



# **Corporate Insiders and Financial Disclosure Quality**

## **Evidence from China's stock market**

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## DECLARATION OF CO-AUTHORSHIP AND PUBLICATIONS

This dissertation consists of three papers. One is written in collaboration with one co-author. My contribution to the conception, implementation and drafting can be summarized as follows:

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*CEOs' International Experience and Earnings Management: Evidence from Chinese Listed Firms*

Contribution: 50 percent

I am solely responsible for the following two papers.

*Board secretary's characteristics and disclosure quality: Evidence from China's listed firms*

Contribution: 100 percent

*How does share pledging influence management and analyst forecast? Evidence from non-state-owned enterprises in China's stock market*

Contribution: 100 percent

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## List of abbreviations

2SLS	Two-Stage Least Squares
ABSDA	Absolute value of discretionary accruals
Adj.	Adjusted
chi-sq	chi <sup>2</sup> statistic
CEO	Chief executive officer
CFO	Chief finance officer
Coef.	Coefficient
CSRC	Chinese Securities Regulatory Commission
CSMAR	China Stock Market and Accounting Research
DA(DACC)	Discretionary accruals
DID	Difference-in-difference
e.g.	exempli gratia
et al.	et alii
FE	Fixed effect
F-Stat	F-statistic
i.e.	id est
MBE	Meet or beat analysts' earnings forecasts
NSOE	Non-stated-owned enterprise
OLS	Ordinary Least Squares
Prob	Probability
PSM	Propensity Score Matching
R-sq	R <sup>2</sup> statistic
SOE	State-owned enterprise
SSE	Shanghai Stock Exchange
ST, *ST, SST, S*ST*	Special Treatment
SZSE	Shenzhen Stock Exchange
TA	Total Accruals

## **I. Introduction**

This dissertation lies primarily in the overlapping area among agency theory and upper echelon theory and establishes a relationship between the top management team members or controlling shareholders and the firm's financial reporting quality. In the financial and accounting area, agency theory established the conflict of interests between the principal (shareholders) and agents (managers), arising from the separation of ownership and management in the firm (Jensen & Meckling, 1976). One ramification of such separation is information asymmetry, embodied mainly as the financial reporting quality. Among all stakeholders of a listed firm, the central conflict of interests exists between shareholders and managers, and between insiders and outsiders. Agents are motivated to present their own interests and impair the firm's value and long-term performance. Previous research endeavours to clarify the critical factors to the principal-agent problem in a corporate context.

One explanation is provided by the upper echelons theory, emphasising that the managerial demographic characteristics, such as age, education, career experience and others, influence firms' performance (Hambrick and Mason, 1984; Hambrick, 2007). One way to address agency problems is to improve corporate governance, reasonably and wisely distributing rights and responsibilities to respective participants. Internal corporate governance controls are discussed by this dissertation, particularly payment structure, implied by information asymmetry theory, which attempts to align managers' incentives with the interests of shareholders (Cheng and Warfield, 2005; Beyer et al., 2010). All the preceding factors are extensively documented to affect financial reporting quality.

To capture comprehensive dimensions of financial reporting quality, I include different measurements in accordance with the responsibilities and power of insiders in respective papers. The management team prepares mandatory disclosure, like audited annual statements and unaudited interim reports, and voluntary disclosure, like unaudited earnings preannouncements. To proxy management reporting quality, I selected several commonly employed measurements: earnings management, management forecast properties, disclosure transparency score issued by the stock exchange. Outside users of the financial reports, such as debtors and investors, act on financial reporting and, in return, affects the firm's value. Among all users of financial reporting, analysts act as an intermediate role in the markets by

receiving and offering information. So, I also include analyst forecast accuracy to measure the professional market participants' perception of the firm's reporting figures and quality.

