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盈餘管理、經理人預測及分析師預測: 以中國為例

Earnings Management, Management Forecasts and Analyst Forecasts: The Evidence from China

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中文摘要

本研究旨在探討中國上市公司是否以不同的盈餘管理方式操弄盈餘以避免達到強制經理人員預測門檻。分析師收集及分析公司資訊以提供予投資人參考。當分析師發布盈餘預測時，能否看穿公司操弄盈餘以避免達到強制預測門檻的行為，進而調整其盈餘預測，以反應真實資訊予投資人係一重要課題。因此，本研究檢視分析師盈餘預測錯誤與公司操弄盈餘以規避強制業績預告之關聯性。本研究亦檢視分析師追蹤人數對強制經理人員預測偏誤之影響。

本研究係以2010年至2012年中國上市公司為樣本，將強制業績預測門檻附近的公司視為潛在盈餘管理公司，並找配對公司進行比較。實證結果顯示，公司為避免強制業績預測，傾向操弄盈餘。此外，實證結果亦顯示分析師雖可以看穿公司使用裁決性應計項目操弄盈餘以避免強制預測，但卻無法看穿公司利用實質盈餘管理進行業外操弄。我們也發現當分析師追蹤人數增加時，經理人預測偏誤將減少。

關鍵詞：經理人員預測、盈餘管理、門檻、分析師預測

Abstract

The objective of this paper is to investigate whether firms manipulate reported earnings to avoid the threshold for mandatory management forecasts. Financial analysts are specialists in interpreting information about firms. Thus, we examine whether analysts discount appropriately for earnings management when they issue earnings forecasts for the firms. We also examine how analysts' coverage affects the extent of management earnings forecast bias.

We collect management forecasts of earnings issued by Chinese listed firms from 2010 to 2012. We find that firms which try to avoid mandatory management forecasts tend to manipulate earnings. These firms that manage earnings upward have unusual low cash flows from operations and unusual high net non-operating income. The empirical results indicate that analysts can see through firms use discretionary accruals to manipulate earnings upward to avoid mandatory forecasts. However, we do not find that analysts see through the real transaction earnings management. Furthermore, our results find that bias of management forecasts reduces when the number of analyst following increases.

Keyword: Management forecasts; Earnings management; Thresholds; Analyst forecast

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時間過得好快，還記得當初考上師大管理研究所的狂喜心情，現在卻已經到了研究所生涯的尾聲。這段求學期間最感謝的是我的指導教授陳慧玲老師，不管是一開始論文的選題、進度的規劃，還是每次論文討論的過程，老師總是能夠很耐心回答我的問題並提供豐富的建議，在論文接近完稿的最後，老師更是不厭其煩的為我檢視論文內容，促使本論文得以順利完成。在此想向我最愛的慧玲老師說聲：「老師，您辛苦了！謝謝您 !」。另外，我也想謝謝林孝倫教授在口試時的熱情提問和建議及林瑞青教授細心地指出論文不足的地方，讓本篇論文可以更臻完善。

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唐華祺謹誌

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1. Motivation

Management forecasts play an important role to convey managers' expectation on firms' future financial performance to investors.In most countries, firms issue voluntary forecasts; however, management forecasts are mandatory in some countries. For example, capital markets in China have not fully developed and market force cannot provide strong incentives for managers to provide forecasts voluntarily. Thus, the China Securities Regulatory Commission (CSRC) issue regulations requiring the listed firms to issue management forecasts when firms meet some criteria.

The underlying objective of regulations for mandatory management forecasts in China is to reduce information asymmetry between insiders and investors. The regulators hope that the earnings information for investment decisions can be improved through mandatory managementforecasts. However, the regulations for mandatory management forecasts create thresholds at zero profit and 50 percent earnings decrease. Extant literature finds that Chinese listed firms which turn losses or have at least 50 percent earnings decrease tend to manipulate earnings in order to avoid mandatory management forecasts (Huang et al., 2013).

Although Huang et al. (2013) provide the empirical results that the firms would like to manipulate earnings to avoid mandatory managementforecasts, they did not examinewhich methods companies use to manage earnings.Differentearnings management methods have different impacts on firms' future performance. For example, real activity manipulation is achieved by changing the timing or structuring of an operation, investment or financing transaction and will have suboptimal business consequences (Zang, 2012). Therefore, how firms use different earnings

management methods to avoid mandatory management forecasts is an important empirical issue. The objective of this paper is to investigate how firms use different earnings management methods to avoid the thresholds for mandatory management forecasts.

Jensen and Meckling (1976) indicate that analysts can be deemed to be external monitors of managers. When Chinese listed firms manipulate earnings to avoid mandatory disclosure threshold (i.e., avoid losses or 50 percent earnings decrease), analyst forecasts may reflect the earnings management. Prior studies find that Chinese use non-operating items or discretionary accruals to manipulate earnings (e.g., Chen and Yuan, 2004; Haw et al., 2005; Yu et al., 2006). Chinese firms may also use real activity management to avoid mandatory management forecasts. We conjecture that analysts can see through earnings management when firms use non-operating items to manipulate earnings. However,analysts may fail to fully adjust the magnitude affected by discretionary accruals or real activity management. The objective of this paper is to investigate whether analyst forecasts impound different earnings management methods which firms use to avoid losses or 50 percent earnings decrease.

The regulatory and legal costs of issuing biased management forecasts are relatively low in China (Song and Ji, 2012). Anecdotal evidence indicates that some firm managers issue biased forecasts upward and then revise their forecasts downward. Other firms provide downward biased forecasts and then revise the forecasts upward. If analysts fully understand managers' incentives to provide biased mandatory management forecasts, they should be able to incorporate information from management forecasts and correct their forecasts for the bias. Under this circumstance, firms may be less likely to issue biased mandatory management forecasts. On the

other hand, analysts face pressures to maintain good relationship with firm management for obtaining potential investment banking business or private information. Analysts may not incorporate information from management forecasts and correct their forecasts for the bias. In this paper, we examine whether analysts react to firms' biased management forecasts.

The empirical results demonstrate that firms are likely to use different earnings management methods to avoid mandatory management forecasts. Also, the results indicate that analysts can see through firms use discretionary accruals to manipulate earnings to avoid mandatory forecasts. However, analysts cannot see through the real transaction earnings management. Besides, the results show that bias of management forecasts reduces when the number of analyst following increases.

This study makes several contributions. First, we find that listed firms use different earnings management methods to avoid mandatory management forecasts. Second, we find that analysts play an important role in reducing managers' incentives to issue biased management forecasts. Management forecasts of firms which are covered by more analysts will be less biased.

The remainder of this paper is organized as follows. Section 2 describes institutional background of management forecasts and reviews the relevant literatures on. Section 3 develops our hypotheses. Section 4 describes the sample, variables and research methods. Section 5 presents both descriptive statistics and the results of the hypotheses tests. Section 6 provides a discussion of the implication derived from our results.

2. Institutional Backgroundand Literature Review

2.1 Institutional background of management forecasts

In order to protect investors and provide information to investors in China, the CSRC requires that the listed firms should provide management forecasts mandatorily when they meet some criteria. Chinese A-share firms have begun to provide mandatory management forecasts since 1998. In 1998, firms which suffer from three consecutive losses or one-year material losses need to issue mandatory management forecasts. In 2000, the regulators require firms expecting a one-year loss should make management forecasts within two months after December 31, 2000.

The regulations have been revised several times since 2001. In 2001, except a three-year continuous loss or a one-year material loss, firms which experience from loss to profits also need to provide management forecasts. Firms that anticipate a loss or a large decline in earnings also need to provide management forecasts before July 31, 2001. In addition, firms which expect earnings increase or decrease of at least 50 percent in net income compared to the previous year should issue management forecasts within 30 working days after December 31, 2001. According to the regulations for mandatory management in 2006, the listed company needs to issue mandatory management forecasts if they face the following situations: (1) turning loss; (2) turning profits; (3) earnings increase of at least 50%; (4) earnings decrease of at least 50%. In addition, firms need to provide management forecasts at quarterly basis.

2.2 Management Forecasts

2.2.1 Factors influencing management forecasts

Management forecasts are voluntary disclosures that provide information about firms' expected earnings. Thus, management forecasts can establish or alter market expectation for earnings, preempt litigation concerns, and affect managers' reputation for providing transparent information (Hirst et al., 2008). Hirst et al. (2008) indicate that forecast environment and forecaster characteristics affect whether managers may issue a forecast. Forecast environment includes legal and regulatory environment as well as analyst and investor environment. Forecaster characteristics include the extent of information asymmetry, prior forecasting behavior, proprietary costs, and managerial incentives.

Some studies examine how legal and regulatory environment affects the type of management forecasts and the channels that managers provide their forecasts. For example, Regulation Fair Disclosure (Reg FD) enacted in 2000 prohibits selective disclosure of material information by firms to certain analysts or investors. Before Reg FD, managers can privately provide earnings information to select analysts. After Reg FD, they need to choose between public disclosures or no disclosures. While large firms increase their voluntary disclosures such as management forecasts, small firms do not increase the frequency of preannouncements after Reg FD (Gomes et al., 2007). In fact, Ahmed and Schneible (2007) find that the quality of information for small firms and for high-tech firms deteriorates in the post-Reg FD period.

Except for forecast environment, forecaster characteristics also affect whether managers provide forecasts voluntarily. Prior literature finds that firms with high

information asymmetry tend to issue management forecasts. Coller and Yohn (1997) examine how the extent of information asymmetry affects managers' decisions to issue earnings forecasts. They also investigate whether management forecasts can reduce information asymmetry. They find that managers tend to issue forecasts when information asymmetry proxied by bid-ask spreads is large. They also find management earnings forecasts can reduce the extent of information asymmetry.

Hilary and Hsu (2011) examine whether managers become overconfident in their ability to forecast future earnings after a series of good predictions. They also investigate the impact of cognitive bias on credibility of management forecasts. The empirical results indicate that the management forecast errors are larger for managers who predict several quarters of earnings accurately. They also find that both investors and financial analysts would not have faith in the forecasts issued by managers who are overconfident.

2.2.2 Management forecast characteristics

Management forecast characteristics are properties or attributes of the earnings forecasts per se (Hirst et al., 2008, p.325). Mercer (2004) integrates four factors that influence the credibility of management disclosure; that is, situational incentives at the time of the disclosure, management's credibility, the degree of external and internal assurance, and characteristics of the disclosure. Mercer finds that disclosures are less credible when managers have stronger incentive to mislead investors. Investors tend to rely more on management disclosures as it provided accurate forecasts before. In addition, external assurance (e.g., auditor or analysts) and internal

assurance (e.g., audit committee or board of directors) increase the credibility of management disclosures. Mercer further indicates that the credibility of management disclosures are affected by degree of disclosure precision, time horizon covered by forward-looking disclosures, amount of supporting information for disclosure, and inherent plausibility of the information contained in disclosure.

