Business strategy, market competition and earnings management

Evidence from China

Peng Wu
School of Economics and Management, Southeast University, Nanjing, Jiangsu, China
Lei Gao
School of Business, State University of New York at Geneseo, Geneseo, New York, USA, and
Tingting Gu
School of Economics and Management, Southeast University, Nanjing, Jiangsu, China

Abstract

Purpose – The purpose of this study is to explore the relationships among business strategy, market competition and earnings management.

Design/methodology/approach – This paper uses 2,037 Chinese A-share listed firms from 2010 to 2012 to test the research questions using regression analyses.

Findings – The firms that follow cost leadership strategy (cost leaders) are more likely to have a higher level of real earnings management. The firms that follow differentiation strategy (differentiators) are less likely to use real earnings management. For cost leaders, the market competition further increases the level of real earnings management, whereas the level of earnings management of differentiators is not significantly impacted by the market competition.

Practical implications – Results of this study indicate the feasibility of differentiation strategy in China and suggest that management should be encouraged to use such a strategy or to use a hybrid strategy to achieve its operational and financial goals.

Originality/value – The study contributes to the research of earning management by providing evidence on that business strategy has significant impacts on earnings management. It also shows an incremental influence of market competition on earnings management through its impacts on business strategy.

Keywords Business strategy, Differentiation, Earnings management, Market competition, Cost leadership

Paper type Research paper

1. Introduction

In this study, we use Porter's (1980) organizational strategy typology to examine whether the companies that follow different business strategies exhibit differences in the extent of earnings management. By doing so, we provide evidence on whether business strategy is one of the underlying determinants of earnings management.

Chinese Management Studies
Vol. 9 No. 3, 2015
pp. 401-424

1750-614X
DOI 10.1108/CMS-12-2014-0225

Furthermore, we examine the interactions between business strategy and market competition and its impact on earnings management, providing evidence on whether an external contributing factor such as market competition may have incremental influence over earnings management through its impact on an internal factor such as business strategy.

Agency theory suggests that the fundamental cause of earnings management is the conflict of interest between owners and management. Due to the information asymmetry and incompleteness of contracts, management may have strong motivations and opportunities to engage earnings management to smooth earnings or to meet analysts' forecast. An extensive prior literature considers how institutional factors such as corporate governance may constrain earnings management. Such research focuses on how the oversight on management through internal or external governance mechanisms such as compensation and capital structure may reduce earnings management (Jaggi, 1975; Jensen, 1993; Saudagaran and Diga, 1997; Eisenberg *et al.*, 1998; Wei *et al.*, 2013). However, as argued by Zahra *et al.* (2005), the current accounting research has a heavy focus on identifying potential indicators of an event rather than exploring its direct causes or antecedents. Business strategy, as an important factor affecting internal governance mechanism (Miles and Snow, 1978, 2003; Ittner *et al.*, 1997) has received little attention on its impacts on earnings management. Our study, for the first time, attempts to explore whether business strategy maybe an underlying determinant of earnings management.

As a factor implemented in an environment of competition, business strategy can be influenced significantly by market competitions. Interestingly, prior research shows inconsistent results regarding the impacts of market competition on earnings management (Marciukaityte and Park, 2009; Karuna *et al.*, 2012; Markarian and Santalo, 2014). One of the reasons explaining such inconsistencies may be that these studies have ignored how the interaction of market competition and business strategy may jointly affect earnings management, which has never been tested in prior research and will be the other focus of this study.

To measure earnings management, this study follows Roychowdhury (2006) and Cohen *et al.* (2010) by using real activities management, which normally involves management decisions on cutting back on R&D or SG&A (selling, general and administrative) expenses, increasing price discounts or overproducing inventory items. Real earnings management is considered to be less risky and receives less scrutiny from auditors and regulators than accrual-based earnings management, and, hence, has been used more often in recent years after the strengthening of regulatory rules (Cohen *et al.*, 2008). However, real activities management represents a deviation from best business practices taken by management to achieve earnings targets and has an obvious negative impact on future performance (Gunny, 2010). Therefore, we believe that more research should be done on understanding what factors contribute to management decisions of using real activities management.

In this study, we use Chinese A-share listed firms from 2010 to 2012 to test the relationships among business strategy, market competitions and earnings management. The use of Chinese listed firms as our sample brings several unique features to the research of business strategy and earnings management. First, firms listed on China stock markets face more pressures on meeting earnings targets to avoid the special treatments from the China Securities Regulatory Commission (CSRC). A

listed company with two consecutive years of losses will be moved a special trading system and designated as a "ST" company. Such a pressure may have a more obvious impact on those companies who follow cost leadership strategy due to their low profit margins. Second, with the increase of labor cost and competitions from other Asian countries, most Chinese companies are undergoing a transition period from a more cost-oriented business strategy to a more differentiation-oriented strategy. In addition to that, China is now observing a big boom of e-commerce, e.g. through Internet and mobile shopping, where the unique features of differentiation strategy such as credibility and brand name recognition becomes even more important due to the lack of physical contact between customers and company personnel (Kim *et al.*, 2004), encouraging a company to adopt the differentiation strategy. How such a change of business strategy interacts with market competitions to influence management decisions on earnings management is an urgent emerging question for researchers to answer.

Our results support our predictions and show a significant relationship between business strategy and earnings management. First, the companies that follow cost leadership strategy are more likely to engage earnings management. Second, the companies that follow differentiation strategy are less likely to engage earnings management. For instance, Tuopai Shede Wine Co. (in the beverage alcohol industry) and Jiao Da Onlly Co. (in the pharmaceutical industry) both have typical characteristics of differentiators with low asset turnovers and high profit margins, and they appear to engage less real earnings management than other companies. On the other side, some typical cost leaders in the ferrous metal smelting and rolling processing industry and the automobile manufacturing industry seem to engage more real earnings management than peer firms, i.e. through cutting R&D and SG&A expense, increasing price discounts or overproducing inventory items. These results suggest that the pressures to meet earning targets might have pushed those companies using cost leadership strategy to engage more earnings management, which will hurt firms' performance in long-term run. Lastly, market competitions are found to increase further earnings management of cost leaders, but do not have a significant impact on earnings management of differentiators.

By linking three research literatures: organizational theory and market competition theory from management literatures and earnings management from the accounting research, our study has three major contributions to the research of business strategy and earnings management. First, we provide the evidence that companies that follow different business strategies actually exhibit different levels of earnings management, which extends the literatures of earnings management in exploring whether business strategy is an underlying determinant of earnings management. Second, compared to prior research using traditional corporate governance factors, our use of business strategy as explanatory variable is unique and provides evidence that those factors that relate to a company's operational styles can potentially influence management's decisions regarding earnings management. Such type of antecedents of earnings management should receive more attention from academic research. Third, this paper studies how the interaction of market competition and business strategy will impact earnings management, which extends the literatures of both market competition and earnings management. The results of this study can be used by management, shareholders and regulators to assess firms' earnings quality.