This dissertation discusses the effect of preceding factors via three participants- CEO, the board secretary and controlling shareholders- on financial reporting quality proxied as earnings management and management forecast quality, and analyst forecast accuracy (only used in the third paper). There are several factual and academic reasons to focus on these insiders. First, for China, an emerging market where corporate governance is hindered by a weak institutional environment and poor management practices, learning from developed markets' experience helps quickly improve firms' performance. One direct way is to gain advanced theoretical knowledge during the overseas study and practical experience during overseas work, which becomes the primary focus of the first research on the international experience of CEOs. Another way is to establish corporate governance systems similar to developed markets, one of which is the board secretary system transplanted from the UK. In the context of China's listed firms, higher corporate governance quality has been demonstrated to effectively increase firm value, mitigate earnings manipulation and improve disclosure quality (Habbash et al., 2014; Sengupta and Zhang, 2015). Controlling shareholders exist in most listed firms in China and play pivotal roles in firm decisions regarding ownership structure. As powerful insiders, controlling shareholders are motivated to influence firms' performance through financing activities (Chan et al., 2018).

The discussion starts with the relation between the international experience of CEOs and earning management. As CEOs play the leading role in the management team, they are more capable and likely to be incentivised to benefit their own interests. As the ultimate decision-maker of operational and financial affairs, CEOs are responsible for financial figures. The effect of demographic characteristics of CEOs is scrutinised by prior research (e.g. Francis et al., 2008; Ali and Zhang, 2015); however, one feature that is possessed mainly by managers in emerging markets is rarely studied: international experience. China, an emerging and developing financial market only since joining WTO, has experienced brain gain in the past two decades (Giannetti et al., 2015). Most returnees have once studied or worked in Europe or the US, where relatively more efficient legal institutions and better environment or investors are established. Expertise from overseas study or work is supposed to cultivate their preference for better corporate governance.

In the light of this trend, China's listed firms gained human capital that a growing number of CEOs earned international study or work experience, which enhances their cognitive capability and a global mindset, and further affects their management style (Hermann and Datta, 2005). Managerial ability and style are documented to significantly influence financial reporting quality (Baik et al., 2011). The first research picks up one fundamental and crucial component of financial reporting quality: earnings management (Kothari et al., 2005).

The second investigation falls on the board secretary system, required by the "Corporate Law" and China Security Regulation Committee, to be set up in China's listed firms. As a top management team member, the board secretary is to be recommended and designated by the board of directors and responsible for the company's information disclosure and compliance with respective regulations. General corporate governance studies suggest that an updated corporate governance system effectively moderates the influence of CEOs, diminishes earnings management (e.g. Lai and Tam, 2017) and improves management forecast quality (e.g. Ajinkya et al., 2005). To better understand the board secretary system, particularly the fulfilment of their duties, the second research assesses three factors that probably affect financial disclosure quality: earnings management, management forecast quality, and Shenzhen Stock Exchange disclosure transparency score.

The managers' stock-based compensation package, consisting of cash salary and firm's stocks and/or stock options, is demonstrated to have an effect on disclosure quality measured by different proxies (Choi and Kim, 2017; Cheng and Warfield, 2005; Bergstresser and Philippon, 2006). To extend the coverage of demographic characteristics, the study of board secretaries includes tenure and financial expertise (Lee et al., 2012; Jiang et al., 2013). Tenure represents the expertise and knowledge about the firm gained from the inside, while financial expertise measures their former career experience accumulated outside the firm. Both are reported to significantly influence disclosure quality (Cheng and Leung., 2012; Lee et al., 2012; DeBoskey et al., 2019). Longer tenure earns the board secretary a comprehensive knowledge of the long-term financial disclosure environment, investor relationships, and regulation compliance. Financial expertise is reported to be associated with more sophisticated financial information reporting skills, that is, and to result in diverse disclosure styles and quality (e.g. Bamber et al. 2010; Jiang et al., 2013). However, there is a gap in the study on the relationship between the foregoing characteristics of the board secretary and disclosure quality.

Information asymmetry exists within principals; inside shareholders get easier access to private information than outside shareholders. Moreover, controlling shareholders wield power over the firm's operational and financial decision and enjoys the extra private benefit of control; activities potentially risking their control right motivate them to involve in financial disclosure quality.