Rogers and Stocken (2005) examine whether management forecasts bias is affected by the extent of investors' ability to assess the truthfulness of management earnings forecasts. They also investigate whether the market's response to management forecasts is consistent with investors identifying predictable bias in the forecasts. They find that the managers are more likely to issue biased forecasts when managers have incentives to self-interest and the market is unable to detect the misrepresentation. They also find that the market predicts the forecast bias from management earnings forecasts. Specifically, the market responds less positively to forecasts with greater predicted optimism and more positively to forecasts with greater predicted pessimism.

Jaggi et al. (2006) examine whether the disclosure regulations for Taiwanese IPO firms would lead to reveal more optimistic earnings forecasts. They also investigate whether firms manipulate reported earnings upwards to lower the forecast errors, especially the optimistic forecasts. They find Taiwanese IPO firms issue more optimistic forecasts after the disclosure regulation is imposed; particularly, when the ROA in the forecast year was expected to be higher than the ROA of the preceding year. They also find mandatory earnings forecast regulation may reduce the quality of reported earnings.

Kato et al. (2009) investigate the credibility of mandatory management forecasts. They also examine whether the forecast bias affects the credibility of the subsequent forecasts. They find that there may be an upward bias at the beginning of the year; however, managers may revise the forecasts downward to meet the earnings. They also find that investors would not trust the forecasts if the firms perform poorly or have issued overly optimistic forecasts in the past.

Gong et al. (2009) investigate the relationship between management earnings forecast errors and accruals. They find there is a significant and positive association between management earnings forecast errors and accruals; particularly, the positive relationship is stronger when the business environment is more uncertain and the covariation between accruals and growth-related activities is stronger. In contrast, the significantly positive relationship does not exist when managers have incentive to manipulate earnings. They also find that the existence of management earnings forecasts could not cut down pricing errors of the accrual-based hedge portfolio returns.

Merkley et al. (2013) examine how forecast disaggregation affects the credibility of management earnings forecasts. They also examine factors that influence the relationship between forecast disaggregation and the credibility of management earnings forecasts. They find that there is a positive relationship between forecast disaggregation and credibility of management forecasts. They also find that disaggregation plays an important role for financial analysts when earnings are difficult to forecast. Furthermore, they find the effect of disaggregation increases after Reg FD, especially for bad news forecasts.

2.2.3 The consequences of management forecasts

Prior literature finds that management forecasts can affect firms' stock price (Pownall et al.,1993), cost of capital (Leuz and Verrecchia, 2000), analysts' earnings forecasts (Baginski and Hassell, 1990), bid-ask spread (Coller and Yohn, 1997), or litigation risk (e.g., Cao and Narayanamoorthy, 2011).

Field et al. (2005) investigate whether disclosure deters or triggers litigation and explore the endogenous relation between disclosure and expected litigation risk. They provide evidence that disclosure deters certain types of litigation and litigation risk may affect firm disclosure policy. They find that firms with higher litigation risk are more likely to issue earnings warnings. Furthermore, they find that firms can lower the expected risk of being sued by early disclosures.

Cao and Narayanamoorthy (2011) investigate the relationship between litigation risk and management earnings forecasts. They also examine the impact of litigation risk on forecast characteristics including forecast horizon, amount of news revealed in a forecast, and forecast precision. They find that firms with bad news are more likely to issue a forecast than firms with good news when facing litigation risk. They also find that firms with higher litigation risk tend to issue bad news forecasts precisely, but reveal fewer inaccurate good news forecasts.

Choi et al. (2011) examine whether management earnings per share forecasts and their characteristics can reflect the information for future earnings. They find that the future earnings response coefficients (FERCs) are greater for firms to issue morefrequent and preciseannual or quarterly forecasts to the investors. They also find

that quarterly andshort-term forecasts have better connection between returns andfuture earnings than annual and long-term forecasts.

2.3 The relationship between management forecasts and analyst reports

Waymire (1986) examines the accuracy of analyst earnings forecasts before and after voluntary management earnings forecasts. Waymire finds that management forecasts are more accurate than prior analyst forecasts; however, the accuracy between management forecasts and posterior analyst forecasts are not significantly different.

Hassell et al. (1988) investigate whether the analysts' earnings forecasts are influenced by the release of management earnings forecasts. They also examine the relative magnitude of changes in analyst forecast errors by comparing two samples of firms. They find that compared to firms without management forecasts, analyst forecast errors are smaller for firms which issues management earnings forecasts. They also find that analyst revisions are influenced by ex-post accuracy and manager's credibility.

Baginski and Hassell (1990) investigate the relation between management earnings forecasts news and financial analysts' subsequent earnings forecast revisions. They also examine whether the timing of forecast disclosure influence the information in pricing. They find that financial analysts revise their forecasts based on security price responded to management forecast. They also find that the timing of forecast disclosure will unintentionally affect the earnings and price variation, especially for

bad news. Furthermore, they point out that there is a greater relevance between forecast news and analysts' revisions, especially in the fourth quarter.

Williams (1996) investigates whether the relation between prior voluntary earnings forecasts by management and follow-up analyst forecast revisions. Williams also investigates whether the accuracy of prior earnings forecasts issued by management influences the belief of analysts. He finds that prior earnings forecasts issued by management affect how an analyst responds to the management forecasts subsequently. He concludes that management forecasting "reputation" is an important factor to analyst forecast revisions.

2.4 Management forecasts in China

Huang et al. (2013) examine mandatory and voluntary management forecasts in China. They find that about 81-90% of firms in the mandatory forecast regime issue management forecasts while 18-22% of firms in the voluntary regime issue management forecasts. They also find that state-owned enterprises are less likely to provide voluntary forecasts but comply with mandatory requirements for providing forecasts. Furthermore, they provide evidence that mandatory forecasts are less timely and precise than voluntary forecasts.

Song and Ji (2012) examine whether the enforcement actions for irregular management forecasts are selective. They also examine whether the effects of the enforcement actions meet expectations during the period from 2002 to 2009. They find forcement actions by securities regulators are selective. They also find, compare

to the firms with lower survival probability, the firms with higher survival probability reach better forecast accuracy. They further indicate that a firm will be punishedfor irregular management forecasting is significantly related to proxies for survivalrates.

Song et al. (2013) examine the supervisory efficiency of independentdirectors in companies about information disclosure. They also examine factors that affect mandatory management forecasts and voluntary management forecasts. They find that independent directors cannotinfluence the management forecast bias or error but can enhance the precision of management forecasts for firms with lower ownership balance. Furthermore, there is a negative effect on the quality of management forecasts either with high ownership balance or independent directors with industrial or corporate governance backgrounds.

2.5 Earnings management

Healy and Wahlen (1999) provide the definition of earnings management. They indicate that managers can manipulate earnings by using judgment in financial reporting or by structuring transactions. Earnings management lets stakeholders mislead about the true performance of the firms or may influence the contractual results which are based on the reported accounting number.

Some studies focus on the factors which influence managers' incentives to manipulate earnings (e.g., Burgstahler and Dichev, 1997; Chen and Yuan, 2004; DeAngelo, 1998; Healy 1985; Teoh et al., 1998). Other studies focus on which methods the firms use to manipulate earnings (e.g., Cohen et al., 2008, 2010;

Roychowdhury, 2006; Teoh et al., 1998; Zang, 2012).

About earnings management methods, some studies focus on discretionary accruals (e.g., Teoh et al., 1998). Except discretionary accruals, managers have also incentives to use real activities to manipulate earnings. Roychowdhury (2006) examines whether managers manipulate real activities to avoid reporting annual losses. He uses cash flows from operating activities, production costs, and discretionary expenses to detect real activities manipulation around the zero earnings threshold. He finds that managers use price discount, overproduce, and reduce discretionary expense to meet zero earnings. He also finds the evidence that some firms would likely to use real activities manipulation to meet annual analyst forecasts.

Cohen et al. (2008) investigate the prevalence of both accrual-based and real earnings management activities before and after passage of Sarbanes Oxley Act. They find that firms switched from accrual-based to real earnings management methods after the passage of Sarbanes Oxley Act. They also find that the increases in accrual-based earnings management in the period preceding Sarbanes Oxley Act are concurrent with increases in the fraction of equity based compensation.

Zang (2012) examines whether managers use real activities manipulation and accrual-based earnings management as substitutes in managing earnings. He investigates real activities manipulation through overproduction and cutting discretionary expenditures. He finds that managers trade off the two earnings management methods based on their relative costs. Besides, managers control the level of accrual-based earnings management according to the level of real activities manipulation realized.

Prior literature finds that Chinese listed firms use different earnings management to achieve the specific threshold such as 10 percent of return on equity for applying rights issues or no losses for not delisting. Chen and Yuan (2004) investigate whether earnings management reduces the effectiveness of a regulation to guide capital to more efficient sectors of the economy. They also examine whether this consequence is connected to the regulators' scrutiny of earnings management in the approval process. They find that Chinese regulators are easier to find firms manipulating earnings by using excess amounts of non-operating income to reach 10 percent hurdle.

Haw et al. (2005) examine whether Chinese listed firms manage earnings to meet regulatory benchmarks. They also investigate whether regulators and investors consider the quality of earnings in their respective regulatory and investment decisions. They find that investors distinguish the quality of earnings and put less value on earnings suspected of a greater degree of management. Furthermore, they imply that the regulatory bodies and investors to some extent make rational adjustments for the quality of earnings.

Yu et al. (2006) examine the earnings management at two ROE thresholds (6% and 10%) in response to regulatory changes by using distribution approach. They find that Chinese firms engage in earnings management to meet the rights issue thresholds during the period 1994-2002. They also find that earnings management around the regulatory thresholds is very pervasive and the non-core income appears to be an important may for earnings management in China.

3. Hypotheses

3.1 Earnings management and management forecasts

According to the regulations for mandatory management forecasts issued by the CSRC, the listed company in China needs to issue mandatory management forecasts if they face the following situations: (1) turning loss; (2) turning profits; (3) at least 50% earnings increase; (4) at least 50% earnings decrease. Thus, the regulations for mandatory management forecasts create thresholds at zero profit and 50 percent of earnings changes.