The remainder of our paper is organized as follows. Section 2 discusses the typologies of business strategy. Section 3 develops our hypotheses. Section 4 describes our data, methodology and research models. Section 5 presents our empirical results, while Section 6 concludes the study.

2. Business strategy

2.1 Porter's (1980) typology of business strategy

This study uses Porter's (1980) typology of business strategies to examine whether companies that follow different business strategies exhibit differences in the extent of earnings management. Porter (1980) argues that three business strategies: cost leadership, differentiation and focus, can be used as a firm's positioning strategy in its industry. Cost leaders focus on efficiency in the production and distribution of goods and services. The sources of cost advantage may include "the pursuit of economies of scale, proprietary technology, preferential access to raw materials", etc. (Porter, 1985, p. 12). On the other hand, to be unique in its industry, successful differentiators need to achieve a technology leadership or to create a high degree of customer intimacy (Porter, 1996). To achieve such a goal, differentiators need to put more investments in R&D activities (Bentley *et al.*, 2013). The focus strategy refers to the implementation of cost leadership or differentiation in a specific purchase group or market.

Consistent with prior research, we focus our discussions on the first two distinct strategies: cost leadership and differentiation, both of which are normally used by firms that serve a broad range of segments (Banker *et al.*, 2011; Chen, 2006; Kald, 2003; David *et al.*, 2002). We exclude the focus strategy because it can be further partitioned into cost-based focus and differentiation-based focus while targeted at a narrow segment.

We select the Porter (1980) classification for three reasons. First, Porter's theory of generic strategies has been one of the most widely used strategy typology and recognized as the dominant paradigm of competitive strategy literature (Kim *et al.*, 2004; Campbell-Hunt, 2000). Many prior literatures have adopted the Porter classification in their studies (Banker *et al.*, 2013; David *et al.*, 2002; Chen, 2006; Kim *et al.*, 2004; Selling and Stickney, 1989). Second, Porter's typology of business strategies can be aligned with other classifications. The inferences based on Porter's typology are likely to be applicable to those that are based on other classifications (Ittner *et al.*, 1997; Bentley *et al.*, 2013). Third, Porter's typology is inherently tied to firm profitability performance (Kim and Lim, 1988), which is particularly important for this study.

2.2 The applicability of Porter's (1980) typology in China

We believe that the Porter's typology is applicable to Chinese enterprises in the current environment based on results from prior research. Chen (2006) finds that both the cost leadership and differentiation strategies have been adopted by Chinese enterprises. There are also other studies that have used Porter's typology to investigate business strategy issues in the environment of Chinese market (Wang, 2013; Liao, 2013; Zheng *et al.*, 2011; Ge and Ding, 2005).

Prior literature also provides support to the Porter's typology in its applicability to the banking industry in Hong Kong (Chen and Wong, 1999) and in other developing countries such as Korea (Kim and Lim, 1988; Kim *et al.*, 2004). Furthermore, Kim *et al.* (2004) finds that the Porter's typology is relevant and can be applied to a new business

environment such as e-business. This finding is particularly important to business strategy research in China, where we are now experiencing a boom of e-commerce.

3. Hypothesis development

3.1 Cost leadership strategy and earnings management

The need of external financing is one of the main motivations of earnings management of an enterprise (Loughran and Ritter, 1995; Defond and Jiambalvo, 1994). When seeking for financing through equities or debts, to satisfy the need of investors and creditors, managers tend to engage earnings management such that to improve the company's financial performance (Frankel *et al.*, 1995; Dechow and Sloan, 1991; Jones, 1991). Those enterprises that follow cost leadership strategy normally have a strong need for external financing for two reasons. First, one of the main sources for reaching cost advantage is the pursuit of economies of scale and operational excellence. To achieve that, cost leaders need to put significant investments in machinery equipment, raw materials, etc. Second, cost leaders tend to have lower profit margins than differentiators and thus are difficult to finance from inside through their own business.

Second, the listed companies in China stock markets have a need to avoid the delisting or special treatments from the CSRC. To avoid a "ST" tag, some firms will attempt to manipulate its earnings to avoid two consecutive years of losses (Jiang and Xiong, 2012; Lu, 1999). Due to low profit margins, a cost leader will have a hard time sustaining its profitability especially when its bases for cost leadership erode, which may lead to earnings management.

Thirdly, management compensation is often affected by a firm's profitability; when choosing accounting policies, they may prefer to use those methods that engage earning management to meet certain financial goals (Holthausen *et al.*, 1995; Gaver *et al.*, 1995). Cost leaders tend to focus more on short-term performance and their compensation schemes are often based on short-term financial measures (Govindarajan and Fisher, 1990; Singh and Agrawal, 2002) such as operating profit and return on investment (Ittner *et al.*, 1997; Miles and Snow, 1978; Simons, 1987). Therefore, managers in a cost leader have stronger motivations of engaging earnings management to improve financial performance. Thus, we propose the following hypothesis:

H1. Cost leadership strategy is positively associated with the level of earnings management.

3.2 Differentiation strategy and earnings management

Porter (1980) argues that differentiators must always seek ways of differentiating themselves from others in the industry to obtain a price premium greater than the cost of differentiating. Porter (1985, p. 120) describes that "differentiation allows the firm to command a premium price, to sell more of its product at a given price". Meanwhile differentiators usually have a strong bargaining power over suppliers, which also increases profit margins.

A high level of earnings can not only help differentiators survive unexpected downturns but also help them meet the needs of investments. According to the pecking order theory (Myers and Majluf, 1984), to reduce the cost of financing, a firm will first choose internal financing rather than external financing. Meanwhile, differentiators often need to exploit new products and market opportunities which results in a higher demand for investments in R&D than other firms, exposing them to higher risk. While,

to meet specific needs of manufacturing or customized design, differentiators' assets are specialized and much less valuable in factor markets compared to what they can create within the firm (Banker *et al.*, 2013). Thus, these assets are difficult to be used as collaterals for loans, resulting in a higher financing cost. As a result, differentiators tend to have a lower demand for external financing than cost leaders. With both a higher profit margin and a lower demand for external financing, differentiators are less motivated to engage earnings management.

