

Mandatory vs. Voluntary Management Earnings Forecasts in China

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ABSTRACT

Capital-market regulators face the question of whether mandating management earnings forecasts would improve the information environment or be counterproductive. We examine the efficacy of a forecast regulation in the emerging market of China, which mandates management earnings forecasts in certain performance regions such as anticipated losses, turning profit, and large changes in earnings from the previous year and allows voluntary forecasts in other circumstances. We examine the quantity, quality, and usefulness of mandatory forecasts by comparing firms' forecast behavior under the mandatory vs. voluntary regime in China. Our results suggest that the Chinese mandate substantially increases the quantity of information available to investors, particularly by state-owned enterprises (SOEs)—firms that play a major role in the economy but are reluctant to provide forecasts voluntarily. Firms that issue mandatory forecasts are more likely to issue voluntary forecasts in the subsequent year. Yet mandatory forecasts are less timely and less precise than voluntary forecasts, suggesting that mandatory forecasts are of lower quality than voluntary forecasts. On balance, investors react to mandatory forecasts as if they are useful. One unintended consequence of the mandate is that firms appear to manage their reported earnings to avoid the bright-line threshold for mandatory forecasts of large earnings decreases. Overall, our evidence provides guidance to regulators in emerging markets and feedback to regulators in developed economies.

Keywords: management earnings forecast; forecast mandate; voluntary disclosure; China.

1. Introduction

In this study we examine the efficacy of a mandate for management earnings forecasts in the emerging market of China. Voluntary corporate disclosure plays a large role in developed capital markets. For example, Beyer, Cohen, Lys, and Walther (2010, p.300) conclude that in the past decade management earnings forecasts provided about 55% of the accounting information available to US investors. Today's popularity of voluntary management forecasts in the US makes it seem almost unthinkable that four decades ago the prospect of a forecast mandate sparked an intense debate over whether the visible hand ("regulation") or the invisible hand ("market forces") is preferable in corporate disclosure decisions. A disclosure mandate can benefit investors by increasing the quantity of publicly available information and is especially useful to small investors who have limited access to private information (Burton 1974; Till 1980). The mandate, however, could have serious drawbacks if it usurps the discretion otherwise exercised by managers who are best positioned to evaluate the benefits and costs associated with the disclosure (Gonedes, Dopuch, and Penman 1976, p.99). For example, under the mandate managers may intentionally delay or obscure the information, resulting in uninformative disclosure.

Although in the late 1970s the SEC finally decided to encourage rather than require management forecasts,¹ the consequences of a disclosure mandate remain relevant today.² Does a forecast mandate improve the information environment? Do managers behave

¹ For decades, the SEC prohibited forward-looking statements in corporate filings. The SEC changed this position in 1973, proposed rules for integrating corporate projections into the SEC disclosure system in 1975, created the *SEC Advisory Committee on Corporate Disclosure* in 1976 (which evaluated the option of a forecast mandate), passed rules to encourage voluntary forecasts in 1978, and added a safe-harbor disclosure protection for firms in 1979 (Gonedes et al. 1976; Gillis 1980; Till 1980).

² For example, a recently debated issue among regulators is whether to require firms to issue corporate sustainability reports (CSR). CSR have been mandated in a growing number of countries but remain voluntary in the US (Ioannou and Serafeim 2012).

differently in a mandatory forecast regime than in a voluntary forecast regime? Are there unintended consequences of a forecast mandate? These important questions cannot be examined empirically using data from the US, where management forecasts have always been voluntary, or from Japan, where management forecasts are mandatory (Skinner 1994; Kato, Skinner, and Kunimura 2009). The questions cannot be answered by comparing firms' forecast behavior in the US and Japan either, because of the drastic differences in the legal, cultural, and macro-economic environments in which firms operate. We use the Chinese setting to explore these questions because mandatory and voluntary forecasts coexist.

As an emerging economy, China has not fully developed its capital markets and thus market forces do not yet provide strong incentives for voluntary disclosure. Voluntary forecasts were rare before the government ushered in a mixed mandatory/voluntary framework in the early 2000s. Since 2004, management earnings forecasts have been mandatory for publicly listed firms that anticipate fiscal-year losses, earning a profit in the current year after reporting a loss in the previous year ("turning profit"), or earnings increases or decreases of at least 50%. Firms are allowed to disclose their forecasts voluntarily in other circumstances. This unique setting allows us to evaluate the costs and benefits associated with a forecast mandate by comparing firms' forecast behavior (e.g., the quantity, quality, and usefulness of forecasts) in the mandatory vs. voluntary regime under the *same* legal, cultural, and macro-economic environment.

We collect management forecasts of fiscal year earnings issued by Chinese companies from 2004 to 2011. We categorize firms into mandatory and voluntary regimes based on their realized earnings relative to the four regulatory thresholds for the forecast mandate. We classify forecasts as mandatory if the issuing firm's earnings fall in the performance regions

prescribed by the regulation and classify all other forecasts as voluntary (see details in Section 4). We find that 81-90% of firms in the mandatory forecast regime issue forecasts, compared with 18-22% of firms in the voluntary regime. In contrast, *US firms* whose earnings fall in the Chinese mandatory performance regions are much less likely to issue forecasts than *US firms* whose earnings fall in the Chinese voluntary performance regions. These comparisons suggest that the forecast mandate overcomes Chinese firms' reluctance to forecast earnings voluntarily.

Next, we examine the effectiveness of the mandate in eliciting information from state-owned enterprises (SOEs). As major players in the Chinese economy, these firms have limited need for external financing and are therefore likely to have weak incentives to provide voluntary disclosure. However, we expect SOE managers to be as likely to comply with a forecast mandate as other managers to avoid the political costs of regulation violations. Consistent with these conjectures, we find that compared with other firms, SOEs are less likely to issue voluntary forecasts, but comply with the mandatory requirements at about the same rate as other firms. These results suggest that the mandate can overcome SOEs' aversion to voluntary disclosure. This finding has important implications for standard setters and investors because, given these companies' leading roles in their respective industries and in the economy as a whole, their increased reporting transparency could improve the overall information environment of the capital market. Furthermore, we find that firms that issue mandatory forecasts are more likely to issue voluntary forecasts in the subsequent year, suggesting that mandatory disclosure accustoms firms to issuing voluntary disclosure subsequently. Collectively, our findings suggest that the Chinese forecast mandate increases the quantity of publicly available information by overcoming firms' reluctance to voluntarily

provide management earnings forecasts and by creating conditions conducive to future voluntary forecasts.

An increase in the quantity of forecasts does not guarantee an improvement in shareholders' information environment. Forecasts could be untimely, imprecise, and inaccurate and therefore of low quality. We compare the properties of mandatory forecasts with those of voluntary forecasts and find that the former are less timely, less precise, and less accurate than the latter. However, these differences could arise from differences in uncertainty associated with the earnings news imbedded in the earnings regions demarcated by the mandate. To gain further insights, we compare the properties of US forecasts in the earnings regions that would be classified as mandatory or voluntary based on the Chinese criteria. We find that mandatory-region forecasts *in the US* are about as timely and precise as, but less accurate than, voluntary-region forecasts *in the US*. We conclude that the Chinese forecast mandate is associated with lower forecast timeliness and precision, though we cannot conclude that it is associated with lower forecast accuracy. Overall, these results suggest that mandatory forecasts are of lower quality than voluntary forecasts.

So far, we have found that the forecast mandate increases the quantity but decreases the average quality of forecast information. The usefulness of mandatory forecasts is an empirical issue. We find that investors react to the news in mandatory forecasts as if they are useful. When financial reports are subsequently released, investors also respond to the earnings surprise benchmarked to the previous forecast, suggesting that mandatory forecasts do not fully preempt the information contained in the financial reports.

Finally, we examine the unintended consequence of the bright-line thresholds in the forecast mandate. We find that after the effective date of the forecast rules based on the 50%

thresholds, Chinese firms appear to manage earnings to avoid the threshold of 50% earnings decrease but not the 50% earnings increase. We do not observe such behavior before these rules were enacted, suggesting that earnings management around the 50% earnings decrease threshold is likely to have been induced by the mandate.

Our study makes three contributions to the literature. First, we extend the scant evidence on the properties and usefulness of mandatory management forecasts by directly comparing mandatory with voluntary forecasts in the same economy. Ours is one of only two studies on mandatory earnings forecasts. Kato et al. (2009) examine Japanese firms, which are required to provide point forecasts of earnings for the forthcoming fiscal year at the previous year's earnings announcement and to update these forecasts at interim earnings announcements. We extend their study by more extensively examining managers' use of discretion under a forecast mandate. Chinese managers have substantial discretion in the timing and precision of their forecasts, whereas such discretion is not allowed in Japan. Moreover, while the Japanese mandate applies to all earnings levels, Chinese managers may avoid the mandate by manipulating the actual reported numbers around the bright-line earnings thresholds. For these reasons, we provide further insights into the consequences of a forecast mandate than Kato et al. and our results cannot be inferred from Kato et al. or other existing studies.

Second, we contribute to the debate on the necessity and effectiveness of government regulations on financial reporting and disclosure (Ball 2009; Stulz 2009; Zingales 2009) by documenting the costs and benefits of a recent disclosure regulation in China. We find that such a regulation increases the quantity of information, especially when managers' incentives for voluntary disclosure are weak. The drawbacks of the regulation include untimely and

imprecise forecasts and earnings manipulations to avoid bright-line thresholds for disclosure. Although the Chinese setting is far from a perfect natural experiment to examine the consequences of a disclosure regulation, the unique setting allows us to gain an understanding of the pros and cons of a particular mandate. Such an understanding would provide guidance to regulators in developing economies who might contemplate imposing a mandate (e.g., what regime to choose?) and feedback to regulators in developed economies who have opted against a mandate (e.g., what could have been?).

Last, this paper is one of the first to extend management forecast research to emerging markets.³ Extant management forecast research is US-centric and extant emerging market research focuses on historical financial reporting.⁴ Corporate earnings forecasts are expected to play an increasing role in emerging markets (Chu 2013). Our evidence suggests that a disclosure mandate could supplement market forces to enrich the information environment in an emerging market (perhaps until market forces are sufficiently developed).

The rest of the paper is organized as follows. Section 2 discusses the institutional background in China. Section 3 develops the hypotheses. Section 4 discusses the data, Section 5 explains the empirical designs and test results, and Section 6 concludes.

2. Institutional Background

Trading venues in Chinese capital markets include the Shenzhen and Shanghai Stock Exchanges, both of which were opened in December 1990. Both exchanges list main-board

³ There is limited management forecast research published in China. Jiang, Tong, and Yang (2003) test the market reaction to warnings, Qin (2004) discusses forecasts by IPO firms, Guo and Qi (2010) examine the accruals management of forecasting firms, and Song (2009) and Song, Li, and Ji (2011) report the penalties for forecast violations.

⁴ A limited number of studies examine voluntary management forecasts outside the US, including Baginski, Hassell, and Kimbrough (2002) on forecasts in Canada, Radhakrishnan, Tsang, and Yang (2012) on forecasts around the world, and Balakrishnan, Li, and Yang (2012) on forecasts in countries that adopted IFRS in 2005.

(i.e., large) companies and the Shenzhen Stock Exchange also lists small- and medium-sized enterprises (SMEs) since June 2004 and growth enterprise market firms (GEMs) since March 2009.⁵ The two exchanges have similar financial reporting and disclosure rules for listed companies. Chinese stock markets experienced phenomenal growth in the past decade, doubling the number of listed companies and experiencing a ten-fold increase in stock market capitalization to about \$4 trillion at the end of 2010. The Shanghai Stock Exchange is now the fifth largest in the world by market capitalization.

