Does the market reward meeting or beating analyst earnings forecasts? Empirical evidence from China

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Abstract

Purpose – Using a sample of 9,898 firm-year observations from 1,821 unique Chinese listed firms over the period from 2004 to 2019, this study aims to investigate whether the market rewards meeting or beating analyst earnings expectations (MBE).

Design/methodology/approach – The authors use an event study methodology to capture market reactions to MBE.

Findings – The authors document a stock return premium for beating analyst forecasts by a wide margin. However, there is no stock return premium for firms that meet or just beat analyst forecasts, suggesting that the market is skeptical of earnings management by these firms. This market underreaction is more pronounced for firms with weak external monitoring. Further analysis shows that meeting or just beating analyst forecasts is indicative of superior future financial performance. The authors do not find firms using earnings management to meet or just beat analyst forecasts.

Research limitations/implications – The authors provide evidence of market underreaction to meeting or just beating analyst forecasts, with the market's over-skepticism of earnings management being a plausible mechanism for this phenomenon.

Practical implications – The findings of this study are informative to researchers, market participants and regulators concerned about the impact of analysts and earnings management and interested in detecting and constraining managers' earnings management.

Originality/value – The authors provide new insights into how the market reacts to MBE by showing that the market appears to focus on using meeting or just beating analyst forecasts as an indicator of earnings management, while it does not detect managed MBE. Meeting or just beating analyst forecasts is commonly used as a proxy for earnings management in the literature. However, the findings suggest that it is a noisy proxy for earnings management.

Keywords Analyst forecast, Meeting or beating expectations, Market reaction, Earnings management, Emerging market, China

Paper type Research paper

1. Introduction

Financial analysts are widely regarded as important intermediaries in the production and dissemination of firm information (Wang, Luo, & Yu, 2022). Investors generally consider analysts' earnings forecasts as crucial earnings benchmarks used in equity valuation. Meeting or beating analyst earnings expectations (MBE) is a phenomenon wherein a firm's reported earnings level is at or above analysts' forecasted earnings. The literature documents that firms achieving MBE reap considerable market rewards (Bartov, Givoly, & Hayn, 2002); however, missing analyst earnings expectations, even by a small amount, can trigger a

disproportionately large negative stock price response (Skinner & Sloan, 2002). Given that managers may respond to market pressure by managing earnings to avoid negative market consequences of missing analyst earnings expectations (e.g. Graham, Harvey, & Rajgopal, 2005; Roychowdhury, 2006; Beardsley, Robinson, & Wong, 2021), a popular notion in the literature is that meeting or just beating analyst forecasts (i.e. MBE by a small margin) is associated with aggressive earnings management (Caskey & Ozel, 2017; Liu, Shen, Welker, Zhang, & Zhao, 2021). However, relatively little is known about how the market reacts to beating analyst forecasts by a big margin vs meeting/just beating analyst forecasts and whether the market is biased against meeting/just beating analyst forecasts. Using a sample of Chinese listed companies, our study fills gaps in the literature by empirically answering these questions.

As the world's largest emerging economy, China offers an ideal setting for examining the market consequences of MBE. While the literature on MBE focuses heavily on developed markets, particularly the US market, how emerging markets react to MBE remains poorly understood. Prior research documents that firm-specific information produced by securities analysts is especially valuable to investors in emerging markets because of the opaque information environment in these markets (e.g. Chan & Hameed, 2006; Xu, Chan, Jiang, & Yi, 2013), highlighting the importance of investigating the role of analysts in contexts other than developed markets. Indeed, Leuz and Wysocki (2016) encourage researchers to explore non-US settings, especially countries with different institutional environments, to enrich our understanding of financial disclosure and reporting. Unlike developed markets such as the US market, retail investors dominate the Chinese capital market (IMF, 2017; Wilson, Wang, & Wu, 2021). Retail investors tend to be more naïve in interpreting and acting on financial information than institutional investors (Hand, 1990). A considerable proportion of Chinese retail investors rely on analyst forecasts to make investment decisions (SZSE, 2011; Cao, He, Wang, & Yin, 2021). A 2017 Shenzhen Stock Exchange (SZSE) survey shows that Chinese retail investors' irrational investment behavior remains an issue in the Chinese stock market, although their overall investment rationality has gradually improved over time (SZSE, 2017). While the Chinese securities analyst industry has a relatively short history and is still a fledgling profession, analysts play an increasingly important role in China's capital markets by promoting rational investment philosophies and improving information transparency and corporate governance (e.g. Chen, Cumming, Hou, & Lee, 2016; Gu, Jiang, & Xu, 2019).

In addition to their importance to retail investors, analyst forecasts play an influential role in Chinese listed firms' reporting and disclosure decisions. The wide use of accounting numbers by financial analysts in stock valuation creates an incentive for managers to manipulate earnings to influence short-term share prices (Lu, Shin, & Zhang, 2019). Therefore, while MBE can avert investor disappointment and boost stock performance, firms that beat analyst benchmarks may be penalized by the market if their investors suspect that these firms have manipulated their earnings to achieve the benchmarks, especially firms that meet or beat analyst forecasts by a very narrow margin.

Using a sample of Chinese listed firms that issued A shares to domestic investors on the main boards of China's stock exchanges in 2004–2019, we find that while firms that beat analyst forecasts by a big margin earn significantly higher abnormal stock returns than firms that miss analyst forecasts (non-MBE firms) upon earnings announcements, there is no significant difference in abnormal stock returns between firms that achieve meeting/just beating analyst forecasts and non-MBE firms. These results provide evidence that the market does not reward meeting/just beating analyst forecasts, but it does reward beating analyst forecasts by a big margin. Our cross-sectional analysis shows that the lack of market reward for meeting/just beating analyst forecasts is moderated by firms' external monitoring environment, which is proxied by analyst coverage and institutional ownership. Our findings are robust to numerous robustness tests, such as Heckman's (1979) two-stage model to

address the concern that self-selection bias may arise from endogenous analyst coverage, a propensity score matched sample to increase the comparability of MBE and non-MBE firms, and alternative measures of abnormal returns and an alternative model to estimate discretionary accruals. In addition, we address concerns about stale analyst forecasts, year effects, firm size effects and the potential collinearity problem.

Next, we explore whether firms achieve meeting or just beating analyst forecasts through earnings management by using multiple measures of earnings management, namely, accrual-based earnings management, real earnings management and abnormal related-party sales and purchases. However, we do not find that firms achieve meeting or just beating analyst forecasts through earnings management. To shed further light on whether meeting/ just beating analyst forecasts is achieved through earnings management, we investigate the long-run operating performance of firms achieving compared with that of non-MBE firms and firms beating analyst forecasts by a big margin. Firms engaging in accrual-based earnings management tend to experience inferior long-run operating performance when accruals reverse in subsequent periods (Dechow, Khimich, & Sloan, 2012). Similarly, meeting or beating earnings targets by altering the timing or structure of real transactions (Graham *et al.*, 2005) or engaging in abnormal related-party transactions (Jian & Wong, 2010) would sacrifice operating performance in the long run. Therefore, if firms manage their earnings to achieve MBE by a small margin, we expect that these firms experience worse long-run operating performance when compared with non-MBE firms. By comparing firms' long-run operating performance using multiple measures, including return on assets (ROA), earnings per share (EPS) and cash flow from operations, we find that firms meeting or just beating analyst forecasts outperform matched non-MBE firms in all measures. Compared with matched MBE firms that beat analyst forecasts by a big margin, MBE firms that meet or just beat analyst forecasts show better performance in terms of cash flow from operations and similar ROA performance. Our findings suggest that the lack of reward for meeting/just beating analyst forecasts is attributable to the market's over-skepticism of earnings management by firms that achieve meeting/just beating analyst forecasts.

In further analysis, we find that the market rewards managed MBE and genuine MBE equally, which shows that the market cannot distinguish between the two types of MBE. Firms that achieve MBE through earnings management tend to experience worse operating performance than genuine MBE firms and non-MBE firms, suggesting that MBE through earnings management is not a predictor of superior operating performance in the future.

Our study contributes to the growing literature on the role of securities analysts in emerging markets in general and in China specifically. Although some studies suggest that it is challenging and costly for analysts in emerging markets to produce firm-specific information because of poor corporate disclosure and transparency (Chan & Hameed, 2006; Xu *et al.*, 2013), recent studies indicate that analysts play an increasingly important role in emerging markets. In the Chinese context, analysts gain information advantages by acquiring private information (e.g. Jiang, Zhou, & Zhang, 2019). Chinese analysts play an informational role by disseminating information, which reduces information asymmetry (Gu *et al.*, 2019). In addition, they play a corporate governance role by disciplining firms that engage in opportunistic reporting behavior, which reduces corporate fraud (e.g. Chen *et al.*, 2016). However, we know little about whether and how the market responds to MBE in emerging markets. We contribute to the literature by systematically assessing the market consequences of MBE in China.

We also contribute to the market behavior literature concerning MBE. US studies (e.g. Bartov *et al.*, 2002) show that firms meeting or beating analyst earnings forecasts exhibit significantly better future accounting performance. This finding indicates that MBE, even by a small margin, provides information about the firms' future performance in the USA. However, Koh, Matsumoto and Rajgopal (2008) and Keung, Lin and Shih (2010) report

changes in the US market's behavior after a series of high-profile corporate scandals at the turn of the 21st century, with the market no longer rewarding meeting/just beating analyst forecasts. Our Chinese results are consistent with those of Koh *et al.* (2008) and Keung *et al.* (2010) in this regard. In addition, we provide new insights into how the market reacts to MBE by showing that the market appears to focus on using meeting/just beating analyst forecasts as an indicator of earnings management, while it does not detect managed MBE. Our finding that firms beating analyst forecasts by a big margin do not outperform firms meeting or just beating analyst forecasts in the long run suggests that the former may be more likely to manage their earnings to achieve MBE than the latter. Overall, our results suggest that corporate managers are not passive observers in MBE. In response to the market's over-skepticism of earnings management by firms meeting or just beating analyst forecasts, managers may choose to reap the market's rewards by opportunistically managing their earnings to achieve beating analyst forecasts by a big margin, while they may constrain themselves from managing their earnings to achieve a small beat.

The findings of this study are informative to researchers, market participants and regulators concerned about the impact of analysts and earnings management and interested in detecting and constraining managers' earnings management. MBE by a small margin is commonly used as a proxy for earnings management in the literature (e.g. Caskey & Ozel, 2017; Liu *et al.*, 2021). Our findings suggest that it is a noisy proxy for earnings management.

2. Literature review
2.1 The role of analyst forecasts in the Chinese market
Like many other emerging markets, the Chinese market is characterized by a poor information environment and high levels of opaque financial reporting and information asymmetry. Consequently, analyst forecasts are especially important because it is more difficult for common investors to collect firm-specific information. While the Chinese securities analyst profession is still young, Chinese analysts play an important role in generating and disseminating firm-specific information. In additional to collecting firm information directly from corporate public disclosures and indirectly from other sources (e.g. media, intermediaries, local governments, stock exchanges and regulators), Chinese analysts collect information through private channels, including formal investigations and firm surveys (e.g. visiting and interviewing firms, attending corporate conference calls) and informal information gathering (e.g. private conversations) (Hu, Lin, & Li, 2008).

Empirical studies confirm the importance of analysts in the Chinese market. Jiang *et al.* (2019) report that analysts' private information reduces stock price synchronicity. Financial markets also consider analysts' stock recommendations as new information (Bartholdy & Feng, 2013). In addition to their informational role, Chinese analysts serve as external monitors who can discipline firms' opportunistic reporting behavior and improve financial reporting (Yu, 2008; Chen *et al.*, 2016).

2.2 Managers' propensity to meet or beat earnings benchmarks
Analysts' earnings forecasts are generally regarded as important performance targets with substantial implications for corporate managers' compensation and career prospects in both developed markets (e.g. Bartov *et al.*, 2002; Graham *et al.*, 2005; Wiersema & Zhang, 2011) and the Chinese market (e.g. Liu *et al.*, 2021). Capital market pressures are generally considered to be the paramount reason that managers seek to avoid missing analyst expectations. Managers have strong incentives to disclose positive earnings surprises to avoid disappointing investors by missing analyst expectations. For example, Healy and Wahlen (1999) note that upward management of reported earnings is a key technique used by

managers to avoid negative earnings surprises and achieve MBE. In this context, the two most widely studied strategies are accrual-based earnings management (Burgstahler & Dichev, 1997) and real earnings management (Roychowdhury, 2006; Cohen & Zarowin, 2010) [1].