Prior research shows that, compared to cost leaders, differentiators that pursue innovation rely more on non-financial measures to compensate CEO (Ittner *et al.*, 1997; Govindarajan and Gupta, 1985; Simons, 1987). They believe that the managerial efforts in these firms are difficult to measure simply based on financial indicators. Non-financial criteria, e.g. personal development or new products, are more informative about managerial efforts. Overall, we believe that managers of differentiators are less motivated to engage earnings management and thus propose the following hypothesis:

H2. Differentiation strategy is negatively associated with the level of earnings management.

3.3 Business strategy, market competition and earnings management

To further understand how business strategies affect earnings management, we should consider the competition environment where firms position their business strategies. Prior research shows that the effect of market competition on earnings management is uncertain. On one hand, a higher degree of market competition may increase earnings management (Karuna *et al.*, 2012; Markarian and Santalo, 2014) due to that firms can reduce the information content of earnings, so as to block certain information to its competitors (Bagnoli and Watts, 2000) and that the market competition will reduce the profit of a firm. To avoid it, managers may have strong incentives to engage earnings management (Karuna *et al.*, 2012). On the other hand, some research also shows a negative relationship between competition and earnings management (Marciukaityte and Park, 2009) due to the decrease of information asymmetry (Holmstrom, 1982; Scharfstein, 1988), providing opportunities for stakeholders to compare firms' performance to that of competitors, and a higher chance of bankruptcy caused by fierce market competitions, encouraging management to work harder to protect their reputations. Under such a circumstance, interests of principals and agents tend to be consistent with each other, which encourage management to choose the beneficial actions for shareholders and reduce the degree of earnings management.

Although market competition reduces information asymmetry and thus decrease earnings management to a certain extent, we believe that its impact in China is limited because of the imperfection of Chinese stock markets (Chen and Xu, 2011). In addition, the increase of market competitions makes it more difficult for a firm to sustain its position as a cost leader or a differentiator (Porter, 1985), which in turn motivates management to engage earnings management. Considering the above reasons, we believe that those firms that face more fierce competitions will be more likely to explore all potential opportunities, including earnings management, to survive in the market and avoid the chance of getting delisted or special treatments in stock markets. Therefore, the interaction of market competition and business strategy will worsen the degree of earnings management of cost leaders. On the other hand, the negative relationship between differentiation strategy and earnings management might be

nullified or reduced to certain extent by market competition, resulting in an insignificant correlation between earnings management and the interaction of differentiation strategy and market competition. Therefore, we propose the following two hypotheses:

H3a. The interaction of market competition and cost leadership strategy will exhibit a positive relationship with earnings management.

H3b. The interaction of market competition and differentiation strategy will exhibit an insignificant relationship with earnings management.

4. Data and methodologies

4.1 Data and sample selection

In this paper, we use Chinese A-share listed companies in the manufacturing industry from 2010 to 2012 as our sample. B-shares and H-shares are excluded from our sample due to their differences in regulatory environments and certain financial characteristics. We choose only manufacturing industry as our sample firms for following reasons:

- the manufacturing industry accounts for more than 60 per cent of listed companies, with a big variety of subdivisions, which is convenient for our further analyses;
- the financial data of firms in manufacturing industry is relatively more complete; and
- Li *et al.* (2007) find that manufacturing companies pay more attention to business strategies than other companies.

We select our sample using the following steps: first, we exclude those firms that belong to a subdivision that has less than ten listed companies; second, firms that belong to the subdivision of "other manufacturing" (industry code C41) are excluded due to the lack of homogeneity among firms; third, firms that issue shares after year 2009 (including year 2009) are excluded because the effects of business strategies on financial results normally take a long time to show; fourth, firms that wore a ST or *ST any of the three years from 2010 to 2012 will be removed from the sample; and, lastly, firms that issue both A-shares and B-shares/H-shares are excluded. In the end, we have 2,037 qualified observations in our sample, representing 21 subdivisions in the manufacturing industry. All financial data are taken from the CSMAR database. Table I outlines the sample composition listed by industry.

4.2 Earnings management measures

In this study, we use real activities manipulations to measure earnings management. With the strengthening of the strictness of regulatory rules and the severity of disciplinary actions, the risk of engaging accrual-based earnings management has increased in today's economic environment. As an alternative, management may turn to real earnings management approach whose costs are higher but with a lower risk of getting uncovered (Graham *et al.*, 2005; Cohen *et al.*, 2008). Nevertheless, the firms that use real earnings management will often need to cooperate with other companies or within the firms, which brings a higher cost (Cohen and Zarowin, 2010), and accordingly has an obvious negative impact on future performance (Gunny, 2010), hurting the firms even more in long-term run. Hence, we believe that more attention should be paid to real earnings management.

Industry name	Industry code	No. of firms	% of sample
Agricultural and sideline products processing	C13	57	2.80
Food manufacturing	C14	33	1.62
Wine, beverage and refined tea manufacturing	C15	69	3.39
The textile industry	C17	84	4.12
Textile and clothing, apparel industry	C18	39	1.91
Paper and paper products	C22	48	2.36
Petroleum processing, coking and nuclear fuel processing	C25	30	1.47
Chemical raw materials and chemical products manufacturing	C26	255	12.52
Pharmaceutical manufacturing	C27	210	10.31
Chemical fiber manufacturing	C28	45	2.21
Rubber and plastic products	C29	54	2.65
Non-metallic mineral products	C30	99	4.86
Ferrous metal smelting and rolling processing	C31	72	3.53
Non-ferrous metal smelting and rolling processing	C32	84	4.12
Metal products	C33	48	2.36
General equipment manufacturing	C34	105	5.15
Special equipment manufacturing	C35	123	6.04
Automobile manufacturing	C36	105	5.15
Railroads, ships, aerospace and other transportation equipment manufacturing	C37	51	2.50
Electrical machinery and equipment manufacturing	C38	186	9.13
Computer, communication and other electronic equipment manufacturing	C39	240	11.78
Total		2,037	100

Table I.
Sample composition by industry from year 2010-2012

Notes: Data sources: all financial data are obtained from CSMAR database, and the industry classification codes are obtained from [Listing Corporation Industry Classification Guidelines (2012) Revised Edition], published by China Securities Regulatory Commission (CSRC)

Consistent with prior research (Roychowdhury, 2006; Cohen and Zarowin, 2010; Zang, 2012), we use three measures to capture real activities manipulations:

(1) abnormal production costs caused by manipulations of manufacturing process;

(2) abnormal operating cash flows caused by manipulations of sales activities; and

(3) abnormal discretionary expenditures caused by manipulations of expenditures activities.

First, we estimate the normal levels of production cost (PROD), discretionary expenditure (DISX) and cash flows from operations (CFO) by running the following cross-sectional regressions for each industry-year where there are at least ten observations and use the code developed by CSRC to classify industries (see Table I). We then calculate the normal levels of PROD, CFO and DISX separately by using the estimated coefficients from equations (1)-(3).