The China Securities Regulatory Commission (CSRC) oversees capital-market activities in China and delegates the authority for issuing disclosure regulations to the stock exchanges.⁶ All Chinese companies end their fiscal years on December 31 and file quarterly, semiannual, and annual financial reports with the stock exchanges. The filing deadline for annual reports is April 30th and 75% of the actual reports are released after late March. Chinese firms operate in an environment with a prominent role of state ownership, underdeveloped or developing information intermediaries, low litigation risk, strong regulatory requirements, frequent regulatory changes, and high regulatory costs.

One important aspect of Chinese capital markets is the role of SOEs. The Chinese government has a controlling interest in many listed companies by being the largest, and often the majority, shareholder. SOEs operate in all strategic industries and are often economically

⁵ Two types of stock shares are issued in China. “A” shares are priced in RMB and “B” shares are priced in US dollars. At the end of 2010, 2,063 companies listed either A or B shares in China: 68% of these companies listed only A shares, 28% listed only B shares, and 4% listed both A and B shares. At the end of 2010, about 2% of Chinese firms were cross-listed in Hong Kong (H shares) or overseas exchanges. Our sample includes firms with A shares listed on Chinese stock exchanges. We exclude B-share-only firms because their financial variables are often missing in the database. Our sample includes 72 firms cross-listed at overseas exchanges. Our results are robust to excluding these firms.

⁶ Since 2007, Chinese firms have followed a set of accounting standards that are conceptually similar to International Financial Reporting Standards (IFRS) but modified to the Chinese situation for a number of issues, including related-party transactions, reversal of asset impairments, fair-value measurements, post-retirement benefits, and inflation (Liu 2007).

important for their respective industries. Therefore, forward-looking disclosure about SOEs often reveals information about the future prospects of their respective industries as well as of the entire Chinese economy. High-quality disclosure from SOEs could facilitate efficient capital allocations in China. However, SOEs are typically shrouded in secrecy. The management of SOEs often has ties with their government supervisors or other government agencies and enterprises (Fan, Wong, and Zhang 2007; Piotroski and Wang 2010). Related-party transactions have been a more serious problem in SOEs than in other Chinese firms (Jiang, Lee, and Yue 2010; Jian and Wong 2010). Disclosure could potentially provide an antidote for secrecy. However, SOEs are generally insensitive to the increased investor demand for information and have weak incentives to provide voluntary disclosure. With their close ties to the government, SOEs often have reliable sources of funding (Allen, Qian, and Qian 2005) and are therefore less concerned about the consequences of withholding information from the capital markets. For example, the amount of financing through bank debt is 20 times as high as equity financing in China, with an average of 98.5% of the loans obtained from state banks (Chen, Chen, Lobo, and Wang 2010). Corporate bonds were introduced in 2007 and account for only 1% of the Chinese bond market (KPMG 2011). Moreover, the compensation of SOE managers is often not pegged to firms' operating or stock market performance (Ke, Rui, and Yu 2012).

The Chinese information environment differs from the US information environment in other ways. While US companies typically announce earnings several weeks before regulatory filings, earnings announcements were uncommon in China in the early 2000s. With the encouragement of the stock exchanges, the percentage of firms announcing earnings before the financial report filing date has increased from 5% in 2004 to 52% in 2011.

Financial analysts are active information intermediaries in the US, but the profession is still developing in China. Analyst coverage has increased from 33% of Chinese firms in 2004 to 91% in 2011, but the role of analysts in Chinese capital markets is still limited and controversial.⁷ While institutional investors have been a major force in the equity market for decades in the US, China lacked capitalistic institutions in the early years of our sample period (Wei, Xie, and Zhang 2005) but saw institutional investors owning 60% of the tradable shares by the end of 2010 (KPMG 2011) and 16% of the average firm in 2011. While litigation risk is a major factor in firms' voluntary disclosure decisions in the US (Skinner 1994, 1997), class-action lawsuits are rare in China (Chen 2003).

In this information environment, China ushered in a mixed mandatory and voluntary management earnings forecast system in December 2000. First, Chinese stock exchanges required firms to issue warnings if managers anticipate losses for the forthcoming year.⁸ In December 2001, the exchanges expanded the scope of mandatory forecasts to include forecasts of large earnings changes (specifically, earnings increase or decrease of at least 50% from the previous year).⁹ In 2004, the stock exchanges added another circumstance for mandatory forecasts: firms that anticipate a profit for the current year after experiencing a loss in the preceding year. Over the years, the stock exchanges gradually added semi-annual and third-quarter earnings as forecast items but then removed these requirements in 2008.¹⁰ The

⁷ A survey of individual investors indicates that investors rank analyst research reports as only the fourth most important information resource after price movements, media, and corporate disclosure (Shenzhen Stock Exchange 2011). Both the media and academic research have questioned the credibility of analyst reports in China (Pan and Wu 2011; Gu, Li, and Yang 2013).

⁸ The earliest requirement for mandatory earnings forecasts was made by the CSRC in December 1998 for anticipated fiscal-year losses. Compliance was low until the stock exchanges intervened in 2000.

⁹ Firms are exempted, upon the approval of the stock exchange, from such forecasts if their previous year's earnings per share (EPS) are RMB0.05 or less. One RMB was equivalent to about \$0.15 in our sample period, so the EPS threshold is equivalent to about 1 US cent per share or less.

¹⁰ To have a clean sample for our empirical analyses, we examine only annual forecasts in this study.

stock exchanges also impose a forecast deadline of January 31 of the following year for annual forecasts and provide forecast forms to standardize the practice. Firms are further required to update a previously issued earnings forecast if the reasons for the previous forecast change or if the new estimate differs by 50% or more from the previous estimate (e.g., the previous estimate is an earnings increase of 50% and the new estimate is an earnings increase of 100%). This requirement for updating obsolete forecasts applies to both mandatory and voluntary forecasts.¹¹

The stock exchanges impose penalties for forecast violations. In particular, the forecasting company, along with its executives and directors, may be denounced publicly by the stock exchanges. Regulatory actions may be imposed on firms whose mandatory forecasts are omitted, delayed, or inaccurate, or whose voluntary forecasts are inaccurate. Such actions are intended to damage the reputation of the company, its executives, and its board of directors. To mitigate such damage and restore investors' trust, a violating company often issues an apology in national newspapers (Qin 2004). Prior research shows that relatively few violations attract regulatory action and that penalties are predominantly imposed on firms reporting bad news (Song 2009; Song et al. 2011).¹² Despite sporadic enforcement, we still expect the potential penalties to deter managers from violating forecast rules, especially for firms with bad news and/or high reputational concerns.

¹¹ In contrast, US firms have no duty to update an existing forecast under the Private Securities Reform Act of 1995 unless the forecast was intentionally misrepresented, in which case Rule 10b-5 of the Securities Act of 1934 would apply.

¹² According to the sanctions data available from the CSMAR database, 51 companies were denounced for annual forecast violations during our sample period and all of these cases were related to bad news.

3. Hypothesis Development

Financial information facilitates efficient resource allocations in an economy. Although investors demand historical financial reports for equity valuation (consistent with a belief that past performance is predictive of future performances), their information needs also include forward-looking information such as management earnings forecasts. It is not surprising that the SEC considered mandating management earnings forecasts in the 1970s and that a large body of analytical and empirical research in the 1970s and 1980s was motivated by the debate on mandatory vs. voluntary disclosures.¹³

Although the SEC eventually opted to encourage voluntary management forecasts, mandating such forecasts was a viable option. According to Till (1980), the SEC Advisory Committee on Corporate Disclosure reported that the Committee chose not to recommend the mandate because (1) there was not enough evidence that management forecasts were credible and important, (2) *the SEC did not have the experience necessary to formulate specific rules for a mandatory system*, and (3) it was unfair to require all companies to incur the costs associated with such disclosure. At about the same time, Japan—another developed economy—effectively mandated management forecasts by writing this requirement into stock exchange rules (Kato et al. 2009).

Hart (2009) offers two reasons for mandating disclosure. First, a mandate can reduce information asymmetry if market forces alone cannot address the information problem. Managers' private information may unravel in a market with few frictions, such as a market with credible managers, efficient information flows, and rational investors (Grossman 1981).

¹³ See the report of the SEC Advisory Committee on Corporate Disclosure published on November 3, 1977, Daily (1971), McDonald (1973), Patell (1976), Gonedes et al. (1976), Penman (1980), Grossman (1981), Verrecchia (1983), Waymire (1984), Pownall and Waymire (1989), etc.

Unraveling is less likely in a market with many frictions, such as an emerging market. Chinese capital markets have many frictions that could potentially lead to infrequent voluntary disclosure. A mandate may increase disclosure activity and reduce information asymmetry to a greater extent than is achievable with market forces alone. Second, a disclosure mandate may compensate for investors' lack of sophistication. If investors are unfamiliar with disclosure venues and have difficulty in gathering or processing disclosure, a mandate to disclose the information in a standard format at a publicized venue, as required in China, could improve investors' ability to access, interpret, and respond to the information.

In addition to increasing the overall quantity of management earnings forecasts and facilitating information processing, a forecast mandate may compel certain important corporate groups to disclose information that they would otherwise withhold. SOEs have weak incentives to provide voluntary disclosure due to their limited need for external financing, but their managers' political ambitions and reputational concerns may induce them to comply with stock exchanges' rules.¹⁴ Therefore, we predict:

H1: Chinese SOEs are less likely to provide voluntary forecasts than other firms, but are as likely to comply with the forecast mandate as other firms.

Some managers may be reluctant to voluntarily issue forecasts because they are unfamiliar with the procedures to produce and release the information about future earnings or are unwilling to bear the cost of such disclosure. To comply with the mandate, managers must establish a budget and control mechanism to determine whether the firm's predicted performance meets the thresholds specified in the mandate. Once managers establish and use

¹⁴ Management forecasts were mandated by Chinese stock exchanges, which are officially private but act like governmental agencies: the lead exchange officer at each exchange is appointed by the State Council—the highest level of the Chinese government—and the managing director is appointed by the CSRC. In addition, many other officers working at these stock exchanges often have previously worked at the CSRC.

such a mechanism, they would be more likely to develop internal earnings predictions and issue forecasts voluntarily in subsequent periods.¹⁵ Our second hypothesis is:

H2: The experience of issuing mandatory forecasts increases the likelihood that firms issue voluntary forecasts in the following year.

We expect management forecast properties to differ under the mandatory regime and under the voluntary regime. Without a disclosure mandate, a firm's disclosure decision is often a result of weighing the benefits of disclosure against the costs, including the proprietary costs from product market competition and the significant amount of effort required to generate accurate projections of future earnings, such as communicating clear strategies to divisional managers, carefully budgeting internal expenses, and analyzing large amounts of external information.¹⁶ The benefits associated with disclosure include a lower cost of capital as a result of improved transparency. Managers who issue forecasts because they are compelled to do so by the mandate may exert less effort to predict future earnings than managers who are motivated by a desire to provide timely and accurate information to market participants. Managers who perceive that their disclosure costs exceed the benefits may intentionally delay or obscure their forecasts to reduce the costs. Thus, we expect mandatory forecasts to be less timely, less precise, and less accurate, on average, than voluntary forecasts. The above arguments lead to the following hypothesis:

H3: Mandatory forecasts are less timely, less precise, and less accurate than voluntary forecasts.

¹⁵ Following a similar argument, Bischof and Daske (2012) document a substantial rise in voluntary disclosure of sovereign credit risk exposures following the one-time mandatory risk disclosure.