Extant studies find that managers have incentive to manipulate earnings around the thresholds such as zero profits or no earnings changes (Burgstahler and Dichev, 1997; Degeorge et al., 1999). Huang et al. (2013) find that stock prices react the mandatory management forecasts in China. When firms provide mandatory management forecasts disclosing expectation to turn losses or earnings to decline at least 50 percent, the stock prices may decline. To maintain the stock prices, firm managers have incentives to manipulate earnings to avoid providing such bad news.

Existing literature finds that Chinese listed firms use non-operating items or accruals to manipulate earnings in order to apply rights issues (e.g. Chen and Yuan, 2004; Haw et al., 2005; Yu et al., 2006). Prior literature finds that firms manipulate earnings through real activities manipulation (e.g. Cohen et al., 2008; Roychowdhury, 2006; Zang, 2012). Therefore, we expect that Chinese listed firms may use different earnings management to avoid mandatory management forecasts for turning losses and earnings decrease.

The following hypothesis summarizes our expectation:

H1: Managers of listed companies use different earnings management methods to avoid issuing mandatory management forecasts for turning losses or earnings decrease.

3.2 Management forecasts and analyst forecasts

Healy and Palepu (2001) indicate that information intermediaries (e.g., financial analysts or rating agencies) in private information production that may help detect managers' misbehavior. Analysts may react to firms which manipulate earnings to avoid mandatory management forecasts. Extant studies find that Chinese listed firms use different methods to manipulate earnings such as non-operating items (e.g., Chen and Yuan, 2004; Haw et al., 2005; Yu et al., 2006), discretionary accruals (Haw et al., 2005). We conjecture that analysts can see through earnings management when firms use non-operating items to manipulate earnings.

However, some studies suggest that investors and analysts fail to fully understand the implications of accruals for future earnings (Bradshaw et al., 2001; Sloan, 1999). Roychowdhury (2006) indicates that compared to discretionary accruals, real activities management could sustain for longer time and do not cause the regulators' attention. We conjecture that analysts cannot discount sufficiently for accruals and real transactionearnings management. The following hypotheses summarize our expectation:

H2a: Analysts can see through firms' earning management using non-operating items to avoid mandatory management forecasts.

H2b: Analysts cannot see through firms' earning management using discretionary accruals to avoid mandatory management forecasts.

H2c: Analysts cannot see through firms' earnings management using realtransactionmanipulation to avoid mandatory management forecasts.

Because the regulatory and legal costs of biasing forecasts are relatively low in China, many Chinese listed firms tend to issue biased mandatory management forecasts. If analysts fully understand managers' incentives to provide biased mandatory management forecasts, they should be able to incorporate information from management forecasts and correct their forecasts for the bias (Yu et al., 2006). Under these circumstances, firms may miss analysts' consensus forecasts. Firms may be likely to issue biased mandatory management forecasts. Thus, management forecast bias may reduce when number of analyst following increases.

On the other hand, analysts may have incentives to cater with management in order to obtain future investment banking business or obtain private information directly from managers (e.g., Dugar and Nathan, 1995; Lim, 2001; Lin and McNicholes, 1998). They may also be under the pressures from the clients of their brokerage houses. Analysts may be less likely to revise earnings forecasts to reflect the biased management forecasts. Under this circumstance, the management forecast bias will not decrease when analyst coverage increases. Thus, two competing hypotheses are summarized as follows:

H3a: Bias ofmanagement forecasts willreducewhen the number of analyst following increases.

H3b: Bias of management forecasts will not decrease when the number of analyst following increases.

4. Research Method

4.1 Sample

We focus on the A-shares of listed companies which provide management forecasts from 2010 to 2012. Financial listed companies are excluded from this study due to the special accounting system employed by those firms. Management forecasts, financial data, and analyst earnings forecasts are obtained from *China Stock Market and Accounting Research* (CSMAR) and firms' annual reports.

4.2 Earnings management variables

According to prior literature, we use non-operating items, discretionary accruals and real transaction management to proxy earnings management.

Net non-operating income

Net non-operating income is computed as non-operating income minus non-operating losses. The net amount of non-operating income (losses) is then divided by sales revenue at the end of year.

Discretionary accruals

Similar to Kothari et al. (2005), total accruals are estimated for each industry-year grouping as follows:

$$\frac{TA_{jt}}{Asset_{j,t-1}} = \beta_0 + \beta_1 \frac{1}{Asset_{j,t-1}} + \beta_2 \frac{\left(\Delta Sales_{j,t}\right)}{Asset_{j,t-1}} + \beta_3 \frac{PPE_{j,t}}{Asset_{j,t-1}} + \beta_4 ROA_{j,t} + \varepsilon_{j,t} \quad (1)$$

where

$TA_{j,t}$ = Total accruals for company j at year t.

$Asset_{j,\,t-1}$ = Total assets for company *j* at the end of year *t-1*.

$\Delta Sales_{j,t}$ = Change in sales for company *j* at year *t*.

$PPE_{j,t}$ = Gross property, plant and equipment for company *j* at the end of year *t*.

$ROA_{j,t}$ = Return on assets for company *j* at year *t*.

The coefficients from equation (1) are used to estimate the firm-specific non-discretionary accrual (*NDA*) for our sample firms:

$$NDA_{j,t} = +\hat{\beta}_1 \frac{1}{Asset_{j,t-1}} + \hat{\beta}_2 \frac{\left(\Delta Sales_{j,t} - \Delta AR_{j,t}\right)}{Asset_{j,t-1}} + \hat{\beta}_3 \frac{PPE_{j,t}}{Asset_{j,t-1}} + \hat{\beta}_4 ROA_{j,t} \ldots (2)$$

where

$\Delta AR_{j,t}$= Change in accounts receivable for company *j* at year *t*.

Finally, discretionary accruals (*DA*) are computed as follows:

$$DA_{j,t} = \frac{TA_{j,t}}{Asset_{j,t-1}} - NDA_{j,t} \ldots . (3)$$

where

$DA_{j,t}$=Total discretionary accruals for company *j* at year *t*.

Real transaction management

Following Roychowdhury (2006), we consider the abnormal levels of cash flows from operations, discretionary expenses, and production costs to measure the level of real transaction management. We first compute the normal levels of cash flows from operations, expenses, and production costs using the models used in

Roychowdhury (2006). To estimate normal cash flows from operations, we use the following cross-sectional regression for each industry and year:

$$\frac{CFO_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \beta_1 \frac{Sales_{j,t}}{Asset_{j,t-1}} + \beta_2 \frac{\Delta Sales_{j,t}}{Asset_{j,t-1}} + \varepsilon_{j,t} \ldots (4)$$

where

$Sales_{j,t}$= The sales of company *j* at year *t.*

$\Delta Sales_{j,t}$= Changes in sales revenue for company *j* at year *t.*

Abnormal cash flows from operation (*ABCFO*) is actual cash flows from operations minus normal level of CFO calculated using the estimated coefficients from equation (4).

The inventory growthis estimated as follows,

$$\frac{INV_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \beta_1 \frac{\Delta Sales_{j,t}}{Asset_{j,t}} + \beta_2 \frac{\Delta Sales_{j,t-1}}{Asset_{j,t-1}} + \varepsilon_{j,t} \ldots (5)$$

where $INV_{j,t}$ is the inventory growth for company *j* at the year *t*.

The level of cost of goods sold (*COGS*) is computed as follows,

$$\frac{COGS_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \beta_1 \frac{Sales_{j,t}}{Asset_{j,t-1}} + \varepsilon_{j,t} \ldots (6)$$

where $COGS_{j,t}$ is cost of goods sold for company *j* at the year *t*.

The normal levels of production costs are estimated as follows,

$$\frac{PROD_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \beta_1 \frac{Sales_{j,t}}{Asset_{j,t-1}} + \beta_2 \frac{\Delta Sales_{j,t}}{Asset_{j,t-1}} + \beta_3 \frac{\Delta Sales_{j,t-1}}{Asset_{j,t-1}} + \varepsilon_{j,t} \text{..(7)}$$

where $PROD_{j,t}$ is production costs for company *j* at the year *t*.

Abnormal level of production costs (*ABPROD*) is actual production costs minus normal level of production cost calculated using the estimated coefficients from equation (7).

We estimate the levels of normal expenses (*SGA*) using equation (8),

$$\frac{SGA_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Asset_{j,t-1}} + \beta_1 \frac{Sales_{j,t-1}}{Asset_{j,t-1}} + \varepsilon_{j,t} \text{ .....(8)}$$

where $SGA_{j,t}$ is the sum of general and administrative expenses and selling expenses for company *j* at year *t*.

Abnormal level of expenses (*ABSGA*) is actual expenses minus normal level of expenses calculated using the estimated coefficients from equation (8). According to Cohen et al. (2008), the levels of real transaction management (*RM*) are computed as the sum of the standardized *ABCFO*, *ABPROD*, and *ABSGA*.

4.3 Research Model

4.3.1 Earnings management and management forecasts

We hypothesize that listed companies' managers may have incentives to use different earnings management methods to avoid mandatory management forecasts (H1). First, we use the cross-sectional of earnings and earnings change to examine whether firms have incentives to avoid mandatory management forecasts. According to Burgstahler and Dichev (1997), the cross-sectional distributions of earnings and earnings change are not smooth if earnings management exists. Thus, we present graphical evidence in the form of histograms of the pooled cross-sectional empirical distributions of earnings change and levels of earnings scaled by beginning-of-the-year total assets for listed companies.

The cross-sectional distributions will be relatively smooth in the absence of earnings management. However, if managers have incentive to manage earnings to avoid the thresholds of mandatory management forecasts, we expect that unusually low frequencies of firms will fall just below the threshold (i.e., zero profits and unusually high frequencies of firms just above it). We choose the observed number of firms at some small interval just above the zeroand below 50 percent earnings decrease. The observations for those companies whose earnings scaled by beginning-of-the-year total assets are between 0 and 0.02 are regarded as potential earnings management firms. The observations for those companies whose earnings change scaled by beginning-of-the-year total assets are between -0.4999 and -0.4000 are regarded as potential earnings management firms.

We also choose a set of matched firms based on the following criteria:

1. Matched firms should be at the same industry as observed firms.
2. Firms do not suffer from losses within two years of management forecast date.
3. Firms do not apply rights issues, seasoned offerings, or private placements.

