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The Impact of the CSRC Regulation No. 12-1996 on the Credibility of Chinese IPO Earnings Forecasts

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ABSTRACT

This study examines whether the Chinese Securities Regulatory Commission (the CSRC) Regulation No. 12-1996, *Announcement of Some Rules on the Issuance of Shares*, may enhance the credibility of management earnings forecasts in Chinese IPO prospectuses. Using a sample of 858 IPO earnings forecasts over the period 1991 to 2005, we find that earnings forecasts have been less optimistic and more accurate after the regulation was promulgated on December 26, 1996. Overall, our findings suggest that the CSRC Regulation No. 12-1996 can improve the reliability of Chinese IPO earnings forecasts.

JEL classification: G15, G38, M41, M48

Keywords: IPO, Regulation, Earnings forecasts, Forecast reliability.

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1. Introduction

Management earnings forecasts contained in prospectuses for initial public offerings (IPOs) provide useful information about future firm performance. However, IPO earnings forecasts are vulnerable to information asymmetry problems because information about an IPO firm is less available to the public than information about a listed firm, and management always have better knowledge about their firm's future performance than outside investors. Moreover, the credibility of IPO earnings forecasts may be impaired by managerial opportunism. For instance, management may have incentives to overestimate IPO earnings forecasts in order to raise more proceeds from the IPO. A significant overestimation of IPO earnings forecasts may mislead investors, and is usually associated with an adverse market reaction and a potential legal liability. Consequently, the credibility of IPO earnings forecasts is a topic of considerable interest to researchers, investors, and regulators.

Research into the reliability of management earnings forecasts in the U.S. started in early 1970s. However, IPO earnings forecasts are hardly ever addressed in U.S. studies because earnings forecasts are rarely disclosed in U.S. IPO prospectuses.[1] Most of prior research on IPO earnings forecasts uses data from British Commonwealth countries (Jelic, Saadouni, & Briston, 1998). So far, fewer studies on management forecast reliability have been conducted for emerging markets, especially for China. This study provides evidence on the reliability of Chinese IPO earnings forecasts. We find that the mean forecast error and

[1] See McDonald (1973), Imhoff (1978), Jaggi (1980), Porter (1982), and Cameron (1982).

the mean absolute forecast error are 0.45% and 15.28%, respectively, for a sample of 858 Chinese IPOs over the period 1991 to 2005.[2]

On December 26, 1996, the Chinese Securities Regulatory Commission (the CSRC) promulgated a regulation, *Announcement of Some Rules on the Issuance of Shares* (No. 12-1996). The Regulation No. 12-1996 (thereafter "the Regulation") imposes penalties on firms whose IPO earnings forecasts are significantly overestimated in their IPO prospectuses. Specifically, the Regulation requires that IPO firms and their auditors must explain and apologize to the public in a CSRC designated newspaper if predicted earnings are overestimated by 10 - 20% compared to actual earnings. IPO firms will be penalized if earnings forecasts are overestimated by more than 20% and the overestimation is deemed to be a fraudulent activity. Auditors will also be penalized if they issue an inappropriate audit opinion on a client company's IPO earnings forecasts. The Regulation also prohibits IPO firms from using earnings forecasts as a basis for setting issuance price.

Although the Regulation was promulgated to improve the reliability of earnings forecasts in Chinese IPO prospectuses, it remains an empirical question because the legal enforcement infrastructure is weak in China. Moreover, Chinese IPO firms are closely connected with the government, which may provide opportunities for them to override the Regulation. Hence, whether the Regulation can enhance the reliability of earnings forecasts is an empirical question. This study examines whether the Regulation has achieved its initial

[2] IPO earnings forecasts from some Commonwealth countries seem less accurate than Chinese IPO earnings forecasts. For example, the mean absolute forecast error is 289% for the Australian forecasts (Hartnett, 1993), 100% for the New Zealand forecasts (Mak, 1989), and 88% for the Canadian forecasts (Pedwell, Warsame, & Neu, 1994).

objective. We find that the Regulation has been efficacious in reducing the overestimation of IPO earnings forecasts after it was promulgated on December 26, 1996. We also document a significant improvement in earnings forecast accuracy resulting from the promulgation of the Regulation.

This study contributes to the literature in the following ways. First, to the best of our knowledge, this is the first study to investigate whether a securities regulation in an emerging market can enhance the reliability of corporate financial disclosure. Since there is rare research into the effects of securities regulations on corporate disclosure, the promulgation of the CSRC Regulation No. 12-1996 provides us an opportunity to enrich this research topic. Second, we document evidence on the efficacy of the CSRC Regulation No. 12-1996. Our findings may provide implications for future regulation promulgation to the CSRC and other securities regulators of emerging markets. Third, this study adds to prior research on the economic determinants of forecast accuracy. Our study suggests some ex ante criteria for evaluating Chinese earnings forecast accuracy.

The remainder of the paper is organized as follows. Section 2 introduces institutional background. The third section develops hypotheses. Section 4 discusses research design. Section 5 provides empirical results, Section 6 conducts additional analyses, and the paper concludes in the seventh section.

2. Institutional Background

2.1 Corporate disclosure in Chinese IPO prospectuses

The Chinese Securities Regulatory Commission (the CSRC), established in 1992 under the State Council, is the official government authority that is responsible for the

formulation of information disclosure regulations in the Chinese securities markets. On June 12, 1993, the CSRC issued the first corporate disclosure regulation for public offering companies, *Implementing Standards on Information Disclosure for Shares Public Offering Companie*s (No. 43-1993). This regulation required that public offering companies should disclose information in their initial public offering prospectuses, annual reports, interim reports, and seasoned public offering prospectuses in accordance with the standards implemented by the CSRC.