¹⁶ For example, a company incurs proprietary cost when an upbeat earnings forecast increases investors' expectations of future cash flows and thus the stock price, but also erodes the firm's future profits by attracting potential competitors to enter the market or by encouraging existing competitors to expand their production (Dontoh 1989; Darrough and Stoughton 1990; Li 2010).

The purpose of a forecast mandate is to provide investors with useful information that they would otherwise not receive. The fact that regulators have chosen the four earnings criteria in mandating forecasts indicates that they consider these types of information important to investors. While the mandate certainly increases the quantity of information that firms provide, we expect the extensive leeway allowed on the timing, precision, and accuracy of forecasts to reduce forecast quality. Whether investors view mandatory forecasts as useful is an empirical issue. A lack of evidence of market reaction to mandatory forecasts would cast doubt on the effectiveness of the forecast mandate. We state the hypothesis in its alternative form:

H4: Stock prices react to mandatory forecasts.

Prior research finds that managers manipulate earnings around economically meaningful earnings thresholds such as zero profit and zero earnings-change thresholds (Burgstahler and Dichev 1997; Degeorge, Patel, and Zeckhauser 1999).¹⁷ Liu (2006) finds that Chinese firms manipulate earnings to avoid reporting losses. Chen and Yuan (2004) find that Chinese companies manipulate their financial reports to maintain a minimum ROE of 10% for three consecutive years before seasoned offerings, as required by stock exchange regulations. A unique feature of the Chinese forecast mandate is that it defines precise earnings thresholds that determine a firm's disclosure regime. The criteria for large earnings decreases and increases, defined as at least 50%, may create new thresholds to which

¹⁷ Gao, Wu, and Zimmerman (2009) document an unintended consequence of a bright-line regulation: firms take real actions to keep their public float within the \$75 million threshold to be exempted from SOX.

managers respond because the regulation imbues those thresholds with new economic meaning.¹⁸ Thus, we predict:

H5: Firms manage earnings to avoid the 50% earnings change thresholds for mandatory forecasts.

4. Data

Our data source for Chinese forecasts of annual earnings is RESSET (which stands for “Research Set”), a commercial database covering management forecasts as well as financial reporting of publicly traded Chinese companies that has been used in several academic studies published in China.¹⁹ The database coverage starts in 2002. We start our sample period in 2004 to ensure that all the forecast rules were in effect and end the sample in 2011. Our sample includes all non-IPO Chinese firms with A shares listed on the Shanghai or Shenzhen Stock Exchange. Most management forecasts (56%) are of earnings levels and the remainder are of earnings changes, which we convert to earnings levels for consistency.²⁰

The database does not distinguish mandatory from voluntary forecasts. As demonstrated in Appendix 2, we use realized earnings to classify a firm-year into either the mandatory or voluntary regime (hereafter M-regime and V-regime, respectively).^{21, 22}

¹⁸ We observe similar behavior around the threshold of zero profit, but do not formally examine it because firms have incentives unrelated to earnings forecasts to avoid reporting losses.

¹⁹ To check the accuracy of the dataset, we randomly sampled 50 observations and were able to verify all the management forecasts and accounting variables using the original forecast announcements and financial reports. We discovered and made adjustment for a recording irregularity in the database. The database records range forecasts in two columns. For example, for an earnings increase forecast of 30% to 50%, the database records “30%” in the first column and “50%” in the second column. However, for an earnings decrease forecast of -30% to -50%, it still records “-30%” in the first column and “-50%” in the second column.

²⁰ For 9% of the forecasts, managers provide an EPS estimate in addition to the earnings level estimate.

²¹ If a firm issues more than one type of consistent mandatory forecast for the same year (e.g., forecasting losses and an earnings decrease of at least 50%), we prioritize the “loss” and “turning profit” categories over the other mandatory categories. We base this judgment on the importance of zero as a performance benchmark.

²² Firms with previous-year EPS of RMB0.05 or less are exempted from the earnings-change-related forecast rules and therefore belong to neither the M- nor V- regime. About 6% fall into this category.

Forecasts issued in the M-regime are referred to as “mandatory forecasts” and those in the V-regime are referred to as “voluntary forecasts.”²³ Managers base their forecast decisions on externally unobservable ex ante information that may not match realized earnings, leading to two types of mismatches. We label the first type of mismatch a “false alarm,” where the stated reason for the forecast falls into one of the four mandatory categories but realized earnings do not qualify for the M-regime. For example, a firm forecasted an earnings decrease of 60% but the actual earnings decrease was only 30%. False alarms occur in fewer than 4% of the publicly listed Chinese firm-years, and we exclude these firm-years from our sample. We label the second type of mismatch “inconsistent mandatory forecasts” (ICF), where a firm belonging to one of the four mandatory categories according to realized earnings provides a prediction indicating either a different type of mandatory forecast or a voluntary forecast. For example, realized earnings decreased by 60% from the previous year, but the firm forecasted an *increase* of 50% (another M-regime category) or a decrease of 30% (a V-regime category). Such observations account for 4% of M-regime firm-years. We tabulate ICF in Table 1 Panel A but exclude them from our following analyses.

Panel A of Table 1 shows our sample firm-years in the M-regime with CF for “consistent mandatory forecast,” ICF, and NF for “no forecast.” Firms with no forecasts may either anticipate earnings to fall outside the M-regime or be unwilling to provide forecasts. The column CF% presents the percentage of CF firms in a given M-regime category and is the compliance rate, ranging from 81% to 90% for the mandatory categories during the sample period as a whole. The compliance rates for “loss” and “turning profit” categories are higher than those for large earnings increases and decreases, reflecting the fact that zero has

²³ To reduce complexity, we classify a revision of an annual forecast in the same M- or V- regime as the original forecast for tabulation purposes but exclude forecast revisions from the analyses.

historically been the most important performance benchmark in China.²⁴ For example, a company's listing is suspended if it reports losses in three consecutive years and is removed after a fourth consecutive loss.

To understand the significance of the volume of forecast information under the mandate, we present in the last row of this panel the forecast rates in four similarly defined earnings performance regions in the US for the same sample period of 2004-2011. We collect US management forecasts from the First Call CIG database and identify the population of publicly listed US firms as those with data on total assets, stock price, and number of shares outstanding at year end in Compustat. The forecast rate in the US ranges from 6% for losses to 27% for large earnings increases. These rates are much lower than the Chinese rates for similar earnings regions, indicating that the high Chinese forecast rates under the M-regime are likely to be a result of the forecast mandate.

Panel B of Table 1 shows the Chinese firm-years in the voluntary forecast regime, labeled F for "forecast" and NF for "no forecast." For both the earnings decrease and earnings increase categories, the forecast rate climbs rapidly during our sample period from 2% in 2004 to about 40% in 2011. In recent years the forecast rate for earnings increases has been much higher than that for earnings decreases, consistent with the economic theory that managers are more likely to disclose good news than bad news (Verrecchia 1983; Dye 1985). Accordingly, we analyze voluntary forecasts for earnings decreases and increases separately in our formal tests. For comparison, we present the US sample with similarly defined earnings performance regions for 2004-2011 in the last row of this panel. We observe that, on average, US firms have a higher voluntary forecast rate than Chinese firms. However, in more recent

²⁴ Chinese regulators' focus on loss forecasts as the first type of mandated management forecast further attests to the importance of zero as a performance benchmark.

years the forecast rates for the Chinese and US samples are comparable. We also observe a higher voluntary forecast rate for good news than for bad news in the US sample. Figure 1 depicts the forecast rate against earnings changes for the Chinese and US samples. The Chinese sample exhibits a U-shaped forecast rate, while the US sample exhibits an inverse-V-shaped forecast rate. The latter finding is consistent with Waymire (1985) who finds that managers are reluctant to forecast in highly uncertain situations, even though the demand for corporate disclosure arguably peaks at these times. In other words, managers' voluntary supply of information dwindles precisely when demand for such information increases. The U-shaped figure for the Chinese sample suggests that the forecast mandate overcomes managers' reluctance to supply information at the tails of the earnings change distribution where uncertainty is high and therefore significantly increases the amount of forward-looking information available to investors.

In Table 2 we summarize the frequency, venue, and forms of Chinese forecasts. Panel A presents forecast frequency for a given firm-year and shows that 84% of the forecasting firms issue only one forecast in a given year.²⁵ In contrast, 14% of US forecasting firms forecast only once per year (untabulated). We use only the initial forecast in our subsequent analysis. Panel B presents the frequency of forecasts issued in different venues: 65% of Chinese mandatory forecasts and 28% of Chinese voluntary forecasts are standalone. In contrast, only 26% of US forecasts are standalone (untabulated). To address the confounding effects of non-forecast information in our market reaction tests, we present results using standalone forecasts in addition to those from forecasts in all venues. Panel C presents the

²⁵ The percentage varies within the M-regime from a low of 74% for loss firms to 90% for firms with large earnings decreases, suggesting that managers are more sensitive to achieving forecast accuracy for losses than for large earnings decreases, consistent with the importance of the benchmark of zero profit in China.

frequency of different forecast forms. About half of Chinese mandatory forecasts are open-interval estimates, whereas point and range estimates account for 85% of Chinese voluntary forecasts. In contrast, 87% of US forecasts are range estimates and 10% are point estimates (untabulated). The above observations provide some initial evidence suggesting that mandatory forecasts are on average less precise than voluntary forecasts.

5. Empirical Tests

5.1. *The disclosure decision*

We examine Chinese firms' disclosure decisions in a probit model with the dependent variable, *Forecast*, taking the value of 1 for a firm that issues a forecast in year t and 0 for a non-forecasting firm. Our main variable of interest is *SOE*, which is defined as 1 if the government is the company's largest shareholder and 0 otherwise. H1 predicts a negative association between *SOE* and the voluntary disclosure decision and no association between *SOE* and the compliance decision with the mandatory disclosure rules. We are also interested in the role of a firm's forecast experience in managers' forecast decisions. *History* is 1 if a firm issued a mandatory or voluntary forecast in the previous year and 0 otherwise.²⁶ We expect a higher forecast propensity for firms with recent forecast experience because of their familiarity with forecast procedures as well as the finding in the US that once firms initiate voluntary disclosure, they tend to continue with the practice (Lansford, Lev, and Tucker 2013). Equation (1) is the probit model and is estimated separately for the four mandatory categories and two voluntary categories.

²⁶ Our results for Equation (1) are similar if we use forecast experience in the past two years to define *History*. We use the previous year's forecast experience in this equation for consistency with a subsequent test in which we partition the sample by the previous and current years' forecast regimes.

$$\Pr(\text{Forecast}) = F \left(\begin{array}{l} a_0 + a_1 \text{SOE} + a_2 \text{Size} + a_3 \text{Competition} + a_4 \text{BM} + a_5 \text{StdROA} \\ + a_6 \text{Follow} + a_7 \text{IO} + a_8 \text{Finance} + a_9 \text{Regulate} + a_{10} \text{History} + e \end{array} \right). \quad (1)$$

We include control variables identified in the US literature (e.g., Kasznik and Lev 1995; Frankel, McNichols, and Wilson 1995; Tucker 2007; Li 2010): (1) firm size (*Size*), which may capture reputation costs in China; (2) industry competition (*Competition*), which proxies for proprietary disclosure costs; (3) book-to-market ratio (*BM*), which captures the firm's growth prospects; (4) earnings volatility (*StdROA*), which reflects the supply of or demand for earnings predictions; (5) analyst coverage (*Follow*), which proxies for information demand by financial analysts; (6) institutional ownership (*IO*), which captures information demand by an important group of investors; (7) equity financing need (*Finance*); and (8) regulated industries (*Regulate*), where firms provide additional information to regulators and information asymmetry is thus reduced if regulators publicize such information. *Size* is the natural logarithm of total assets at the beginning of year t, *BM* is measured at the beginning of year t, *StdROA* is the standard deviation of return on assets measured in the five years before year t, *Follow* is the number of analysts who provided earnings estimates for year t-1, *IO* is the institutional ownership at the beginning of year t, and *Finance* is a dummy indicating whether the firm accessed the stock market in year t+1. We measure *Competition* by the sum of absolute changes in the sales rankings (where the raw rankings are divided by the number of firms in the industry) from year t-2 to t-1 for all firms in the industry.²⁷ Intense industry competition should lead to changes in firms' rankings from one year to the next. *Regulate* is 1 for mining, utilities, financial services, media, and transportation and 0 otherwise.