- We estimate the normal level of production cost (PROD) using equation (1):

$$\frac{PROD_t}{A_{t-1}} = \alpha_0 + \alpha_1\frac{1}{A_{t-1}} + \alpha_2\frac{S_t}{A_{t-1}} + \alpha_3\frac{\Delta S_t}{A_{t-1}} + \alpha_4\frac{\Delta S_{t-1}}{A_{t-1}} + \varepsilon_t \quad (1)$$

- We estimate the normal level of cash flows from operations (CFO) using equation (2):

$$\frac{CFO_t}{A_{t-1}} = \alpha_0 + \alpha_1\frac{1}{A_{t-1}} + \alpha_2\frac{S_t}{A_{t-1}} + \alpha_3\frac{\Delta S_t}{A_{t-1}} + \varepsilon_t \quad (2)$$

- We estimate the normal level of discretionary expenditures (DISX) using equation (3):

$$\frac{DISX_t}{A_{t-1}} = \alpha_0 + \alpha_1\frac{1}{A_{t-1}} + \alpha_2\frac{S_{t-1}}{A_{t-1}} + \varepsilon_t \quad (3)$$

Where:

A_{t-1} = total assets at the end of year $t-1$;
S_t = net sales in year t;
ΔS_t = the change in net sales from year $t-1$ to t;
$PROD_t$ = sum of the cost of goods sold in year t;
$DISX_t$ = discretionary expenditures in year t (i.e. the sum of SG&A expenses).

Second, we estimate the abnormal PROD (APROD) by subtracting the estimated normal level from its actual PROD. We perform the same step to obtain abnormal CFO (ACFO) and abnormal DISX (ADISX). The equations are shown as follows:

$$APROD_t = \frac{PROD_t}{A_{t-1}} - \left[\alpha_1\frac{1}{A_{t-1}} + \alpha_2\frac{S_t}{A_{t-1}} + \alpha_3\frac{\Delta S_t}{A_{t-1}} + \alpha_4\frac{\Delta S_{t-1}}{A_{t-1}}\right] \quad (4)$$

$$ACFO_t = \frac{CFO_t}{A_{t-1}} - \left[\alpha_1\frac{1}{A_{t-1}} + \alpha_2\frac{S_t}{A_{t-1}} + \alpha_3\frac{\Delta S_t}{A_{t-1}}\right] \quad (5)$$

$$ADISX_t = \frac{DISX_t}{A_{t-1}} - \left[\alpha_1\frac{1}{A_{t-1}} + \alpha_2\frac{S_{t-1}}{A_{t-1}}\right] \quad (6)$$

Where:

$APROD_t$ = the abnormal level of production cost in year t;
$ACFO_t$ = the abnormal level of cash flow from operation in year t;
$ADISX_t$ = the abnormal level of discretionary expenditure in year t.

The companies that attempt to manipulate their earnings tend to have higher APROD, lower ADISX and lower ACFO.

Lastly, we combine the three real activities manipulation measures into one proxy, named as RM, by putting them together (Zang, 2012; Cohen *et al.*, 2008) using equation (7):

$$RM_t = APROD_t - ACFO_t - ADISX_t \quad (7)$$

4.3 Business strategy measures and regression model

Snow and Hambrick (1980) proposed four approaches for measuring strategic positioning: investigator inference, self-typing, external assessment and objective indicators. This study uses objective indicators to measure business strategies due to its objectivity and its close ties with a firm's financial performance, which is the focus of this study. Prior studies have used two major types of objective indicators to proxy for business strategies. One is through the use of financial ratios (Banker *et al.*, 2011; Zhang, 2008; Selling and Stickney, 1989), and the other is to use a composite measure (Banker *et al.*, 2013; Bentley *et al.*, 2013; Ittner *et al.*, 1997).

This study follows the approach of Banker *et al.* (2011) and uses selected financial ratios to proxy for business strategies. The financial-based measures of business strategies permits an explicit gauge on the "realized strategies" rather than the "intended strategies" (David *et al.*, 2002; Mintzberg, 1978), and are not prone to the perceptual biases (David *et al.*, 2002).

The ratio of return on assets (ROA) is an important financial ratio which indicates firm profitability. Consistent with prior research, we use the Du Pont method for analyzing ROA by breaking it into profit margin and asset turnover (Fairfield and Yohn, 2001; Nissim and Penman, 2000; Stickney and Brown, 1999). The ratios of asset turnover, reflecting a firm's asset utilization, and the profit margin, reflecting a firm's profitability, are the partial products of a firm's business strategy (Fairfield and Yohn, 2001). Selling and Stickney (1989) argue that business strategies affect ROA in such a way that the increase of ROA can be a result of the increase of profit margin via differentiation strategy or of the increase of asset turnover via cost leadership strategy. For this consideration, we use these two financial ratios to measure business strategies.

4.3.1 Cost leadership strategy measure. As discussed previously, cost leadership strategy is used by firms to achieve its uniqueness in an industry by lowering costs. Cost leaders often make efforts to achieve operational excellence through efficient operations, resulting in a lean cost structure. Assets turnover reflects a critical dimension of cost efficiency in that the higher the ratio between output (i.e. sales) and input (i.e. capital assets), the more likely a firm is to achieve cost efficiency in utilizing its resources (Hambrick, 1983; Prescott, 1986; Kotha and Nair, 1995). A larger value of this variable is likely to be associated with firms pursuing a cost leadership strategy (David *et al.*, 2002; Hambrick, 1983).

Following the approach of prior research (Selling and Stickney, 1989; Banker *et al.*, 2011, 2013; Wang, 2013), we use asset turnover as the measure of cost leadership strategy and use equation (8) to compute it:

$$\text{Asset Turnover of Operation (ATO)} = \text{Operating Sales/Average Operating Assets} \tag{8}$$

Where:

$$\text{Operating Assets} = \text{Total Assets} - \text{Cash} - \text{Short-term Investments} \tag{9}$$

A high ATO means that the firm is more capable of obtaining revenues through efficient business operations and utilizing its resources well, which indicates that the firm is positioned more toward a cost leadership strategy.