According to the implementing standards, information to be disclosed in IPO prospectuses includes the issuance price of shares, amount of capital to be raised, total amount of share capital, intended application of the capital raised, certificate of capital verification, parties involved in the new issuing, risk and strategy, dividend policy, underwriting, company's background, operational performance, report of asset appraisal, financial information, earnings forecasts, development plan, commitments and litigation, and so on.[3]

On January 7, 1997, the CSRC formalized the implementing standards into a regulation, *Standards on the Content and Format of Information Disclosure for Shares Public Offering Companies: the Content and Format of IPO Prospectuses* (No. 2-1997). On March 15, 2001, the CSRC issued a new regulation on IPO prospectuses, *Standards on the Content and Format of Information Disclosure for Securities Public Offering Companies: IPO Prospectuses* (No. 41-2001), to supersede the Regulation No. 2-1997. The Regulation No. 41-2001 required that, in addition to the information required by the Regulation No. 2-1997, IPO firms should also disclose their business and technology, industry competition and

[3] See Tang, Chow, and Cooper (1996).

related transactions, and corporate governance in their IPO prospectuses. Moreover, the CSRC made a significant change regarding earnings forecast disclosure in the Regulation No. 41-2001. Specifically, the Regulation No. 2-1997 required that companies must disclose earnings forecasts in their IPO prospectuses, whereas according to the Regulation No. 41-2001, companies have the option of not disclosing earnings forecasts in their IPO prospectuses.[4]

2.2 The CSRC Regulation No. 12-1996

On December 26, 1996, the CSRC issued a regulation, *Announcement of Some Rules on the Issuance of Shares* (No. 12-1996).[5] This regulation addresses issues related to share issuance, including the criteria for initial public offerings, use of the capital raised, revaluation of assets, earnings forecasts, determination of issuance price, trading of employee's shares, issuance costs, and so on.

According to the CSRC Regulation No. 12-1996, IPO firms and their auditors must explain and apologize to the public in a CSRC designated newspaper if the predicted earnings in their IPO prospectuses are overestimated by 10 - 20% compared to the actual earnings. Penalties will be imposed on the IPO firm if earnings forecasts are overestimated by more than 20% and the overestimation is deemed to be a fraudulent activity. Auditors

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[4] IPO firms who voluntarily disclose earnings forecasts in their prospectuses will be penalized by the CSRC based on the Regulation No.12-1996 (as discussed in Section 2.2.) if their earnings forecasts are significantly overstated compared to the actual earnings. Indeed, few IPO firms have disclosed earnings forecasts in their prospectuses after the Regulation No. 41-2001 became effective.

[5] This regulation is currently effective.

will also be penalized if they issue an inappropriate audit opinion on a client company's IPO earnings forecasts. Further, the Regulation prohibits IPO firms from using earnings forecasts as a basis for determining issuance price.[6]

In 1997, the CSRC publicly denounced eight Chinese listed companies for significantly overestimating earnings forecasts in their IPO prospectuses.[7] For instance, *Zhongyan Tango* applied a very high gross profit rate of 80% in developing earnings forecasts, whereas its average gross profit rate was 20% for the two years prior to the IPO year. The company's actual earnings for the IPO year were only 12.30 million yuan, compared to the predicted 49.97 million yuan in its IPO prospectus. Other listed companies being publicly denounced by the CSRC in 1997 included *Kaidi Silk, Lanlia Chenxiang*, *Shijiazhuang Quanye*, *Wuhan Twin-Tigers*, *Guhan Group*, *Huaya Paper*, and *Northeast Pharmaceutical.*

In addition to the eight listed companies, three accounting firms were also penalized by the CSRC for their deceptions and frauds in conducting the audits of IPO earnings forecasts. Specifically, *Shenyang Certified Public Accountants* received a disciplinary warning and a pecuniary penalty, and *Beijing Certified Public Accountants* and *Shijiazhuang Certified Public Accountants* were publicly denounced.

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[6] IPO earnings forecasts provide forward-looking information about an IPO firm's future cash flow, and thus affect corporate valuation reflected in stock prices (Miller & Modigliani 1961). Hence, although not to be used in determining issuance price after the Regulation No.12-1996, IPO forecasts are still important for investors in making investing decisions.

[7] See Qi, Wu, and Zhang (1998).

3. Hypotheses Development

Effective on December 26, 1996, the CSRC Regulation No. 12-1996 was formulated because Chinese securities administrators were seriously concerned with the reliability of IPO earnings forecasts. Under the Regulation, IPO firms are not allowed to use earnings forecasts as a basis for setting issuance price. Moreover, any significant and opportunistic overestimation of earnings forecasts in IPO prospectuses will be penalized by the CSRC. The Regulation may influence both the benefits and the costs of overstating earnings forecasts. Before the Regulation, earnings forecasts were allowed for setting issuance price. Hence, if earnings forecasts were overstated, the issuance price would also be exaggerated. The Regulation prohibits IPO firms from using earnings forecasts as a basis for determining issuance prices, thus reduces the instant benefits of overestimating earnings forecasts.

The Regulation also increases the potential costs of overestimating earnings forecasts in at least three ways. First, any penalty from the CSRC will lower the reputation of an IPO firm and its auditor, especially as the penalty is publicly announced. Second, the stock markets will react adversely if an IPO firm is penalized for overstating earnings forecasts. A decline in stock price will consequently reduce the wealth of a large number of shares owned by the management of the firm. Further, it will be more difficult to obtain approval for seasoned equity offerings from the CSRC if a firm had once been penalized for a fraud. Seasoned equity offerings may be an important tunnel for Chinese listed firms to survive when incurring significant operating losses. Overall, the CSRC Regulation No. 12-1996 increases the costs and decreases the benefits of overstating earnings forecasts, and thus may mitigate opportunistic overestimation of earnings forecasts and enhance the reliability of the forecasts.

However, prior research shows that legal enforcement is different across countries (La Porta, Lopez-De-Silances, Shleifer, & Vishny, 1998). In countries with weak enforcement environments, a regulation may not be strictly enforced even though the regulation itself is well designed, and consequently, may not meet its initial objective. Moreover, Cai (2007, pp.7) argues that "the China Securities Regulatory Commission (the CSRC), the executive branch body that is responsible for enforcing the securities law, has also not proven to be effective, independent, or professional based upon international standards". Thus, the weak legal enforcement infrastructure in China may impair the efficacy of the CSRC Regulation No. 12-1996.