²⁷ This measure is inspired by a measure that Lev and Zarowin (1999) use to identify unstable industries.

The left panel of Table 3 presents the mean and median of the independent variables for Chinese forecasting and non-forecasting firm-years. The majority of Chinese firms are SOEs. On average, forecasting firms are smaller than non-forecasting firms with the former reporting total assets of RMB11,024 million (about \$1,750 million) and the latter reporting total assets of RMB38,199 million (about \$6,000 million). For comparison, the right panel presents the descriptive statistics for the US sample. In contrast to the Chinese sample, forecasting firms are much larger than non-forecasting firms in the US sample, with average total assets of \$5,611 million and \$2,091 million for forecasting and non-forecasting US firms, respectively.

Table 4 presents the probit estimation for the V-regime in the left two columns and the M-regime in the right four columns. The forecast rate of SOEs is 8% for small earnings decreases and 11% for small earnings increases, whereas the forecast rate for non-SOEs is 33% and 40%, respectively. After other factors are considered, as predicted in H1, *SOE* has a significantly negative coefficient of -0.749 and -0.816 in the first two columns, suggesting a reluctance to voluntarily forecast both earnings decreases and earnings increases. Surprisingly, but consistent with the descriptive statistics in Table 4, *Size* also has a negative coefficient, indicating that large firms are more reluctant to provide voluntary forecasts than small firms (*SOE* and *Size* have a positive correlation of 0.24, untabulated).

For the M-regime columns, the compliance rate of SOEs is lower than that of non-SOEs for large earnings increases, but is similar in other categories. After controlling for other factors, the *SOE* coefficient is statistically insignificant for the large earnings decrease, loss, and turning profit samples, suggesting that the mandate overcomes SOEs' reluctance to forecast. The coefficient on *SOE* is still significantly negative in the large earnings-increase

column. These firms' continued reluctance to forecast even when they are required to do so is perhaps explained by the stock exchanges' tendency to punish bad-news firms for failure to forecast but ignore noncompliant good-news firms. In addition, large firms comply with the mandatory rules at the same rate as small firms except for large earnings decreases.

The coefficient on *History* is significantly positive in all models, suggesting that forecasting experience increases the likelihood of subsequent disclosure. The control variable coefficients are consistent with our expectations, except for *Competition* with a positive coefficient in the V-regime and *IO* with an insignificant or negative coefficient. Except for the turning-profit column, the explanatory power for compliance is much lower than that for voluntary disclosure, perhaps because the high levels of compliance for mandatory forecasts leave little variation to be explained by firm characteristics.

To test H2—the effect of mandatory forecasts on subsequent voluntary disclosure decisions, we first partition the sample by whether a firm falls into the M- or V-regime in the previous year and the current year. As shown in Panel A of Table 5, 31% of the firm-years in the V-regime in year *t* belonged to the M-regime in year *t*-1 and we refer to these as MV firms. MV firms allow us to test H2 because *History* for these firms indicates whether they provided a mandatory forecast in year *t*-1. We re-estimate Equation (1) on MV firms in Panel B and find that the coefficient on *History* is significantly positive for voluntary forecasts of both small earnings decreases and increases, suggesting that the mandatory forecast experience induces voluntary disclosure in the subsequent year, consistent with H2.²⁸

²⁸ Our results are similar if we exclude firms that issued a mandatory forecast in year *t*-1 and a voluntary forecast in year *t*-2, mitigating the concern that the voluntary forecast in year *t* is due to firms' commitment to voluntary disclosure. In subsequent untabulated forecast property tests, we find that the experience of mandatory forecast is also associated with more timely voluntary forecasts in the subsequent year.

5.2. Forecast properties

We examine forecast timeliness (*Timeliness*), forecast precision (*Precision*), and forecast error (*Error*), retaining a firm's initial forecast in each year if it issues multiple forecasts. *Timeliness* is the number of days between the fiscal-year-end and the forecast date. A higher value indicates more timely (earlier) forecasts. *Precision* is an ordinal variable for forecast form, with 3 for point, 2 for range, 1 for open-interval, and 0 for qualitative forecasts. *Error* is the absolute difference between managers' estimate (point estimate, midpoint of a range estimate, or the stated starting point of an open-interval estimate) and the realization, scaled by the absolute value of the realization.²⁹ A higher number indicates lower accuracy. To avoid small scalars, we exclude the loss and turning-profit categories from the forecast error analysis. The variable is winsorized at the 98th percentile to avoid outlier influence.

As illustrated in Panel A of Figure 2, Chinese mandatory forecasts are clearly less timely than Chinese voluntary forecasts. About half of the mandatory forecasts are issued within the 31-day window from the fiscal year end to the forecast deadline (*Timeliness* between 0 and -31), with a few forecasts occurring after the deadline. In contrast, voluntary forecasts are spread throughout the year, with a cluster around the third-quarter report date and a large proportion (15%) issued 200 or more days before the fiscal year end. These patterns suggest that a substantial portion of mandatory forecasts are issued late and timed to meet the compliance deadline. To mitigate the concern that the lack of timeliness of Chinese mandatory forecasts is due to high uncertainty in the corresponding earnings performance regions, we plot the timeliness of US forecasts in Panel B, but observe little difference

²⁹ As Christie (1987) shows, there is no unique theoretically correct scalar for analyses except for return regressions, where the correct scalar for the news variable is the market value or share price at the beginning of the return window. We do not scale forecast error by market value to avoid any influence of equity mispricing.

between forecasts patterns in the earnings regions that corresponding to Chinese M- and V-regimes. These observations provide some initial evidence that Chinese mandatory forecasts are less timely than Chinese voluntary forecasts.

Table 3 also includes the mean and median of *Timeliness*, *Precision*, and *Error* for Chinese and US forecasting firms. One notable difference is that managers' mean forecast error is considerably larger in the Chinese sample (6.291) than in the US sample (0.235). The median error of Chinese forecasts is about twice of the magnitude of US forecasts. We compare the efficacy of outlier removal versus winsorization for avoiding outlier influence. When we remove the outliers of *Error* at the 98th percentile, we still observe higher forecast error in China with the mean (median) of 0.389 (0.184) than the mean (median) 0.200 (0.099) in the US (untabulated). Such large errors of Chinese forecasts could reduce the usefulness of management forecasts to investors.³⁰

We test differences between mandatory and voluntary Chinese forecasts for forecast timeliness using OLS Equation (2), forecast precision using ordered-probit Equation (3), and forecast error using OLS Equation (4). We estimate the *Timeliness* and *Error* equations using the robust-regression MM-estimation method to more effectively address the influence of outliers and normality violations than the alternative methods of winsorization/truncation and log transformation (Anderson 2008). In all three models, *M* is 1 for mandatory forecasts and 0 for voluntary forecasts and *Bad* is 1 for bad-news forecasts and 0 for good-news forecasts. We additionally control for forecast timeliness when we examine forecast precision and error.

³⁰ In untabulated analysis, we compare management earnings forecast error with the error of an alternative forecast that assumes a random walk model for annual earnings. This new error variable has a mean (median) of 1.595 (0.579) after outliers at the 98th percentile are removed, suggesting that management forecasts are superior in forecast accuracy to the time-series expectations model. This conclusion holds for the mandatory forecast subsample as well, suggesting that mandatory forecasts improve investors' information environment.

$$Timeliness = \begin{pmatrix} a_0 + a_1M + a_2Bad + a_3M \times Bad + a_4SOE + a_5Size \\ + a_6Competition + a_7BM + a_8StdROA + a_9Follow \\ + a_{10}IO + a_{11}Finance + a_{12}Regulate + a_{13}History + e \end{pmatrix} \quad (2)$$

$$Precision = \phi \begin{pmatrix} a_0 + a_1M + a_2Bad + a_3M \times Bad + a_4SOE + a_5Size \\ + a_6Competition + a_7BM + a_8StdROA + a_9Follow \\ + a_{10}IO + a_{11}Finance + a_{12}Regulate + a_{13}History \\ + a_{14}Timeliness + e \end{pmatrix} \quad (3)$$

$$Error = \begin{pmatrix} a_0 + a_1M + a_2Bad + a_3M \times Bad + a_4SOE + a_5Size \\ + a_6Competition + a_7BM + a_8StdROA + a_9Follow \\ + a_{10}IO + a_{11}Finance + a_{12}Regulate + a_{13}History \\ + a_{14}Timeliness + e \end{pmatrix}. \quad (4)$$

Table 6 presents the test results with the sum of coefficients of $M+M \times Bad$ presented in the last row. To better interpret the test results, we summarize the signs of key coefficients after the estimation results. Compared with voluntary good-news forecasts, mandatory good-news forecasts are less timely, less precise, and less accurate, as indicated by the coefficient on M . The inferences are the same for bad-news forecasts, as indicated by the coefficient on $M + M \times Bad$.

The above results could be due to differences in management uncertainty in the earnings regions corresponding to the M- and V-regimes. To examine this possibility, we present in the right panel results from the US sample, with variables defined similarly to those in the Chinese sample except that we exclude SOE and define *Regulate* as 1 for utilities, communications, and financial services. For *Timeliness*, the coefficient on M is only weakly significant and the coefficient on $M + M \times Bad$ is insignificant. For *Precision*, the coefficients on M and $M + M \times Bad$ are insignificant. Therefore we conclude that there is no significant difference in timeliness and precision between US forecasts in the M- and V-regimes. For *Error*, we find positive coefficients on M and $M + M \times Bad$, suggesting that US forecasts in the

M-regime are less accurate than those in the V-regime—similar to the Chinese sample. Therefore, we conclude that Chinese mandatory forecasts are less timely and less precise than Chinese voluntary forecasts, but our evidence on forecast accuracy is inconclusive.

5.3. *Investor reaction to Chinese Forecasts*

We measure investors' response to management earnings forecasts using CAR_{MF} , the three-trading-day [-1, +1] market-adjusted stock return around the management forecast date. We use Equation (5) to examine investor responsiveness to management earnings forecasts, where $MFnews$ is the difference between managers' estimate (point estimate, midpoint of a range estimate, or the stated starting point of an open-interval estimate) and the previous year's earnings number, scaled by market capitalization before the return window:

$$CAR_{MF} = a_0 + a_1 MFnews + e. \quad (5)$$

We estimate the model separately for mandatory and voluntary forecasts with the robust-regression estimation method. We restrict the sample to the initial forecast for a firm-year. The left half of Panel A of Table 7 reports results when we do not restrict forecast venues and the right half reports results from standalone forecasts. We discuss the latter results to mitigate confounding-news effects. The coefficient on $MFnews$ is significantly positive for mandatory forecasts, indicating that mandatory forecasts have information content, consistent with H4. The coefficient on $MFnews$ is positive and weakly significant for voluntary forecasts even though its magnitude appears larger than that for mandatory forecasts, indicating very large standard errors for the voluntary forecast coefficient estimate, perhaps due to the small sample size.