The third research focuses on the controlling shareholders' share-based collateralised loan: share pledging, which bears the risk of losing control right when the short-term stock price of the firm tumbles. Controlling shareholders, therefore, are highly incentivised to stabilise stock price through management forecast. Management earnings forecasts are documented as a primary disclosure type that affects a firm's market value (Beyer et al., 2010) and a method to convey timely earnings information to lower the crash risk (Hutton and Stocken, 2009).

Financing activities of insiders generate idiosyncratic risks to the firm; specifically, share pledging bears complicated cash flow prospects and accounting discretions. Under margin call pressure, listed firms with share pledges tend to manipulate both financial and non-financial information and operations (DeJong et al., 2020), which introduces informative input or disturbance into analysts' forecast processes. Thus, how professional market participants perceive share pledging also piques interest. When securities companies are permitted to enter the share pledging market as pledgees, analysts employed by securities companies now benefit from extra private information gained from affiliated departments and meanwhile are motivated to issue optimistically biased reports in the interest of underwriting business or trading commissions (Gu et al. 2013). On the contrary, their reputation and career development depend on credibility from clients (investors) who prefer impartial forecasts (Brown et al., 2015). With contradictory conclusions presented by prior researchers, analysts' behaviour under share pledging business needs to be clarified.

To sum up the preceding arguments, this dissertation attempts to answer the following questions:

1. Is there any relationship between CEOs with international experience and earnings management?
2. What are the associations between the characteristics of the board secretary and the firm's disclosure quality?
3. How does the share pledging affect management and analyst earnings forecasts?

Each question is addressed based on a sample of China's listed firms. An instrumental approach and propensity score matching method are employed to alleviate endogeneity problems.

#### *CEOs' international experience and earnings management*

Previous research extensively examines the relationship between different demographic characteristics of CEO and earnings management (Kuang et al., 2014; Ali & Zhang, 2015; and others). Based on data of listed firms in China's stock markets from 2010 to 2014, this paper investigates the effect of CEOs' international experience on earnings management. As evidenced by empirical results, international experience, measured as the length of all abroad experience, is not significantly related to earnings management. With international experience being categorised into two types: (1) only study and (2) study and work experience, the results provide evidence of a negative relation between the former measurement and conditional conservatism and between the latter one and absolute discretionary accruals. The results show that CEOs with international study and work experience reduce accrual-based earnings management instead of those with only study experience, indicating that expertise knowledge gained from work and practice abroad enhances the CEOs' ability not to manage earnings when they serve in listed firms in China. Moreover, international study experience only has less tendency to recognise loss timely.

Inspired by the brain gain topic (Giannetti et al., 2015) and an emerging phenomenon of Chinese returnees, this research enriches the literature on demographic factors of the CEOs, specifically, their international experience, by investigating its relationship with earnings management. Another finding contradicts those in mature stock markets, like the US, where CEOs have strong incentives to meet or beat analyst earnings forecast (Chen et al., 2015; Hsieh et al., 2014), that in China, CEOs with international experience have a slight tendency to meet or beat analyst earnings forecast.

#### *Characteristics and incentives of the board secretary and disclosure quality*

The second paper focuses on the role of the board secretaries, a transplanted system with Chinese attributes. This study examines the association between the motivations and characteristics of the board secretary and firms' disclosure quality, based on China's listed firms on the Shenzhen Stock Exchange from 2012 to 2016. The to-be-examined aspects of the board secretary are tenure, stock-based incentive, and financial expertise. Four proxies are

chosen to measure disclosure quality: discretionary accruals, management forecasts accuracy, properties of earnings preannouncements, and disclosure transparency score graded by the Shenzhen Stock Exchange.

