13.41522 (1.47)
BOD	-18.40681 (-0.16)	-2.53606 (-0.44)	2.54566 (0.03)	-18.41641 (-0.28)
Auditor	-3.65022 (-0.24)	0.16419 (0.22)	4.54922 (0.37)	-8.36363 (-0.98)
CEO	20.73163 (1.07)	1.27272 (1.34)	18.52198 (1.17)	0.93693 (0.09)
Committee	-10.98107 (-0.71)	1.50499** (1.97)	-5.10015 (-0.40)	-7.38636 (-0.85)
Leverage	-0.16109 (-0.22)	-0.00938 (-0.26)	-0.0818 (-0.14)	-0.06992 (-0.17)
Sales growth	3.6465*** (86.61)	0.05608*** (27.09)	3.44892*** (100.24)	0.14149*** (60.1)
Industry A	-24.33486 (-0.36)	-0.71559 (-0.21)	-21.01422 (-0.38)	-2.60504 (-0.07)
Industry B	5.33741 (0.08)	0.17057 (0.05)	1.34287 (0.02)	3.82397 (0.10)
Industry C	2.31704 (0.04)	0.20059 (0.08)	2.09255 (0.05)	0.0239 (0.00)
Industry F	-1.09172 (-0.02)	-0.48953 (-0.16)	-1.55166 (-0.03)	0.94947 (0.03)
Industry G	73.56116 (1.25)	2.95577 (1.02)	68.40286 (1.42)	2.20254 (0.07)
Industry H	3.02075 (0.05)	0.18598 (0.07)	2.10391 (0.04)	0.73086 (0.02)
Industry J	142.7875** (2.56)	9.22319*** (3.36)	79.85348* (1.75)	53.71078* (1.72)
Industry K	5.85663 (0.09)	-0.28575 (-0.09)	6.61852 (0.13)	-0.47615 (-0.01)
Industry L	1.22934 (0.01)	-0.26305 (-0.06)	1.33945 (0.02)	0.15294 (0.00)
Industry M	1.71947 (0.03)	0.24372 (0.08)	2.77978 (-0.55)	-1.30404 (-0.04)
N	8886	8886	8886	8886
F (17, 8868)	447.77	48.67	596.39	3.37
R-squared	0.4619	0.0853	0.5334	0.0064
Adjusted R^2	0.4609	0.0836	0.5325	0.0045