The literature on the Chinese capital market suggests that related-party transactions are a widely used strategy by Chinese managers to meet or beat earnings benchmarks. Transactions between related parties are common in China (e.g. Peng, Wei, & Yang, 2011). To report higher earnings, managers may manipulate the price, volume or both the price and volume of related-party transactions. By simply overproducing and selling at inflated prices to related parties, firms can obtain window-dressing earnings (Jian & Wong, 2010). When firms have strong incentives to report higher earnings, the amounts of their related-party sales and associated operating profits are both abnormally high (Jian & Wong, 2010). Similarly, Ding, Zhang and Zhang (2007) find that controlling shareholders are more likely to engage in related-party transactions to prop up firms under pressure to achieve high earnings.

2.3 Market reactions to meeting or beating analyst earnings expectations
Investors use earnings information as a prominent source of firm-specific information for equity valuation (Francis, Schipper, & Vincent, 2003). Naturally, analyst earnings forecasts are valuable for equity investors because they provide crucial earnings benchmarks, which investors use to evaluate firm performance and make investment decisions. Therefore, meeting or missing analyst earnings forecasts can significantly affect firms' stock prices. Studies show that a failure to achieve MBE can trigger disproportionately large negative stock price responses (e.g. Skinner & Sloan, 2002). By contrast, firms that achieve benchmarks obtain considerable stock market rewards (e.g. Bartov *et al.*, 2002).

While some studies (e.g. Koh *et al.*, 2008; Keung *et al.*, 2010) show a decline in the rewards for MBE in the post-2000 period, Graham *et al.* (2005) find that chief financial officers still believe that investors are obsessed with MBE, which suggests that the market still reacts to MBE. In addition, the emerging nature of the Chinese stock market, a high level of information opacity, and high demand from public investors for analyst forecasts due to the scarcity of publicly available firm-specific information imply that analyst forecasts are important benchmarks used by public investors for equity valuation in China. Consequently, the market may perceive MBE as good news, leading to positive market reactions.

In this paper, we use a Chinese setting to first perform a test to determine whether there is a positive overall market reaction to MBE. We then develop our hypotheses on the market reactions to meeting/just beating analyst forecasts and the moderating roles of analyst coverage and institutional ownership in determining these market reactions. Finally, we hypothesize that the market is biased against meeting/just beating analyst forecasts.

3. Hypothesis development
3.1 Market reactions to meeting/just beating analyst forecasts
Market reactions to MBE depend on how these outcomes are perceived by investors (e.g. Bartov *et al.*, 2002). *Ex ante*, it is unclear how investors perceive meeting/just beating analyst forecasts because the literature presents conflicting views on the nature of meeting/just beating analyst forecasts. Some studies indicate that MBE, even by a small margin, is a signal of firms' superior future financial performance. For example, Bartov *et al.* (2002) show that firms that meet or beat analyst earnings forecasts in a given quarter exhibit significantly better future accounting performance. They argue that even by a small margin, MBE signals superior future performance. In addition, Koh *et al.* (2008) find that MBE has become a

stronger signal for future cash flows in the post-scandal period. Thus, if investors perceive meeting/just beating analyst forecasts as indicating better future performance, firms that achieve meeting/just beating analyst forecasts are expected to gain a premium relative to non-MBE firms.

However, meeting/just beating analyst forecasts may be indicative of earnings management. For example, Healy and Wahlen (1999) note that upward earnings management is a key strategy used by managers to avoid missing analyst forecasts. Bartov et al. (2002) find that avoiding negative earnings surprises is entrenched in today's corporate culture. Dechow and Skinner (2000) observe that firms with zero annual earnings surprises have significantly higher discretionary accruals than other firms. Brown (2001) shows a right-skewed distribution of earnings surprises with a surprisingly high frequency of values ranging between US$0.00 and US$0.01, which suggests that managers manipulate earnings to avoid negative earnings surprises. Burgstahler and Eames (2006) also provide empirical results indicating that managers manipulate earnings to meet or narrowly beat analyst earnings forecasts.

In particular, the revelation of a series of high-profile accounting scandals worldwide at the beginning of this century may have heightened investor sensitivity to managerial earnings manipulation. For example, firms that beat analyst forecasts by small margins in the post-scandal period are not rewarded in the US market, which is likely due to increased investor skepticism (Koh et al., 2008). Similarly, Keung et al. (2010) find that given the increase in the number of firms playing the numbers game in the post-2000 period, US investors regard zero or small positive earnings surprises as red flags signifying earnings management. Our sample period falls within the post-2000 period because the Chinese financial analyst industry was only formally established in the early 2000s. Accordingly, we predict that investors do not reward firms that achieve meeting/just beating analyst forecasts if they perceive the achievement to be a result of earnings management. This leads to our first hypothesis:

H1. There are no significant differences in market reactions to earnings announcements by firms that achieve meeting/just beating analyst forecasts and non-MBE firms.

3.2 The moderating roles of analyst coverage and institutional ownership on market reactions to meeting/just beating analyst forecasts
Financial analysts collect information from both public and private sources, evaluate firms' current performance, forecast their future prospects and make stock recommendations to current and potential investors (Hu et al., 2008). They usually interact directly with firm management and raise questions with top managers about various aspects of corporate strategy and performance through various channels, such as earnings release conferences and corporate site visits (Yu, 2008). From an agency perspective, analysts' gathering of private information can help detect managers' misbehavior; therefore, analysts are effective external monitors of firm management who can discipline firms for engaging in opportunistic managerial behavior by reducing information asymmetry between corporate insiders and outside investors (Healy & Palepu, 2001; Tsang, Wang, Wu, & Lee, 2022; Wang & Zhu, 2022; Wang, Luo, & Liu, 2022). Firms followed by more analysts are subject to more intense external monitoring; therefore, they should have better financial reporting quality. Supporting this perspective in the context of China, firms followed by more analysts are less likely to engage in earnings management (Yu, 2008) and have a lower incidence of corporate fraud (Chen et al., 2016).

The literature commonly considers institutional investors as another type of external monitor that can constrain self-serving managers from manipulating financial information through monitoring or even direct intervention (Goranova & Ryan, 2014; Lemma, Negash, Mlilo, & Lulseged, 2018; Liao, Tsang, Wang, & Zhu, 2022). Compared with common investors,

institutional investors hold more shares, are more financially literate and have more resources. Therefore, they have more incentives and are better able to collect and analyze corporate information (Wang & Wang, 2017; Wang & Sun, 2022). Institutional investors can monitor firms by voting during shareholder meetings (Chung, Firth, & Kim, 2002) or voting with their feet (Firth, Gao, Shen, & Zhang, 2016), thereby constraining opportunistic managerial behavior. The Chinese market is characterized by concentrated ownership and severe agency conflicts between corporate insiders and outside minority shareholders (Li, Quan, Tian, Wang, & Wu, 2022); therefore, the monitoring role of institutional investors is especially important in constraining earnings manipulation (Wilson *et al.*, 2021).

To the extent that the market perceives that analysts and institutional investors play a positive role in constraining opportunistic managerial behavior and improving financial reporting quality, the market's skepticism of meeting/just beating analyst forecasts may be attenuated for firms that are followed by more analysts and firms with a higher level of institutional ownership.

However, a high level of external monitoring by analysts and institutional investors may introduce higher performance expectations on managers and thus create excessive pressure on them to manage their earnings to meet earnings benchmarks. This suggests that managers are more likely to engage in opportunistic reporting activities when the number of analysts following the firm or the level of institutional ownership increases (Yu, 2008). This high-pressure perspective suggests that the market's skepticism of meeting/just beating analyst forecasts may be accentuated for firms with high analyst coverage and institutional ownership.

Given these competing perspectives, we propose the following null hypotheses:

H2. Market reactions to meeting/just beating analyst forecasts do not vary with the level of analyst coverage.

H3. Market reactions to meeting/just beating analyst forecasts do not vary with the level of institutional ownership.

3.3 Is the market biased against meeting/just beating analyst forecasts?
The literature presents mixed evidence as to whether investors are correct in their skepticism of meeting/just beating analyst forecasts. For example, some studies report that firms manipulate their earnings to meet or marginally beat analyst forecasts to avoid disappointing investors (e.g. Healy & Wahlen, 1999; Dechow & Skinner, 2000; Brown, 2001; Burgstahler & Eames, 2006), which suggests that the market's skepticism of meeting/just beating analyst forecasts is warranted. However, other studies suggest that the market may be overly skeptical of MBE firms, particularly after the revelation of a series of large accounting scandals in the early 2000s. Koh *et al.* (2008) show that MBE has become a strong predictor of future cash flows in the post-scandal period. They suggest that the lack of rewards for MBE results from possibly unwarranted levels of investor skepticism. Byun and Roland-Luttecke (2014) also report that the market appears to underreact to the earnings surprises of certain MBE firms because of high levels of skepticism regarding their earnings management strategies. Keung *et al.* (2010) ascribe the market's lack of reward for meeting/just beating analyst forecasts to the collective cost borne by firms due to information asymmetry and investor backlash, and suggest that investors' skepticism toward zero and small positive earnings surprises is a phenomenon induced by the rising number of firms playing the numbers game.

Based on the above discussion, if investors are overly skeptical of meeting/just beating analyst forecasts, we anticipate a lack of a significant association between income-increasing earnings management and the likelihood of meeting/just beating analyst forecasts. We also

expect the relative future financial performance of firms that achieve to be higher than that of non-MBE firms. Thus, we propose the following two testable hypotheses:

H4. There is no significant correlation between income-increasing earnings management and the likelihood of meeting/just beating analyst forecasts.

H5. The relative future financial performance of firms that achieve meeting/just beating analyst forecasts is higher than that of non-MBE firms.

4. Data and research design

4.1 Data

Our sample consists of all Chinese listed corporations that issued A shares to domestic investors on the main boards of the Shanghai Stock Exchange or Shenzhen Stock Exchange between 2004 and 2019 with data available for regression analysis. We choose 2004 as the start year because analyst forecast data from the China Stock Market and Accounting Research (CSMAR) database begin in 2003 and the construction of some of the control variables (e.g. sales growth and changes in earnings relative to the previous year) requires one-year lag data. We obtain basic firm information and raw data on related-party transactions from the Wind database, raw data on corporate ultimate controlling shareholders from firms' audited annual reports and other data such as analyst forecasts and accounting and market data from CSMAR. Our final sample consists of 9,898 firm-years from 1,821 unique firms.

4.2 Testing for the overall market reaction to MBE

We use an event study methodology to capture market reactions to MBE. The event is the annual earnings announcement. Following the literature on market reactions to earnings surprises (e.g. Doyle, Jennings, & Soliman, 2013; Chen, Hu, Wu, & Zhao, 2020), we use the buy-and-hold abnormal return (BHAR) to measure market reactions in our main tests. The regression model for testing the maintained hypothesis regarding the overall market reaction to MBE is as follows:

$$BHAR(t_1, t_2) = \beta_0 + \beta_1 MBE_{i,t} + \beta_c Controls_{i,t} + Year\ Fixed\ Effect + Industry\ Fixed\ Effect$$
$$+ \varepsilon_{i,t}$$

(1)

where *BHAR* is the market-adjusted buy-and-hold abnormal return. To calculate *BHAR*, we first compound the raw returns of firm i and its benchmark (the corresponding value-weighted market index returns) over various event windows $[t_1, t_2]$ centered on the annual earnings announcement day (denoted by Day 0). We then calculate *BHAR* as the difference between the compound returns of firm i and its benchmark [2]. Our test variable is *MBE*, which is a dummy variable that equals 1 if a firm's reported EPS equals or exceeds the latest analysts' forecasted EPS (i.e. the earnings surprise is 0 or positive), and 0 otherwise [3]. We also require the latest analyst forecast to be made at most 150 days before the earnings announcement because the accuracy of analyst forecasts is higher when they are closer to the earnings announcement date, which reduces noise when measuring *MBE* [4]. In addition, we require that the analyst forecasts be made at least one day before the beginning of the BHAR event window to ensure that the BHARs capture market reactions to meeting or beating analyst earnings benchmarks. The coefficient of *MBE* (β_1) captures the incremental market rewards for achieving analyst expectations after controlling for other factors that may affect

market reactions to earnings announcements. In this model, non-MBE firms serve as the control group and we omit them from the regression for comparison with *MBE*.