An instrumental variable approach is used in the regression on tenure and propensity score matching in the investigation on financial expertise to alleviate endogeneity problems. My results provide evidence of the different effects of explanatory variables on each measurement of disclosure quality. Stock-based incentives are significantly associated with upward accrual-based earnings management and an increase in the likelihood and number of earnings preannouncement issuances; in contrast, tenure with less upward discretionary accruals and a reduction in the likelihood and frequency of preannouncements. Besides, disclosure transparency score and management forecast accuracy are improved with more extended service of the board secretary. Financial expertise plays a limited role, only shows less tendency in the likelihood and number of issuing preannouncements. The results suggest that board secretary's familiarity and power, represented by tenure, boost their reporting capability, resulting in better figures accompanied by a reduction in the number of disclosures. Financial expertise resembles tenure; the reluctance to issue preannouncements could come from their knowledge of the financial market and discretionary operations on market anticipation.

*How does share pledging influence management and analyst forecast? Evidence from non-state-owned enterprises in China's A-share security market*

The third paper examines a particular financing activity, share pledging, of a powerful insider: controlling shareholders. It focuses on the impact of share pledging on management and analyst forecast properties. The sample consists of non-state-owned enterprises listed on China's A-share market from 2011 to 2018. On 24th June 2013, "Measures for Stock Pledged Repurchase Transactions and Registration and Settlement Business (Trial)" allowed securities companies to make floor trade of share pledging business as pledgee (loan provider), which substantially scaled up the size of share pledging market. Therefore, two types of share pledging are investigated: those made by controlling shareholders and those traded against securities companies.

A fixed-effect model is used to examine the first type. Results present evidence that the occurrence of controlling shareholder's share pledging is positively associated with management forecast frequency and accuracy, while the value and ratio of share pledging are

in a negative relationship with analyst forecast accuracy and relative optimism of managers (less optimistic of managers than analysts). The improvement in management forecast quality suggests that the firm, under such financial activity, tries to alleviate information asymmetry through frequent and credible private information disclosure to avoid stock price crash risk and further dodge margin call pressure. When controlling shareholders pledge more, more noises are caused by pledging activity and translated as disturbance into analysts' forecasting model.

A two-period difference-in-difference model tests the second type of share pledging. Empirical evidence shows that the share pledging against securities companies is associated with more accurate analyst forecasts and more optimistic managers' forecasts. It could be interpreted that analysts might acquire additional informative messages from securities companies. However, the firm tends to influence securities companies and other outside shareholders by issuing relatively optimistically biased forecasts. Compared to the results in the first model, the introduction of the new regulation appears to change the behaviour and perception of both managers and analysts.

This dissertation contributes to the extant literature in the following aspects. First, it provides evidence about the effect of CEOs' international experience on earnings management and enriches the literature about "brain gain" (e.g. Giannetti et al., 2015). Second, it adds to the studies about corporate governance by focusing on the board secretary (e.g. Xing et al., 2019) and expands the factors of the board secretary to stock-based incentives and demographic characteristics, such as tenure and financial expertise. Third, the dissertation provides an event study of share pledging, using a difference-in-difference model to address the policy effect. Finally, each paper includes several proxies to measure financial reporting quality, capturing comprehensive dimensions and facilitating comparative analysis.

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## II. CEOs' International Experience and Earnings Management: Evidence from Chinese Listed Firms

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**Abstract:** As more returnees have come back to China, it becomes an interesting topic to investigate the brain gain from their international experience. In this paper, we attempt to study the possible effect of CEOs' international experience<sup>1</sup> on earnings management in the listed firms in China from 2010 to 2014. Although we do not find any evidence to support this effect in general, no matter if earnings management is measured by discretionary accruals, meeting or beating analyst earnings forecast or conditional conservatism, a significant and negative relation between CEOs with both international study and work experience<sup>2</sup> and earnings management through discretionary accruals is concluded. Besides, CEOs with international study experience only are less likely to recognise loss timely, indicating of less conditional conservatism.

**Keywords:** CEO, International experience, Earnings management.

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<sup>1</sup> CEOs with international experience are those who once studied in a foreign college/university or worked in a foreign company abroad.

<sup>2</sup> CEOs with international study experience refer to those who once studied in a foreign college or university; CEOs with international work experience refer to those who once worked in a foreign company abroad.