4.3.2 Differentiation strategy measure. Selling and Stickney (1989) believe that differentiation strategy may be viewed as a profit margin-focused strategy. At the same time, to make the product or service more unique, differentiators must invest more into R&D activities. David *et al.* (2002) argue that the higher the R&D propensity the more likely the firm is pursuing product differentiation. Therefore, consistent with prior literatures (Selling and Stickney, 1989; Banker *et al.*, 2011, 2013; Wang, 2013), we use the profit margin (PM) to measure the differentiation strategy. Prior research shows that this ratio can capture a firm's use of product differentiation strategy (David *et al.*, 2002; Porter, 1980; Hambrick, 1983; Prescott, 1986). We obtain the profit margin (PM) by using the following equation (10):

$$\text{Profit Margin (PM)} = (\text{Operating Income} + \text{R\&D Expenditure})/\text{Sales} \quad (10)$$

A higher PM suggests that the firm has an overall high profit margin and invests more into R&D activities than other firms, and is positioned more toward a differentiation business strategy.

4.3.3 Market competition measure and control variables. We use the HHI index (Herfindahl–Hirschman Index) to measure industry-level market competition (Markarian and Santalo, 2014; Marciukaityte and Park, 2009) and use the share index (SHARE) to measure firm-level competition (Rhoades, 1985; Dutta and King, 1980; Harrigan, 1981). They are defined as follows:

$$HHI = \sum_{i=1}^{n} (X_i/X)^2 \quad (11)$$

$$SHARE = X_i/X \quad (12)$$

Where X_i refer to the sales of firm i and X refer to the total sales in a particular industry. A lower HHI or SHARE means a higher degree of competitions.

Given that both the HHI index and the SHARE index are decreasing in competition, we multiply them by minus one to compute CHHI and CSHARE, such that to facilitate the interpretation of the regression results.

Based on prior research (Dechow and Sloan, 1991; Jones, 1991), we include the following control variables in our model: debt to asset ratio (LEV), firm size (SIZE), ROA, and growth (GROWTH). We summarize our definitions of all variables in Table II.

4.3.4 Regression model. To empirically test *H1* and *H2*, we build a regression model by using real earnings management as the dependent variable and using ATO as the test variable to measure cost leadership strategy and PM to measure differentiation strategy. Market competition indexes (CHHI and CSHARE) are also integrated into the model, with their interactions with the variables of business strategies as test variables for *H3a* and *H3b*. The ratios of ROA, LEV, SIZE and GROWTH are used as control variables in our model.

Prior literatures find that some companies tend to combine the cost leadership and differentiation strategies to satisfy customers (Kim *et al.*, 2004; Kim and Lim, 1988). Similar results are also found in business strategy studies in China (Chen, 2006; Ge and Ding, 2005; Chen and Wong, 1999). To examine whether such a way of combining both

Categories	Variable name		Symbol	Definition
Dependent variables	Real earnings management		|RM|	The absolute value of real earnings management, with the |RM| values calculated by equation (7), a higher |RM| indicates a higher degree of earnings management
Independent variables	Business strategy	Cost leadership strategy	ATO	Calculated by equation (8), a larger value means that the firm follows a cost leadership strategy
		Differentiation strategy	PM	Calculated by equation (10), a larger value means that the firm follows a differentiation strategy
	Market competition	Degree of industry-level market competition	CHHI	HHI multiplied by −1; The HHI values are calculated by equation (11), using the sum of the square of market shares of all firms in an industry; a higher CHHI index indicates a higher degree of competitions
		Degree of firm-level market competition	CSHARE	SHARE multiplied by −1; The SHARE values are calculated by equation (12), using the percentage of sales of a firm over the total sales of an industry; a higher CSHARE indicates a higher degree of competitions
Control variables	Return on assets		ROA	Net Income/Year-end Total Assets
	Debt to asset ratio		LEV	Year-end total liabilities/Year-end total assets
	Firm size		SIZE	The natural logarithm of year-end total assets
	Growth		GROWTH	(Total sales of next year/total sales of current year) − 1

Table II.
Variable definitions

strategies may affect a firm's earnings management, we add an interaction of ATO and PM in our full model, presented as follows:

$$\begin{aligned} |RM_t| = {} & C + \beta_1 ATO_{i,t} + \beta_2 PM_{i,t} + \beta_3 CHHI_{i,t} + \beta_4 CSHARE_{i,t} \\ & + \beta_5 ATO_{i,t} * CHHI_{i,t} + \beta_6 PM_{i,t} * CHHI_{i,t} + \beta_7 ATO_{i,t} * CSHARE_{i,t} \\ & + \beta_8 PM_{i,t} * CSHARE_{i,t} + \beta_9 ATO_{i,t} * PM_{i,t} + \beta_{10} ROA_{i,t} \\ & + \beta_{11} * LEV_{i,t} + \beta_{12} * SIZE_{i,t} + \beta_{13} * GROWTH_{i,t} + \beta_{14} year + \varepsilon_{i,t} \end{aligned} \quad (13)$$

5. Results

To avoid the distortions caused by extreme values on the empirical results, we take two steps to treat the extreme values: first, we delete 40 sample firms that represent the extreme maximum and minimum 1 per cent values of |RM|, we then winsorize all the

independent variables at the top and bottom 0.5 per cent, so that these variables are normally distributed within reasonable ranges.

5.1 Descriptive statistics

Table III reports summary statistics of variables used in the study. The minimum value of |RM| is 0.0044, while the maximum value reaches 1.9616, with a standard deviation of 0.3588, showing that the degree of earnings management of listed companies vary greatly across firms.

Table III also shows large differences in ATO across firms, with a mean value of 1.05, a standard deviation of 0.621, a minimum value of 0.146, and a maximum value of 4.314, indicating that not all Chinese enterprises are currently adopting the cost leadership strategy. On the other hand, we also observe large differences in PM across firms with a mean value of 0.064 and a maximum value of 0.630, suggesting that there are companies in China that have adopted the differentiation strategy. Such observations provide evidence to support our expectations of the applicability of the Porter's (1980) generic strategies to Chinese companies. We also notice that our descriptive statistics of ATO and PM are comparable to those studies that examine business strategy issues in an economic environment of developed countries (Banker *et al.*, 2011).

Figure 1 and 2 depict the distributions of ATO and PM. From both graphs, one can notice that, the values of these two variables, measuring cost leadership and differentiation, vary greatly across firms rather than packed in a narrow area.

Table IV further presents the mean values of variables by industry.

Based on the results in Table IV, we have the following observations: the extent of real earnings management (mean of |RM|) of those industries with higher ATO (indicating the cost leadership strategy) is higher than the rest of the sample. On the contrary, |RM| of these industries with higher PM (measuring the differentiation strategy) are lower than the rest of the sample. These results provide some preliminary supports to our hypotheses. They also make economic sense to us. For example, those companies in beverage alcohol and purified tea manufacturing industry (C15) tend to have higher profit margin than other industries because some alcohol and tea are special merchandises in China and are often sold as high-end gifts. Customers are willing to pay higher prices for these goods, resulting in high profit margins, which is a characteristic of differentiators. Similar situations apply to the pharmaceutical industry (C27) and textile and garment industry (C28). It also suggests that the Porter's typology is applicable in China and our measures of strategies are appropriate.