Based on the literature (e.g. Koh *et al.*, 2008; Brown, Hillegeist, & Lo, 2009; Kirk, Reppenhagen, & Tucker, 2014; Wang & Li, 2016), we include a range of firm-level variables that can affect market reactions to earnings announcements. We control for earnings surprises (*Surprise*) because unexpected earnings can explain abnormal stock returns (Ball & Brown, 1968). We include analyst coverage (*Analysts*) because scholars argue that the market pays less attention to earnings surprises from firms with less analyst coverage (Doyle, Lundholm, & Soliman, 2006). We control for government control (*GVT*) and expect its coefficient to be negative because Wang and Shailer's (2018) meta-analysis shows that, compared with private ownership, government ownership is associated with inferior performance. *GVT* is a dummy variable that equals 1 if a firm is ultimately controlled by either the central or a local government, and 0 otherwise (Wang, Wu, & Sun, 2021; Zhu, Wang, & Wilson, 2021). We include *ROA* and earnings-to-price ratio (*ETP*) to control for accounting performance. We expect the coefficients of both variables to be positive. We include firm size (*Size*) and expect its coefficient to be negative because Fama and French (1993) show that small firms have higher market returns than large firms. We include the market-to-book ratio (*MTB*) because firms' growth opportunities have a positive effect on market reactions to their earnings. We include financial leverage (*Leverage*) and expect its coefficient to be positive because firms with higher leverage subsequently have higher returns to compensate for their higher risk (Wang & Li, 2016). Following Koh *et al.* (2008), we include *CFO* (cash flow from operating activities divided by year-end total assets) and expect its coefficient to be positive. We include *Prior stock return* to control for past stock performance, and expect its coefficient to be negative if investors perceive pre-event returns to be evidence of market overreactions and make corrections accordingly, and positive if investors believe pre-event returns will persist in the future (Wang & Li, 2016). Appendix 1 summarizes the definitions of all variables.

4.3 Testing for market reactions to meeting/just beating analyst forecasts and the moderating effects of analyst coverage and institutional ownership

H1 predicts that the market does not reward meeting/just beating analyst forecasts. To test H1, we further classify MBE firms into two groups: (1) *SMBEAT* for MBE firms that beat the analyst earnings benchmark by a small margin and (2) *BIGBEAT* for MBE firms that beat the analyst earnings benchmark by a big margin. We then replace *MBE* with *SMBEAT* and *BIGBEAT* in equation (1). The regression model is as follows:

$$BHAR(t_1, t_2) = \beta_0 + \beta_1 SMBEAT_{i,t} + \beta_2 BIGBEAT_{i,t} + \beta_c Controls_{i,t} + Year\ Fixed\ Effect$$
$$+ Industry\ Fixed\ Effect + \varepsilon_{i,t}$$

(2)

where *SMBEAT* (*BIGBEAT*) is a dummy variable equal to 1 if a firm's actual EPS equals or exceeds the latest analyst forecast by ≤1 cent per share (>1 cent per share), and 0 otherwise. We use 1 cent as the cutoff to classify small and big beats because the phenomenon of managers scrambling for the last cent to meet or beat earnings targets attracts extensive scholarly and media attention (Koh *et al.*, 2008; Byun & Roland-Luttecke, 2014). H1 is supported if the coefficient of *SMBEAT* is not statistically significant. In this model, non-MBE firms serve as the control group, and we omit them from the regression for comparison with *SMBEAT* and *BIGBEAT*.

To test H2 (H3), which predicts that analyst coverage (institutional ownership) moderates market reactions to meeting/just beating analyst forecasts, we adopt a split sample approach

by partitioning the sample into firms with high and low analyst coverage (institutional ownership) subsamples, using the yearly median value as the cutoff. We then rerun equation (2) for the two subsamples.

4.4 Testing whether the market is biased against meeting/just beating analyst forecasts
4.4.1 Association between income-increasing earnings management and the likelihood of meeting/just beating analyst forecasts. To test H4, we examine whether firms engage in various types of earnings management for MBE: (1) accrual-based earnings management (abnormal accruals, *AAcruals*); (2) real earnings management (abnormal production, *AProduction*; abnormal discretionary expenditures, *AExpenditures*; and abnormal cash flow from operations, *ACFO*); and (3) related-party transactions (abnormal related-party sales, *ARPS*, and abnormal related-party purchase, *ARPP*). Appendix 2 discusses the construction of the measures for these earnings management practices.

We follow the literature (e.g. Athanasakou, Strong, & Walker, 2011) and use the following logistic regression to estimate the probability of a firm meeting or marginally beating analyst forecasts using various earnings management techniques:

$$SMBEAT_{i,t} = \gamma_0 + \gamma_1 AAcruals_{i,t} + \gamma_2 AProduction_{i,t} + \gamma_3 AExpenditures_{i,t} + \gamma_4 ACFO_{i,t}$$
$$+ \gamma_5 ARPS_{i,t} + \gamma_6 ARPP_{i,t} + \gamma_c Controls_{i,t} + Year\ Fixed\ Effect +$$
$$Industry\ Fixed\ Effect + \varepsilon_{i,t}$$

(3)

Our test variables are *AAcruals*, *AProduction*, *AExpenditures*, *ACFO*, *ARPS* and *ARPP*. When testing H4, the significance and signs of $\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5$ and γ_6 are of interest. We cannot reject H4 if the coefficients of these variables are not statistically significant. Conversely, if the signs of $\gamma_1, \gamma_2, \gamma_5$ and γ_6 are significantly positive and those of γ_3 and γ_4 are significantly negative, this will indicate that managers engage in corresponding income-increasing earnings management practices to meet or beat analyst forecasts.

We control for the following variables that may explain the probability of meeting/just beating analyst forecasts. *Analysts* is included because Yu (2008) finds that analyst coverage affects earnings management. We include *GVT* and expect its coefficient to be positive because the government can help firms deal with external uncertainties and provide explicit and implicit bailout guarantees for failing firms (Shailer & Wang, 2015; Wang & Shailer, 2022). This suggests that government-controlled firms have more resource at their disposal for MBE and thus fewer incentives to manage earnings. To control for the impact of profitability on the likelihood of MBE, we include *ROA*, positive earnings change (*PosiΔProfit*), and positive profit (*Profitable*). We expect the signs of the coefficients of these three variables to be positive because profitable firms or firms with increased profits have more incentives and a higher likelihood of MBE (Degeorge, Patel, & Zeckhauser, 1999; Graham *et al.*, 2005). We include sales growth (*Sales growth*) and *MTB* to control for firms' actual growth and growth potential, respectively (Skinner & Sloan, 2002). We include *Size* and *CFO* because larger firms and firms with more cash flow from operations have a greater ability to meet or beat analyst forecasts. We control for seasoned equity offerings (*SEO*) and delisting risk (*Delisting risk*) because the earnings management incentives of firms that anticipate the issuance of new shares in the near future or firms that are at risk of delisting may differ from those of other firms [5]. We also include industry and year indicators to control for industry and year fixed effects.
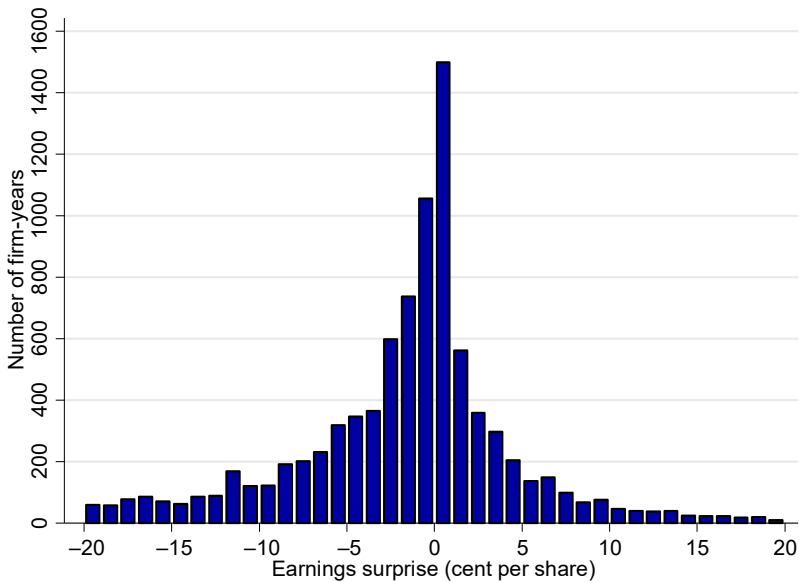
4.4.2 The relative future financial performance of firms that achieve MBE by a small margin. To test H5, we compare the future operating performance of firms that achieve MBE by a small margin with that of matched non-MBE firms in the next three years. We match each MBE firm with a non-MBE firm in the same industry and year based on *Analyst*, *GVT*,

ROA, *ETP*, *Size*, *MTB*, *Leverage*, *CFO*, and *Prior stock return* in year *t* using one-to-one nearest neighbor propensity score matching without replacement. To enhance the effectiveness of the matching procedure, we use a small caliper of 0.01 to identify sets of matches. Drawing on studies that investigate the long-run operating performance of MBE firms (e.g. Gunny, 2010; Byun & Roland-Luttecke, 2014), we use *ROA*, *EPS* and *CFO* as indicators of operating performance.

5. Results and analysis

5.1 Descriptive statistics

Figure 1 plots the frequency distribution of earnings surprises for the full sample. We assign earnings surprise observations to 40 equally sized bins ranging from −20 to +20 cents per share, with a size of 1 cent per share for each bin. The first bin to the right of 0 includes zero earnings surprise and earnings surprises > 0 but ≤ 1 cent. Following the literature (e.g. An, Lee, & Zhang, 2014), we eliminate observations outside the range of −20 to +20 cents per

Note(s): The X-axis represents the magnitude of earnings surprise (measured in RMB). The Y-axis represents the number of firm-years. Earnings surprise is the difference between the actual annual earnings per share and the last analyst forecast made within 150−2 days prior to the earnings announcement date. Earnings surprise observations are aggregated into 40 equally sized bins, ranging from −20 cents to +20 cents per share, with the size of 1 cent per share for each bin. For the bins to the right of zero, the first bin includes zero earnings surprise and earnings surprises greater than zero but less than or equal to 1 cent, and the second is for earnings surprises greater than 1 cent but less than or equal to 2 cents, and so forth. For the bins to the left of zero, the first bin is for earnings surprises smaller than zero but greater than or equal to -1 cent, and so forth. The full sample of this study is 9,898 firm-years. The figure includes 8,800 firm-years because observations outside the range between −20 cents and +20 cents per share are eliminated for brevity

Figure 1.
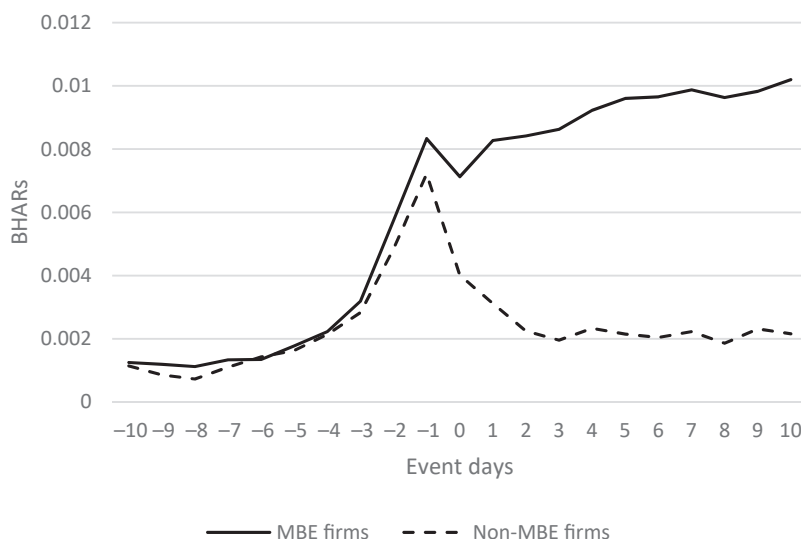Frequency distribution
of earnings surprises

share for brevity. The figure includes 8,800 firm-years, which accounts for 89% of the firm-years in the full sample. The results show that the number of firms that just meet or narrowly beat analyst forecasts by ≤1 cent is disproportionally higher than the number of firms that just miss forecasts by ≤1 cent. The number of firms that beat or miss analyst forecasts decreases as the margin by which firms beat or miss analyst forecasts increases, which shows that firms are more likely to beat or miss forecasts by smaller margins.

Figure 2 presents the mean BHARs for MBE (solid line) and non-MBE firms (dashed line) over a 20-day event window [−10, 10]. The BHARs for MBE firms are consistently higher than those for non-MBE firms over the entire event window. There is an increasing trend of better market performance for MBE firms than non-MBE firms across the post-event window [6].

Table 1 reports the descriptive statistics for the variables used in regression analyses for the full sample and the samples of MBE firms ($MBE = 1$) and non-MBE firms ($MBE = 0$) [7]. The BHARs of MBE firms are significantly higher than those of non-MBE firms. Regarding the earnings management variables, MBE firms have significantly higher abnormal expenditures, abnormal cash flows from operation and abnormal related-party transactions than non-MBE firms. There is no significant difference in the mean values of other earnings management variables between MBE firms and non-MBE firms.