4. Firms do not issue management forecasts.
5. Firms have similar size.

We use t-test and Wilcoxon test to examine whether the earnings management are different between potential earningsmanagement firms and the matched firms. We alsouse the following equation to H1:

$$EM_{j,t} = \delta_0 + \delta_1 Potential_{j,t} + \delta_2 Size_{j,t} + \delta_3 Institute_{j,t} + \delta_4 Lev_{j,t} + \sum \delta_k Year_k + \varepsilon_{1j,t} \quad \ldots\ldots(9)$$

where

$EM_{j,t}$= The level of earnings management for company *j* at the year *t.* We use discretionary accruals, real transaction management and non-operating items divided by total assets to proxy earnings management

$Potential_{j,t}$= A dummy variable that equals one if company *j* is a potential earnings management firm at year *t*, and zeroif company *j* is a matching firm.

$Size_{j,t}$ = Natural logarithm of total assets for company*j*at the end of year*t*.

$Institute_{j,t}$ =The percentage of shares held by institutional investors for company *j*at the end of year *t*.

$Lev_{j,t}$= Total liability divided by total assets for company *j*at the end of year *t*.

4.3.2 Management forecasts and analyst forecasts

We conjecture that analysts may see through whether a company conducts earning management using non-operating items (H2a). We also expect that analysts cannot see through whether firms manipulate earnings using discretionary accruals or

real transaction activity (H2b and H2c). We use the following equation to examine H2:

$$AFE_{j,t} = \gamma_0 + \gamma_1 EM_{j,t} + \gamma_2 Potential_{j,t} + \gamma_3 EM * Potential_{j,t} + \gamma_4 Size_{j,t} + \gamma_5 Volatility_{j,t} + \gamma_6 Following_{j,t} + \sum \delta_k Year_k + \varepsilon_{2\,j,t} \quad \text{.....(10)}$$

where

$AFE_{j,t}$= The absolute forecast error for analysts who follows company *j* in year *t*. Forecast error is computed as the difference between actual earnings per share and analysts' forecasts scaled by the stock price.

$Volatility_{j,t}$=Standard deviation of earnings for company *j* in the previous three years.

$Following_{j,t}$=The number of analysts following for company *j* at year *t.*

We use the following equation to examine H3a and H3b:

$$Bias_{j,t} = \gamma_0 + \gamma_1 Following_{j,t} + \gamma_2 Size_{j,t} + \gamma_3 Growth_{j,t} + \gamma_4 Institute_{j,t} + \gamma_5 Volatility_{j,t} + \sum \delta_k Year_k + \varepsilon_{j,t} \quad \text{..... (11)}$$

where

$Bias_{j,t}$=Management forecasts bias for company *j*at the end of year *t*. Management forecast bias is computed as the difference between management forecasts and actual net income scaled by the beginning-of-the-year total assets.

$Growth_{j,t}$=Book to market ratio for company *j* at year *t.*

5. Empirical Results

5.1 Descriptive statistics

Panel A of Table 1 presents a summary of the sample selection process. The original sample obtained from the CSMAR database between 2010 and 2012 are 7,241 firm-year observations. Due to the special nature, B-shares, small and medium-sized board and ChiNext market are eliminated. The financial structure of financial industry is distinctly different from other industries. We also exclude firms in financial industry. There are 4,588 firm-year observations after we eliminate B-shares and firms in financial industry. Furthermore, we exclude missing value observations. We have 4,319 firm-year observations available. Panel B of Table 1 shows the distribution of years to which our sample belongs. The number of firms in "machinery and equipment" industry is 684. The number of firms in "Chemicals" is 504.

We also choose listed firms whose earnings are just higher zero or earnings changes are just smaller than -50 percent. We think that such firms may use earnings management to avoid mandatorily disclosing management forecasts. These firms are regarded as Potential firms. The number of Potential firms is 458. Because we need to find matching firms, some industries are too small to find matching firms. Therefore, we delete those industries that the sample number is less than 10. The final sample in subsequent research is 411.

Table 1: Sample selection and distribution by industry

Panel A: Sample selection	
Criterion	Number of firms
Data available in CSMAR database	7241
Data available after eliminating B-shares, small and medium-sized board, ChiNext market and firms in financial industry	4588
Data available after eliminating missing value	4319

Panel B: Distribution of sample firms by industry		
Industry		Number of firms
A	Agriculture, forestry, and fishery	28
B	Metal mining	61
C1	Food processing and textile	293
C2	Lumber and wood	3
C3	Paper and allied products	75
C4	Chemicals	504
C5	Electronics	207
C6	Metal products	380
C7	Machinery and equipment	684
C8	Medicine and biological products	193
C9	Other manufacturing	16
D	Utilities	119
E	Construction	69
F	Wholesale	69
G	Transportation	252
H	Retail trades	161
J	Estate development and operation	188
K	Hotels and tourism	104
L	Leasing and commerce service	17
M	Conglomerates	59

Note: Panel A presents a summary of the sample selection process. Panel B presents the distribution of sample observations by industry. The classification of industry is based on Chinese Securities Regulatory Commission.

Panel A of Table 2 shows the number of firms which provide mandatory or voluntary management forecasts. The number of firms issuing mandatory management forecasts varies from 534 to 638. The number of firms issuing management forecasts voluntarily increases from 205 in 2010 to 525 in 2012. Panel B presents the distribution of management forecast type. In 2010, the results indicate that 338 firms belong to "50% increase" category and 113 firms belong to "turning lossto profits" category. About 73.57 percent of firms which issue mandatory management forecasts report good news. However, the number of firms in "turning loss to profits" category and "50% decrease" category decrease from 2010 to 2012.

We combine "turning loss" and "still loss" into "turning loss" category. The number of firms that turning profits to loss is 67 and the number of firms that still loss is 31. Similarly, the number of firms that turning profits to loss is 87 and the number of firms that still loss is 32 in 2011 while the number of firms that turning profits to loss is 144 and the number of firms that still loss is 33 in 2012.We find the number of firms that turning losses increase from 2010 to 2012. We also find that the number of firms in "decrease 50%" increase from 2010 to 2012. Moreover, the "others" category includes "uncertain", "increase less than 50%", or "decrease less than 50%". Firms in this category are classified as voluntary forecasters.

Panel C shows the distribution of management forecast format. Most of firms provide management forecasts by using closed interval format. The number of firms using closed interval increase from 485 in 2010 to 906 in 2012. In contrast, the number of firms using open interval decreases.

Table 2: Distribution of management forecasts

Panel A: Distribution of mandatory and voluntary management forecasts

Year	Number of listed firms	Number of firms provided mandatory management forecasts	Number of firms provided voluntary management forecasts
2010	1883	613	205
2011	2008	534	323
2012	2074	638	525

Panel B: Distribution of cases meeting the criteria of mandatory management forecast

Year	Turning losses	Turning losses to profits	50% decrease	50% increase	others
2010	98	113	64	338	205
2011	119	61	125	229	323
2012	177	94	199	168	525

Panel C: Distribution of management forecast format

Year	Point estimate	Closed interval	Opened interval	Qualitative
2010	125	485	116	92
2011	103	568	106	80
2012	132	906	53	72

Note: According to regulations, there are four criteria that firms need to issue mandatory management forecast. Four criteria include "turning losses", "turning losses to profits", "50% decrease", and "50% increase". Point estimate indicates that firms provide one figure only. Closed interval indicates that firms have both higher and lower limit. Opened interval indicates that firms have only higher or lower limit.

The descriptive statistics of variables for firms issuing management forecasts in our analyses are presented in Table 3. The mean and median of *SIZE*are 21.830 and 21.707 in 2010, 21.990 and 21.867 in 2011 and 21.953 and 21.791 in 2012. *LEV* is the ratio of total liabilities to total assets.The mean and median of *LEV* is 0.546 and 0.521, respectively in 2010, 0.537 and 0.522 in 2011 and 0.488 and 0.426 in 2012.The average percent of shares held by institutional shareholders (*Institute*) is 0.061 while

the median is 0.024 in 2010. We find there are not a large range of these number changed in 2010 to 2012.

The mean and median of *Volatility* is 0.197 and 0.127 in 2010, respectively. The mean discretionary accrual (*DA*) is -0.003 in 2010, -0.002 in 2011, and -0.002 in 2012. The mean (median) *ABCFO* is 0.003 (0.008), 0.006 (0.010), and 0.008 (0.009) from 2010 to 2012. The mean and median *ABPROD* is -0.006 and 0.137 in 2010, -0.006 and -0.009 in 2011, and -0.007 and -0.009 in 2012. The mean and median *ABSGA* is 0.006 and 0.003 in 2010, 0.007 and 0.003 in 2011 and -0.007 and -0.009 in 2012. The average *RM* is 0.003 while the median RM is 0.005 in 2010, 0.007 and 0.008 in 2011, 0.008 and 0.010, respectively in 2012.

Table 3: Descriptive statistics of variables for firms issuing management forecasts

Panel A: 2010 (n=1,273)					
	Mean	Standard deviation	Median	Q1	Q3
Size	21.830	1.305	21.707	20.947	22.594
Lev	0.545	0.507	0.523	0.368	0.661
Institute	0.061	0.087	0.024	0.002	0.086
Volatility	0.196	0.227	0.127	0.057	0.251
DA	-0.003	0.117	-0.002	-0.064	0.053
ABCFO	0.003	0.105	0.008	-0.044	0.062
ABPROD	-0.006	-0.014	0.137	-0.076	0.055
ABSGA	0.006	0.070	0.003	-0.020	0.027
RM	0.003	0.119	0.005	-0.048	0.052
Net non-operating income	0.058	0.807	0.005	0.001	0.015
Panel B: 2011 (n=1,358)					
	Mean	Standard deviation	Median	Q1	Q3
Size	21.990	1.314	21.867	21.075	22.737
Lev	0.537	0.342	0.521	0.365	0.662
Institute	0.053	0.081	0.017	0.002	0.071
Volatility	0.186	0.206	0.127	0.058	0.241
DA	-0.002	0.109	-0.003	-0.061	0.052
ABCFO	0.006	0.091	0.010	-0.040	0.058
ABPROD	-0.006	0.119	-0.009	-0.065	0.051
ABSGA	0.007	0.071	0.003	-0.021	0.030
RM	0.007	0.102	0.008	-0.046	0.055
Net non-operating income	0.032	0.345	0.005	0.001	0.016

Table 3 (Continued)

Panel C: 2012 (n=1,676)					
	Mean	Standard deviation	Median	Q1	Q3
Size	21.953	1.290	21.791	21.050	22.697
Lev	0.488	0.481	0.426	0.309	0.642
Institute	0.012	0.033	0.000	0.000	0.003
Volatility	0.208	0.264	0.131	0.061	0.257
DA	-0.002	0.110	0.001	-0.053	0.053
ABCFO	0.008	0.088	0.009	-0.036	0.056
ABPROD	-0.007	0.111	-0.009	-0.060	0.045
ABSGA	0.008	0.069	0.004	-0.018	0.029
RM	0.008	0.103	0.010	-0.039	0.052
Net non-operating income	0.015	0.199	0.006	0.001	0.018

Note: This table reports the descriptive statistics ofall firms which issue management forecasts. Panel A exhibits descriptive statistics in 2010. Panel B exhibits descriptive statistics in 2011, and Panel C exhibits descriptive statistics in 2012. *Size*= the natural logarithm of total assets. *Lev* = total liability divided by total assets. *Institute* = the percent of shares held by the institutional investors. *Volatility* =Standard deviation of earnings for company *j* in the previous three years. *DA*= the discretionary accruals which are calculated based on themodel proposed by Kothari et al. (2005). *ABCFO*= the abnormal cash flows from operation, which is equal toactual cash flows from operations minus normal level of CFO. *ABPROD*= abnormal level of production costs, which isequaltoactual production costs minus normal level of production cost. *ABSGA*= abnormal level of expenses which is equal to actual expenses minus normal level of expenses. *RM*= the sum of*ABCFO*, *ABPROD*, and *ABSGA*. Net non-operating income=net non-operating income divided by sales revenue.