Variables	*N*	Mean	SD	Minimum	25%	Median	75%	Maximum
|RM|	1997	0.382	0.359	0.004	0.120	0.268	0.528	1.962
ATO	1997	1.050	0.621	0.146	0.642	0.905	1.299	4.314
PM	1997	0.064	0.115	−0.486	0.014	0.049	0.104	0.630
CHHI	1997	−0.082	0.059	−0.267	−0.094	−0.066	−0.038	−0.020
CSHARE	1997	−0.018	0.033	−0.287	−0.018	−0.007	−0.003	0.000
ROA	1997	0.044	0.054	−0.159	0.013	0.035	0.067	0.270
LEV	1997	0.477	0.184	0.054	0.348	0.487	0.615	0.948
GROWTH	1997	0.202	0.348	−0.462	0.021	0.153	0.313	2.745
SIZE	1997	21.880	1.113	19.295	21.094	21.758	22.542	25.377

Table III. Summary statistics of variables

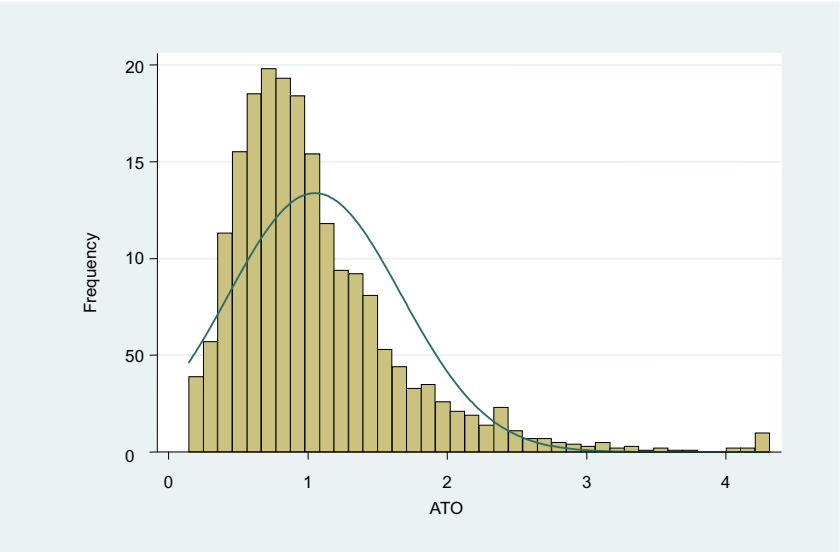

Figure 1.
ATO histogram

Notes: Mean = 1.050; SD = 0.621; $N = 1997$

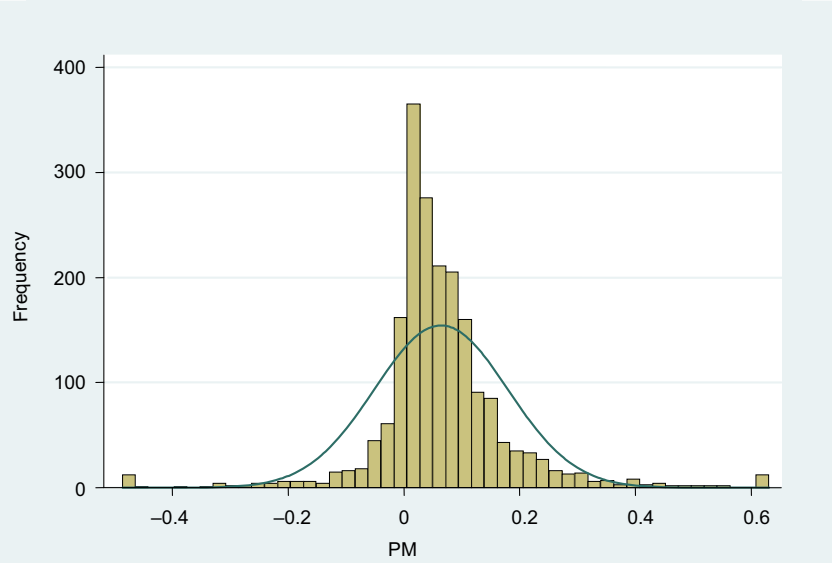

Figure 2.
PM histogram

Notes: Mean = 0.064; SD = 0.115; $N = 1997$

Table IV.
Means of variables classified by industry

Industry name	Code	*N*	|RM|	ATO	PM	CHHI	CSHARE	ROA	LEV	GROWTH	SIZE
Agricultural and sideline products processing	C13	52	0.461	1.65***	0.014***	−0.149***	−0.035**	0.033	0.540**	0.204	21.774
Food manufacturing	C14	32	0.370	1.216	0.024**	−0.234***	−0.067***	0.030	0.549**	0.186	22.222***
Wine, beverage and refined tea manufacturing	C15	69	0.375	0.996	0.1873***	−0.091***	−0.028**	0.096***	0.364***	0.200	21.856
The textile industry	C17	83	0.384	0.983	0.021***	−0.039***	−0.026**	0.022***	0.483	0.150	21.408***
Textile and clothing, apparel industry	C18	39	0.302	0.948	0.122***	−0.152***	−0.038**	0.063**	0.382***	0.145	21.590
Paper and paper products	C22	47	0.337	0.772***	0.022**	−0.095***	−0.038***	0.021***	0.523**	0.164	22.032
Petroleum processing, coking and nuclear fuel processing	C25	28	0.477	1.644**	0.015***	−0.261***	−0.044**	0.016***	0.488	0.241	22.109
Chemical raw materials and chemical products manufacturing	C26	252	0.384	1.017	0.047**	−0.025***	−0.009***	0.035***	0.477	0.235	21.835
Pharmaceutical manufacturing	C27	209	0.335*	0.915***	0.139***	−0.021***	−0.011***	0.084***	0.389***	0.185	21.617***
Chemical fiber manufacturing	C28	43	0.474*	1.047	0.038	−0.116***	−0.026	0.029*	0.474	0.202	21.800
Rubber and plastic products	C29	54	0.440	1.159**	0.061	−0.052***	−0.037***	0.053	0.491	0.168	21.927
Non metallic mineral products	C30	99	0.261***	0.654***	0.093**	−0.077***	−0.014**	0.048	0.533***	0.232	22.009
Ferrous metal smelting and rolling processing	C31	69	0.607***	1.417***	0.008***	−0.067***	−0.033***	0.013***	0.661***	0.120*	23.692***
Non-ferrous metal smelting and rolling processing	C32	78	0.459*	1.440***	0.023***	−0.121***	−0.018	0.021***	0.603***	0.283*	22.529***
Metal products	C33	47	0.415	1.156	0.041***	−0.206***	−0.029	0.031*	0.454	0.146**	21.560*
General equipment manufacturing	C34	105	0.332*	0.804***	0.062	−0.088***	−0.007***	0.041	0.510*	0.128**	21.648***
Special equipment manufacturing	C35	120	0.361	0.886***	0.065	−0.055***	−0.015	0.043	0.524***	0.272	21.920
Automobile manufacturing	C36	201	0.473**	1.377***	0.051***	−0.200***	−0.017	0.049	0.533***	0.182	22.176**
Railroads, ships, aerospace and other transportation equipment manufacturing	C37	51	0.352	1.050	0.052	−0.175***	−0.015	0.031***	0.426**	0.217	21.909
Electrical machinery and equipment manufacturing	C38	182	0.372	1.071	0.039***	−0.073***	−0.011***	0.039	0.480	0.199	21.711*
Computer, communication and other electronic equipment manufacturing	C39	237	0.345	1.011	0.073	−0.059***	−0.008***	0.047	0.401***	0.222	21.648***
Total	Mean	1997	0.382	1.050	0.064	−0.082	−0.018	0.044	0.477	0.202	21.880