Prior research also suggests that political connections may relax regulatory oversight of a company in question (Faccio, 2006). Politically connected firms are more likely to obtain assistance from the government (Faccio, Masulis, & McConnell, 2006). Most of Chinese IPO companies were state-owned enterprises before they went public, and the majority of their shares are still owned by the government after initial public offerings. Fan, Wong, and Zhang (2007) further find that about 27% of CEOs from a sample of 790 Chinese IPO firms are former or current government bureaucrats. Overall, Chinese IPO firms are closely connected with the government, and thus may take advantage of the affiliated relationship to challenge the authority of the CSRC, a regulatory body that is also highly affiliated with the government. Thus, the effectiveness of the CSRC regulation is questionable considering the prevalence of political connections between Chinese IPO firms and the government.

In summary, the CSRC Regulation No. 12-1996 may increase the reliability of IPO earnings forecasts as the costs (benefits) of opportunistic overestimation will be higher

(lower). However, the positive impact of the regulation on forecast reliability might be attenuated due to the weak legal enforcement infrastructure and the solid political connections between IPO firms and the government. Thus, whether the CSRC Regulation No. 12-1996 can enhance the reliability of IPO earnings forecasts is still an empirical question. Based on the above discussions, we develop two hypotheses with regard to forecast bias and forecast accuracy, respectively:

H1 *IPO earnings forecasts have been less optimistic after the promulgation of the Regulation than before.*

H2 *IPO earnings forecasts have been more accurate after the promulgation of the Regulation than before.*

4. Research Design

4.1 Sample selection

The sample of this study includes all Chinese IPOs over the period 1991 to 2005 that satisfy the following criteria:

(1) IPO prospectuses are available on *www.cnlist.com*, a Chinese website that provides all information disclosed by Chinese listed companies,

(2) Earnings forecasts for the IPO year are disclosed in the prospectuses,

(3) Earnings forecasts for the IPO year are based on profit before tax (firms that only issued forecasts of net income are excluded from the sample),[8] and

[8] Although the income tax rate is 33% for all non-public Chinese companies, it is not uniform and is determined by local tax authority after a firm is publicly listed. The annual profit for the IPO year may be taxed on a post-IPO rate for the whole year, or be taxed on a pre-IPO rate for the pre-IPO period and on a post-IPO

(4) Other data are available for analysis.

Insert Table 1 about here

The above criteria yield the final sample consisting of 858 IPO firms over the period 1991 to 2005. Table 1, panel A reports the distribution of these sample firms by year. A total of 313 and 545 firms went public before and after the end of 1996, respectively. An interesting phenomenon is that only 62 IPO earnings forecasts were issued after 2000, suggesting that few Chinese IPO firms have been willing to disclose earnings forecasts in their prospectuses after the CSRC changed the mandatory disclosure of IPO earnings forecasts into a voluntary requirement on March 15, 2001.[9] Table 1, panel B provides the distribution of sample firms by CRSC industry classification. About 59% of our sample firms are manufacturing companies. In addition, 502 out of the 858 sample firms are listed on the Shanghai Stock Exchange and the other 356 firms are listed on the Shenzhen Stock Exchange.

4.2 Univariate analysis

The reliability of earnings forecasts can be decomposed into a bias component and an accuracy component. Forecast bias for an IPO firm is measured by forecast error (*FE*), which is commonly defined as follows:[10]

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rate for the rest of the year. Hence, we use forecasts of profit before tax instead of forecasts of net income to avoid any impact due to changes in post-IPO tax policy on forecast reliability.

[9] There are 54 IPO earnings forecasts disclosed after March 15, 2001 in our sample.

[10] See McConomy (1998), Clarkson (2000), Hartnett and Romcke (2000), Lonkani and Firth (2005), El-Rajabi and Gunasekaran (2006), etc.

$$FE = (A - F) / |F| \quad (1)$$

where

F = earnings forecast for the IPO year,

A = actual earnings for the IPO year.

We focus on earnings forecasts for the IPO year because many IPO firms did not issue forecasts for years after the IPO year. A negative (positive) sign of *FE* indicates that earnings forecasts are overestimated (underestimated) for an IPO firm. However, the average forecast error across firms may not accurately reflect the average size of forecast errors because negative and positive errors cancel each other out.

Following prior research, forecast accuracy for an IPO firm is measured by absolute forecast error (*AFE*), that is,

$$AFE = |A - F| / |F| \quad (2)$$

Earnings forecasts with lower *AFE* are more accurate than forecasts with higher *AFE*.

We first conduct univariate analysis to test the two hypotheses about the effects of the CSRC Regulation No. 12-1996 on IPO forecast credibility. Both forecast error (*FE*) and absolute forecast error (*AFE*) of IPO earnings forecasts issued after the end of 1996 are compared with those issued before the end of 1996. We use the end of 1996 as the clear-cut date because the Regulation became effective as of December 26, 1996. Both student *t*-tests and Wilcoxon tests are employed for the comparisons. Using Wilcoxon tests can mitigate the potential effect of outliers on the results. If the reliability of IPO earnings forecasts is significantly affected by the Regulation, the two hypotheses will not be statistically rejected. The two hypotheses are also tested by conducting regression analysis as described in the next subsection.

4.3 Regression analysis

We run the following pooled regression to test the two hypotheses after controlling for several factors that may affect IPO forecast reliability:[11]

$$FE\ (AFE) = \alpha + \beta_1 REG + \beta_2 SIZE + \beta_3 FH + \beta_4 PEV + \beta_5 LEV + \beta_6 BIG5 + \beta_7 RTO + \beta_8 GDP + \beta_9 STE + Industry\ dummies + \varepsilon \quad (3)$$

where

FE = Forecast error,

AFE = Absolute forecast error,

REG = the CSRC Regulation No. 12-1996,

SIZE = Firm size,

FH = Forecast horizon,

PEV = Past earnings variability,

LEV = Financial leverage,

BIG5 = Big Five auditor,

RTO = Retention ownership,

GDP = GDP growth rate,

STE = Stock exchange.

The test variable (*REG*) equals to "1" if a firm went public after the end of 1996 and "0" if before the end of 1996. The control variables are defined as follows. Firm size (*SIZE*) is measured as the logarithm value of total assets at the end of the IPO year. Forecast horizon

[11] The pooled regression does not lead to any serial correlations because each firm has only one observation in the sample.