We also examine investors' reaction at the financial reporting date to understand how investors respond to signed management forecast errors (i.e., news revealed by the earnings

announcement).³¹ CAR_R is the three-trading-day [-1, +1] market-adjusted stock return around the earlier of the earnings announcement or the financial reporting date. We estimate Equation (6), where $Surprise$ is the difference between reported earnings and managers' estimate, scaled by market capitalization before the return window:

$$CAR_R = a_0 + a_1 Surprise + e. \quad (6)$$

Panel B of Table 7 reports the results using forecasts in all venues as well as from standalone forecasts. Again, we discuss the results from standalone forecasts. The coefficient on $Surprise$ is significantly positive for the mandatory forecast sample, suggesting that investors rationally update their beliefs upon observing the signed management forecast error and confirming that investors pay attention to mandatory forecasts. The coefficient for the voluntary forecast sample is positive and weakly significant, as in Panel A, suggesting very large standard errors of the coefficient estimate. A firm's total earnings surprise (i.e., the difference between the current year's earnings and the previous-year's earnings) has two components: $MFnews$ and $Surprise$. Our results suggest that investors respond to both earnings surprise components of mandatory-forecasting firms, indicating that mandatory forecasts are useful but do not fully preempt the information contained in the financial reports.

5.4. Distribution discontinuity of earnings changes

We follow Burgstahler and Dichev (1997) and present both graphical evidence and formal statistical tests of the discontinuity at 50% in the earnings change distribution. The 50% thresholds were imposed on December 20, 2001. We skip 2001 to avoid any confusion about implementing this new rule and compare the distributions for 1999-2000—two years

³¹ If a firm announced earnings before the final report date, the earnings announcement date is the event day.

immediately before this rule—with 2002-2003—two years immediately after.³² We use all non-IPO Chinese firms with A-shares listed on Shanghai and Shenzhen Stock Exchanges in the analysis.

We present the distributional graph for 1999-2000 in Panel A of Figure 3 and the graph for 2002-2003 in Panel B. The width of each bin is 0.05, or 5% of earnings change. The bin marked as “-0.50” includes firms with earnings change percentages between -55% (exclusive) and -50% (inclusive). The bin marked as “-0.45” includes firms with earnings change percentages between -50% (exclusive) and -45% (inclusive). There is no noticeable discontinuity at either -50% or 50% for 1999-2000, but a clear discontinuity at -50% for 2002-2003. This evidence is consistent with our H5, suggesting that managers manipulate reported earnings either to avoid mandatory forecasts of large earnings decreases or justify their failure to forecast after the deadline passes.

Table 8 presents our formal statistical tests of the discontinuity at the -50% and 50% thresholds in the 1999-2000 and 2002-2003 graphs. Under the null hypothesis of no earnings manipulation, we expect the number of observations in adjacent bins to change at a constant rate (i.e., smoothness). Following the method specified in Burgstahler and Dichev (1997), we calculate the difference between the actual number of observations and predicted number of observations assuming smoothness. The standardized difference has a standard normal distribution. This statistic is -4.24, significant at the 1% level, for the bin of “-0.50” for 2002-2003, indicating that unusually few firms report earnings decreases of 50% or more. The corresponding statistic for the bin of “-0.45” is 3.93, also significant, corroborating the

³² The distribution for 2004-2011 is qualitatively similar to that for 2002-2003. We use the two years immediately after the new rule to mitigate the concern that the distributional differences are due to significant structural changes in the Chinese economy.

statistic to the left of the threshold.³³ In contrast, none of the test statistics for 1999-2000 are statistically significant, suggesting that earnings manipulations to avoid the -50% threshold are associated with the forecast mandate pegged at 50%. We find no evidence of manipulations to avoid the +50% threshold, perhaps because managers typically have incentives to disclose good news even without a mandate. Overall, the results are consistent with H5 and indicate that managers avoid issuing warnings of large earnings decreases by manipulating reported earnings.

6. Conclusion

Capital market regulators must decide whether to mandate earnings forecasts or leave the decision to managers' discretion. On the one hand, mandatory forecasts could increase the flow of information to investors, especially for firms that would have been reluctant to provide forecasts without a mandate. On the other hand, their information content may be low if managers issue delayed, imprecise, or inaccurate forecasts for the sake of compliance. In this study we investigate a Chinese forecast mandate, which requires firms to issue earnings forecasts in certain performance regions and allows voluntary forecasts in others, and examine its effectiveness in improving the information environment. To gain further insight into the mandate, we examine firms' forecast behavior in similar performance regions in the US, where management earnings forecasts are voluntary.

We find a high level of compliance with mandatory forecast rules, with over 80% of the covered firms providing at least one forecast in a given year. By comparison, only about 20% of the Chinese firms in the voluntary-forecast regime and 12% of US firms whose earnings are in the Chinese mandatory forecast regions provide forecasts. These findings

³³ The two statistics are dependent and one is sufficient.

suggest that the forecast mandate increases the amount of information to investors. More importantly, the mandate appears to overcome the reluctance of state-owned enterprises and large firms to provide voluntary forecasts and a mandatory forecast experience induces firms to issue voluntary disclosure in the subsequent year. However, we find that mandatory forecasts are less timely and less precise than voluntary forecasts. Especially, firms tend to issue mandated forecasts near the regulatory deadline. Despite the low quality, we find that investors respond to the news in mandatory forecasts as if they are useful. Lastly, we find that firms appear to manage their reported earnings to avoid the threshold for mandatory forecasts of large earnings decreases, suggesting an unintended consequence of a bright-line regulation—providing managers with new targets and incentives for earnings management. Our study documents the pros and cons of a disclosure mandate in an emerging market, and the evidence provides guidance to regulators in emerging markets and feedback to regulators in developed economies.

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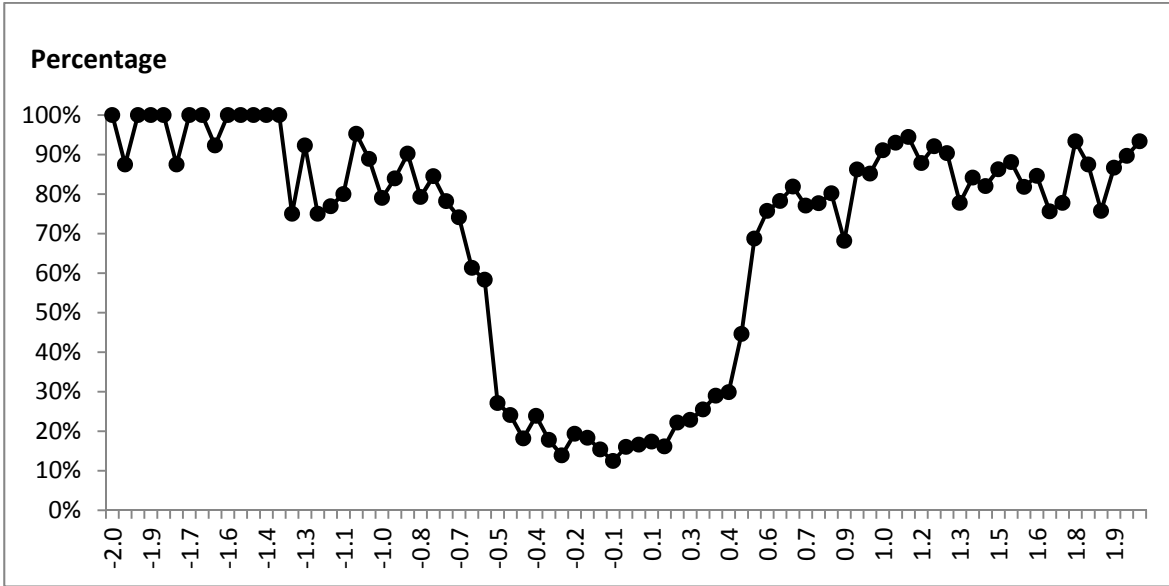
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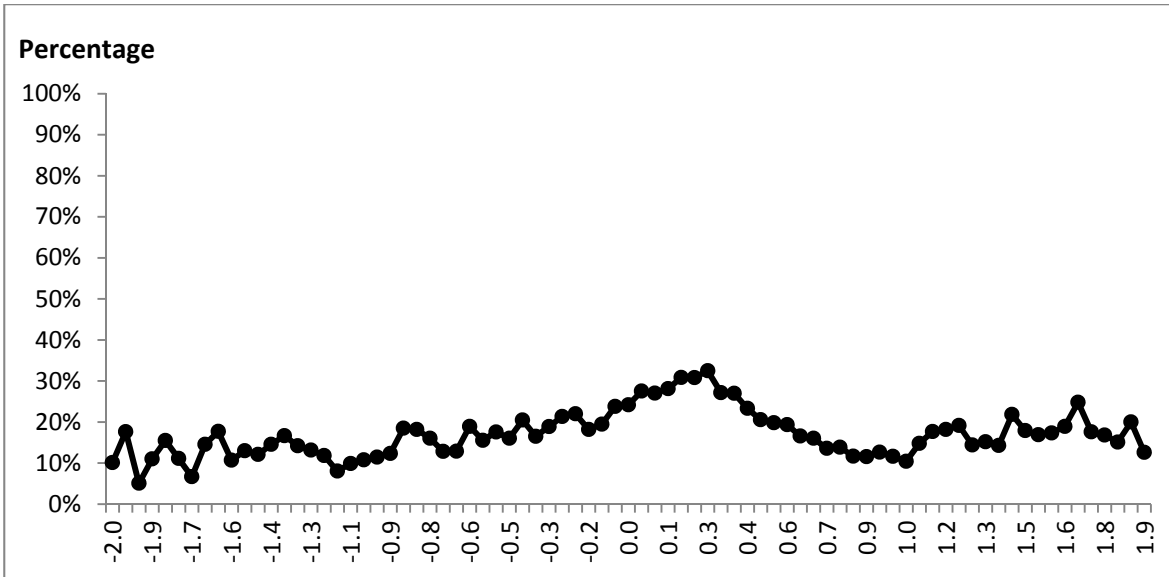
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FIGURE 1
Percentage of Firms Issuing Management Forecasts of Annual Earnings

Panel A: Chinese Firms



Panel B: US Firms

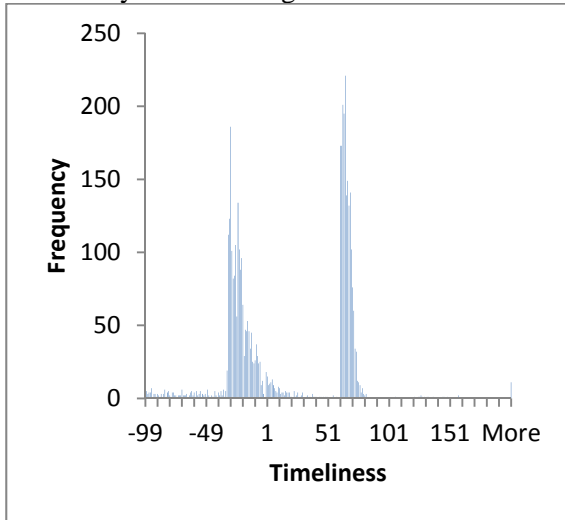


Note: In Panel A we plot the percentage of Chinese publicly listed firms during 2004-2011 that issue forecasts of annual earnings for intervals of percentage earnings change from the previous year. In Panel B we do the same for US publicly listed firms.