The descriptive statistics of variables for firms using earnings management to avoid mandatory management forecasts in our analyses are presented in Table 4. The mean and median *SIZE* are 21.525 and 21.351 in 2010, 21.776 and 21.865 in 2011 and 21.884 and 21.804 in 2012. The mean and median *Institute* are 0.024 and 0.066 in 2010, 0.022 and 0.028 in 2011 and 0.020 and 0.004 in 2012. The mean and median *Volatility*are 0.280 and 0.178 in 2010, 0.183 and 0.150 in 2011 and 0.273 and 0.185 in 2012. The mean and median of *Bias* are all close to -0.01 from 2010 to 2012, so that

management forecasts bias is similar in these years. The mean and median *Growth* are 0.526 and 0.544 in 2010, -0.706 and 0.719 in 2011 and 0.729 and 0.751 in 2012. The results indicate that the book to market ratio for company is increasing.

The mean *DA* is larger for firms which use earnings management to avoid the mandatory forecasts than that of firms which issue mandatory management forecasts in 2010 and 2012. The mean *DA* is smaller than that of firms which issue mandatory management forecasts in 2011. The mean and median *ABCFO* is -0.015 and -0.015 in 2010, -0.020 and -0.013 in 2011 and 0.002 and -0.003 in 2012. The mean and median *ABPROD* is 0.005 and 0.002 in 2010, 0.039 and 0.019 in 2011 and 0.012 and -0.001 in 2012. The mean and median *ABSGA* is -0.014 and 0.057 in 2010, -0.017 and -0.006 in 2011 and -0.003 and -0.002 in 2012.The mean and median of *RM* is -0.024 and -0.003, respectively in 2010, while 0.002 and 0.008 separately in 2011 and 0.011 and 0.102 in 2012.

Table 4: Descriptive statistics of variables for firms using earnings management to avoid forecasts

Panel A: 2010 (n=39)					
	Mean	Standard deviation	Median	Q1	Q3
Size	21.525	1.447	21.351	20.621	22.265
Lev	0.490	0.192	0.455	0.351	0.642
Institute	0.024	0.003	0.066	0.000	0.023
Volatility	0.280	0.270	0.178	0.087	0.473
Bias	-0.008	0.009	-0.006	-0.013	-0.002
Growth	0.526	0.252	0.544	0.283	0.636
DA	-0.008	0.107	0.005	-0.076	0.068
ABCFO	-0.015	0.060	-0.015	-0.056	0.025
ABPROD	0.005	0.115	0.002	-0.046	0.073
ABSGA	-0.014	-0.006	0.057	-0.028	0.013
RM	-0.024	0.087	-0.003	-0.076	0.039
Net non-operating income	0.011	0.085	0.005	-0.002	0.013
Panel B: 2011 (n=111)					
	Mean	Standard deviation	Median	Q1	Q3
Size	21.776	1.056	21.865	20.932	22.509
Lev	0.523	0.185	0.514	0.405	0.653
Institute	0.022	0.007	0.028	0.001	0.038
Volatility	0.183	0.131	0.150	0.083	0.251
Bias	-0.010	0.008	-0.012	-0.017	-0.005
Growth	0.706	0.259	0.719	0.493	0.855
DA	-0.028	0.121	-0.029	-0.084	0.027
ABCFO	-0.020	0.084	-0.013	-0.066	0.033
ABPROD	0.039	0.103	0.019	-0.018	0.079
ABSGA	-0.017	0.051	-0.006	-0.038	0.013
RM	0.002	0.091	0.008	-0.049	0.043
Net non-operating income	0.019	0.078	0.005	0.006	0.015

Table 4 (Continued)

Panel C: 2012 (n=151)					
	Mean	Standard deviation	Median	Q1	Q3
Size	21.884	1.213	21.804	21.160	22.804
Lev	0.482	0.203	0.510	0.324	0.631
Institute	0.020	0.034	0.004	0.000	0.022
Volatility	0.273	0.311	0.185	0.106	0.312
Bias	-0.012	0.008	-0.012	-0.018	-0.006
Growth	0.729	0.242	0.751	0.591	0.905
DA	-0.017	0.097	-0.009	-0.073	0.043
ABCFO	0.002	0.078	-0.003	-0.043	0.032
ABPROD	0.012	0.078	-0.001	-0.032	0.040
ABSGA	-0.003	0.055	-0.002	-0.021	0.018
RM	0.011	0.009	0.102	-0.045	0.040
Net non-operating income	0.018	0.034	0.010	0.003	0.023

Note:Table 4 presents the descriptive statistics of variables for firms which use earning management to avoid mandatory earnings forecasts. *Size* = the natural logarithm of total assets. *Lev* = total liability divided by total assets. *Institute* = the percent of shares held by the institutional investors. *Volatility* = Standard deviation of earnings for company *j* in the previous three years. Bias = Management forecasts bias for company *j* at the end of year *t*. Growth =Book to market ratio for company *j* at year *t. DA* = the discretionary accruals which are calculated based on themodel proposed by Kothariet al. (2005). *ABCFO* = the abnormal cash flows from operation, which is equal to actual cash flows from operations minus normal level of CFO. *ABPROD* = abnormal level of production costs, which isequal to actual production costs minus normal level of production cost. *ABSGA* = abnormal level of expenses which is equal to actual expenses minus normal level of expenses. *RM* = the sum of*ABCFO*, *ABPROD*, and *ABSGA*. Net non-operating income = net non-operating income divided by sales revenue.

Table 5 presentsthe descriptive statistics of matching firms in 2010, 2011 and 2012. The mean and median of *SIZE* are 21.774 and 21.559 in 2010, 21.833 and 21.843 in 2011 and 22.037 and 21.840 in 2012. *LEV* is the ratio of total liabilities to total assets.The mean and median of *LEV* is 0.510 and 0.484, respectively in 2010, 0.495 and 0.165 in 2011 and 0.471 and 0.185 in 2012. The average *Institute* is 0.062

while the median Institute is 0.097 in 2010, 0.042 and 0.059 in 2011 and 0.056 and 0.097 in 2012.

The mean and median of *Volatility* is 0.065 and 0.042, 0.085 and 0.080, 0.078 and 0.086 respectively in 2010, 2011 and 2012. The mean and median *DA* is -0.001 and 0.042 in 2010, -0.020 and -0.016 in 2011 and 0.019 and 0.019 in 2012. We can see the number is becoming bigger. The mean and median *ABCFO* is 0.004 and 0.005 in 2010, 0.012 and 0.007 in 2011 and 0.008 and 0.008 in 2012. The mean and median *ABPROD* is 0.011 and -0.027 in 2010, -0.011 and -0.003 in 2011 and -0.016 and -0.020 in 2012. The mean and median *ABSGA* is -0.018 and -0.004 in 2010, -0.002 and 0.058 in 2011 and 0.019 and 0.006 in 2012. The average *RM* is -0.004 while the median *RM* is -0.010 in 2010.We find the number is stable in these three years. The mean and median of *Net non-operating income* is 0.016 and 0.006 in 2010, the figures in 2011 is 0.010 and 0.006, and the figures in 2012is0.011 and 0.005.

Table 5: Descriptive statistics of variables for matching firms

Panel A: 2010 (n=35)					
	Mean	Standard deviation	Median	Q1	Q3
Size	21.774	1.382	21.559	20.869	22.323
Lev	0.510	0.148	0.484	0.397	0.633
Institute	0.062	0.014	0.097	0.000	0.095
Volatility	0.065	0.062	0.042	0.017	0.101
DA	-0.001	0.062	0.042	0.017	0.101
ABCFO	0.004	0.062	0.005	-0.030	0.044
ABPROD	0.011	0.138	-0.027	-0.060	0.042
ABSGA	-0.018	0.063	-0.004	-0.044	0.008
RM	-0.004	0.137	-0.010	-0.066	0.051
Non-operating items	0.016	0.043	0.006	0.000	0.012
Panel B: 2011 (n=69)					
	Mean	Standard deviation	Median	Q1	Q3
Size	21.833	1.019	21.843	21.139	22.343
Lev	0.495	0.480	0.165	0.387	0.617
Institute	0.042	0.018	0.059	0.001	0.057
Volatility	0.085	0.061	0.080	0.029	0.114
DA	-0.020	0.094	-0.016	0.080	0.033
ABCFO	0.012	0.072	0.007	-0.031	0.052
ABPROD	-0.011	0.098	-0.003	-0.048	0.043
ABSGA	-0.002	-0.003	0.058	-0.019	0.018
RM	-0.000	0.090	0.010	-0.042	0.047
Non-operating items	0.010	0.012	0.006	0.002	0.013

Table 5 (continued):

Panel C: 2012 (n=68)					
	Mean	Standard deviation	Median	Q1	Q3
Size	22.037	1.104	21.840	21.359	22.826
Lev	0.471	0.444	0.185	0.347	0.641
Institute	0.056	0.014	0.097	0.000	0.058
Volatility	0.078	0.046	0.086	0.021	0.116
DA	0.019	0.079	0.019	-0.028	0.080
ABCFO	0.008	0.789	0.008	-0.034	0.054
ABPROD	-0.016	0.116	-0.020	-0.086	0.046
ABSGA	0.019	0.077	0.006	-0.012	0.034
RM	0.011	0.082	0.006	-0.045	0.062
Non-operating items	0.011	0.017	0.005	0.001	0.015