(*FH*) is measured as the number of months between the forecast date and the end of the IPO year. If the forecast date belongs to the first (second) half of a month, that month is (not) counted when calculating forecast horizon.[12] Past earnings variability (*PEV*) is computed by dividing the standard deviation of earnings across the three years prior to the IPO year by the mean of the three years' earnings (Cheng & Firth, 2000; Lonkani & Firth, 2005). Financial leverage (*LEV*) is measured by the total liabilities over the total assets at the end of the IPO year. Big Five auditor (*BIG5*) is coded "1" if the auditor is a Big Five firm and "0" otherwise. Retention ownership (*RTO*) is the percentage of total equity retained by extant owners after the initial public offering. GDP growth rate (*GDP*) is yearly Gross Domestic Product growth rate. The stock exchange dummy (*STE*) is coded "1" if a firm is listed on the Shanghai Stock Exchange and "0" if listed on the Shenzhen Stock Exchange. Industry dummies are coded "1" if there are at least 10 sample firms from an industry and "0" otherwise.[13]

We include the control variables in the regression model based on the literature. Prior research considers firm size as a potential factor affecting earnings forecast accuracy. For instance, Hagerman and Ruland (1979) suggest that larger firms can produce more accurate forecasts because they are more diversified and thus are better able to survive economic changes than smaller firms. Cox (1995) argues that larger firms have adequate human resources to prepare high-quality forecasts and a stable earnings process in which earnings

[12] For example, the forecast horizon for a firm that went public on 06/14/1997 is 7 months, and the forecast horizon for a firm that went public on 08/16/1996 is 4 months. The fiscal year end is December 31 for all Chinese companies.

[13] All continuous variables in the model are winsorized at 1% and 99%.

are more predictable. Larger firms may also have better control over their market settings, and thus may be less susceptible to economic fluctuations (Firth & Smith, 1992).

It has been argued that an important determinant of forecast reliability is forecast horizon. A negative association between forecast horizon and forecast accuracy is reported in earlier U.S. studies (Collins & Hopwood, 1980; Brown, Foster, & Noreen, 1985). As earnings forecast is an inherently uncertain process, the longer the forecast horizon the greater the possibility that unexpected events may occur. Additionally, forecasts developed on a date close to the end of the forecast period may incorporate more updated information and thus are more reliable.

Another potential determinant of forecast reliability is past earnings variability. Porter (1982) documents a negative association between past earnings variability and forecast accuracy in the U.S. As past earnings data are usually used as inputs to the forecasting process, it might be more difficult to forecast earnings if past data show a large variation across different years. In addition, the performance of a firm is usually sensitive to local and global market conditions, interest rate movements, exchange rate movements, etc. The effects of these factors on a firm's future performance might be incorporated in past earnings variability (Eddy & Seifert, 1992).

A firm's financial leverage may also affect its forecast reliability. Clarkson (2000) finds significant evidence that earnings forecasts are less accurate for firms with high leverage in Canada although the results are sensitive to alternative specifications. Eddy and Seifert (1992) suggest that higher leverage may make earnings forecasting more difficult because firms with relatively high debt levels are likely to experience more volatile earnings. Francis, Philbrick, and Schipper (1998) find that even a modest decline in sales relative to

management's expectations is likely to result in a large earnings shortfall for firms with high financial leverage.

IPO earnings forecasts are required to be audited by certified public accountants in China. Simunic and Stein (1987) argue that Big Five accounting firms produce high-quality audits. Big Five firms should have a strong incentive to provide high quality services in order to maintain their good reputations (DeAngelo, 1981; Healy & Lys, 1986). Hartnett and Romcke (2000) and Cheng and Firth (2000) find that auditor quality is positively associated with IPO forecast accuracy in Australia and Hong Kong, respectively. Thus, we include *BIG5* in the model.

Retention ownership may also relate to the reliability of IPO forecasts. Keasey and McGuinness (1991) argue that firms with a lower level of equity retention may inflate their earnings forecasts in order to maximize the issuance proceeds. Further, an entrepreneur who retains less equity may be less concerned with a firm's adverse reputation resulted from inaccurate earnings forecasts. In addition, firms with a higher level of retention may have less variation in financial performance compared to firms with a lower level of retention, because the former is less affected by expansion of their scales. Consistently, El-Rajabi and Gunasekaran (2006) find significant evidence on the positive association between retention ownership and forecast accuracy in Jordan.

Finally, we add GDP growth rate for the IPO year in the model to control for the effect of general economic conditions on forecast reliability. We also include a stock exchange dummy in the model. To control for fixed industry effects, we include industry dummies in the model.

We expect a positive and significant coefficient on *REG* for the model with forecast error (*FE*) as dependent variable if H1 is supported. We also expect a negative and significant coefficient on *REG* for the model with absolute forecast error (*AFE*) as dependent variable if H2 is supported.

5. Empirical Results

Table 2, panel A reports the distribution of forecast errors for the sample of 858 IPO earnings forecasts. Table 2, panel B presents the distribution of optimistic earnings forecasts across years. We find that 49.41% of the 858 forecasts were overestimated, whereas 50.59% of the forecasts were underestimated. The distribution of forecast errors for Chinese IPO earnings forecasts seems fairly symmetric. About 55% of the sample firms have forecast errors in a range between -10% and +10%, compared to 8% of Australian forecasts (Hartnett, 1993), 45.97% of Malaysian forecasts (Jelic et al., 1998), and 4.9% of Jordanian forecasts (El-Rajabi & Gunasekaran, 2006). About 75% of the sample firms have forecast errors in a range between -20% and +20%, compared to 55% of Canadian forecasts (Pedwell et al., 1994), 19% of New Zealand forecasts (Firth & Smith, 1992), and 7.3% of Jordanian forecasts (El-Rajabi & Gunasekaran, 2006). Moreover, about 0.8% of the sample firms have forecast errors beyond the range of -100% to +100%, compared to 53% of Australian forecasts (Hartnett, 1993) and 39.0% of Jordanian forecasts (El-Rajabi & Gunasekaran, 2006).