Notes: *t*-tests are used to examine whether the difference between the means of a particular industry and the average mean of the entire sample is significant; *, **, *** indicate significance at the level of 0.10, 0.05 and 0.01, respectively

When looking further into specific firms' performance, we notice that those companies that have more obvious characteristics of either differentiators or cost leaders tend to have more extreme values of real earnings management than that of other companies in the same industry. For instance, our untabulated results show that Tuopai Shede Wine Co., a company in beverage alcohol industry, and Jiao Da Onlly, a company in pharmaceutical industry, both have higher PM and lower ATO than industry averages, indicating that they are more of differentiators. When comparing values of real earnings management to industry averages, both companies show a significant lower amount of |RM| than the rest of the industry. On the other hand, those companies with typical characteristics of cost leaders, such as higher ATO and lower PM, tend to have higher amount of |RM| than industry averages, suggesting that these companies are more likely to use real earnings management than their peers to meet earnings targets. Such observations provide further support to our expectations.

Table V reports the correlation matrices for variables used in this study and indicate that there is a significantly positive correlation between |RM| and ATO, CHHI, CSHARE, ROA, LEV, and GROWTH, respectively, while not between |RM| and PM or SIZE.

5.2 Regression results

Tables VI and VII reports our regression results. Table VI describes the effects of business strategies on earnings management without integrating interactions terms into the models. Model 1 tests the effects of business strategies on earnings management. Model 2 integrates market competition variables into the regression analysis.

Both models show good explanatory powers over the variables. Model 1 shows that ATO exhibit a significantly positive relationship with |RM| at the 0.01 level ($p < 0.001$), indicating that cost leaders engage in a higher level of real earnings management, which supports our *H1*. While the coefficient of PM is significantly negative at the level of 0.01 ($p = 0.001$), indicating that differentiators use less real earnings management, which is consistent with our *H2*. These results hold strongly after adding the variables of market competitions.

Table VII introduces interaction variables between both business strategies and market competitions to test whether business strategies and market competitions can jointly affect earnings management, as proposed by *H3a* and *H3b*. To avoid the potential multicollinearity problems between interaction terms and other variables, we conduct the standardization process on the interaction terms (Miao *et al.*, 2014). The untabulated VIF values show that there are no multicollinearity problems in our sample. All four models have good explanatory powers on the variables.

Using Model 1 of Table VI, we test the combined effect of business strategies and industry competition on earnings management. Results show that the coefficient of ATO is significantly positive (coefficient = 0.228, $p < 0.001$), so does the coefficient of the interaction of ATO and CHHI (coefficient = 0.013, $p = 0.007$), supporting our *H3a*, indicating that when cost leaders face more severe industry-level competitions, their level of earnings management will be higher. On the other hand, while the coefficient of PM is significantly negative (coefficient = −0.321, $p < 0.001$), the coefficient of the interaction of PM and CHHI is not significant. This result indicates that the interaction

Variables	|RM|	ATO	PM	CHHI	CSHARE	ROA	LEV	GROWTH	SIZE
|RM|	1								
ATO	0.413***	1							
PM	0.025	−0.012	1						
CHHI	−0.064***	−0.189***	0.103***	1					
CSHARE	−0.158***	−0.313***	−0.029	−0.203***	1				
ROA	0.143***	0.200***	0.793***	0.099***	−0.098***	1			
LEV	0.070***	0.029	−0.409***	−0.098***	−0.237***	−0.381***	1		
GROWTH	0.269***	0.174***	0.203***	0.014	−0.117***	0.237***	0.066***	1	
SIZE	0.039	0.092***	0.043	−0.077***	−0.592***	0.026	0.431***	0.068***	1

Note: *, **, *** indicate significance at the level of 0.10, 0.05, and 0.01, respectively

Table V.
Pearson correlations

Table VI.
OLS regression of the effects of business strategies on earnings management: models without interactions between business strategies and market competitions

Independent variables	Predicted sign	Dependent variable: |RM| (1)	(2)
ATO	+	0.218*** (0.000)	0.222*** (0.000)
PM	−	−0.295*** (0.001)	−0.296*** (0.001)
CHHI	±		0.096 (0.326)
CSHARE	±		0.138 (0.536)
ROA	±	0.463** (0.010)	0.452** (0.013)
LEV	+	0.076* (0.052)	0.076* (0.051)
GROWTH	±	0.033* (0.059)	0.033* (0.062)
SIZE	±	0.015*** (0.010)	0.018** (0.011)
Year controls		Yes	Yes
_cons		0.073	0.022
		(0.533)	(0.878)
F		274.820	219.967
p		0.000	0.000
Adjusted R^2		0.523	0.523
Sample size		1997	1997

Notes: *, **, ***Represent significance at the level of 0.10, 0.05 and 0.01, respectively

Table VII.
OLS regression of the effects of business strategies on earnings management: full models with interactions between business strategies and market competitions