## II.1 Introduction

This paper investigates the possible effect of CEOs' international study and work experience on earnings management in the Chinese listed firms. Although piles of research have been carried out to examine the relationship between different aspects of CEO and earnings management (Bergstresser and Philippon, 2006; Chen et al., 2015; Hsieh et al., 2014; Laux and Laux, 2009; Hazarika et al., 2012; Kuang et al., 2014; Ali and Zhang, 2015; Krishnan et al., 2011; Mande and Son, 2012; Ho et al., 2015; Ahmed and Duellman, 2013), the possible relation between CEOs' international experience and earnings management remains untouched.

Meanwhile, with more returnees returning to China, it is increasingly interesting to examine if their international experience is a real brain gain to the Chinese listed firms and China's economy. As more returnees climb to the position of CEO in the Chinese listed firms, it provides an ample sample to detect if CEOs' international experience does help restrain earnings management, a usual indication of better earnings quality.

With hand-collected data of CEOs in the Chinese stock markets from 2010 to 2014, we define a dummy variable as one if CEOs have international experience and zero otherwise. This paper measures earnings management by discretionary accruals (DA), meeting or beating analyst earnings forecast (MBE) and conditional conservatism. Then, ordinary least squares regressions are adopted, and the results demonstrate that no evidence is found to support a relation between CEOs' international experience and earnings management.

Further, we divide the whole sample into three sub-samples according to different types of CEOs' international experience, namely CEOs with international study experience, CEOs with international work experience, and CEOs with both international study and work experience. Since there are 17 CEOs with international work experience only, we focus on the regressions on the other two sub-samples: CEOs with international study experiences and those with international study and work experience. Although the results from the further regressions are primarily consistent with those from the regressions on the whole sample, we do find a negative relation between CEOs with both international study and work experience and earnings management through discretionary accruals at a significant level of 5%, and a sensitivity test confirms the robustness of this significant result. It states that those CEOs with

both international study and work experience could have a curbing effect on earnings management, not CEOs with international study experience only. It indicates that knowledge from the practices in a foreign company can be more directly and effectively transformed into the current CEO's position in China. Besides, CEOs with international study experience only are related to less conditional conservatism.

This paper contributes to the following three aspects. First, to our best knowledge, this is the first paper to examine the possible effect of CEOs' international experience on earnings management. This paper enriches the literature on the brain gain from returnees (Giannetti et al., 2015) and the relation between different aspects of CEO and earnings management.

Second, this paper suggests that listed firms in China should value the international work experience more than the international study experience when nominating a CEO. Only CEOs with both international study and work experience are related to fewer earnings management through discretionary accruals. At the same time, there is no support for such a relation for CEOs with international study experience only.

Third, this paper sheds light on the relation between CEOs' international experience and meeting or beating analyst earnings forecast in China, a country with an immature stock market and an unsound legal system. Unlike in the mature stock market of the US, where CEOs have a strong incentive to meet or beat analyst earnings forecast (Bergstresser and Philippon, 2006; Chen et al., 2015; Hsieh et al., 2014), no evidence shows that CEOs with international experience have the will to meet or beat analyst earnings forecast.

This paper is further conducted as follows: Part 2.2 summarizes the literature review on CEO and earnings management and develops hypotheses; Part 2.3 describes the sample selection and variable definitions; Part 2.4, 2.5 and 2.6 present the empirical results; Part 2.7 concludes.

### **II.2 Literature Review and Hypotheses Development**

Agency theory has clarified that managers pursue self-interest since the separation of ownership and control (Jensen and Meckling, 1976) in the firm. As CEOs play the leading role in the management team, they have both incentives and abilities to pursue their benefits.

One common way to obtain this goal is through earnings management (Bergstresser and Philippon, 2006; Chen et al., 2015; Hsieh et al., 2014).