Insert Table 2 about here

Table 3, panel A reports the descriptive statistics on forecast bias and forecast accuracy of Chinese IPO earnings forecasts. The mean forecast error and mean absolute

forecast error are 0.45% and 15.28%, respectively, for the full sample. Comparatively, the mean absolute forecast error is 289% for Australian forecasts (Hartnett, 1993), 100% for New Zealand forecasts (Mak, 1989), 88% for Canadian forecasts (Pedwell et al., 1994), 163.4% for Jordanian forecasts (El-Rajabi & Gunasekaran, 2006), 35.76% for Thailand forecasts (Lonkani & Firth, 2005), 27.91% for Malaysian forecasts (Mohamad, Nassir, Kuing, & Ariff, 1994), 18% for Hong Kong forecasts (Chan, Sit, Tong, Wong, & Chan, 1996), 11% for British forecasts (Keasey & McGuiness, 1991), and 10.4% for Singaporean forecasts (Firth, Kwok, Liau-Tan, & Yeo, 1995). Our findings suggest that Chinese IPO forecast errors are moderate compared to other countries, consistent with the evidence provided by Chen and Firth (1999).[14]

Insert Table 3 about here

Table 3, panel A also reports that the mean and median forecast error are 1.60% and 0.18%, respectively, after the end of 1996, compared to -1.55% and 0.05%, respectively, before the end of 1996. The mean and median absolute forecast error are 14.46% and 8.31%, respectively, after the end of 1996, compared to 16.72% and 9.89%, respectively, before the end of 1996. Table 3, panel B provides evidence on univariate tests of the two hypotheses. Both *t*-test and Wilcoxon test show that earnings forecasts are significantly less optimistic after the promulgation of the Regulation than before (*t*-statistic = 1.97 and *z*-statistic = 2.09, respectively), consistent with H1. The univariate tests also show that earnings forecasts are significantly more accurate after the promulgation of the Regulation than before (*t*-statistic = -1.80 and *z*-statistic = -1.55, respectively), consistent with H2. These results suggest that the

[14] In addition, Chen and Firth (1999) find that earnings forecasts in Chinese IPO prospectuses are more accurate than time series extrapolations of historical earnings.

CSRC Regulation No. 12-1996 enhances the credibility of earnings forecasts contained in Chinese IPO prospectuses.

Insert Table 4 about here

Table 4, panel A tabulates the descriptive statistics on the independent variables used in the regression analysis. Table 4, panel B reports Pearson correlations among the independent variables. As the correlation between *REG* and *GDP* is highly negative (r = -0.76), we first conduct collinearity diagnostics for the regression analysis. We find that the components associated with a high condition index (i.e., greater than 30) do not contribute strongly to the variance of two or more variables (i.e., variance proportion greater than about 0.5). Thus, multicollinearity is not a substantive issue when both *REG* and *GDP* are included in the regression model.

Table 5 presents the results of the regression analysis. Table 5, columns 2 and 3 report the results on testing H1. We find that *REG* is positive and significant (*t*-statistic = 3.31), consistent with H1. Thus, results from the univariate tests of H1 still hold after adding control variables in the regression model. Our findings suggest that the CSRC Regulation No. 12-1996 mitigates the overestimation of earnings forecasts in Chinese IPO prospectuses. In addition, we find that the coefficient on *LEV* is significantly negative (*t*-statistic = -1.61), suggesting that IPO firms with higher financial leverage issued more optimistic earnings forecasts than IPO firms with lower financial leverage.

Table 5, columns 4 and 5 report the results on testing H2. We find a negative and significant coefficient on *REG* (*t*-statistic = -1.71), consistent with H2. Hence, results obtained from the univariate tests of H2 still hold after we control for potential confounding effects in the regression. Overall, the regression analysis provides further evidence that the

CSRC Regulation No. 12-1996 enhances the accuracy of earnings forecasts in Chinese IPO prospectuses.

Insert Table 5 about here

In addition, we find that the coefficient on forecast horizon (*FH*) is significantly positive (*t*-statistic = 6.98), consistent with the studies in Canada (Davidson & Neu, 1993; Clarkson, 2000), New Zealand (Mak, 1989), the U.K. (Keasey & McGuinness, 1991), Australia (Hartnett, 1993), Singapore (Firth et al., 1995), and Thailand (Lonkani & Firth, 2005). This finding suggests that Chinese IPO earnings forecasts with shorter horizon are more accurate than those with longer horizon. Also, past earnings variability (*PEV*) is positively associated with absolute forecast error (*t*-statistic = 1.96), consistent with a Hong Kong study by Chan et al. (1996). Thus, Chinese IPO firms with lower past earnings variability issue more accurate earnings forecasts than those with higher past earnings variability. Moreover, we find that financial leverage (*LEV*) is positively associated with absolute forecast error (*t*-statistic = 1.82), suggesting that Chinese IPO earnings forecasts with higher financial leverage are less accurate than those with lower financial leverage. Finally, we document a negative and significant coefficient on retention ownership (*RTO*) (*t*-statistic = -1.43), consistent with a Jordanian study by El-Rajabi and Gunasekaran (2006). Thus, Chinese IPO earnings forecasts are more accurate for firms with higher ownership retention than for those with lower ownership retention.

6. Additional Analyses

We also conduct additional analyses as follows. First, we examine whether the results of our regression analysis are sensitive to using alternative measures of forecast bias

and accuracy. We consider five different ways to calculate *FE* and *AFE* by using (1) absolute actual earnings (Cheng & Firth, 2000), (2) total assets (Hartnett, 2006), (3) sales, (4) book value of common equity, or (5) market value of common equity as the denominator in the formulae of *FE* and *AFE*, respectively. Table 6 reports the results on the alternative measures of forecast reliability. We find that earnings forecasts have been significantly less optimistic after the promulgation of the CSRC Regulation No. 12-1996, regardless of which alternative measure is used (*t*-statistic = 3.83, 3.49, 2.82, 3.64, and 2.13, respectively). We also find that forecast accuracy, as measured by one of the five different ways, has been significantly higher after the promulgation of the Regulation (*t*-statistic =-3.14, -4.45, -3.97, -4.53, and -1.34, respectively). Thus, our results are not sensitive to the use of alternative proxies for forecast reliability.