Independent variables	Predicted sign	Dependent variable: |RM| (1)	(2)	(3)	(4)
ATO	+	0.228*** (0.000)	0.223*** (0.000)	0.229*** (0.000)	0.228*** (0.000)
PM	−	−0.321*** (0.000)	−0.300*** (0.000)	−0.334*** (0.000)	−0.364** (0.019)
CHHI	±	0.075 (0.453)		0.097 (0.335)	0.098 (0.334)
CSHARE	±		−0.202 (0.484)	−0.251 (0.390)	−0.246 (0.400)
ATO × CHHI	+	0.013*** (0.007)		0.011** (0.032)	0.011** (0.031)
PM × CHHI	±	0.007 (0.311)		0.011 (0.157)	0.011 (0.154)
ATO × CSHARE	+		0.009** (0.025)	0.007* (0.070)	0.007* (0.073)
PM × CSHARE	±		−0.005 (0.353)	−0.007 (0.210)	−0.008 (0.222)
ATO × PM	±				−0.003 (0.812)
ROA	±	0.445** (0.015)	0.457** (0.012)	0.440** (0.017)	0.481* (0.057)
LEV	+	0.070* (0.074)	0.070* (0.073)	0.066* (0.091)	0.065 (0.101)
GROWTH	±	0.033* (0.064)	0.037** (0.036)	0.036** (0.040)	0.036** (0.040)
SIZE	±	0.015*** (0.009)	0.015** (0.043)	0.013* (0.064)	0.013* (0.062)
Year controls		Yes	Yes	Yes	Yes
_cons		0.072	0.081	0.113	0.112
		(0.536)	(0.583)	(0.443)	(0.449)
F		201.359	201.100	158.921	148.259
p		0.000	0.000	0.000	0.000
Adjusted R^2		0.525	0.524	0.526	0.525
Sample size		1997	1997	1997	1997

Notes: To avoid the multicollinearity issue, all interaction terms are standardized; the VIF values show no obvious multicollinearity problems; *, **, ***represent significance at the level of 0.10, 0.05 and 0.01, respectively

between market competitions and differentiation strategy does not affect earnings management further, which is consistent with our predication in *H3b*.

Model 2 of Table VII exhibit similar results after we use the other measure of market competition – CSHARE, a proxy for the internal competition within an industry. All of our hypotheses are supported, indicating that the internal competition within an industry has a similar impact as that of the between-industry competition on earnings management through its interactions with business strategies.

In Models 3 and 4, we combine Models 1 and 2 by integrating all the interaction terms of business strategies and market competitions into the test. In addition, we add the interaction between cost leadership strategy (ATO) and differentiation strategy (PM) to the regression Model 4 to measure the impact of a hybrid strategy. Similar results are obtained.

In summary, those firms that follow cost leadership strategy appear to be more likely to engage earnings management, which becomes even worse when there is a higher degree of market competitions. On the other side, those firms that follow differentiation strategy are less likely to engage earnings management, and the interaction of differentiation strategy and market competitions does not influence earnings management significantly.

5.3 Robustness tests

For the concern that it is possible for all firms in a given industry to adopt one particular type of business strategies, we do not include industry controls in our regression models, which is consistent with prior research (Banker *et al.*, 2011). This is also consistent with Porter's (1980) generic strategies that apply across industries.

Nevertheless, we perform robustness tests to examine whether the impacts of business strategies on earnings management will be the same after ruling out industry effects. Based on the recommendations by Sharp *et al.* (2013), we use the following two methods separately to control for industry effects:

(1) adding the industry average of ATO and PM as control variables in the regression models, which is suggested by Sharp *et al.* (2013) as a more appropriate method for controlling industry effects than using the difference between a firm's value and industry average; and

(2) integrating industry dummy variables into regression models, which is one of the most popular ways in management literature to control for industry effects.

After controlling for industry effects using both methods, we obtain similar regression results and find no changes to our findings.

5.4 Implications for management

Our results indicate that business strategy has a significant impact on the management's use of real earnings management to achieve certain financial goals. Companies adopting cost leadership strategy tend to be more likely to use real earnings management, while differentiators seem to be the opposite. Although earnings management may allow a firm to "achieve" its financial targets temporarily, it will result in a negative impact on the business future performance, hurting the company more in long-term run (Gunny, 2010). Considering the long-term health and success of a

company, management of cost leaders should consider using other approaches to achieve its financial goals.

Our descriptive results show that there are sufficient amount of companies that have adopted the differentiation strategy in China and seem to achieve financial goals equally successful without engaging earning management, which indicates the feasibility of differentiation strategy in China and management should be encouraged to use such a strategy or to consider using a hybrid strategy by integrating both to achieve its operational and financial goals.

6. Conclusions

In this study, we investigate the impacts of business strategies on earnings management using a sample of Chinese A-share listed companies of manufacturing industry from 2010 to 2012. Based on Porter's (1980) strategy typology, we divide business strategies into two generic categories: cost leadership and differentiation, and use real earnings manipulations to proxy for earnings management.

First of all, we examine the relationship between business strategies and earnings management, and find that business strategies have significant effects on earnings management. The cost leadership strategy is positively related to earnings management, indicating that those firms that follow cost leadership strategy tend to have higher level of earnings management. On the contrary, the differentiation strategy is negatively related to real earnings management, indicating that differentiators are less likely to engage earnings management.

These findings suggest that due to the lower profit margins and the higher need for external financing, cost leaders are under more pressures than other companies to meet earnings targets. When the regular ways of improving earnings through business operations are running out, the firms may seek for other opportunities such as engaging earnings management to achieve such objectives. Considering that regulators should pay more attention to the earnings quality of cost leaders and may need to consider ways of reducing the motivations for cost leaders to manage earnings such as through adjustments of special treatment and/or delisting rules. Another way is to establish more rules on the prevention of vicious price competitions or cost competitions such that to reduce the pressures and opportunities for cost leaders to manipulate their earnings.

Secondly, we perform our investigations further by testing the impacts of the interactions between business strategies and market competitions on a firm's engagement of earnings management. Our findings indicate that the level of earnings management of cost leaders gets worse when market competitions increases. On the other side, the level of earnings management of differentiators is not significantly affected by the increase of market competition. These findings suggest that although market competition may decrease the degree of information asymmetry which is one of the factors causing earnings management, it cannot totally nullify the effects of other factors on earnings management that are brought by competitions such as management compensation and financing need, especially in an environment of China stock market where firms may receive special treatments after consecutive years' losses.

It seems that the market competition is not inhibiting but instead increasing the earnings management of a firm. Such a situation is especially true when the firm is a cost leader. On the other side, we believe that the market competition has also increased the earnings management of differentiators such that the negative impact of the

differentiation strategy on earnings management has been offset by the positive influence of market competition. Considering these findings, regulators should improve and perfect the market so that the market plays its due roles. To prevent earnings management, the government could also consider strengthening its regulatory rules over industry competitions.

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Corresponding author

Peng Wu can be contacted at: wupeng76@seu.edu.cn