5.2 Results for the overall market reaction to MBE
Our maintained hypothesis predicts that market reactions are higher for MBE firms than for non-MBE firms. Table 2 presents the regression results using *BHAR* to measure market reactions over five event windows around the annual earnings announcement event: three-day [−1, 1], five-day [−2, 2], seven-day [−3, 3], 11-day [−5, 5] and 21-day [−10, 10][8]. Across

Note(s): This figure shows the mean BHARs for firms that meet/beat analyst forecasts (solid line) and those for firms that miss analyst forecasts (dashed line) over event window [−10, 10]. The X-axis represents the event days with the original point being the event date. The Y-axis represents the level of BHARs

Variables	Full sample (N = 9,898)		MBE firms (MBE = 1) (N = 3,930)		Non-MBE firms (MBE = 0) (N = 5,968)		Mean difference	
	Mean	Median	Mean	Median	Mean	Median	Mean	p-value
MBE	0.397	0.000	1.000	1.000	0.000	0.000	1.000	0.000
BHAR[−1, 1]	−0.001	−0.003	0.003	0.000	−0.003	−0.005	0.006	0.000
BHAR[−2, 2]	0.000	−0.003	0.005	0.001	−0.002	−0.006	0.007	0.000
BHAR[−3, 3]	0.001	−0.004	0.006	0.000	−0.002	−0.006	0.008	0.000
BHAR[−5, 5]	0.003	−0.004	0.008	0.001	0.000	−0.007	0.008	0.000
BHAR[−10, 10]	0.006	−0.006	0.011	−0.001	0.002	−0.009	0.009	0.000
AAcruals	0.014	0.010	0.015	0.009	0.014	0.011	0.001	0.694
AProduction	−0.031	−0.008	−0.034	−0.013	−0.029	−0.005	−0.006	0.278
AExpenditures	0.019	−0.007	0.022	−0.004	0.017	−0.008	0.006	0.007
ACFO	0.009	0.011	0.014	0.015	0.005	0.007	0.009	0.053
ARPS	0.000	−0.015	0.002	−0.015	−0.001	−0.015	0.003	0.080
ARPP	0.000	−0.012	0.003	−0.013	−0.001	−0.012	0.005	0.017
Surprise	−0.004	−0.001	0.005	0.002	−0.010	−0.004	0.015	0.000
Analyst	11.931	9.000	12.278	9.000	11.702	9.000	0.575	0.007
GVT	0.569	1.000	0.586	1.000	0.558	1.000	0.028	0.006
ROA	0.052	0.044	0.057	0.048	0.048	0.042	0.009	0.000
ETP	0.037	0.031	0.045	0.037	0.032	0.028	0.013	0.000
Size	22.725	22.529	22.791	22.601	22.681	22.477	0.109	0.000
MTB	3.082	2.136	2.740	2.094	3.307	2.166	−0.567	0.093
Leverage	0.497	0.497	0.485	0.487	0.505	0.504	−0.020	0.093
CFO	0.065	0.061	0.074	0.067	0.059	0.057	0.015	0.000
Prior stock return	0.024	−0.001	0.041	0.011	0.012	−0.008	0.029	0.000
PosiAProfit	0.816	1.000	0.867	1.000	0.782	1.000	0.085	0.000
Profitable	0.956	1.000	0.972	1.000	0.945	1.000	0.028	0.000
Sales growth	0.157	0.133	0.179	0.144	0.142	0.126	0.037	0.000
SEO	0.178	0.000	0.188	0.000	0.172	0.000	0.016	0.040
Delisting risk	0.010	0.000	0.010	0.000	0.010	0.000	0.000	0.952

Table 1.
Summary statistics

Note(s): This table presents summary statistics for the full sample, the MBE firms and the non-MBE firms. The full sample comprises 9,898 observations from 1,821 unique firms. All variables are defined in Appendix 1

all event windows, the coefficient of *MBE* is significantly positive, which supports the maintained hypothesis. Considering the magnitude of the premium for MBE firms, the coefficient of *MBE* ranges from 0.006 to 0.008, indicating that by holding other factors constant, MBE firms earn $0.6\% - 0.8\%$ higher abnormal returns than non-MBE firms across the event windows.

The results for the control variables are generally consistent with our prediction. Firms with higher *Analysts*, *ROA* or *MTB* have higher abnormal returns. However, we do not find any significant association between BHARs and earnings surprises across all event windows. This lack of a linear correlation between BHARs and earnings surprises is not surprising because the magnitude of earnings surprises alone is not a reliable indicator of market reactions to earnings announcements, given that the association between earnings surprises and return may be *S*-shaped (Kinney, Burgstahler, & Martin, 2002).

5.3 Results for market reactions to meeting/just beating analyst forecasts and the moderating roles of analyst coverage and institutional ownership

Table 3 presents the results for market reactions to meeting/just beating analyst forecasts (H1). Across all event windows, we consistently find that the coefficient of *SMBEAT* is not statistically significant, while the coefficient of *BIGBEAT* is significantly positive in all five

Dep. var	Pred Sign	(1) BHAR[−1, 1]	(2) BHAR[−2, 2]	(3) BHAR[−3, 3]	(4) BHAR[−5, 5]	(5) BHAR[−10, 10]
MBE	+	0.006*** (0.000)	0.006*** (0.000)	0.007*** (0.000)	0.007*** (0.000)	0.008*** (0.000)
Surprise	+	−0.006 (0.638)	−0.002 (0.919)	−0.010 (0.589)	−0.015 (0.408)	0.011 (0.670)
Analyst	+	0.001*** (0.005)	0.001*** (0.001)	0.001*** (0.000)	0.001** (0.016)	0.001 (0.717)
GVT	−	−0.002 (0.121)	−0.001 (0.242)	−0.001 (0.513)	0.000 (0.909)	−0.001 (0.681)
ROA	+	0.033*** (0.005)	0.051*** (0.000)	0.061*** (0.000)	0.064*** (0.001)	0.047* (0.091)
ETP	+	−0.010 (0.460)	0.006 (0.714)	0.017 (0.347)	0.022 (0.320)	0.061** (0.039)
Size	−	0.000 (0.619)	0.000 (0.979)	−0.001 (0.258)	−0.001 (0.224)	−0.002** (0.047)
MTB	+	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.032)
Leverage	+	−0.000 (0.716)	−0.000 (0.794)	−0.000 (0.499)	−0.000 (0.619)	0.001 (0.255)
CFO	+	−0.000 (0.930)	0.000 (1.000)	0.002 (0.730)	0.005 (0.343)	0.006 (0.396)
Prior stock return	?	0.002 (0.397)	0.005 (0.135)	0.003 (0.342)	0.010** (0.018)	0.007 (0.204)
Constant		−0.008 (0.416)	−0.006 (0.618)	0.010 (0.494)	0.018 (0.277)	0.050** (0.031)
Year fixed effects		Yes	Yes	Yes	Yes	Yes
Industry fixed effects		Yes	Yes	Yes	Yes	Yes
Observations		9,898	9,831	9,773	9,539	8,813
R²		0.019	0.024	0.024	0.025	0.024

Note(s): This table presents the regression results of the overall market reaction to meeting or beating analyst earnings forecasts over the three-day [−1, 1], five-day [−2, 2], seven-day [−3, 3], 11-day [−5, 5] and 21-day [−10, 10] event windows around earnings announcements. Non-MBE firms serve as the control group omitted from the regression for comparison with MBE. All variables are defined in Appendix 1. p-values for two-tailed tests are given in parentheses and are based on robust standard errors clustered by firm and year. *, ** and *** indicate statistical significance at the 10, 5 and 1% levels, respectively

Table 2.
Overall market
reaction to MBE

Dep. var	(1) BHAR[−1, 1]	(2) BHAR[−2, 2]	(3) BHAR[−3, 3]	(4) BHAR[−5, 5]	(5) BHAR[−10, 10]
SMBEAT[a1]	0.002 (0.254)	0.002 (0.146)	0.003 (0.112)	0.003 (0.195)	0.002 (0.602)
BIGBEAT[a2]	0.007*** (0.000)	0.009*** (0.000)	0.009*** (0.000)	0.009*** (0.000)	0.011*** (0.002)
Surprise	−0.009 (0.505)	−0.006 (0.677)	−0.015 (0.385)	−0.020 (0.456)	0.005 (0.883)
Analyst	0.001*** (0.006)	0.001*** (0.007)	0.001*** (0.000)	0.001** (0.024)	0.001 (0.751)
GVT	−0.002* (0.099)	−0.001 (0.239)	−0.001 (0.471)	0.000 (0.953)	−0.001 (0.648)
ROA	0.033** (0.021)	0.050** (0.012)	0.060*** (0.000)	0.064* (0.077)	0.047 (0.327)
ETP	−0.011 (0.617)	0.004 (0.897)	0.015 (0.416)	0.021 (0.615)	0.059 (0.237)
Size	0.000 (0.752)	−0.000 (0.983)	−0.001 (0.243)	−0.001 (0.554)	−0.002 (0.428)
MTB	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001* (0.076)
Leverage	−0.000 (0.686)	−0.000 (0.739)	−0.000 (0.446)	−0.000 (0.667)	0.001 (0.188)
CFO	−0.000 (0.856)	−0.000 (0.975)	0.002 (0.746)	0.005 (0.333)	0.005 (0.503)
Prior stock return	0.002 (0.538)	0.004 (0.219)	0.003 (0.386)	0.009 (0.109)	0.007 (0.489)
Constant	−0.008 (0.527)	−0.006 (0.768)	0.010 (0.478)	0.019 (0.574)	0.051 (0.375)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	9,898	9,831	9,773	9,539	8,813
R^2	0.020	0.025	0.025	0.025	0.025
Test of equality of coefficients					
p-value (H$_0$; a1 = a2)	0.005	0.003	0.005	0.021	0.004

Note(s): This table presents the regression results of market reactions to meeting/just beating analyst forecasts over three-, five-, seven-, 11- and 21-day event windows around earnings announcements. *SMBEAT (BIGBEAT)* is a dummy variable equal to 1 if a firm's actual EPS equals or exceeds the latest analyst forecast by ≤1 cent per share (> 1 cent per share), and 0 otherwise. Non-MBE firms serve as the control group omitted from the regression for comparison with *MBE (SMBEAT* and *BIGBEAT)*. All variables are defined in Appendix 1. *p*-values for two-tailed tests are given in parentheses and are based on robust standard errors clustered by firm and year. *, ** and *** indicate statistical significance at the 10, 5 and 1% levels, respectively. The test of equality of coefficients is an *F*-test.

Table 3.
Market reactions to meeting/just beating analyst forecasts (H1)

regressions for BHARs, i.e. over the three-, five-, seven-, 11- and 21-day event windows around the earnings announcements. These results suggest that the market does not reward firms for beating analyst forecasts by a small margin, which is consistent with H1.

H2 (H3) predicts that analyst coverage (institutional ownership) moderates market reactions to meeting/just beating analyst forecasts. Table 4 report the regression results. The lack of market reward for meeting/just beating analyst forecasts only occurs for the subsample of firms with low analyst coverage (Panel A) or low institutional ownership (Panel B), suggesting that the market tends to be more skeptical of meeting/just beating analyst forecasts for firms with weak external monitoring.

5.4 Results for market bias against meeting/just beating analyst forecasts
5.4.1 Results for H4. H4 predicts a lack of significant correlations between income-increasing earnings management and the likelihood of meeting/just beating analyst forecasts if the market is biased against meeting/just beating analyst forecasts. We examine this conjecture by regressing *SMBEAT* on the three types of earnings management, with six earnings management variables serving as proxies: accruals earnings management (*AAcruals*), real earnings management (measured by *AProduction*, *AExpenditures*, and *ACFO*), and related-party transactions (measured by *ARPS* and *ARPP*). Table 5 reports the results. The sample consists of firms that achieve meeting/just beating analyst forecasts and non-MBE firms. Consistent with our predictions, all proxies for earnings management are insignificant, which shows no evidence that firms achieving MBE by a small margin manipulate earnings to improve the probability of MBE.

5.4.2 Results for H5. H5 predicts that the relative future financial performance of firms that achieve MBE by a small margin will be superior to that of non-MBE firms. Table 6 reports the results. Firms that meet or just beat analyst forecasts outperform matched non-MBE firms in all aspects of financial performance (*ROA*, *EPS* and *CFO*) in the next three years, which supports H5.

As a further test, we compare the future operating performance of firms that meet or just beat analyst forecasts with that of matched firms that beat analyst forecasts by a big margin in the same industry and year based on *Analyst, GVT, ROA, ETP, Size, MTB, Leverage, CFO* and *Prior stock return* in year t using one-to-one nearest neighbor propensity score matching without replacement [9]. The results show that firms achieving MBE by a small margin underperform in terms of *ROA* in year $t + 1$ and *EPS* in year $t + 1$ and year $t + 2$ but have better *CFO* performance in all three years after MBE. Notably, in year $t + 3$, firms beating analyst forecasts by a big margin do not outperform firms achieving MBE by a small margin in any aspect.