Insert Table 6 about here

Second, we examine whether earnings forecasts being less optimistic after 1996 was due to management's overstatement of ex post earnings realization rather than the impact of the Regulation on management's ex ante forecasting behaviour. As firms will be penalized by the CSRC if their IPO earnings forecasts are overstated, management may feel more pressure to manage IPO year's actual earnings to meet their pre-IPO forecasts. We measure earnings management as the ratio of the absolute value of accruals to the absolute value of cash flow from operations (Leuz, Nanda, and Wysocki, 2003), and add this measure in eq. (3) to control for the effects of earnings management on IPO forecast bias and accuracy. We find that *REG* is positively associated with forecast error and is negatively associated with absolute forecast error (non-tabulated *t*-statistic = 3.32 and -1.71), consistent with our results reported earlier in the text. In addition, we use actual earnings for the year prior to the IPO

instead of actual earnings for the IPO year in computing forecast error. We document that the mean and median forecast error were -11.27% and -13.17%, respectively, in 1997, and were -30.12% and -30.86%, respectively, in 1996. Both *t*-test and Wilcoxon test show that earnings forecasts were significantly less optimistic in 1997 than in 1996 (non-tabulated *t*-statistic = 6.42 and *z*-statistic = 7.67, respectively). These results suggest that the less optimistic IPO earnings forecasts in 1997 were not resulted from management's overstatement of ex post earnings realization to meet their pre-IPO forecasts.

Third, we examine whether earnings forecast being more reliable after the Regulation is confounded by the development of market infrastructure such as the accumulation of investors' knowledge and experience, the development of institutional investors, and the improvement in information disclosure environment. We conduct three tests to address this concern. We first compare forecast reliability for IPOs before 1996 and IPOs in 1996 by estimating eq. (3). We find that forecast bias was not different for the two sub-periods (non-tabulated *t*-statistic = 0.06), whereas IPO earnings forecasts were less accurate in 1996 than before 1996 (non-tabulated *t*-statistic = 1.98). These findings suggest that Chinese IPO forecast reliability had not been improved before the promulgation of the Regulation at the end of 1996. We then estimate eq. (3) using IPO forecasts from 1996 and 1997 only. Compared to the regressions using several years' data, this test is more likely to mitigate confounding effects as there are fewer changes in market infrastructure in a single year than in several years. We find that earnings forecasts were significantly less optimistic in 1997 than in 1996 (non-tabulated *t*-statistic = 4.00), although forecast accuracy was not significantly improved in 1997 than in 1996 (non-tabulated *t*-statistic = -0.98). To control for the effects of forecast bias, we run regression for absolute forecast error by including forecast

error in eq. (3). We find that forecast accuracy was significantly higher in 1997 than in 1996 (non-tabulated *t*-statistic = -1.87), suggesting that the insignificant change in forecast accuracy from 1996 to 1997 before controlling for forecast error could be due to IPO firms' over-conservative forecasting in 1997. Moreover, we estimate eq. (3) by adding two market-wide variables for each year. Specifically, we use the correlation coefficient between earnings and stock return for all listed firms in each year to reflect changes in information disclosure environment (Frankel, Kothari, & Weber, 2006). We also use the ratio of market value of common shares held by all institutional investors over the total market capitalization in each year to reflect the development in institutional investors. We find that, consistent with our findings reported earlier, IPO earnings forecasts are less optimistic and more accurate after the promulgation of the CSRC Regulation No. 12-1996 (non-tabulated *t*-statistic = 4.37 and -1.40, respectively). Overall, these three tests provide evidence supporting that IPO forecast reliability being more reliable after the Regulation is not confounded by changes in market infrastructure.

Fourth, we examine whether IPO earnings forecasts being less optimistic in 1997 was driven by the Asian Financial Crisis. We compare forecast error for IPOs in 1996 with IPOs in the first half of 1997 as the Asian Financial Crisis started with the collapse of the Thai currency market on July 2, 1997 (Jeon & Seo, 2003). Of the 172 IPOs in 1997, 125 companies went public in the first half of 1997 (i.e., before the Asian Financial Crisis). By estimating eq. (3) for forecast error using IPOs in 1996 and IPOs in the first half of 1997, we find that IPO earnings forecasts were less optimistic for the first half of 1997 than for 1996 (non-tabulated *t*-statistic = 3.88). This finding suggests that IPO earnings forecasts being less optimistic in 1997 was not driven by the Asian Financial Crisis.

Fifth, we examine the determinants of forecast accuracy before and after the promulgation of the CSRC Regulation No. 12-1996 separately. For the period before the promulgation, we find that forecast horizon and past earnings variability are significantly positively associated with absolute forecast error (non-tabulated *t*-statistic = 4.15 and 1.42, respectively). For the period after the promulgation, we find that forecast horizon, financial leverage, and Big Five auditor are significantly positively associated with absolute forecast error (non-tabulated *t*-statistic = 4.89, 2.07, and 1.88, respectively). These results suggest a temporal change in the pattern of the determinants of forecast accuracy.

Sixth, we examine whether shifting from mandatory to voluntary disclosure of earnings forecasts affects IPO earnings forecast reliability after March 15, 2001. In our sample, only 54 IPO firms voluntarily disclosed earnings forecasts after March 15, 2001, and we compare forecast reliability for these 54 firms with the 134 firms that mandatorily issued earnings forecasts between January 1, 2000 and March 15, 2001.[15] We find that there is no significant difference in either forecast bias or forecast accuracy between voluntary and mandatory disclosure. We also examine the determinants of forecast accuracy for the 54 firms with voluntary disclosure. We find that forecast horizon, financial leverage, and Big Five auditor are significantly positively associated with absolute forecast error (non-tabulated *t*-statistic = 1.36, 1.84, and 2.31, respectively), and retention ownership is negatively associated with absolute forecast error (non-tabulated *t*-statistic = -1.36).