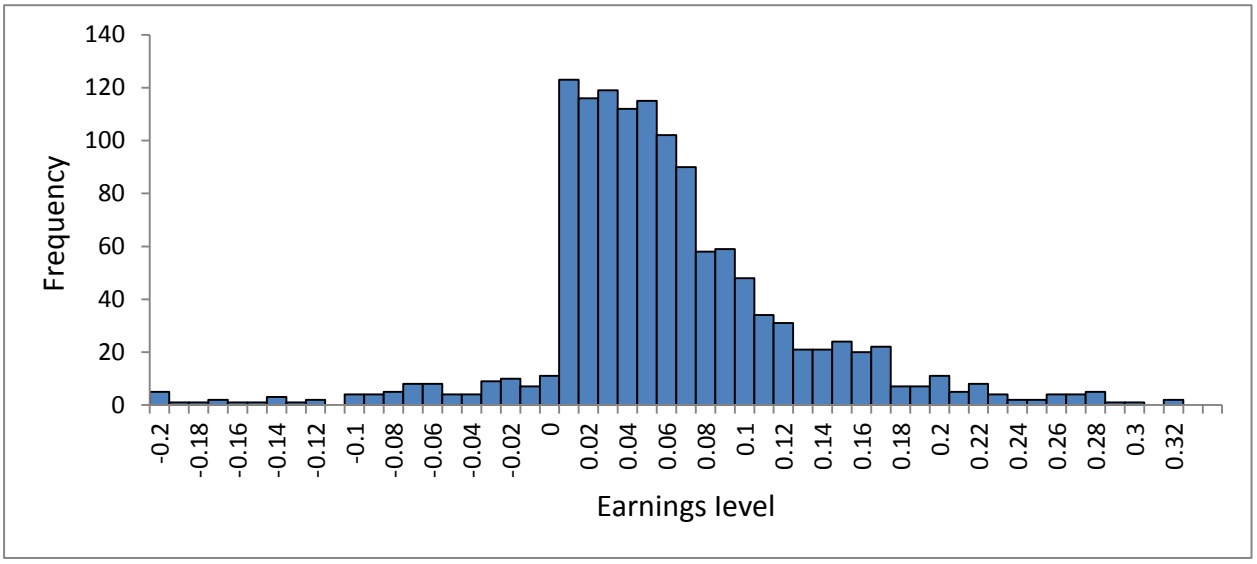
Note: Table 5 presents the descriptive statistics of variables for matching firms. *Size* = the natural logarithm of total assets. *Lev* = total liability divided by total assets. *Institute* = the percent of shares held by the institutional investors. *Volatility* = Standard deviation of earnings for company *j* in the previous three years. *DA* = the discretionary accruals which are calculated based on themodel proposed by Kothariet al. (2005). *ABCFO* = the abnormal cash flows from operation, which is equal to actual cash flows from operations minus normal level of CFO. *ABPROD* = abnormal level of production costs, which isequal to actual production costs minus normal level of production cost. *ABSGA* = abnormal level of expenses which is equal to actual expenses minus normal level of expenses. *RM* = the sum of*ABCFO*, *ABPROD*, and *ABSGA*. Non-operating items = net non-operating items divided bysales revenue.

5.2 Distribution for earnings changes

Figures 1, 2 and 3 show that the distribution of actual earnings scaled by beginning-of-year market value from 2010 to 2012. The interval width is 0.01 and range from -0.2 to +0.2. We find that there are relatively few observations immediately to the left of zero and a substantially greater number of observations immediately to the right of zero. The three years have similar outcomes. The results indicate that listed companies have incentives to manage earnings particularly when

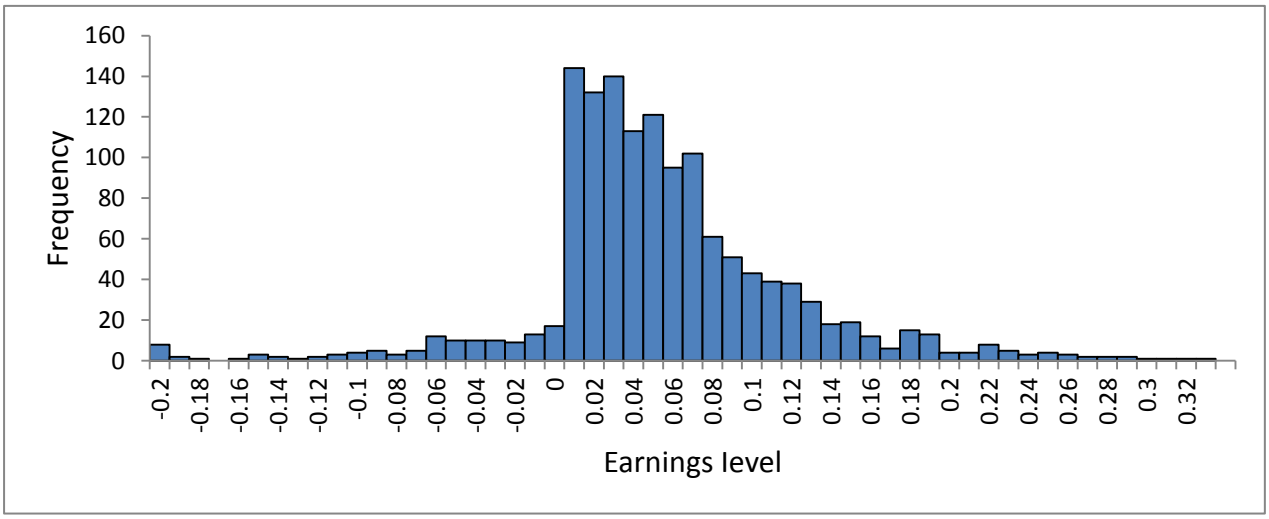
the earnings are close to threshold.

Figure 1: Distribution for earnings level in 2010



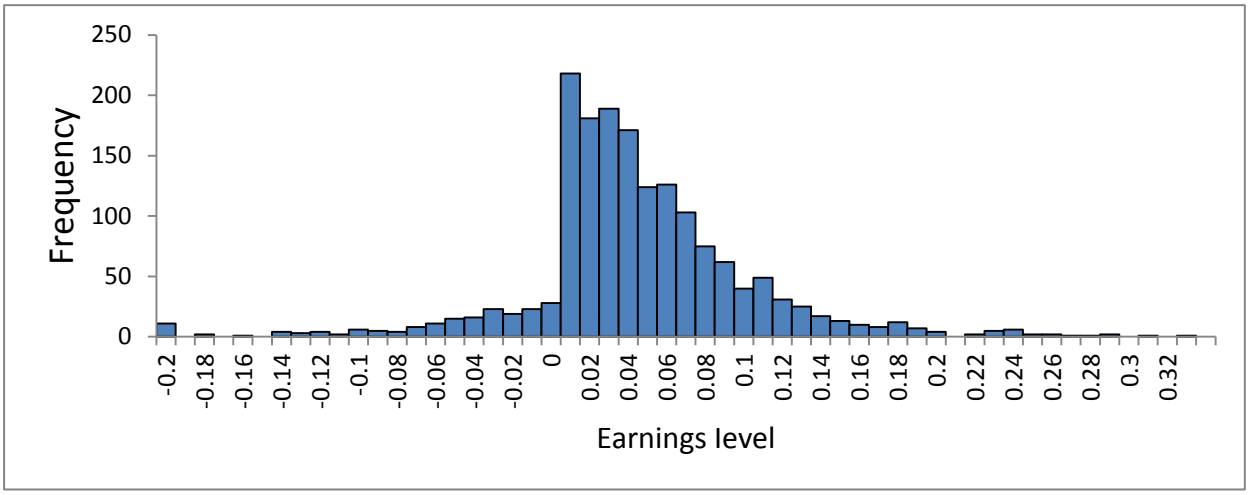
Note: Figure1 presents the distribution of earnings level in 2010. Earnings are scaled by market value at the beginning of 2010. The interval width is 0.01.

Figure 2: Distribution for earnings level in 2011



Note: Figure 2 presents the distribution of earnings level in 2011. Earnings are scaled by market value at the beginning of 2011. The interval width is 0.01.

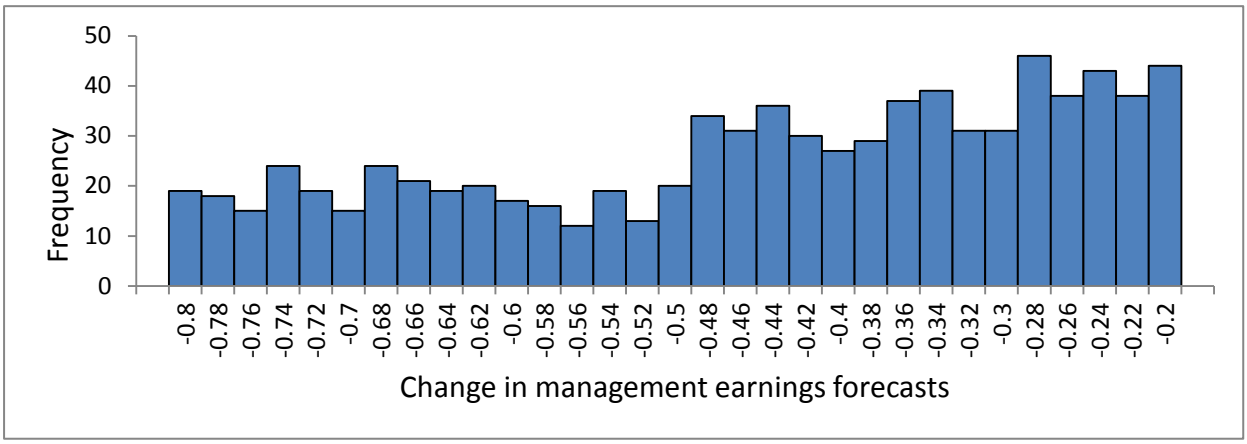
Figure 3: Distribution for earnings level in 2012



Note: Figure 3 presents the distribution of earnings level in 2012. Earnings are scaled by market value at the beginning of 2012. The interval width is 0.01.