Overall, the results for H4 and H5 suggest that the market is biased against meeting/just beating analyst forecasts, which is consistent with the hypothesis that the market is overly skeptical of meeting/just beating analyst forecasts.

5.5 Robustness tests
5.5.1 Heckman's two-stage model. Market reactions to meeting or beating analyst forecasts are observable only for firms with analyst coverage; therefore, our results may be biased if analysts' decision to follow specific firms is not determined randomly. To address this concern, we use Heckman's (1979) two-stage model to condition market reactions to the likelihood of analyst coverage. Specifically, in the first stage, we estimate a probit regression for the probability that a company has analyst coverage (*Analyst dummy*) against the non-analyst-related control variables used in equation (1), year and industry fixed effects, and the external instrumental variable *IndAnaCov*, which is the proportion of firms with at least one analyst in the same industry in a given year. Li, Lu and Lo (2019) find that industry-level

Table 4.
The moderating effects of analyst coverage and institutional ownership (H2 and H3)

Dep. var	(1) BHAR[-1, 1]	(2)	(3) BHAR[-2, 2]	(4)	(5) BHAR[-3, 3]	(6)	(7) BHAR[-5, 5]	(8)	(9) BHAR[-10, 10]	(10)
Sample	High	Low	High	Low	High	Low	High	Low	High	Low
Panel A. The moderating effect of analyst coverage										
SMBEAT	0.005** (0.033)	-0.000 (0.879)	0.006** (0.029)	-0.001 (0.710)	0.006** (0.021)	-0.000 (0.914)	0.006* (0.064)	0.001 (0.789)	0.002 (0.714)	0.003 (0.381)
BIGBEAT	0.008*** (0.000)	0.006*** (0.007)	0.009*** (0.000)	0.007*** (0.006)	0.010*** (0.000)	0.009*** (0.000)	0.009*** (0.001)	0.010** (0.013)	0.011*** (0.002)	0.011** (0.025)
Constant	-0.026 (0.104)	0.000 (0.972)	-0.015 (0.544)	-0.010 (0.642)	-0.010 (0.636)	0.008 (0.704)	-0.007 (0.867)	0.024 (0.502)	0.010 (0.888)	0.055 (0.364)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,743	5,155	4,700	5,131	4,656	5,117	4,499	5,040	4,038	4,775
R^2	0.036	0.012	0.044	0.017	0.046	0.019	0.046	0.022	0.050	0.028
Panel B. The moderating effect of institutional ownership										
SMBEAT	0.004*** (0.008)	0.002 (0.271)	0.005** (0.011)	0.002 (0.436)	0.005** (0.024)	0.003 (0.289)	0.006** (0.040)	0.003 (0.335)	0.005 (0.182)	0.000 (0.976)
BIGBEAT	0.006*** (0.000)	0.008*** (0.000)	0.006*** (0.002)	0.011*** (0.000)	0.007*** (0.002)	0.012*** (0.000)	0.007*** (0.008)	0.012*** (0.000)	0.009*** (0.009)	0.013*** (0.000)
Constant	-0.019 (0.145)	0.007 (0.650)	-0.022 (0.174)	0.018 (0.357)	-0.010 (0.600)	0.037* (0.095)	0.013 (0.566)	0.038 (0.138)	0.051 (0.109)	0.069*** (0.046)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,945	4,953	4,908	4,923	4,878	4,895	4,747	4,792	4,352	4,461
R^2	0.028	0.020	0.037	0.024	0.041	0.020	0.039	0.023	0.037	0.029

Note(s): This table presents the regression results of the moderating effects of analyst coverage (Panel A) and institutional ownership (Panel B) on market reactions to meeting/just beating analyst forecasts. In Panel A (B), the full sample is partitioned into high and how analyst coverage (institutional ownership) subsamples using the yearly median value as the cutoff. *SMBEAT* (*BIGBEAT*) is a dummy variable equal to 1 if a firm's actual EPS equals or exceeds the latest analyst forecast by ≤ 1 cent per share (>1 cent per share), and 0 otherwise. In Panels A and B, non-MBE firms serve as the control group omitted from the regression for comparison with *MBE* (*SMBEAT* and *BIGBEAT*). All control variables are included in the regressions, but their results are not tabulated for the sake of brevity. All variables are defined in Appendix 1. *p*-values for two-tailed tests are given in parentheses and are based on robust standard errors clustered by firm and year. *, ** and *** indicate statistical significance at the 10, 5 and 1% levels, respectively

Dep. var	(1) *SMBEAT*
AAcruals	0.045 (0.780)
AProduction	0.092 (0.668)
AExpenditures	−0.267 (0.330)
ACFO	0.229 (0.176)
ARPS	0.038 (0.952)
ARPP	0.761 (0.237)
Analyst	0.008** (0.046)
GVT	−0.014 (0.835)
ROA	0.380 (0.682)
PosiΔProfit	0.409*** (0.000)
Profitable	0.348** (0.037)
Sales growth	0.022 (0.837)
MTB	−0.030** (0.048)
Size	−0.037 (0.205)
CFO	0.350 (0.330)
SEO	−0.125* (0.070)
Delisting risk	0.420 (0.217)
Constant	−0.748 (0.191)
Year fixed effects	Yes
Industry fixed effects	Yes
Observations	7,484
Pseudo R^2	0.029

Note(s): This table presents the logistic regression results of the relation between income increasing earnings management and meeting/just beating analyst forecasts. The sample consists of firms that achieve MBE by a small margin and non-MBE firms. All variables are defined in Appendix 1. *p*-values for two-tailed tests are given in parentheses and are based on robust standard errors clustered by firm and year. *, ** and *** indicate statistical significance at the 10, 5 and 1% levels, respectively

Table 5.
Logistic regression results of the relation between income-increasing earnings management and the probability of meeting/just beating analyst forecasts (H4)

analyst coverage positively affects a firm's probability of having analyst coverage but is unlikely to directly affect market reactions to the firm's events. In the second stage, we include the inverse Mills ratio (*Inverse Mills*) obtained from the first step as the latent variable to control for the impact of self-selection.

Appendix 3 reports the results for the first-stage Heckman regression. Similar to Li *et al.* (2019), we find that firms in industries that have a higher proportion of firms with analyst coverage are more likely to be followed by analysts. In addition, we find that government-controlled firms and those with higher *ROA, ETP, MTB* and *Prior stock return*, larger *Size* and lower *Leverage* are more likely to have analyst coverage.

Panels A and B of Table 7 show the results for the second-stage Heckman regression of the overall market reaction to MBE and to meeting/just beating analyst forecasts, respectively. Across all regressions, the coefficients of *MBE* are quantitatively and statistically similar to those in the main results after controlling for *Inverse Mills*. These results show that our inference remains unchanged after accounting for potential sample selection bias.

5.5.2 Propensity score matched sample. Another endogeneity concern is that the relationship between the stock market reaction to earnings announcements and the likelihood of MBE may be endogenously determined by certain firm characteristics. To address this concern, in our main regression analyses, we control for various firm characteristics that may jointly affect firms' likelihood of MBE and abnormal stock returns. To mitigate this concern further, we use a propensity score matched sample to increase the comparability between MBE and non-MBE firms. We use the matching approach in Section 4.4.2 to obtain the matched sample. Appendix 4 presents the summary statistics for the

| | | Year t + 1 | | | Year t + 2 | | | Year t + 3 | | |
		ROA_{t+1} (1)	EPS_{t+1} (2)	CFO_{t+1} (3)	ROA_{t+2} (4)	EPS_{t+2} (5)	CFO_{t+2} (6)	ROA_{t+3} (7)	EPS_{t+3} (8)	CFO_{t+3} (9)
(1) Firms that achieve MBE by a small margin	Mean	0.051***	0.445***	0.065***	0.046***	0.422***	0.063***	0.042***	0.423***	0.061***
(2) Matched non-MBE firms	Mean	0.042***	0.402***	0.055***	0.038***	0.377***	0.051***	0.037***	0.386***	0.053***
Difference (1) − (2)	Dif	0.009***	0.042**	0.011***	0.008***	0.045**	0.012***	0.006**	0.037*	0.008***
Matched pairs	N	1,513	1,513	1,513	1,430	1,430	1,430	1,319	1,319	1,319
(3) Firms that achieve MBE by a small margin	Mean	0.048***	0.455***	0.065***	0.044***	0.437***	0.063***	0.042***	0.438***	0.061***
(4) Matched firms that beat analyst forecasts by a big margin	Mean	0.055***	0.610***	0.060***	0.046***	0.555***	0.056***	−0.005	0.483***	0.053***
Difference (3) − (4)	Dif	−0.007**	−0.155***	0.005*	−0.002	−0.118***	0.007**	0.047	−0.045	0.008***
Matched pairs	n	1,490	1,490	1,490	1,407	1,407	1,407	1,296	1,296	1,296

Note(s): This table compares the future operating performance of firms achieving MBE by a small margin ($SMBEAT = 1$) with that of matched non-MBE firms ($MBE = 0$) and firms that beat analyst forecasts by a big margin ($BIGBEAT = 1$). The match is based on $Analyst$, GVT, ROA, ETP, Sze, MTB, $Leverage$, CFO, $Prior$ $stock$ $return$ and industry in year t using one-to-one nearest neighbor propensity score matching without replacement. To enhance the effectiveness of matching, we use a small caliper of 0.01 to identify sets of matches. MBE firms (non-MBE firms) are those firms whose reported EPS equals or exceeds (below) the latest analysts' forecasted EPS made within 150 −2 days before the earnings announcements. Firms achieving MBE by a small margin (firms beating analyst forecasts by a big margin) are those firms whose actual EPS equals or exceeds the latest analyst forecast by ≤1 cent per share (>1 cent per share), and 0 otherwise. ROA is net profit scaled by closing total assets. EPS is the actual earnings per share. CFO is cash flows from operating activities divided by year-end total assets. The test of mean differences is a two-tailed t-test. *, ** and *** indicate statistical significance at the 10, 5 and 1% levels, respectively

Table 6.
Comparison of long-run operating performance between firms achieving MBE by a small margin and matched control firms (H5)

Dep. Var	(1) BHAR[−1, 1]	(2) BHAR[−2, 2]	(3) BHAR[−3, 3]	(4) BHAR[−5, 5]	(5) BHAR[−10, 10]
Panel A: Overall market reaction to MBE					
MBE	0.006*** (0.000)	0.006*** (0.000)	0.007*** (0.000)	0.007*** (0.000)	0.008*** (0.000)
Inverse Mills	−0.004 (0.216)	−0.007* (0.071)	−0.007* (0.082)	−0.005 (0.277)	−0.010 (0.126)
Constant	0.010 (0.575)	0.027 (0.226)	0.046* (0.075)	0.044 (0.130)	0.102** (0.014)
Controls	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	9,898	9,831	9,773	9,539	8,813
R^2	0.019	0.025	0.024	0.025	0.024
Panel B: Market reactions to meeting/just beating analyst forecasts					
SMBEAT[a1]	0.002 (0.247)	0.002 (0.135)	0.003 (0.106)	0.003 (0.187)	0.002 (0.493)
BIGBEAT[a2]	0.007*** (0.000)	0.008*** (0.000)	0.009*** (0.000)	0.009*** (0.000)	0.011*** (0.000)
Inverse Mills	−0.003 (0.464)	−0.006 (0.296)	−0.007* (0.095)	−0.005 (0.615)	−0.010 (0.140)
Constant	0.010 (0.731)	0.026 (0.451)	0.045* (0.080)	0.043 (0.411)	0.101** (0.015)
Controls	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	9,898	9,831	9,773	9,539	8,813
R^2	0.020	0.026	0.025	0.025	0.025
Test of equality of coefficients					
p-value (H_0; a1 = a2)	0.010	0.001	0.001	0.013	0.006

Note(s): This table presents the results for the second-stage Heckman regression analysis of the overall market reaction to MBE (Panel A) and market reactions to meeting/just beating analyst forecasts (Panel B) over the three-, five-, seven, 11- and 21-day event windows around earnings announcements, respectively. In Panel A (Panel B), non-MBE firms serve as the control group omitted from the regression for comparison with MBE (SMBEAT and BIGBEAT). Appendix 3 reports the results for the first-stage Heckman regression. All control variables are included in the regressions, but their results are not tabulated for the sake of brevity. The test of equality of coefficients is an *F*-test. All variables are defined in Appendix 1. *p*-values for two-tailed tests are given in parentheses and are based on robust standard errors clustered by firm and year. *, ** and *** indicate statistical significance at the 10, 5 and 1% levels, respectively

Table 7.
Results of the second-stage Heckman regression

matched sample. We find no significant difference between MBE and non-MBE firms in terms of the control variables used in equation (1), except for *Surprise*, which we do not use in matching [10]. These statistics indicate that the matching procedure is effective. Panels A and B of Table 8 show the results for the overall market reaction to MBE and market reactions to MBE by a small margin, respectively. Our inferences remain unchanged.