Finally, we examine whether IPOs were more underpricing for 1997 than for 1996. If the enactment of the CSRC Regulation No. 12-1996 constrains managerial motivation in

[15] Eight out of the 134 firms issued IPO earnings forecasts between January 1 and March 15, 2001.

overstating forecasts for increasing offer price, IPOs would be more underpricing for 1997 than for 1996. We estimate the following model to test this conjecture:

$$UDP = \alpha + \beta_1 REG + \beta_2 SIZE + \beta_3 PRCD + \beta_4 PEV + \beta_5 LEV + \beta_6 BIG5 + \beta_7 RTO + \beta_8 ROA + Industry\ dummies + \varepsilon \quad (4)$$

where *UDP* is IPO underpricing, measured as first-day closing price minus offer price divided by offer price. *REG* is coded "1" for IPOs in 1997 and "0" for IPOs in 1996. *PRCD* is IPO proceeds, computed as the logarithm value of IPO proceeds. *ROA* is return on assets, measured as net income deflated by total assets. Based on prior research (e.g., Beatty, 1989; Willenborg, 1999; Willenborg & McKeown, 2001), we include control variables in eq. (4) to control for company size (*SIZE*), issue size (*PRCD*), risk (*PEV* and *LEV*), auditor reputation (*BIG5*), retention ownership (*RTO*), and profitability (*ROA*). We expect a positive and significant coefficient for *REG* if IPOs were more underpricing for 1997 than for 1996.

Insert Table 7 about here

Table 7 presents results on the changes in IPO underpricing from 1996 to 1997. We find that the coefficient on *REG* is positive and significant (*t*-statistic = 1.36). Thus, IPOs were more underpricing for 1997 than for 1996. Our results suggest that managers were less motivated to exaggerate earnings forecasts for setting offer price after the enactment of the CSRC Regulation No. 12-1996. In addition, we document that IPO underpricing is positively associated with IPO proceeds and audit quality (*t*-statistic = 6.78 and 3.33, respectively), and is negatively associated with firm size and return on assets (*t*-statistic = -8.75 and -5.74, respectively).

7. Conclusion

This study examines whether the CSRC Regulation No. 12-1996, *Announcement of Some Rules on the Issuance of Shares*, can mitigate the overestimation of earnings forecasts and improve forecast accuracy in Chinese IPO prospectuses. We find that IPO earnings forecasts have been less optimistic after the Regulation was promulgated on December 26, 1996. We also find that forecast accuracy has been significantly improved by the Regulation. Overall, the CSRC Regulation No. 12-1996 can enhance the forecast reliability of IPO earnings forecasts.

Meanwhile, this study provides evidence on the determinants of Chinese IPO forecast accuracy. We find that forecast horizon, past earnings variability, and financial leverage are positively associated with absolute forecast error, and retention ownership is negatively associated with absolute forecast error.

This study has three contributions to the literature. First, to the best of our knowledge, no other studies in the literature have been conducted to examine the effects of securities administrators' regulations on the reliability of management earnings forecasts. Second, our findings may provide implications for future regulation promulgation to the CSRC and other securities regulators in emerging markets. Third, this study suggests some ex ante criteria for evaluating Chinese earnings forecast accuracy.

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Table 1
Distribution of sample firms

Panel A. By year

Year	Frequency	Percent (%)
1991	1	0.12
1992	36	4.20
1993	72	8.39
1994	22	2.56
1995	12	1.40
1996	170	19.81
1997	172	20.05
1998	95	11.07
1999	90	10.49
2000	126	14.69
2001	37	4.31
2002	18	2.10
2003	3	0.35
2004	3	0.35
2005	1	0.12
Total	858	100.00

Panel B. By CSRC industry

Industry	Frequency	Percent (%)
Agriculture, forestry, poultry, and fishing	23	2.68
Mining	16	1.86
Manufacture	507	59.09
Utilities	34	3.96
Construction	11	1.28
Transportation and storage	31	3.61
Information technology	53	6.18
Wholesale and retail	55	6.41
Finance and insurance	3	0.35
Real estate	36	4.20
Social service	31	3.61
Media and communication	5	0.58
Conglomerate	53	6.18
Total	858	100.00

Table 2
Distribution of forecast error

Panel A. Full sample

Forecast Error	Frequency	Percent (%)	Cumulative Percent (%)
≤-1	2	0.23	0.23
(-1 , -0.5]	17	1.98	2.21
(-0.5, -0.2]	83	9.67	11.89
(-0.2, -0.1]	96	11.19	23.07
(-0.1, 0]	226	26.34	49.41
(0 , 0.1]	244	28.44	77.85
(0.1, 0.2]	74	8.62	86.48
(0.2 , 0.5]	86	10.02	96.50
(0.5 , 1]	25	2.91	99.41
>1	5	0.58	100.00
Total	858	100.00	-

Panel B. By year

Year	Optimistic forecast	Total forecast	Percent (%)
1991	0	1	0.00
1992	19	36	52.78
1993	21	72	29.17
1994	12	22	54.55
1995	4	12	33.33
1996	97	170	57.06
1997	63	172	36.63
1998	49	95	51.58
1999	59	90	65.56
2000	62	126	48.41
2001	23	37	62.16
2002	12	18	66.67
2003	2	3	66.67
2004	1	3	33.33
2005	0	1	0.00
Total	424	858	49.41

Forecast error (*FE)* is calculated as follows:

$$FE = (A - F) / |F| \quad (1)$$

where

F = Earnings forecast,

A = Actual earnings.

Table 3
Univariate analysis

Panel A. Descriptive statistics

		FE			*AFE*		
Period	N	Mean	Median	Std	Mean	Median	Std
Full sample	858	0.45%	0.08%	0.226	15.28%	8.90%	0.177
Before regulation	313	-1.55%	0.05%	0.243	16.72%	9.89%	0.186
After regulation	545	1.60%	0.18%	0.215	14.46%	8.31%	0.171

Panel B. t-tests and Wilcoxon tests

Test	*FE*	*AFE*
t-statistic	1.97**	-1.80**
z-statistic	2.09**	-1.55*

"Before regulation" and "After regulation" refer to whether an IPO earnings forecast was issued before or after the promulgation of the CSRC Regulation No.12-1996
FE is forecast error defined in table 2.
AFE is absolute forecast error defined as follows:

$$AFE = |A - F| \,/\, |F| \qquad (2)$$

where

F = Earnings forecast,
A = Actual earnings.