Figure 4 presents the distribution of changes in management forecasts. Changes of management forecasts are computed as the differences between management forecast this year and management forecasts last year divided by management forecasts last year. The interval width is 0.02 and range from -0.8 to -0.2. The middle point is -0.5. Figure 4 demonstrates that there are relatively few observations immediately to the left of -0.5 and a substantially greater number of observations immediately to the right of -0.5. Figure 4 supports the notion that companies may use earnings management methods to avoid 50 percent earnings decrease.

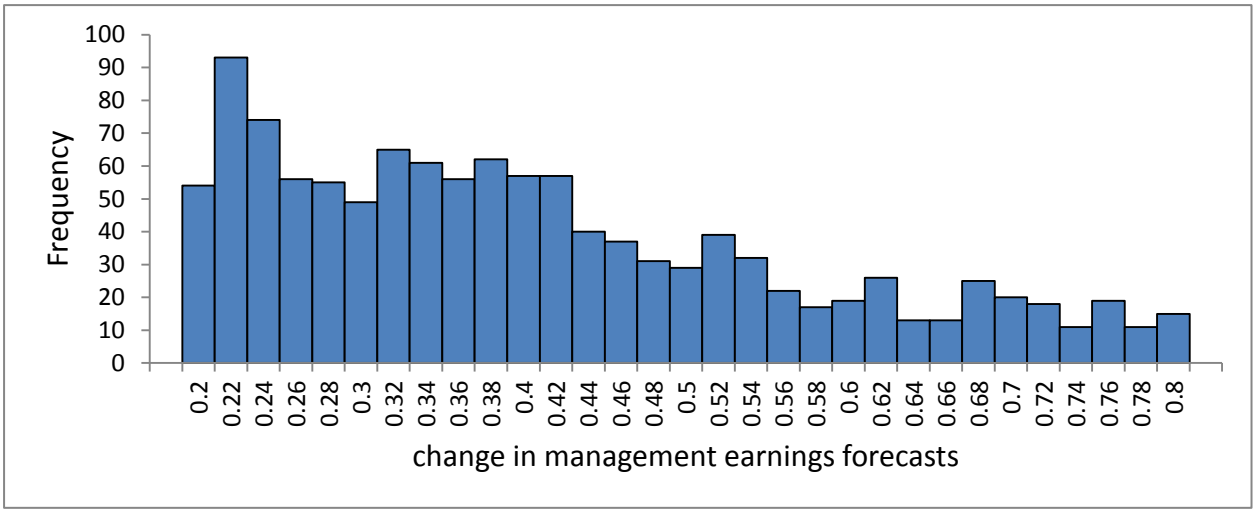
Figure 4: Distribution of negative management forecast changes



Note: Figure 4 presents the distribution of changes in management earnings forecasts. The interval width is 0.02.

Figure 5 presents the distribution of changes of management forecasts. The interval width is 0.02 and range from +0.2 to +0.8. The middle point is 0.5. Figure 5 show that there are relatively few observations immediately to the right of 0.5 and a greater number of observations immediately to the left of 0.5. It seems that firms may manipulate earnings to achieve the threshold of 50 percent increase in order to provide good news to investors.

Figure 5: Distribution of positive management forecast changes



Note: Figure 5 presents the distribution of changes in management earnings forecasts. The interval width is 0.02.

5.3 Results for univariate tests

Table 6 presents the results of univariate tests. Table 6 shows that the size of matching firms is insignificantly different from that of firms which are likely to manipulate earnings to avoid mandatory management forecasts. The results also indicate that *ABPROD* is significantly higher for the "potential EM firm" group (0.02 vs. -0.01). It suggests that firms which avoid mandatory management forecasts tend to produce more products. Moreover, the results indicate that non-operating item is significantly larger for the "potential EM firm" group (t-value = 1.86, p = 0.06). It indicates that firms which avoid mandatory management forecasts tend to use non-operating items to increase their earnings. *ABCFO* and *ABSGA* are significantly lower for the "potential EM firm" group. It indicates that firms which avoid mandatory management forecasts tend to recognize lower operating expenses. However, the discretionary accruals (*DA*) are insignificantly different between the "potential EM firm" group and the "matching firm" group. Furthermore, the leverage ratio (*Lev*) in "potential EM firm" group is significantly higher than that in the "matching firm" group (t-value = 2.89, p = 0.00).The percent of shares held by institutional investors (*Institute*) is significantly lower for the "potential EM firm" group than for the "matching firm" group.

Table 6: Univariate Analyses

	Potential EM firm	Matching firm	t value	Potential EM firm	Matching firm	Z
	Mean	Mean		Median	Median	
Size	21.97	21.88	0.89	22.01	21.84	0.83
			(0.37)			(0.41)
Lev	0.52	0.48	2.89	0.57	0.48	3.12
			(0.00)***			(0.00)***
Institute	0.02	0.05	-4.45	0.01	0.01	-2.36
			(0.00)***			(0.02)**
Volatility	0.21	0.07	10.96	0.13	0.05	12.41
			(0.00)***			(0.00)***
DA	-0.01	0.00	-1.12	0.00	-0.10	1.18
			(0.26)			(0.24)
ABCFO	-0.01	0.01	-3.51	0.00	0.03	-3.45
			(0.00)***			(0.00)***
ABPROD	0.02	-0.01	4.36	0.11	-0.12	4.79
			(0.00)***			(0.00)***
ABSGA	-0.01	0.00	-1.90	-0.00	0.01	-1.07
			(0.06)*			(0.29)
RM	0.00	-0.00	0.59	0.01	0.01	0.44
			(0.56)			(0.66)
Net non-operating income	0.01	0.01	1.86	0.00	0.00	2.38
			(0.06)*			(0.02)**

Note:Table 6 presents the comparison between"potential EM firm" and "matching firm". *Size* = the natural logarithm of total assets. *Lev* = total liability divided by total assets. *Institute* = the percent of shares held by the institutional investors. *Volatility* = Standard deviation of earnings for company *j* in the previous three years. *DA* = the discretionary accruals which are calculated based on themodel proposed by Kothariet al. (2005). *ABCFO* = the abnormal cash flows from operation, which is equal to actual cash flows from operations minus normal level of CFO. *ABPROD* = abnormal level of production costs, which isequal to actual production costs minus normal level of production cost. *ABSGA* = abnormal level of expenses which is equal to actual expenses minus normal level of expenses. *RM* = the sum of*ABCFO*, *ABPROD*, and *ABSGA*. Net non-operating income= net non-operating items divided by sales revenue.

pvalues are reported in parentheses. ***, **, and *separately represent significant level at 1%, 5%, and 10% (two-tailed test).

5.4 Results for multivariate tests

Table 7 presents the regression results for regression model (9). The dependent variables in regressions have*DA,ABCFO, ABPROD, ABSGA, RM,* and *Non-operating items* divided by total sales. The coefficient on *Potential* in Model (2) is significantly negative (t-statistics = -2.26, p = 0.02). It suggests that given sales level, firms that manage earnings upward to avoid mandatory management forecasts have unusually lower cash flows from operations. The coefficient on *Potential* in Model (6) is significantly positive (t-statistics = 1.74, p = 0.08). It indicates that firms use net non-operating income to manage earnings upward to avoid mandatory management forecasts. However, the coefficients on *Potential* in Model (1), (3), (4), and (5) are insignificant. Thus, H1 is weakly supported.

For the control variables, the coefficients on *SIZE* in Models (1), (4), and (5) are significantly positive. It suggests that larger firms have higher discretionary accruals, lower non-operating items, and higher operating expenses. The coefficients on*Lev* in Models (1), (2) are significantly negative and are significantly positive in Model (3) (t-statistics = 2.47, p = 0.01). It suggests that firms with higher leverage ratio have lower discretionary accruals, unusually lower cash flows from operations, unusually higher production costs, and unusually lower operating expenses.

Table 7: Regression results for the relationship between earnings management and management forecasts

	Model(1) DA	Model (2) ABCFO	Model (3) ABPROD	Model(4) ABSGA	Model(5) RM	Model(6) NON
Constant	-7.185	-0.908	4.452	-8.083	-0.271	0.067
	(-1.85)**	(-0.27)	(1.26)	(-2.62)***	(-3.77)***	(1.83)**
Potential	0.503	-0.829	0.253	-0.014	0.003	0.007
	(1.25)	(-2.26)**	(0.65)	(-0.04)	(0.44)	(1.74)**
Size	0.387	0.105	-0.269	0.376	0.012	-0.002
	(2.02)**	(0.63)	(-1.55)	(2.47)***	(3.27)***	(-1.30)
Institute	8.634	-0.295	-5.678	2.665	0.060	-0.013
	(2.46)***	(-0.09)	(-1.70)**	(0.86)	(0.87)	(-1.11)
Lev	-3.856	-1.443	2.783	-0.813	0.030	0.034
	(3.20)***	(-1.36)**	(2.47)***	(-0.82)	(1.30)	(0.97)
Adj R^2	0.02	0.01	0.01	0.01	0.03	0.01
n	627	671	663	675	720	655

Note: Table 7 reports the results of regression (9). The regression model is estimated as follows:

$$EM_{j,t} = \delta_0 + \delta_1 Potential_{j,t} + \delta_2 Size_{j,t} + \delta_3 Institute_{j,t} + \delta_4 Lev_{j,t} + \sum \delta_k Year_k + \varepsilon_{1j,t} \quad (9)$$

$Potential_{j,t}$= a dummy variable which equals one if Company j is a potential earnings management firms at year t or matching firm for zero at year t. *Size* = natural logarithm of total asset. *Institute* = the percent of shares held by the institutional investors. Lev = total liability divided y total assets. $Year_k$=*a dummy* variable which equals one if Company j is a potential earnings management firms at year *k* .*DA* = the discretionary accruals which are calculated based on the model proposed by Kothari et al. (2005). *ABCFO* = the abnormal cash flows from operation, which is equal to actual cash flows from operations minus normal level of CFO. *ABPROD* = abnormal level of production costs, which is equal to actual production costs minus normal level of production cost. *ABSGA* = abnormal level of expenses which is equal to actual expenses minus normal level of expenses. *RM* = the sum of *ABCFO, ABPROD,* and *ABSGA*. NON = net non-operating income divided sales revenue. The t values are reported in parentheses. ***, **, and *separately represent significant level at 1%, 5%, and 10% (two-tailed test).

Table 8 presents the results for regression model (10). The coefficient on *Potential* in all Modelsare significantly positive (p = 0.00).It indicates that the analysts' forecast errors are significantly larger for firms which use earnings management to avoid mandatory management forecasts. The interaction term *Potential *Nonoperating*is insignificantly positive, suggesting that analysts cannot see through firms use non-operating items to manipulate earnings upward to avoid mandatory forecasts. Thus, H2a is not supported.