5.5.3 Concerns about stale analyst forecasts. In our main tests, we require analyst forecasts to be made within 150 days of the earnings announcement to mitigate the problem of stale analyst forecasts. We note that the average age of the last forecast in our sample is 56 days, with a median of 45 days. Only 9.4% of the last forecasts are made during the 130–150 days preceding the earnings announcement. None of the analyst forecasts in our sample is made before the end of the third quarter of the fiscal year. These statistics suggest that stale analyst forecasts are not a concern in our study. We also restrict our regression analysis to analyst forecasts made within 30 days of the earnings announcement. Despite the much smaller sample size, our results remain similar. Additionally, we add forecast age (*Horizon*), which is measured as the natural logarithm of the age (in days) of the last analyst forecast for the firm's earnings in the year, as an additional control variable in the regression and find comparable results, suggesting that our findings are not affected by stale analyst forecasts. We do not tabulate these results for brevity.

5.5.4 Potential collinearity problem. In developing the model (equation 1) to test market reactions to MBE, we follow the literature (e.g. Koh *et al.*, 2008; Brown *et al.*, 2009; Kirk *et al.*, 2014) and include both *MBE* and *Surprise* in the regression. In our sample, the correlation between *MBE* and *Surprise* is 0.265. Although the correlation is not very high, to address the concern that our results may be driven by collinearity between *MBE* and *Surprise*, we replace *Surprise* with the demeaned earnings surprise (*Surprise_demeaned*), which is calculated as *Surprise* less the average *Surprise* of the industry over the year. We use this demeaned approach to address concerns about multicollinearity (e.g. Liu & McConnell, 2013). The untabulated results are quantitatively and statistically similar to our main results.

5.5.5 Fama–French three-factor model. In our main analyses, we follow the literature (e.g. Doyle *et al.*, 2013; Chen *et al.*, 2020) on market reactions to earnings surprises and use the market-adjusted BHARs to measure market reactions. To alleviate potential concerns that the market-adjusted BHARs may suffer from problems of cross-sectional correlations and inflated standard errors (Fama, 2021), in the spirit of Cheng, Lin, Lu, & Wei (2020), we estimate BHARs based on the Fama–French three-factor model to check the robustness of our results:

$$BHAR\_FF(t_1, t_2) = \prod_{t1}^{t2} R_i - \prod_{t1}^{t2} E(R_i) \qquad (4)$$

where *BHAR_FF* is the BHAR estimated based on the Fama–French three-factor model over various event windows $[t_1, t_2]$ centered on the annual earnings announcement day. R_i is firm *i*'s daily return and $E(R_i)$ is the firm's expected daily return. We estimate the firm's expected daily returns using the Fama–French (1993) three-factor model:

$$E(R_i) = R_f + \alpha + \beta_1(R_m - R_f) + \beta_2 SMB + \beta_3 HML \qquad (5)$$

where R_f is risk-free return, R_m is the return from the value-weighted market index, *SMB* is the size factor (constructed by small portfolios minus big portfolios) and *HML* is the value factor (constructed by high value portfolios minus low value portfolios). The data for the three factors are collected from CSMAR. The parameters α, β_1, β_2 and β_3 are estimated over the window $[-250, -30]$. In all tests, the results are quantitatively and qualitatively similar to our main results. We do not tabulate the results for brevity.

Dep. Var	(1) BHAR[−1, 1]	(2) BHAR[−2, 2]	(3) BHAR[−3, 3]	(4) BHAR[−5, 5]	(5) BHAR[−10, 10]
Panel A: Overall market reaction to MBE					
MBE	0.005*** (0.000)	0.007*** (0.000)	0.007*** (0.000)	0.007*** (0.000)	0.009*** (0.000)
Constant	−0.011 (0.376)	−0.007 (0.638)	0.004 (0.816)	0.020 (0.330)	0.046 (0.122)
Controls	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	6,698	6,608	6,566	6,364	5,850
R^2	0.021	0.026	0.025	0.025	0.026
Panel B: Market reactions to meeting/just beating analyst forecasts					
SMBEAT[a1]	0.002 (0.366)	0.002 (0.299)	0.002 (0.262)	0.002 (0.352)	0.003 (0.364)
BIGBEAT[a2]	0.007*** (0.000)	0.009*** (0.000)	0.010*** (0.000)	0.010*** (0.000)	0.011*** (0.004)
Constant	−0.011 (0.386)	−0.007 (0.762)	0.005 (0.876)	0.021 (0.513)	0.047 (0.407)
Controls	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	6,698	6,608	6,566	6,364	5,850
R^2	0.023	0.028	0.026	0.026	0.027
Test of equality of coefficients					
p-value (H$_0$; a1 = a2)	0.005	0.000	0.000	0.008	0.019

Note(s): This table presents the regression results of the overall market reaction to MBE (Panel A) and market reactions to meeting/just beating analyst forecasts (Panel B) over the three-, five-, seven-, 11- and 21-day event windows around earnings announcements, respectively, using a matched sample. We match each MBE firm with a non-MBE firm in the same industry and year based on *Analyst, GVT, ROA, ETP, Size, MTB, Leverage, CFO, Prior stock return* using one-to-one nearest neighbor propensity score matching without replacement. To enhance the effectiveness of matching, we use a small caliper of 0.01 to identify sets of matches. In Panel A (B), the matched non-MBE firms serve as the control group omitted from the regression for comparison with *MBE* (*SMBEAT* and *BIGBEAT*). All control variables are included in the regressions, but their results are not tabulated for brevity. The test of equality of coefficients is an *F*-test. All variables are defined in Appendix 1. *p*-values are for two-tailed tests are given in parentheses and are based on robust standard errors clustered by firm and year. *, ** and *** indicate statistical significance at the 10, 5 and 1% levels, respectively

Table 8.
Propensity score
matched sample

5.5.6 *Other robustness tests.* To examine the robustness of our results, we conduct the following additional tests and obtain similar results (untabulated). First, we use the CSRC 2012 three-digit industry classification (90 industries) to estimate the earnings management variables. Second, we use a performance-adjusted modified Jones model to estimate discretionary accruals. Third, we scale earnings surprises and actual EPS by the stock price one day before the beginning of the event windows for BHARs when calculating *Surprise* and *ETP*.

5.6 Further analysis

5.6.1 *Market reactions to managed MBE.* Our earlier results suggest that the market is overly skeptical of meeting/just beating analyst forecasts. In this section, we further examine whether the market distinguishes between managed and genuine MBE. To identify MBE firms that have engaged in income-increasing earnings management, we sort firms in each year into quintiles based on the values of the six earnings management variables (*AAcruals*, *AProduction*, *AExpenditures*, *ACFO*, *ARPS* and *ARPP*). We classify a firm year as engaging in income-increasing earnings management through discretionary accruals, production, related-party sales, related-party purchases, expenditure or CFO if it is in the highest quintile of *AAcruals*, *AProduction*, *ARPS* or *ARPP*, or in the lowest quintile of *AExpenditures* and *ACFO*.

To investigate whether the market penalizes managed MBE, we first compare BHARs for MBE firms identified as having managed earnings to achieve MBE (*MBE_EM* = 1) with those not identified as engaging in earnings management (*MBE_EM* = 0). Panel A of Table 9 shows the results. The abnormal returns earned by MBE firms that are (not) identified as having managed earnings to achieve MBE range between 0.2 and 1.0% (0.3%–1.4%). There are no significant differences in the abnormal returns earned by the two types of MBE firms, which suggests that the market does not distinguish between these two types of firms.

Next, we follow the literature (e.g. Doyle *et al.*, 2013; An *et al.*, 2014) and examine the earnings response coefficient (ERC) of the interaction between *MBE_EM* and *Surprise_rank* over short event windows using the following regression model:

$$BHAR(t_1, t_2) = \beta_0 + \beta_1 MBE\_EM_{i,t} + \beta_2 Surprise\_rank_{i,t} + \beta_3 MBE\_EM_{i,t}$$
$$\times Surprise\_rank_{i,t} + \beta_c Controls + Year\ Fixed\ Effect+ \qquad (6)$$
$$Industry\ Fixed\ Effect + \varepsilon_{i,t}$$

where *MBE_EM* is a dummy variable that equals 1 if an MBE firm is identified as having managed earnings to achieve MBE, and 0 otherwise. *Surprise_rank* is an ordinal variable obtained by ranking *Surprise* into deciles, subtracting 1 and then dividing by 9. Other variables are as defined in equation (1). The test variable is the interaction term *MBE_EM* × *Surprise_rank*. We expect its coefficient to be negative (i.e. lower ERC) if the market penalizes firms that achieve MBE using income-increasing earnings management. We follow Doyle *et al.* (2013) and only include MBE firms to simplify the interpretation of the ERC.

Panel B of Table 9 reports the results. Across all regressions, the coefficients of *MBE_EM* × *Surprise_rank* are insignificant, which suggests that investors do not discount earnings surprises associated with the use of income-increasing earnings management to meet or beat analyst forecasts. There are two possible reasons for this phenomenon. First, meeting or beating analyst forecasts through earnings management is a signal of future performance. Bartov *et al.* (2002) find that although the future operating performance of firms that manage their earnings to achieve MBE is inferior to that of firms that genuinely meet or beat analyst forecasts, the former still fare better than non-MBE firms. In such cases, rational investors will not penalize firms that achieve MBE through earnings management. Second, the market does not distinguish between firms that manage their MBE from those with genuine MBE.

Panel A: BHARs for MBE_EM firms

		(1) BHAR[−1, 1]	(2) BHAR[−2, 2]	(3) BHAR[−3, 3]	(4) BHAR[−5, 5]	(5) BHAR[−10, 10]
(1)	MBE_EM = 1					
	Mean	0.002**	0.004***	0.006***	0.007***	0.010***
	p-value	(0.014)	(0.000)	(0.000)	(0.000)	(0.000)
	n	2,387	2,387	2,387	2,387	2,387
(2)	MBE_EM = 0					
	Mean	0.003***	0.006***	0.008***	0.011***	0.014***
	p-value	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)
	n	1,543	1,543	1,543	1,543	1,543
Dif: (1) − (2)	Dif	−0.001	−0.001	−0.002	−0.004	−0.003
	p-value	(0.383)	(0.452)	(0.330)	(0.119)	(0.278)

Dep. var	Pred. sign	(1) BHAR[−1, 1]	(2) BHAR[−2, 2]	(3) BHAR[−3, 3]	(4) BHAR[−5, 5]	(5) BHAR[−10, 10]
Panel B: Regression results of market reactions to earnings announcements by MBE_EM firms						
MBE_EM	−	0.014 (0.139)	0.006 (0.628)	−0.000 (0.990)	0.010 (0.516)	0.008 (0.684)
Surprise_rank	+	0.023** (0.015)	0.021* (0.060)	0.022* (0.091)	0.032** (0.028)	0.046** (0.019)
MBE_EM × Surprise_rank	−	−0.018 (0.120)	−0.007 (0.633)	0.000 (0.999)	−0.014 (0.437)	−0.012 (0.610)
Analyst	+	0.000*** (0.008)	0.000*** (0.003)	0.000*** (0.001)	0.000* (0.064)	0.000 (0.715)
GVT	−	−0.002 (0.301)	−0.002 (0.255)	−0.002 (0.480)	0.002 (0.509)	−0.000 (0.903)
ROA	+	0.027 (0.178)	0.042* (0.091)	0.032 (0.249)	0.044 (0.172)	0.061 (0.229)
ETP	+	0.001 (0.969)	0.014 (0.575)	0.025 (0.390)	0.020 (0.521)	0.032 (0.489)
Size	−	−0.000 (0.912)	−0.000 (0.740)	−0.001 (0.187)	−0.002 (0.171)	−0.005*** (0.004)
MTB	+	0.001*** (0.002)	0.001** (0.047)	0.001 (0.110)	0.001 (0.135)	0.001 (0.135)
Leverage	+	0.006 (0.221)	0.006 (0.320)	0.004 (0.553)	0.002 (0.816)	0.023* (0.063)
CFO	+	0.000 (0.975)	−0.000 (0.980)	0.002 (0.709)	0.004 (0.555)	0.006 (0.393)
Prior stock return	?	−0.004 (0.335)	−0.001 (0.873)	0.001 (0.905)	0.009 (0.156)	0.011 (0.212)
Constant		−0.018 (0.289)	−0.008 (0.693)	0.019 (0.412)	0.023 (0.394)	0.080** (0.033)
Year fixed effects		Yes	Yes	Yes	Yes	Yes
Industry fixed effects		Yes	Yes	Yes	Yes	Yes
Observations		3,930	3,902	3,873	3,809	3,622
R^2		0.030	0.029	0.028	0.031	0.030

Note(s): This table presents results of market reactions to earnings announcements by MBE firms that are identified as having managed earnings to achieve MBE (MBE_EM firms). Panel A presents mean BHARs for MBE_EM firms (MBE_EM = 1) and MBE firms not identified as MBE_EM firms (MBE_EM = 0). Panel B presents the regression results. The sample used in Panel B is MBE firms (MBE_EM = 1), and MBE firms that are not identified as MBE_EM firms serve as the control group omitted from the regression for comparison with MBE_EM. MBE_EM is a dummy variable equal to 1 if an MBE firm is identified as having engaged in income increasing earnings management, and 0 otherwise. A firm is classified as an MBE_EM firm in a year if it is either in the highest quintile of AAccruals, AProduction, ARPS or ARPP, or in the lowest quintile of AExpenditures and ACFO in the year. Surprise_rank is an ordinal variable obtained by ranking Surprise into deciles, subtracting 1 and then dividing by 9. Other variables are defined in Appendix 1. p-values for two-tailed tests are given in parentheses and are based on robust standard errors clustered by firm and year. *, ** and *** indicate statistical significance at the 10, 5 and 1% levels, respectively

Table 9.
Market reactions to managed MBE

To disentangle these two possible reasons, we examine the predictive power of managed and genuine MBE considering future operating performance in the next section.