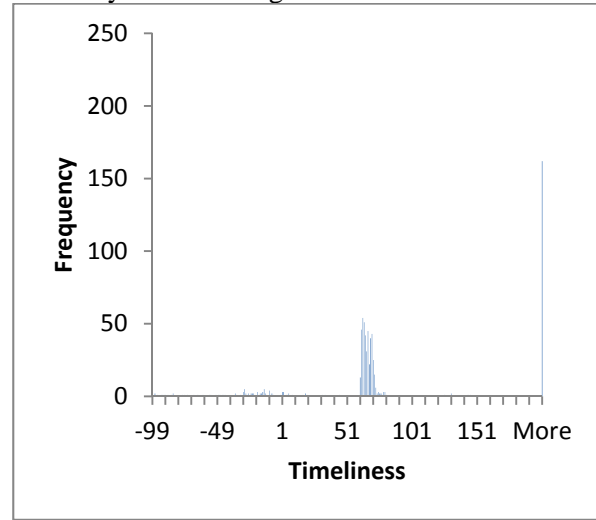
FIGURE 2
Forecast Timeliness

Panel A: Chinese Forecasts

Mandatory Forecast Regime

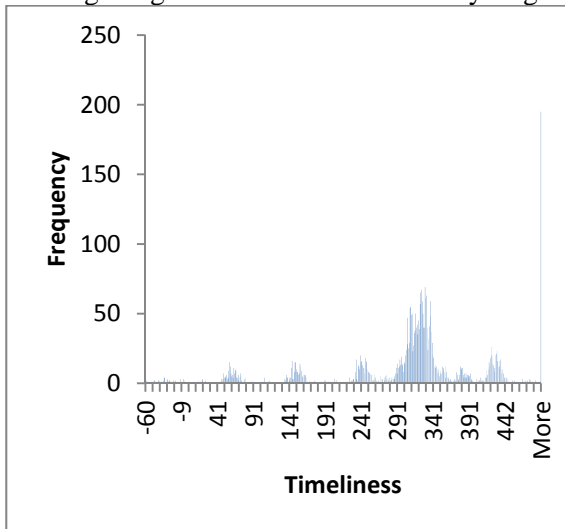


Voluntary Forecast Regime

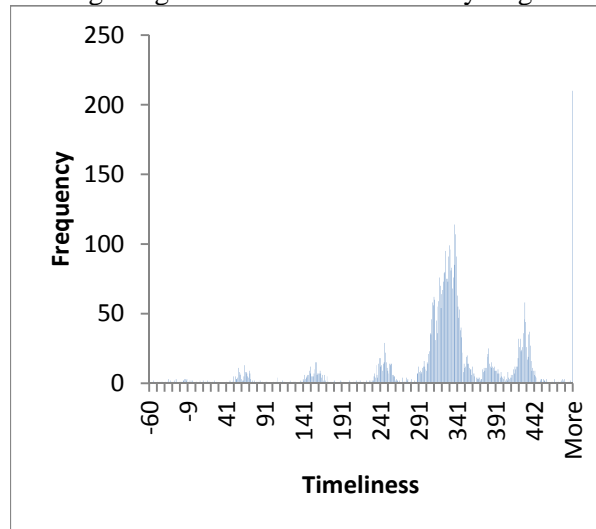


Panel B: US Forecasts

Earnings Regions of Chinese Mandatory Regime



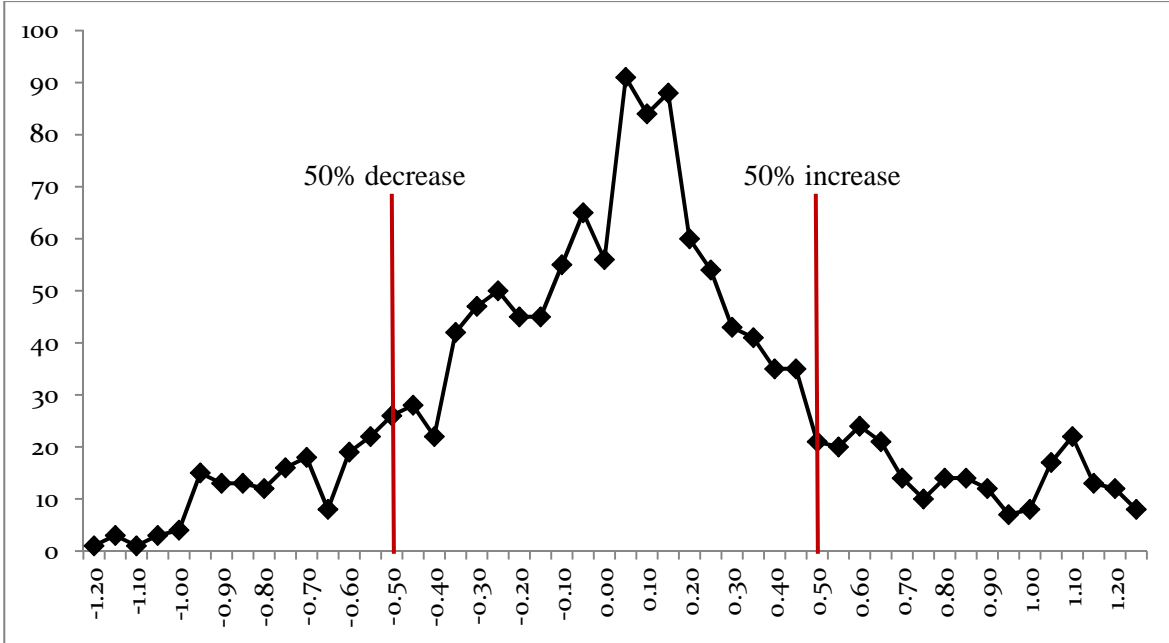
Earnings Regions of Chinese Voluntary Regime



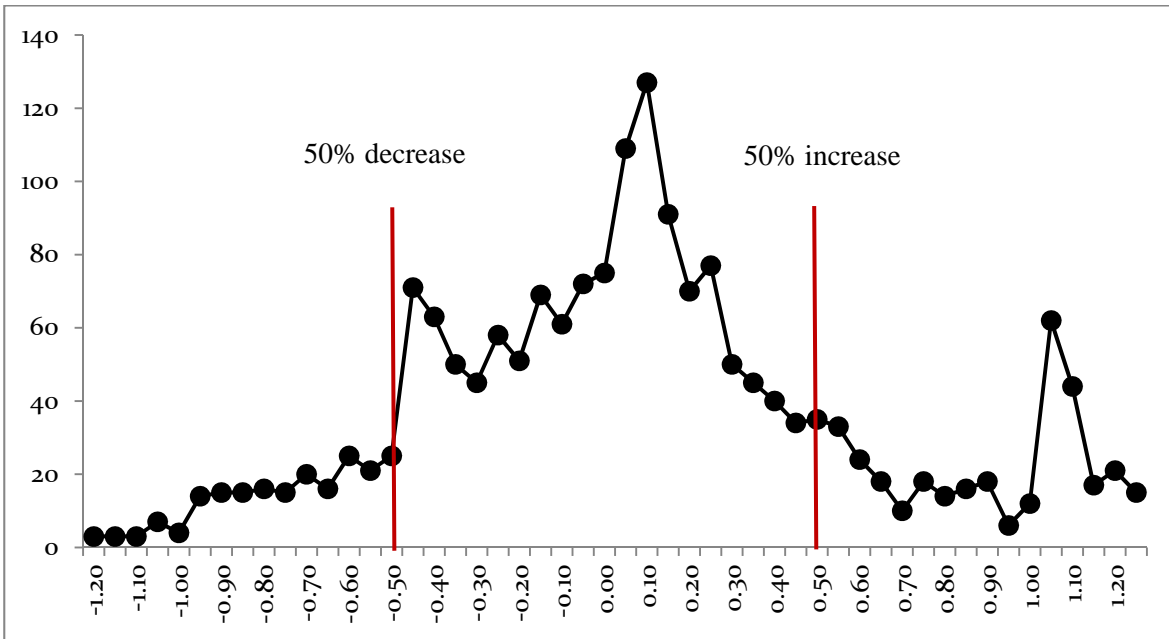
Note: *Timeliness* is the number of days between the fiscal year end date and the forecast date. A higher value indicates more timely forecasts. The bars at the end of the spectrum are the observations beyond the end of the x-axis. In Panel A we plot the timeliness of forecasts issued by Chinese publicly listed firms during 2004-2011. In Panel B we plot the timeliness of forecasts issued by US publicly listed firms during the same time period. The Chinese mandatory regime includes losses, turning profit from previous-year loss, and earnings changes of at least 50% in magnitude; the rest belong to the Chinese voluntary regime.

FIGURE 3
Distribution of Chinese Firms Reporting Earnings Changes

Panel A: Before the Forecast Mandate (1999-2000)



Panel B: After the Forecast Mandate (2002-2003)



Note: The x-axis is the percentage earnings change from the previous year and the y-axis is the number of firm-years. The requirement of forecasts for earnings changes of at least 50% in magnitude took effect in December 2001.

APPENDIX 1 Variable Definitions

Disclosure and Compliance Factors:

SOE	=1 if the firm is directly owned or ultimately controlled by the government at the beginning of year t and 0 otherwise.
Size	= the logarithm of total assets at the beginning of the firm-year.
Competition	= the sum of absolute changes in the sales ranking (each raw ranking is divided by the number of firms in the industry) from year t-2 to t-1 for all firms in the industry.
BM	= the book-to-market ratio at the beginning of year t.
StdROA	= the standard deviation of accounting return on assets in years t-1 to t-5.
Follow	= the number of financial analysts following the firm in year t-1.
IO	= the number of shares owned by institutional investors as a percentage of total shares outstanding at the beginning of year t.
Finance	= 1 if the firm issues equity in year t+1 and 0 otherwise.
Regulate	= 1 if the firm is in a regulated industry and 0 otherwise. The regulated industries in China are mining, electricity/water/gas, financial services, media, and transportation. The regulated industries in the US are utilities, communications, and financial services.
History	= 1 if the Chinese firm issued a consistent mandatory earnings forecast or voluntary earnings forecast in year t-1 and 0 otherwise.

Forecast Properties:

Timeliness	= the number of days between the fiscal year end date and the management forecast date. The higher the number, the more timely the forecast.
Precision	= 0 for qualitative, 1 for open-interval, 2 for range, and 3 for point forecasts.
Error	= the absolute difference between management earnings estimate and earnings realization, scaled by the absolute value of the realization. This variable is not calculated for “loss” and “turning profit” forecasts.
M	= 1 for consistent mandatory forecasts and 0 for voluntary forecasts.
Bad	= 1 for consistent mandatory forecasts of large earnings decreases and losses or voluntary forecasts of small earnings decreases and 0 for consistent mandatory forecasts of large earnings increases and turning profit or voluntary forecasts of small earnings increases.

Investor Responses:

CAR_MF	= the three-trading-day, [-1, +1], market-adjusted stock return around the management forecast.
CAR_R	= the three-trading-day, [-1, +1], market-adjusted stock return around the earnings announcement date or the financial report date, whichever is earlier.
MFnews	= the difference between managers’ earnings estimate and the previous year’s earnings, scaled by the market value of equity two days before the forecast.
Surprise	= the difference between reported earnings and managers’ earnings estimate, scaled by the market value of equity two days before the report date.

Note: In calculating *Error*, *MFnews*, and *Surprise*, managers’ earnings estimate is the point forecast, the midpoint of a range forecast, or the stated starting point of an open-interval estimate.