The interactionterm*Potential*DA* in Model (1) is significantly negative (t-statistics =-1.79, p = 0.07).It suggests that analysts can see through firms use discretionary accruals to manipulate earnings upward to avoid mandatory forecasts. Thus, H2b is not supported. The coefficients on interaction terms *Potential * ABCFO*, *Potential*ABPROD*, *Potential*ABSGA*, and *Potential *RM* are insignificant negative. It indicates that analysts cannot see through firms use real transaction management to manipulate earnings upward to avoid mandatory forecasts. Thus, H2c is supported. We also find the coefficients on *Size* in Models (1) to (6) are significantly negative. It suggests that analysts' forecast errors are significantly smaller for firms with larger size.

Table 8: Regression results for the relationship between management forecasts and analyst forecast

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Constant	5.904	6.907	7.276	6.828	6.94	7.142
	(3.93)***	(4.83)***	(5.06)***	(4.78)***	(4.82)***	(3.98)***
Potential	0.998	1.014	1.03	1.041	1.067	1.216
	(6.55)**	(6.83)***	(6.94)***	(7.08)***	(7.18)***	(6.29)***
DA	1.938					
	(1.64)*					
ABCFO		-0.561				
		(-0.36)				
ABPROD			-0.230			
			(2.08)**			
ABSGA				-0.985		
				(-0.55)		
RM					1.888	
					(1.55)	
Net non-operating income						-1.961
						(6.29)***
Potential*DA	-2.677					
	(-1.79)**					
Potential*ABCFO		-1.114				
		(-0.58)				
Potential* ABPROD			1.006			
			(-0.71)			
Potential*ABSGA				-0.537		
				(-0.22)		
Potential*RM					-2.094	
					(-1.36)	
Potential						-1.715
*Nonoperating						(0.724)
Size	-0.244	-0.290	-0.307	-0.287	-0.29	-0.302
	(-3.50)***	(-4.38)***	(-4.61)***	(-4.37)***	(-4.38)***	(-3.64)***
Volatility	0.165	0.302	0.285	0.244	0.312	0.919
	(0.423)	(0.79)	(0.74)	(0.63)	(0.81)	(1.93)**
Following	-0.012	-0.012	-0.012	-0.011	-0.013	-0.021
	(-1.32)	(-1.26)	(-1.25)	(-1.23)	(-1.44)	(-1.80)**
Adj R^2	0.13	0.15	0.17	0.16	0.17	0.14
n	420	463	458	464	458	467

Note: The table 8 reports the results of regression (10). The regression model is as follows:

$$AFE_{j,t} = \gamma_0 + \gamma_1 EM_{j,t} + \gamma_2 Potential_{j,t} + \gamma_3 EM * Potential_{j,t} + \gamma_4 Size_{j,t} + \gamma_5 Volatility_{j,t} + \gamma_6 Following_{j,t} + \sum \delta_k Year_k + \varepsilon_{2j,t} \quad (10)$$

AFE= the absolute forecast error for analysts who follows company j in year t.*DA* = the discretionary accruals which are calculated based on the model proposed by Kothari et al. (2005). *ABCFO* = the abnormal cash flows from operation, which is equal to actual cash flows from operations minus normal level of CFO. *ABPROD* = abnormal level of production costs.*ABSGA* = abnormal level of expenses .*RM* = the sum of *ABCFO, ABPROD*, and *ABSGA*. NON = net non-operating income divided sales revenue. *Potential* = a dummy variable which equals one if Company j is a potential earnings management firms or matching firm for zero in year t. *Volatility* = Standard deviation of earnings for company j in the previous three years. *Following* =The number of analysts following for company j at year t. t value are reported in parentheses.***, **, and * represent significant level at 1%, 5%, and 10% (two-tailed test).

Table 9 presents the results for the third hypothesis. The coefficient of *Following* in model (1) is significantly negative (t = -1.71), suggesting that the bias of management forecasts decreases when the number of analyst following increases. We further delete the sample without analyst following and focus on the firms covered by analysts. We rerun the regression and the results are shown in model (2) of table 9. The coefficient of *Following* in model (2) is significant negative (t = -1.69). It also indicates that management forecast bias decreases when the number of analyst following increases. Thus, H3a is supported while H3b is not supported. Except *Growth*, the coefficients on other control variable (*Size*, *Institute*, and *Volatility*) are insignificant.

Table 9: Regression results for the relationship between bias of management forecasts and the number of analyst following

	Model (1)	Model (2)
Constant	-0.05	-0.05
	(-3.87)***	(-3.11)
Following	0.00	0.00
	(-1.71)*	(-1.69)*
Size	0.00	0.00
	(2.74)***	(2.11)
Growth	-0.00	0.00
	(0.88)	(0.02)**
Institute	0.01	0.02
	(1.38)	(1.24)
Volatility	0.00	0.00
	(-0.22)	(1.84)
Adj R^2	0.07	0.09
n	306	223

Note: Table 9 reports the results of regression (11). The regression model is estimated as follows:

$$Bias_{j,t} = \gamma_0 + \gamma_1 Following_{j,t} + \gamma_2 Size_{j,t} + \gamma_3 Growth_{j,t} + \gamma_4 Institute_{j,t} + \gamma_5 Volatility_{j,t} + \sum \delta_k Year_k + \varepsilon_{j,t} \quad (11)$$

Bias=Management forecasts bias for company j at the end of year t. *Following* =The number of analysts following for company j at year t. *Size* = natural logarithm of total asset. *Growth* =Book to market ratio for company j at year t. *Institute* = the percent of shares held by the institutional investors. *Volatility* = Standard deviation of earnings for company j in the previous three years. The t value are reported in parentheses.***, **, and * represent significant level at 1%, 5%, and 10% (two-tailed test).

5.5 Additional analyses

Because the somce coefficients in Table 7 are insignificant, we do additional tests. We consider that firms which want to avoid mandatory management forecasts tend to manipulate earnings upward. Thus, we use absolute discretionary accruals (*ABSDA*), postitve discretionary acdruals (*PDA*), negative abnormal cash flows (*NABCFO*), postivie abnormal production costs (*PABPROD*), negative abnormal expenses (*NABSGA*), and non-operating income divided by sales revenue. We rerun equation (9) and the results are shown in Table 10.

Most of the results in Table 10 are similar to those shown in Table 7. However, the coefficient on *Potential* in Model (1) is significantly negative (t-statistics = -1.79, p = 0.04). The coefficient on *Potential* in Model (3) becomes insignificantly negative. level.

For the control variables, the coefficients on *SIZE* in Models (5) are significantly positive. The coefficients on *Lev* in Models (3), (5) and (6) are significantly negative and significantly positive in Model (4) (t-statistics = 4.03, p = 0.03). It suggests that firms with higher leverage ratio have unusually higher production costswhenwe only see the positive part of ABPROD.

Table 10: Additional analyses

	Model(1) ABSDA	Model (2) PDA	Model (3) NABCFO	Model(4) PABPROD	Model(5) NABSGA	Model(6) Non-operating income
Constant	1.870	6.459	-0.070	0.150	-0.317	0.082
	(0.66)	(1.52)	(-1.01)	(1.47)	(-5.45)***	(2.18)**
Potential	-0.554	-0.463	-0.009	0.000	-0.006	0.008
	(-1.79)**	(-1.01)	(-1.15)	(-0.03)	(-0.97)	(1.94)**
Size	0.095	-0.102	0.002	-0.007	0.014	-0.003
	(0.68)	(-0.49)	(0.65)	(-1.36)	(4.97)***	(-1.49)
Institute	0.994	4.253	-0.002	0.111	-0.172	0.036
	(0.38)	(1.21)	(-0.03)	(1.00)	(-3.22)***	(1.00)
Lev	0.292	0.533	-0.055	0.129	-0.027	-0.020
	(0.33)	(0.40)	(-2.56)**	(4.03)**	(-1.67)*	(-1.71)*
Adj R^2	0.01	-0.00	0.01	0.04	0.07	0.01
n	555	246	324	331	339	653

Note: Table 10 reports the results of regression (9). The regression model is estimated as follows:

$$EM_{j,t} = \delta_0 + \delta_1 Potential_{j,t} + \delta_2 Size_{j,t} + \delta_3 Institute_{j,t} + \delta_4 Lev_{j,t} + \sum \delta_k Year_k + \varepsilon_{1j,t} \quad (9)$$

$Potential_{j,t}$= a dummy variable which equals one if Company j is a potential earnings management firms at year t or matching firm for zero at year t. *Size* = natural logarithm of total asset. *Institute* = the percent of shares held by the institutional investors. *Lev* = total liability divided y total assets. *ABSDA* = the absulate value of discretionary accruals which are calculated based on the model proposed by Kothari et al. (2005). *PDA* = the discretionary accruals are larger than zero. *NABCFO* = the abnormal cash flows from operation is smaller than zero. *PABPROD* = abnormal level of production costs is larger than zero. *NABSGA* = abnormal level of expenses is smaller than zero. Non-operating income = non-operating income divided sales revenue. The t values are reported in parentheses. ***, **, and *separately represent significant level at 1%, 5%, and 10% (two-tailed test).

6. Conclusions

This research aims to investigate whether listed companies have incentives to manage earnings to avoid issuing mandatory management forecasts for turning losses or earnings decrease. Also, this research examine whether analysts can see through firms' earning management using non-operating items, discretionary accruals or real transaction manipulation to avoid mandatory management forecasts. The third motivation of this research is to examine whether the number of analyst following would have influence to the bias of management forecasts.

The univariate analyses indicate that firms which avoid mandatory management forecasts have unusually lower operating expenses and cash flows from operations while these firms have unusually higher production costs. There is no significant difference between firms which avoid mandatory management forecasts and matching firms. The regression results indicate that firms which avoid mandatory management forecasts have unusually cash flows from operations and unusually higher production costs after controlling other factors. Our results also indicate that analysts can see through firms using discretionary accruals to manipulate earnings upward to avoid mandatory management forecasts. However, analysts cannot see through firms using non-operating items and real transaction management. When the number of analysts increases, the bias of management forecasts reduces.

Our results have policy implications. Regulators require firms to disclose their management forecasts mandatorily in order to provide more transparent information to investors. However, the regulations will provide firms' managers incentive to manipulate earnings. Regulators should pay more attention to those firms whose profit are little higher than zero. Furthermore, investors also need to pay more attention to

those firms whose profit are little higher than zero and the following numbers of analyst before they make investment decisions.

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