5.6.2 Association between future operating performance and extent of earnings management to achieve MBE. To examine whether MBE through earnings management is predictive of future operating performance, we compare the long-run operating performance (*ROA*, *EPS*, and *CFO* in years $t + 1$, $t + 2$ and $t + 3$) of firms that are likely to have engaged in income-increasing earnings management to achieve MBE (*MBE_EM* firms) with matched MBE firms that are not likely to have engaged in income-increasing earnings management to achieve MBE. Matching is based on the same matching approach in Section 4.4.2. An MBE firm is identified as likely (not likely) to have engaged in income-increasing earnings management to achieve MBE using accruals, production, related-party sales, related-party purchases, expenditure or CFO in a year if it is in the highest (lowest) quintile of *AAcruals*, *AProduction*, *ARPS* or *ARPP*, or in the lowest (highest) quintile of *AExpenditures* and *ACFO* in the year.

Table 10 presents the results. Panels A, B and C compare the future performance of MBE firms that are likely to have managed earnings to achieve MBE using accruals, real earnings management (including the use of production, expenditure and CFO) and related-party transactions (including related-party sales and purchases) with that of MBE firms that are unlikely to have used the respective strategies. We find that MBE firms suspected of earnings management to achieve MBE tend to underperform when compared with MBE firms with genuine MBE in terms of *ROA*, *EPS* and *CFO* in the three years following the MBE year.

Overall, we document that MBE through earnings management is detrimental to firms' future operating performance. This finding is consistent with the literature showing firms with high levels of accruals are more likely to experience a decrease in long-run operating performance because accruals reverse over subsequent periods (Dechow *et al.*, 2012). Our findings also reflect the literature showing by adapting the timing or structure of real transactions to meet or beat current earnings targets or by conducting abnormal related-party transactions, firms may end up sacrificing their operating performance in the long run (Graham *et al.*, 2005; Jian & Wong, 2010).

6. Conclusion

Using a sample of Chinese listed firms, we investigate how the stock market reacts to MBE and whether there is any bias in market reactions. We find that the market does not reward meeting/just beating analyst forecasts but rewards beating analyst forecasts by a big margin. However, we do not find evidence that firms manipulate earnings to achieve MBE by a small margin. We also show that firms achieving MBE by a small margin outperform non-MBE firms in terms of long-run operating performance. Compared with firms beating analyst forecasts by a big margin, firms that achieve MBE by a small margin also show better performance in terms of cash flow from operations and similar ROA performance. This finding suggests that the market's lack of rewards for meeting/just beating analyst forecasts results from investors' overly skeptical attitude toward this phenomenon. Our cross-sectional analysis shows that the market is less skeptical of meeting/just beating analyst forecasts for firms that are subject to more intense external monitoring.

Further analysis indicates that the market rewards managed MBE and genuine MBE equally, which suggests that the market does not distinguish between firms that manage or do not manage their earnings to achieve MBE. Firms that achieve MBE through earnings management tend to experience inferior operating performance compared with genuine MBE and non-MBE firms. Therefore, achieving MBE through earnings management is not an indicator of superior future performance.

| | | Year t + 1 | | | Year t + 2 | | | Year t + 3 | | |
		ROA_{t+1} (1)	EPS_{t+1} (2)	CFO_{t+1} (3)	ROA_{t+2} (4)	EPS_{t+2} (5)	CFO_{t+2} (6)	ROA_{t+3} (7)	EPS_{t+3} (8)	CFO_{t+3} (9)
Panel A: Effect of accruals EM										
(1) MBE firms likely to engage in accrual-based EM	Mean	0.048***	0.542***	0.035***	0.034***	0.461***	0.038***	0.035***	0.428***	0.038***
	N	791	791	791	745	745	745	694	694	694
(2) MBE firms not likely to engage in accrual-based EM	Mean	0.055***	0.588***	0.079***	0.048***	0.573***	0.070***	0.045***	0.568***	0.070***
	n	791	791	791	745	745	745	694	694	694
Difference: (2) – (1)	Dif	0.006	0.047	0.045***	0.014**	0.111***	0.032***	0.010***	0.140***	0.032***
Panel B: Effect of REM										
(3) MBE firms likely to engage in production REM	Mean	0.031***	0.366***	0.030***	0.022***	0.331***	0.037***	0.022***	0.313***	0.037***
	n	761	761	761	722	722	722	675	675	675
(4) MBE firms not likely to engage in production REM	Mean	0.085***	0.871***	0.091***	0.071***	0.846***	0.086***	0.071***	0.842***	0.076***
	n	761	761	761	722	722	722	675	675	675
Difference: (4) – (3)	Dif	0.054***	0.505***	0.060***	0.049***	0.514***	0.049***	0.049***	0.529***	0.039***
(5) MBE firms likely to engage in expenditure REM	Mean	0.038***	0.386***	0.048***	0.024***	0.309***	0.047***	0.020***	0.221***	0.046***
	n	757	757	757	723	723	723	678	678	678
(6) MBE firms not likely to engage in expenditure REM	Mean	0.071***	0.729***	0.083***	0.061***	0.698***	0.078***	0.062***	0.695***	0.071***
	n	757	757	757	723	723	723	678	678	678
Difference: (6) – (5)	Dif	0.033***	0.343***	0.035***	0.037***	0.389***	0.030***	0.041***	0.474***	0.025***
(7) MBE firms likely to engage in CFO REM	Mean	0.030***	0.409***	0.021***	0.012	0.324***	0.024***	0.022***	0.307***	0.021***

(continued)

Table 10.
The relation between the long-run operating performance and the extent of earnings management

Table 10.

| | | Year t + 1 | | | Year t + 2 | | | Year t + 3 | | |
		ROA_{t+1} (1)	EPS_{t+1} (2)	CFO_{t+1} (3)	ROA_{t+2} (4)	EPS_{t+2} (5)	CFO_{t+2} (6)	ROA_{t+3} (7)	EPS_{t+3} (8)	CFO_{t+3} (9)
(8) MBE firms not likely to engage in CFO REM	n	749	749	749	708	708	708	656	656	656
	Mean	0.086***	0.872***	0.104***	0.074***	0.815***	0.094***	0.066***	0.795***	0.089***
Difference: (8) – (7)	n	749	749	749	708	708	708	656	656	656
	Dif	0.056***	0.463***	0.083***	0.062***	0.491***	0.071***	0.044***	0.487***	0.068***
Panel C: Effect of abnormal related-party transactions										
(9) MBE firms likely to engage in ARPS	Mean	0.054***	0.577***	0.062***	0.048***	0.539***	0.060***	0.044***	0.532***	0.059***
	n	740	740	740	695	695	695	643	643	643
(10) MBE firms not likely to engage in ARPS	Mean	0.051***	0.727***	0.067***	0.046***	0.594***	0.064***	0.043***	0.572***	0.062***
	n	740	740	740	695	695	695	643	643	643
Difference: (10) – (9)	Dif	–0.003	0.150***	0.006	–0.001	0.055	0.004	–0.001	0.040	0.003
(11) MBE firms likely to engage in ARPP	Mean	0.053***	0.557***	0.062***	0.046***	0.519***	0.059***	0.041***	0.492***	0.058***
	n	748	748	748	705	705	705	650	650	650
(12) MBE firms not likely to engage in ARPP	Mean	0.050***	0.719***	0.066***	0.044***	0.652***	0.065***	0.040***	0.605***	0.064***
	n	748	748	748	705	705	705	650	650	650
Difference: (12) – (11)	Dif	–0.004	0.163***	0.004	–0.001	0.133**	0.006	–0.000	0.113*	0.007*

Note(s): Panels A, B and C compare the future operating performance of MBE cases that are likely to reflect earnings management (EM) with that of matched MBE cases that are not likely to be achieved through EM. The match is based on *Analyst, GVT, ROA, ETP, Size, MTB, Leverage, CFO, Prior stock return* and industry in year t using one-to-one nearest neighbor propensity score matching without replacement. To enhance the effectiveness of matching, we use a small caliper of 0.01 to identify sets of matches. MBE firms are those firms whose reported EPS equals or exceeds the latest analysts' forecasted EPS made within 150–2 days before the earnings announcements. An MBE firm is identified as likely (not likely) to have engaged in EM to achieve MBE using accrual-based EM, production real EM (REM), abnormal related-party sales (ARPS), abnormal related-party purchase (ARPP), expenditure REM or CFO REM in a year if it is in the highest (lowest) quintile of *AAccruals, AProduction, ARPS* or *ARPP,* or it is in the lowest (highest) quintile of *AExpenditures* and *ACFO* in the year. *ROA* is net profit scaled by closing total assets. *EPS* is the actual earnings per share. *CFO* is cash flows from operating activities divided by year-end total assets. Other variables are defined in Appendix 1. We calculate the mean of a treatment group only using treatment firms in the group that have matched control firms. The test of mean differences is a two-tailed t-test. *, ** and *** indicate statistical significance at the 10, 5 and 1% levels, respectively

Overall, we provide evidence of market underreaction to meeting or just beating analyst forecasts, with the market's over-skepticism of earnings management being a plausible mechanism for this phenomenon. Our findings have important implications for researchers, regulators and business practitioners who are concerned about the information environment and quality of corporate disclosure in emerging markets. While a popular notion in the empirical literature on earnings management is that meeting or just beating analyst forecasts is associated with aggressive earnings management, our findings indicate that it is a noisy proxy for earnings management. Our findings also highlight that regulators and business practitioners should be cautious about using the incidence of firms meeting or just beating analyst forecasts as a means to detect managers' earnings management.

As with any empirical research focusing on a single-country context, however, one caveat is that our findings may not be generalizable to other economies, especially those that have substantially different institutional contexts from China. An interesting direction for future research would be to examine whether investors focus on using meeting or just beating analyst forecasts as a signal of earnings management in other markets with varying levels of stock market sophistication and development of the financial analyst profession.

Notes

1. Roychowdhury (2006) describes real earnings management as the management of practical and operational activities, which departs from normal operational practices and is conducted by managers attempting to alter the timing or structure of their transactions and investments.

2. We estimate *BHAR* based on the Fama–French three-factor model in our robustness check (Section 5.5.6) and find similar results.

3. Following the literature (e.g. Bartov *et al.*, 2002; Koh *et al.*, 2008), we use the latest analyst forecasts made before earnings announcements to prevent contamination from analysts' knowledge of the actual earnings due to any information leakage before the earnings announcements. If more than one forecast is released on the day, then we use the average value of the forecasts. Our inferences are unchanged if we use the consensus analyst forecast.

4. In Section 5.5.3, we conduct further robustness tests to address the concern of stale analyst forecasts.

5. In 1998, the China Securities Regulatory Commission (CSRC) implemented the Special Treatment (ST) system to protect investors' interests, where firms that report losses (based on the audited net profit in the annual reports) for two consecutive years are issued a delisting risk warning on its shares to alert investors. If the company's next audited annual report reveals negative earnings, the exchange suspends the listing of its shares.

6. The market starts to react to earnings information about four days before firms' earnings announcements, which suggests that the market may receive earnings information from other sources (e.g. analysts and news media).

7. The sample includes all firm-year observations for which the latest analyst forecast is released just two days before the earnings announcement.

8. The sample size decreases as the event window widens because we drop firm-years for which the last analyst forecast is released during the event window.

9. We use a small caliper of 0.01 to identify sets of matches to enhance the effectiveness of the matching procedure.

10. We expect *Surprise* to differ for MBE and non-MBE firms because *MBE* is derived from *Surprise*; thus, we do not match MBE firms with non-MBE firms based on *Surprise*.