APPENDIX 2
Chinese Management Earnings Forecast Regimes

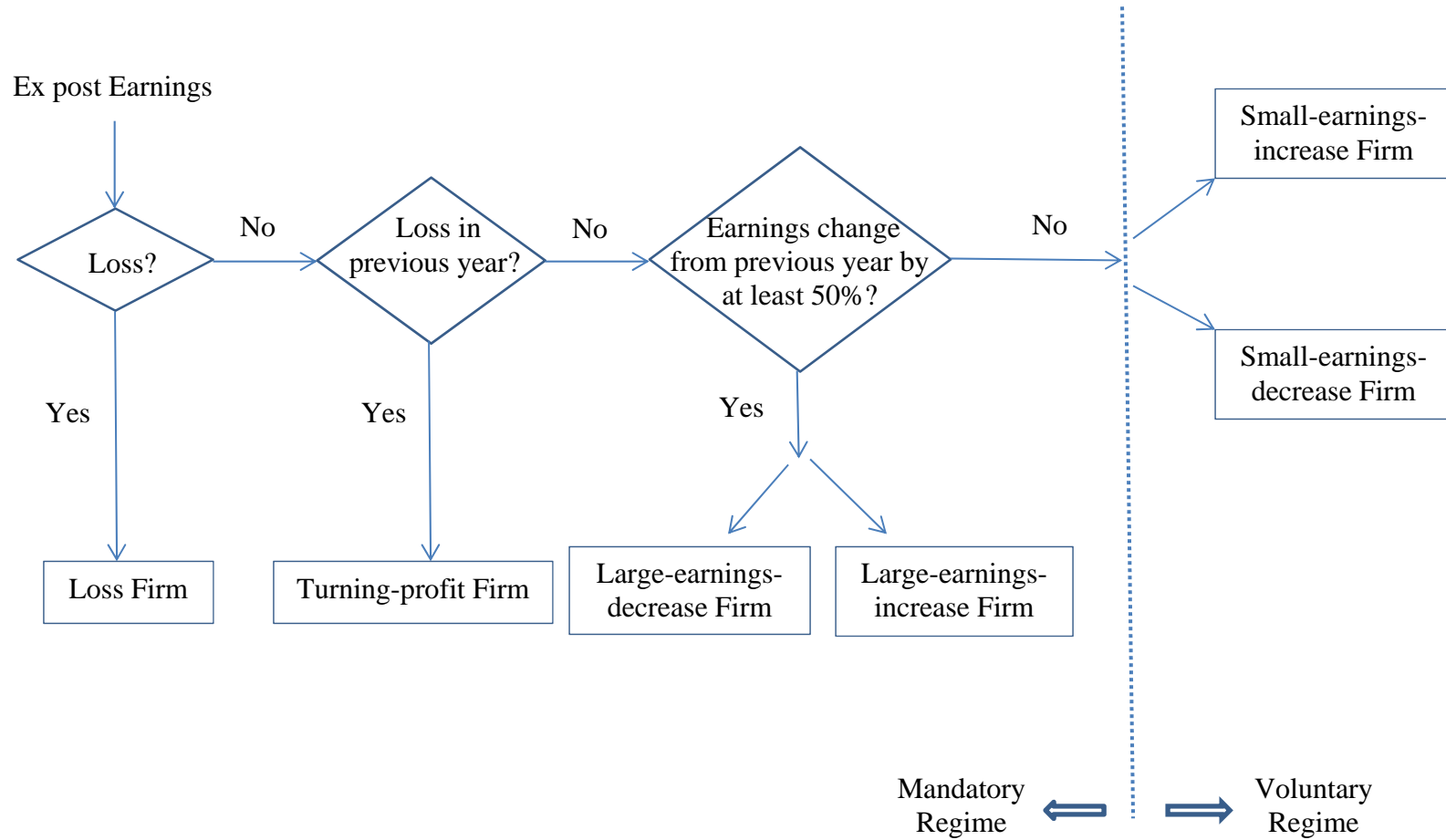


TABLE 1
Management Earnings Forecast Regimes

Panel A: Chinese Firms in the Mandatory Forecast Regime

Year	Large Earnings Decrease				Loss				Turning Profit				Large Earnings Increase				Total
	CF	ICF	NF	CF%	CF	ICF	NF	CF%	CF	ICF	NF	CF%	CF	ICF	NF	CF%	
2004	44	2	15	72%	153	12	8	88%	84	2	8	89%	124	0	44	74%	496
2005	83	0	13	86%	242	16	8	91%	67	1	5	92%	97	3	18	82%	553
2006	35	2	19	63%	157	10	12	88%	150	7	11	89%	171	2	43	79%	619
2007	25	3	13	61%	110	2	8	92%	126	10	5	89%	344	6	46	87%	698
2008	198	9	21	87%	238	15	8	91%	60	3	4	90%	152	4	29	82%	741
2009	90	6	16	80%	183	15	5	90%	161	13	6	89%	243	8	35	85%	781
2010	60	1	12	82%	104	9	9	85%	147	12	8	88%	322	2	33	90%	719
2011	148	17	8	86%	149	7	3	94%	73	4	2	92%	259	29	11	87%	710
Total	683	40	117	81%	1,336	86	61	90%	868	52	49	90%	1,712	54	259	85%	5,317
US	538		2,094	20%	1,167		16,802	6%	520		3,413	13%	1,458		3,963	27%	29,955

Panel B: Chinese Firms in the Voluntary Forecast Regime

Year	Small Earnings Decrease			Small Earnings Increase			Total
	F	NF	Forecast Rate	F	NF	Forecast Rate	
2004	5	270	2%	8	349	2%	632
2005	2	298	1%	3	375	1%	678
2006	7	190	4%	20	367	5%	584
2007	20	136	13%	44	313	12%	513
2008	74	271	21%	71	240	23%	656
2009	58	195	23%	130	254	34%	637
2010	46	191	19%	136	383	26%	756
2011	183	291	39%	355	391	48%	1,220
Total	395	1,842	18%	767	2,672	22%	5,676
US	1,816	4,545	29%	3,490	5,683	38%	15,534

Note: The Chinese sample includes Chinese firms with A shares listed on Shanghai or Shenzhen Stock Exchange that have non-missing total assets, stock price, and net income. The mandatory and voluntary regimes (M-regime and V-regime) are determined by realized earnings. Chinese firms are required to forecast earnings decreases (from the previous year) of at least 50%, loss, turning profit from previous-year loss, and earnings increases of at least 50%. In Panel A, “CF” means that a firm issued a forecast under one of the four anticipated situations and the subsequently reported earnings are consistent with the situation. “ICF” means that a firm belongs to an M-regime category according to reported earnings, but the firm forecasted a different M-regime category or small earnings increases/decreases in the V-regime. “NF” means that no forecast is issued. “CF%” is the percentage of CF firms in a given category. In Panel B, “F” means forecasting firms and “F%” is the percentage of F firms in a given category. We classify US firms into the corresponding earnings regions as Chinese firms and present the forecast rates in the last rows of Panels A and B. The US sample includes US publicly listed firms with non-missing total assets, stock price, the number of shares outstanding, and earnings before extraordinary items and discontinued operations in Compustat in the same sample period as the Chinese sample.

TABLE 2
Frequency and Venues of Chinese Management Earnings Forecasts

Panel A: Single vs. Multiple Forecasts for a Given Firm-year

	Mandatory-forecast Firms					Voluntary-forecast Firms			Total Firms
	Large Earnings Decrease	Loss	Turning Profit	Large Earnings Increase	Subtotal	Small Earnings Decrease	Small Earnings Increase	Subtotal	
Single	614	984	762	1477	3,837	328	688	1,016	4,853
Multiple	69	352	106	235	762	67	79	146	908
Total	683	1,336	868	1,712	4,599	395	767	1,162	5,761
Single%	90%	74%	88%	86%	83%	83%	90%	87%	84%

Panel B: Venues of Forecasts

	Mandatory Forecasts					Voluntary Forecasts			Total Forecasts
	Large Earnings Decrease	Loss	Turning Profit	Large Earnings Increase	Subtotal	Small Earnings Decrease	Small Earnings Increase	Subtotal	
Standalone	533	1,147	633	1,215	3,528	148	222	370	3,898
At interim earnings ann.	0	3	0	3	6	2	1	3	9
At interim earnings report	220	635	347	732	1934	315	627	942	2,876
Total	753	1785	980	1950	5468	465	850	1,315	6,783
Standalone %	71%	64%	65%	62%	65%	32%	26%	28%	58%

Panel C: Forms of Forecasts

	Mandatory Forecasts				Voluntary Forecasts		Total
	Large E. Decrease	Loss	Turning Profit	Large E. Increase	Small E. Decrease	Small E. Increase	
Point	105 (15%)	335 (25%)	168 (19%)	194 (11%)	62 (16%)	126 (16%)	990 (17%)
Range	259 (38%)	234 (18%)	184 (21%)	765 (45%)	269 (68%)	516 (67%)	2,227 (39%)
Open Interval	319 (47%)	767 (57%)	516 (59%)	753 (44%)	58 (15%)	115 (15%)	2,528 (44%)
Qualitative					6 (2%)	10 (1%)	16 (0%)
Total	683 (100%)	1,336 (100%)	868 (100%)	1,712 (100%)	395 (100%)	767 (100%)	5,761 (100%)

Note: "Interim earnings ann." means that a forecast is issued at the earnings announcement event for the previous year or the first three fiscal quarters of the current year. "Interim earnings report" means that a forecast is issued at the financial reporting event for the previous year or the first three fiscal quarters of the current year.

TABLE 3
Descriptive Statistics

	China						US					
	Forecast Firms			Non-forecasting Firms			Forecast Firms			Non-forecasting Firms		
	obs.	mean	median	obs.	mean	median	obs.	mean	median	obs.	mean	median
<u>Disclosure Decision:</u>												
SOE	6,840	0.514	1	5,303	0.679	1						
Total assets (m)	6,840	11,024	1,468	5,300	38,199	2,191	8,989	5,611	1,176	36,256	2,091	164
Competition	6,833	6.158	4.650	5,299	5.668	4.408	8,936	4.751	1.351	35,447	6.775	2.769
BM	6,822	0.558	0.525	5,295	0.663	0.665	8,909	0.468	0.412	35,491	0.368	0.470
StdROA	6,527	3.918	0.030	5,123	2.539	0.020	8,872	0.053	0.024	33,760	1.060	0.065
Follow	6,840	5.578	1	5,303	6.890	2	8,989	9.765	8	36,500	3.595	1
IO	6,838	0.185	0.115	5,303	0.180	0.109	8,989	0.695	0.784	36,500	0.304	0.124
Finance	6,840	0.078	0	5,303	0.058	0	8,989	0.143	0	36,500	0.334	0
Regulate	6,840	0.189	0	5,303	0.252	0	8,989	0.094	0	36,500	0.090	0
History	6,840	0.522	1	5,303	0.258	0	8,989	0.817	1	36,500	0.044	0
<u>Forecast Properties:</u>												
Timeliness	6,840	37	62				8,989	323	328			
Precision	6,840	1.723	2				8,989	2.039	2			
Error	4,099	6.291	0.196				7,202	0.235	0.102			
<u>Return Tests:</u>												
CAR_MF	6,712	-0.002	-0.004									
CAR_R	6,514	-0.005	-0.007									
MFnews	6,670	0.026	0.009									
Surprise	6,596	-0.029	0.001									

Note: See Appendix 1 for variable definitions. *Error* is not calculated for “loss” and “turning profit” forecasts to avoid small scalars. The Chinese sample is in RMB and the US sample is in \$. One \$ is about RMB 6.3 during our sample period. The continuous variables are winsorized at 2% and 98% except for positively valued variables, which are winsorized at 98%.