** Significant at the level of 5% (one-tailed).
* Significant at the level of 10% (one-tailed).

Table 4
Descriptive statistics and Pearson correlations of independent variables

Panel A. Descriptive statistics

Variable	N	Mean	Median	Std	Q1	Q3
REG	858	0.64	1.00	0.482	0.00	1.00
SIZE	858	11.22	11.14	0.872	10.68	11.67
FH	858	5.60	6.00	3.025	3.00	8.00
PEV	858	0.33	0.26	0.250	0.15	0.44
LEV	858	0.36	0.36	0.149	0.24	0.46
BIG5	858	0.08	0.00	0.265	0.00	0.00
RTO	858	0.68	0.68	0.108	0.61	0.75
GDP	858	0.09	0.09	0.020	0.08	0.10
STE	858	0.59	1.00	0.493	0.00	1.00

Panel B. Pearson correlations (n=858)

Variable	*SIZE*	*FH*	*PEV*	*LEV*	*BIG5*	*RTO*	*GDP*	*STE*
REG	0.39***	0.21***	-0.23***	-0.22***	-0.16***	-0.11***	-0.76***	-0.04
SIZE		0.06*	-0.18***	0.20***	0.27***	0.25***	-0.32***	0.03
FH			-0.06*	-0.02	-0.07**	-0.05	-0.11***	-0.02
PEV				-0.03	0.04	-0.02	0.18***	0.06*
LEV					0.04	0.05	0.12***	-0.04
BIG5						0.40***	0.24***	0.05
RTO							0.20***	0.15***
GDP								0.14***

REG is coded "1" if a firm went public after the end of 1996 and "0" if before the end of 1996.
SIZE is measured by the logarithm value of total assets.
FH is measured as the number of months between the forecast date and the end of the IPO year.
PEV is computed by dividing the standard deviation of earnings across the three years prior to the IPO year by the mean of the three years' earnings.
LEV is measured by the total liabilities over the total assets.
BIG5 is coded "1" if the auditor is a Big Five firm and "0" otherwise.
RTO is the percentage of total equity retained by extant owners after the initial public offering.
GDP is Gross Domestic Product growth rate.
STE is coded "1" if a firm is listed on the Shanghai Stock Exchange and "0" if listed on the Shenzhen Stock Exchange.
*** Significant at the level of 1% (two-tailed).
** Significant at the level of 5% (two-tailed).
* Significant at the level of 10% (two-tailed).

Table 5
Regression analysis

	FE		*AFE*	
Variable	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Intercept	-0.107	-0.64	0.165	1.28
REG	0.090	3.31***	-0.036	-1.71**
SIZE	-0.004	-0.35	-0.003	-0.29
FH	-0.002	-0.75	0.014	6.98***
PEV	0.041	1.28	0.048	1.96**
LEV	-0.092	-1.61*	0.080	1.82**
BIG5	0.032	0.93	0.032	1.20
RTO	-0.068	-0.83	-0.090	-1.43*
GDP	1.707	2.69***	-0.173	-0.36
STE	-0.032	-2.01**	-0.006	-0.46
Industry dummies		Included		Included
N		858		858
F-statistic		1.59**		3.66***
Adj. R^2		1.36%		5.86%

The regression model is as follows**:**

$$FE\ (AFE) = \alpha+\beta_1 REG+\beta_2 SIZE+\beta_3 FH+\beta_4 PEV+\beta_5 LEV+\beta_5 BIG5+\beta_6 RTO+\beta_8 GDP+\beta_9 STE + Industry\ dummies + error \quad (3)$$

where the variables in equation (3) are defined in Tables 2, 3, and 4.
*** Significant at the level of 1% (one-tailed).
** Significant at the level of 5% (one-tailed).
* Significant at the level of 10% (one-tailed).

Table 6
Results on alternative measures of *FE* and *AFE*

	FE		*AFE*	
Denominator	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Absolute actual earnings	0.150	3.83***	-0106	-3.14***
Total assets	0.008	3.49***	-0.008	-4.45***
Sales	0.016	2.82***	-0.018	-3.97***
Book value of common equity	0.014	3.64***	-0.014	-4.53***
Market value of common equity	0.005	2.13**	-0.002	-1.34*

Eq.(3) is estimated by using alternative measures of *FE* and *AFE* based on the denominator of absolute actual earnings, total assets, sales, book value of common equity, and market value of common equity, respectively, instead of absolute earnings forecast.
*** Significant at the level of 1% (one-tailed).
** Significant at the level of 5% (one-tailed).
* Significant at the level of 10% (one-tailed).

Table 7
IPO underpricing

Variable	Coefficient	*t*-statistic
Intercept	1.199	1.68**
REG	0.129	1.36*
SIZE	-0.507	-8.75***
PRCD	0.582	6.78***
PEV	0.137	0.95
LEV	-0.295	-1.02
BIG5	0.647	3.33***
RTO	0.406	1.12
ROA	-3.457	-5.74***
Industry dummies		Included
N		340
F-statistic		8.18***
Adj. R^2		25.31%

The regression model is as follows**:**

$$UDP = \alpha + \beta_1 REG + \beta_2 SIZE + \beta_3 PRCD + \beta_4 PEV + \beta_5 LEV + \beta_6 BIG5 + \beta_7 RTO + \beta_8 ROA + Industry\ dummies + error \quad (2)$$

where *UDP* is IPO underpricing, measured as first-day closing price minus offer price divided by offer price. *REG* is coded "1" for IPOs in 1997 and "0" for IPOs in 1996. *PRCD* is IPO proceeds, computed as the logarithm value of IPO proceeds. *ROA* is return on assets, measured as net income deflated by total assets. Other variables in eq. (4) are defined in Table 4.

*** Significant at the level of 1% (one-tailed).
** Significant at the level of 5% (one-tailed).
* Significant at the level of 10% (one-tailed).