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Appendix 1

Variable	Definition	Data source
$BHAR[t_1, t_2]$	Market-adjusted BHAR over the event window $[t_1, t_2]$ is calculated by first compounding the raw returns of firm i and its benchmark (the corresponding value-weighted market index returns) over the event window $[t_1, t_2]$ and then calculating the BHAR as the difference between the compounded returns of firm i and its benchmark	CSMAR
MBE	A dummy variable equal to 1 if a firm's reported EPS equals or exceeds the latest analysts' forecasted EPS (i.e. the earnings surprise is 0 or positive), and 0 otherwise. For all variables that involve analyst forecasts (e.g. MBE, SMBEAT and BIGEAT), the latest analyst EPS forecast should be made at most 150 days before the firm's annual earnings announcement date and at least 1 day before the beginning of the event window of the corresponding BHAR in the regression model	CSMAR
MBE_EM	A dummy variable equal to 1 if an MBE firm is identified as having engaged in income-increasing earnings management to achieve MBE, and 0 otherwise. We classify a firm as engaging in income-increasing earnings management through discretionary accruals, production, related-party sales, related-party purchases, expenditures or CFO if it is in the highest quintile of AAcruals, AProduction, ARPS or ARPP, or it is in the lowest quintile of AExpenditures and ACFO during the year	CSMAR, Wind
SMBEAT	A dummy variable equal to 1 if a firm's actual EPS equals or exceeds the latest analyst forecast by 1 cent per share or less, and 0 otherwise	CSMAR
BIGBEAT	A dummy variable equal to 1 if a firm's actual EPS equals or exceeds the latest analyst forecast by more than 1 cent per share, and 0 otherwise	CSMAR
AAcruals	Abnormal accruals are estimated using the modified Jones model (equation (A1) in Appendix 2)	CSMAR
AProduction	Abnormal production cost is estimated using equation (A2) in Appendix 2	CSMAR
AExpenditures	Abnormal expenditures are estimated using equation (A3) in Appendix 2	CSMAR
ACFO	Abnormal cash flows from operations are estimated using equation (A4) in Appendix 2	CSMAR
ARPS	Abnormal related-party sales are estimated using equation (A5) in Appendix 2	Wind
ARPP	Abnormal related-party purchases are estimated using equation (A6) in Appendix 2	Wind
Surprise	Earnings surprise scaled by the stock price per share at the beginning of the year. Earnings surprise is measured as the actual EPS released on the annual earnings announcement date minus the latest analyst EPS forecast made at most 150 days before the firm's annual earnings announcement date and at least 1 day before the beginning of the event window of the corresponding BHAR in the regression model	CSMAR
Analyst	Analyst coverage of a firm, which is measured as the total number of analysts following the firm during the year	CSMAR
GVT	A dummy variable equal to 1 if a firm is ultimately controlled by either the central government or a local government, and 0 otherwise	Audited annual reports
ROA	Net profit scaled by year-end total assets	CSMAR

Table A1.
Summary of the key variables (with value measured in RMB for all variables)

(continued)

Variable	Definition	Data source
ETP	The ratio of earnings to price, which is calculated as actual EPS scaled by the closing share price 3 days before the annual earnings announcement date	CSMAR
Size	The natural logarithm of total assets at year end	CSMAR
MTB	The ratio of market value of equity to book value of equity at year end	CSMAR
Leverage	The ratio of total liabilities to total assets at year end	CSMAR
CFO	Cash flows from operating activities divided by year-end total assets	CSMAR
Prior stock return	Market adjusted BHAR over the window $[-210, -11]$ before the annual earnings announcement date	CSMAR
PosiΔProfit	A dummy variable equal to 1 if a firm has a positive increase in earnings during the year, and 0 otherwise	CSMAR
Profitable	A dummy variable equal to 1 if a firm reports a positive net profit in its annual earnings announcement, and 0 otherwise	CSMAR
Sales growth	Changes in net sales revenue from year $t-1$ to year t divided by net sales revenue in year $t-1$	CSMAR
SEO	A dummy variable equal to 1 if a firm makes a share issue application between year $t + 1$ and year $t + 3$, and 0 otherwise	CSMAR
Delisting risk	A dummy variable equal to 1 if a firm is issued a delisting risk warning, and 0 otherwise	CSMAR
Analyst dummy	A dummy variable equal to 1 if a firm is covered by at least one analyst in a given year, and 0 otherwise	CSMAR
IndAnaCov	The proportion of firms with at least one analyst in the same industry in a given year	CSMAR
Inverse Mills	Inverse Mills ratio, calculated based on the Heckman (1979) two-stage model	Authors' construction
Surprise_rank	An ordinal variable obtained by ranking Surprise into deciles, subtracting 1 and then dividing by 9	CSMAR

Appendix 2
Constructing variables for income-increasing earnings management

Drawing on the literature, we estimate measures of income-increasing earnings management that capture the different techniques used by managers to meet or beat analyst expectations: (1) accrual-based earnings management, (2) real earnings management and (3) related-party transactions. The measures of these earnings management practices are discussed below.

Measuring discretionary accruals. We use the following Dechow *et al.*'s (1995) modified Jones' model to estimate abnormal accruals (*AAcruals*) because it is a commonly used model in the earnings management literature (e.g. Zang, 2012):

$$\frac{Accruals_{i,t}}{A_{i,t-1}} = \gamma_0 \frac{1}{A_{i,t-1}} + \gamma_1 \frac{\Delta Sales_{i,t} - \Delta Rec_{i,t}}{A_{i,t-1}} + \gamma_2 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \tag{A1}$$

where i and t index firm and year, respectively. *Accruals* is total accruals calculated as the difference between net profit and cash flow from operations. $A_{i,t-1}$ is total assets. $\Delta Sales$ and ΔRec are changes in net sales revenue and net receivables from year $t-1$ to year t, respectively. *PPE* is gross property, plant and equipment. The residuals are the discretionary component of the total accruals.

Measuring real earnings management. Following Roychowdhury (2006), we measure real earnings management as abnormal levels of production, discretionary expenditure and cash flows from operations. We estimate abnormal production (*Aproduction*) as the residuals from the following regression by year and industry:

$$\frac{Production_{i,t}}{A_{i,t-1}} = \gamma_0 + \gamma_1 \frac{1}{A_{i,t-1}} + \gamma_2 \frac{Sales_{i,t}}{A_{i,t-1}} + \gamma_3 \frac{\Delta Sales_{i,t}}{A_{i,t-1}} + \gamma_4 \frac{\Delta Sales_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t} \tag{A2}$$

where *Production* is the sum of the cost of goods sold and the change in inventory. $Sales_{i,t}$ is net sales revenue. Other variables are defined previously. Roychowdhury (2006) argues that, to obtain higher earnings, managers may overproduce inventory to report a high operating margin, as the fixed overhead costs are spread over an increasing volume of production. This signifies a lower total cost per unit and thus allows better operating margins to be reported. Nevertheless, overproduction and holding costs are abnormally high. We thus expect a positive relation between *Aproduction* and the probability of MBE.

We estimate abnormal discretionary expenditures (*AExpenditures*) as the residuals from the following regression by year and industry:where *Disexpenditures* is the sum of business and management expenses, selling expenses and administration expenses. Other variables are defined previously. Discretionary expenditures are directly expensed to earnings and normally do not immediately generate revenues for firms. Thus, firms may reduce reported expenses to increase earnings through activities that reduce discretionary expenditures. We therefore expect a negative relation between *AExpenditures* and the probability of MBE.

We estimate abnormal cash flow from operations (*ACFO*) as the residuals from the following equation:

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \gamma_0 + \gamma_1\frac{1}{A_{i,t-1}} + \gamma_2\frac{Sales_{i,t}}{A_{i,t-1}} + \gamma_3\frac{\Delta Sales_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \tag{A4}$$

where *CFO* is cash flow from operations. Other variables are defined previously. As suggested by Cohen and Zarowin (2010) and Roychowdhury (2006), managers may offer limited-time price discounts or lenient credit terms to accelerate sales anticipated for the next financial year into the current year and generate extra sales and temporarily improve a firm's sales performance. However, this price advantage for customers may diminish in the next financial year when the price reverts. Also, although promotion activities can increase current period sales, the increased volumes are at the cost of overproduction attached to sales and greater price discounts, which can result in lower margins. In other words, sales management activities may lead to an abnormally lower CFO in the current period due to price discount, lenient credit and higher production cost given the sales level. Therefore, the relation between *ACFO* and the probability of MBE is expected to be negative.

Measuring abnormal related-party transactions. We distinguish between related-party sales and related-party purchase when estimating abnormal related-party transactions. We follow Jian and Wong (2010) and partition the level of related-party sales and purchase into normal and abnormal components using the following models:

$$RPS_{i,t} = \gamma_1 Size_{i,t} + \gamma_2 Leverage_{i,t} + \gamma_3 MTB_{i,t} + \varepsilon_{i,t} \tag{A5}$$

$$RPP_{i,t} = \gamma_1 Size_{i,t} + \gamma_2 Leverage_{i,t} + \gamma_3 MTB_{i,t} + \varepsilon_{i,t} \tag{A6}$$

where *RPS* is related-party sales over total assets, *RPP* is related-party purchase over total assets, *Size* is natural logarithm of total assets, *Leverage* is total liabilities over total assets, *MTB* is market value divided by book value of total equity and ε is the error term. The residuals of equations (A5) and (A6) are the estimated abnormal related-party sales (*ARPS*) and abnormal related-party purchase (*ARPP*), respectively.

The ordinary least squares (OLS) estimation method is used to estimate equations (A1)−(A6) for the cross-sections of each industry and year where at least ten firm-year observations available. The industry classification for our main tests is based on 2012 CSRC first-digit industry code.

Appendix 3

Dependent variable	(1) Analyst dummy
IndAnaCov	1.690*** (0.000)
GVT	0.132*** (0.000)
ROA	2.092*** (0.000)
ETP	2.782*** (0.000)
Size	0.522*** (0.000)
MTB	0.127*** (0.000)
Leverage	−0.404*** (0.000)
CFO	−0.068 (0.548)
Prior stock return	0.657*** (0.000)
Constant	−11.712*** (0.000)
Year fixed effects	Yes
Industry fixed effects	Yes
Observations	27,325
Pseudo R^2	0.266

Note(s): The table reports the regression results of the first-stage Heckman regression. *IndAnaCov* is the proportion of companies in the same industry that have analyst coverage in a given year. All variables are defined in Appendix 1. *p*-values for two-tailed tests are given in parentheses and are based on robust standard errors clustered by firm and year. *, ** and *** indicate statistical significance at the 10, 5 and 1% levels, respectively

Table A2.
Results of the first-stage Heckman regression: probability of analyst coverage

Appendix 4

Variables	Full sample (N = 7,578) Mean	Median	MBE = 1 (N = 3,789) Mean	Median	MBE = 0 (N = 3,789) Mean	Median	Mean difference Difference	p-value
MBE	0.496	0.000	1.000	1.000	0.000	0.000	1.000	0.000
BHAR[−1, 1]	0.000	−0.002	0.003	0.000	−0.002	−0.005	0.005	0.000
BHAR[−2, 2]	0.002	−0.002	0.005	0.000	−0.001	−0.005	0.006	0.000
BHAR[−3, 3]	0.003	−0.003	0.006	−0.001	−0.001	−0.006	0.007	0.000
BHAR[−5, 5]	0.005	−0.003	0.008	0.000	0.001	−0.006	0.007	0.000
BHAR[−10, 10]	0.007	−0.005	0.011	−0.001	0.003	−0.009	0.009	0.000
Surprise	−0.002	0.000	0.005	0.002	−0.009	−0.004	0.014	0.000
Analyst	12.247	9.000	12.269	9.000	12.225	9.000	0.044	0.855
GVT	0.586	1.000	0.582	1.000	0.590	1.000	−0.008	0.470
ROA	0.055	0.047	0.056	0.047	0.054	0.046	0.001	0.234
ETP	0.042	0.035	0.042	0.036	0.041	0.034	0.001	0.531
Size	22.782	22.568	22.763	22.584	22.802	22.557	−0.039	0.245
MTB	2.748	2.075	2.787	2.102	2.710	2.053	0.077	0.240
Leverage	0.485	0.489	0.483	0.486	0.486	0.492	−0.003	0.509
CFO	0.068	0.064	0.069	0.066	0.067	0.063	0.002	0.591
Prior stock return	0.032	0.006	0.032	0.009	0.032	0.003	0.001	0.884

Note(s): This table presents the summary statistics for the matched sample. We match each MBE firm with a non-MBE firm based on *Analyst, GVT, ROA, ETP, Size, MTB, Leverage, CFO, Prior stock return*, year and industry using one-to-one nearest neighbor matching without replacement and with a small caliper value of 0.01

Table A3.
Summary statistics of the matched sample