TABLE 4
Probit-Model Estimation of Chinese Forecast Decisions

	Voluntary Forecast Regime		Mandatory Forecast Regime			
	Small E. Decrease	Small E. Increase	Large E. Decrease	Loss	Turning Profit	Large E. Increase
Intercept	3.413*** (3.13)	1.906** (2.23)	3.785*** (2.99)	-0.556 (-0.41)	-0.638 (-0.35)	1.390 (1.43)
SOE	-0.749*** (-9.44)	-0.816*** (-11.46)	0.030 (0.24)	0.030 (0.23)	-0.156 (-0.94)	-0.400*** (-4.78)
Size	-0.186*** (-3.49)	-0.093** (-2.24)	-0.147** (-2.24)	0.104 (1.52)	0.017 (0.19)	0.004 (0.09)
Competition	0.032*** (3.75)	0.046*** (6.42)	0.009 (0.70)	0.020 (1.38)	0.032 (1.37)	0.018* (1.69)
BM	-0.632*** (-4.01)	-1.135*** (-7.36)	0.247 (0.89)	-0.358 (-1.63)	0.381 (1.27)	-0.688*** (-3.84)
StdROA	-1.523* (-1.83)	-2.008*** (-2.76)	0.357 (0.37)	0.652 (0.68)	2.028 (1.34)	-1.173 (-1.43)
Follow	0.018*** (3.81)	0.009*** (2.65)	0.030** (2.44)	-0.017 (-1.16)	0.008 (0.34)	0.009* (1.87)
IO	0.175 (0.81)	-0.412** (-2.21)	-0.348 (-1.08)	0.177 (0.56)	0.043 (0.13)	0.177 (0.89)
Finance	0.099 (0.65)	0.176* (1.74)	0.251 (0.81)	0.131 (0.29)	-0.607 (-1.57)	0.099 (0.87)
Regulate	-0.443*** (-3.83)	-0.309*** (-3.42)	-0.154 (-1.05)	0.055 (0.37)	0.049 (0.26)	0.038 (0.41)
History	0.394*** (5.00)	0.511*** (8.40)	0.259** (2.13)	0.205 (1.62)	1.744*** (9.36)	0.349*** (4.35)
Obs.	2,130	3,229	770	1,377	915	1,888
Pseudo R ²	18.9%	21.9%	3.4%	2.1%	24.7%	6.4%
SOE forecast rate	8%	11%	85%	96%	94%	83%
Non-SOE forecast rate	33%	40%	86%	96%	95%	92%

Note: See Appendix 1 for variable definitions. Z-statistics are in the parenthesis and the standard errors are clustered by firm. ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

TABLE 5
The Role of Mandatory Forecast Experience in Subsequent Voluntary Forecast Decisions

Panel A: Mandatory and Voluntary Forecast Regime Transition Matrix

	Belong to M-regime in year t	Belong to V-regime in year t
Belong to M-regime in year t-1	2,984 (MM, 65%)	1,408 (MV, 31%)
Belong to V-regime in year t-1	1,608 (VM, 35%)	3,153 (VV, 69%)
Subtotal	4,592 (100%)	4,561 (100%)

Panel B: Voluntary Forecast Probit-Model Estimation

	Type MV Firms			
	Small Earnings Decrease		Small Earnings Increase	
	Coeff.	z-stat.	Coeff.	z-stat.
Intercept	2.413	1.38	2.674*	1.76
History	0.485**	1.98	0.633***	2.64
SOE	-0.440***	-3.24	-0.552***	-4.49
Size	-0.179**	-2.21	-0.175**	-2.35
BM	-0.139	-0.53	-0.607*	-1.95
StdROA	0.268	0.21	-2.768**	-2.05
Follow	0.026***	3.13	0.033***	5.07
IO	-0.453	-1.11	-0.633	-1.62
Finance	0.432**	2.08	0.545***	3.18
Regulate	-0.067	-0.38	-0.269*	-1.65
Obs.	620		788	
Pseudo R ²	10.8%		17.7%	

Note: See Appendix 1 for variable definitions. Type MV firms fell into the M-regime in the previous year, so *History* captures the mandatory forecast experience in the previous year. Z-statistics are in the parenthesis and the standard errors are clustered by firm. ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

TABLE 6
Management Earnings Forecast Properties

	China			US		
	Timeliness	Precision	Error	Timeliness	Precision	Error
Intercept	105.195*** (6.67)	Not reported	0.223*** (4.15)	277.520*** (84.24)	Not reported	0.096*** (11.69)
M	-42.128*** (-17.68)	-0.485*** (-9.26)	0.019*** (2.72)	-2.732* (-1.83)	-0.051 (-1.13)	0.062*** (17.81)
Bad	-3.972 (-1.14)	0.027 (0.37)	0.081*** (8.91)	-3.018** (-2.05)	-0.028 (-0.78)	0.041*** (12.97)
M x Bad	0.598 (0.16)	0.073 (0.92)	0.024** (2.21)	1.506 (0.67)	-0.018 (-0.28)	-0.011* (-1.68)
SOE	2.225 (1.45)	-0.078** (-2.37)	0.010* (1.96)			
Size	-2.491*** (-3.16)	0.020 (1.17)	-0.008*** (-2.80)	4.774*** (10.88)	-0.003 (-0.17)	-0.010*** (-9.32)
Competition	-0.651*** (-3.75)	0.005 (1.47)	0.000 (0.76)	0.219*** (2.67)	0.001 (0.29)	-0.001*** (-3.05)
BM	1.045 (0.34)	-0.396*** (-5.86)	0.062*** (5.50)	-15.626*** (-7.92)	-0.011 (-0.18)	0.035*** (6.52)
StdROA	-0.001 (-0.35)	0.000 (1.04)	-0.001*** (-12.97)	4.059 (0.61)	-0.050 (-0.20)	0.057*** (3.03)
Follow	0.202** (2.30)	0.000 (0.19)	-0.000 (-0.29)	0.115 (1.10)	0.003 (0.84)	0.000 (0.06)
IO	4.230 (1.11)	0.083 (1.01)	0.004 (0.34)	2.945* (1.69)	0.189*** (3.14)	-0.003 (-0.70)
Finance	5.934** (2.23)	0.069 (1.23)	-0.001 (-0.15)	5.801*** (3.57)	0.037 (0.68)	-0.006 (-1.41)
Regulate	0.803 (0.43)	-0.003 (-0.08)	-0.004 (-0.70)	4.815** (2.40)	0.038 (0.58)	-0.026*** (-5.66)
History	11.080***	0.019	-0.008*	27.650***	0.127**	-0.001

	(7.60)	(0.60)	(-1.69)	(18.29)	(2.56)	(-0.27)
Timeliness		0.000	0.000***		-0.000	0.000***
		(0.33)	(10.56)		(-1.35)	(14.04)
Obs.	5,478	5,478	3,290	8,802	8,802	7,060
Model F	46.99	256.04	51.92	81.52	28.63	87.44
Model	Linear reg.	Ordered probit	Linear reg.	Linear reg.	Ordered probit	Linear reg.
M + MxBad	-41.53***	-0.458***	0.043***	-1.226	-0.069	0.051***

Interpretation of Coefficients:

Coefficient	Comparison Groups	China			US		
		Timeliness	Precision	Error	Timeliness	Precision	Error
M	M versus V for good-news forecast	-	-	+	-*	No	+
M+MxBad	M versus V for bad-news forecast	-	-	+	No	No	+

Note: “+” means statistically significantly positive, “-” means statistically significantly negative, “-*” means weakly significantly negative, and “No” means insignificant.

Note: The Chinese test sample includes consistent mandatory earnings forecasts and voluntary earnings forecasts that have non-missing values for the dependent and independent variables. The US sample includes voluntary forecasts classified into the Chinese mandatory and voluntary forecast performance regions. We use the first forecast in a given year if a firm issues multiple forecasts. The forecast error tests exclude “loss” and “turning profit” categories to avoid the use of small scalars in the dependent variable. See Appendix 1 for variable definitions. Z-statistics are in the parenthesis. We use the robust-regression method to estimate the linear regressions. The ordered probit estimation is clustered by firm. ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

TABLE 7
Investor Reaction to Chinese Management Earnings Forecasts and Subsequent Earnings Realizations

Panel A: Price Reaction to Management Earnings Forecasts

	All-venue Forecasts		Standalone Forecasts	
	Mandatory	Voluntary	Mandatory	Voluntary
Intercept	-0.005*** (-5.22)	-0.006*** (-3.44)	0.001 (0.591)	-0.016*** (-4.09)
MFnews	0.050*** (8.41)	0.069** (1.97)	0.109*** (15.79)	0.210* (1.74)
Model F	70.8	3.88	249.36	3.01
Obs.	4,510	1,141	3,213	353

Panel B: Price Reaction to the Earlier Date of Earnings Announcement or Financial Report

	All-venue Forecasts		Standalone Forecasts	
	Mandatory	Voluntary	Mandatory	Voluntary
Intercept	-0.006*** (-5.45)	-0.008*** (-4.80)	-0.006*** (-5.28)	-0.014*** (-4.90)
Surprise	0.030*** (4.46)	-0.020 (-0.47)	0.034*** (3.40)	0.346* (1.86)
Model F	19.88	0.22	11.53	3.46
Obs.	4,312	1,139	3,058	352

Note: The test sample includes consistent mandatory earnings forecasts and voluntary earnings forecasts that have non-missing values for the dependent and independent variables. We use the first forecast in a given year if a firm issues multiple forecasts. See Appendix 1 for variable definitions. The robust-regression estimation method is used. Z-statistics are in the parenthesis ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.

TABLE 8
Tests of Distribution Discontinuity around 50% Earnings Changes in China

	Left of the 50%-change threshold					Right of the 50%-change threshold					
	Actual	Predict	Diff.	Std.	Test Statistic	Actual	Predict	Diff.	Std.	Test Statistic	
<u>2002-2003</u>											
(-0.60,-0.55]	21					(-0.55,-0.50]	25				
(-0.55,- 0.50)	25	46	-21.0	4.96	-4.24***	(- 0.50 ,-0.45]	71	43.5	27.5	6.99	3.93***
(-0.50,-0.45]	71					(-0.45,-0.40]	62				
<u>1999-2000</u>											
(-0.60,-0.55]	22					(-0.55,-0.50]	26				
(-0.55,- 0.50)	26	25	1.0	4.62	0.22	(- 0.50 ,-0.45]	28	24	4.0	4.70	0.85
(-0.50,-0.45]	28					(-0.45,-0.40]	22				
<u>2002-2003</u>											
[0.40, 0.45)	34					[0.45, 0.50)	35				
[0.45, 0.50)	35	33.5	1.5	5.36	0.28	[0.50 , 0.55)	33	29.5	3.5	5.14	0.68
[0.50, 0.55)	33					[0.55, 0.60)	24				
<u>1999-2000</u>											
[0.40, 0.45)	35					[0.45, 0.50)	21				
[0.45, 0.50)	21	27.5	-6.5	4.36	-1.49	[0.50 , 0.55)	20	22.5	-2.5	4.16	-0.6
[0.50, 0.55)	20					[0.55, 0.60)	24				

Note: We use two years' data before the forecast mandate regarding 50% earnings changes and two years' data after the mandate. “(” and “)” mean the number at the boundary is excluded and “[” and “]” mean the number at the boundary is included. *Actual* is the actual number of firm-years falling into a given interval. *Predict* is the number of firm-years falling into the interval assuming the distribution across the interval and its two adjacent intervals is smooth; that is, the value is the average number of observations in the adjacent intervals. *Diff* is *Actual* minus *Predict*. *Std* is the standard deviation calculated using the formula provided in Footnote 6 of Burgstahler and Dichev (1997). The test statistic is $Diff / Std$ and follows a standard normal distribution. *** indicates statistical significance at 1%.