We focus on one of the most critical experiences of top managers- international experience (Gregersen et al., 1998) since it helps form the cognitive orientation and enhancing a global mindset, which affects the way top managers manage the firms (Hermann and Datta, 2005, Carpenter et al., 2000). CEOs' international experience affects their values, influencing their behaviours (Slater and Dixon-Fowler, 2008; Suutari and Mäkelä, 2007). Therefore, their engagement in earnings management could be affected by their international experience. Since most of the returnees back to China have once studied or worked in Europe or in the US, where they were exposed to the relative sounder legal institution and the better environment of investor protection, they would be supposed to favour solid corporate governance and disclosure of reliable financial results to the public, i.e., fewer earnings management in the financial reporting process.

In this paper, earnings management is measured by three commonly adopted measurements: Discretionary accruals (Jones, 1991; Kothari et al., 2005; Dutilleul et al., 2016; Asthana et al., 2015; Fang and Jin, 2011); meeting or beating analyst earnings forecast (Ahmed and Duellman, 2013; Filzen and Peterson, 2015; Brown, 2015) and conditional conservatism (Basu, 1997; Ball and Shivakumar, 2005).

### ***II.2.1 CEO and Discretionary Accruals***

Research has studied different CEO and earnings management aspects, most commonly measured by discretionary accruals. Concerning CEO incentive, research based on the US setting concludes that CEO with more stock options is related to more earnings management through discretionary accruals (Bergstresser and Philippon, 2006; Chen et al., 2015; Hsieh et al., 2014). However, by applying a theoretical model estimation, Laux and Laux (2009) find no evidence between CEO equity incentives and earnings management because the board of directors and audit committee would adjust their oversight effort after the stock option is granted.

Quite a bunch of research focuses on CEO turnover. Through empirical research in the US setting, Hazarika et al. (2012) state that it depends on whether the turnover is a forced one or

a voluntary one, and more earnings management through discretionary accruals occurs only in the forced turnover. Different origins of succeeding CEO also matter, Kuang et al. (2014) in the US setting and Choi et al. (2014) in the Korean setting both suggest that a succeeding CEO from outside tends to enter more in income-increasing accrual-based earnings management. Nevertheless, this incentive of engaging in income-increasing earnings management does not last after the outside CEO survives in the short-run (Kuang et al., 2014). A particular type of CEO, the interim CEO, is also studied by Chen et al. (2015) in the US setting, and the results show that interim CEOs enter more in income-upward earnings management through discretionary accruals until their position is converted to a permanent one. Although Wells (2002) does not find any evidence between resigned CEO and earnings management in the Australian setting, there is some support that the incoming CEO takes big bath through discretionary accruals, and this big bath scenario is identified only if the incoming CEO is from inside by Choi et al.(2014) in the Korean setting.

Besides, Ali and Zhang (2015) study the CEO tenure and earnings management and find that there is significant earnings overstatement through discretionary accruals only in the early years of the CEO in the US setting. On the relation between CEO reputation and earnings management, Francis et al. (2008) analyze a dataset from the US setting and find more earnings management through discretionary accruals among the more reputed CEOs, measured by the press coverage.

In the Chinese setting, Jiang et al. (2013) focus on the financial experience of CEO and earnings management and find no evidence between them. Research by Giannetti et al. (2015) suggests that the foreign experience of directors on the board has a positive effect on firm performance, which is a brain gain for the listed firms in China. However, a direct link between CEOs with international experience and earnings management is not tested. Nevertheless, CEOs with international experience are supposed to be more likely to disclose reliable financial results, i.e. with less earnings management through discretionary accruals, to the public, as stated above.

*H1: CEOs with international experience are associated with less earnings management through discretionary accruals.*

### ***II.2.2 CEO and Meeting or Beating Analyst earnings forecast***

Research on CEO and MBE, another common measure of earnings management, is undertaken in the US. Krishnan et al. (2011) conclude that analyst earnings forecast is more likely to be met when CEO or CFO has a solid social tie with directors on the board in the post-Sarbanes-Oxley Act time, because CEO or CFO may take advantage of these informal friendships to undermine corporate governance and board oversight. Krieger and Ang (2013) suggest that new CEOs under higher expectations or pressure are related to a higher likelihood of meeting or beating analyst earnings forecast.

Mande and Son (2012) examine the effect of the relative CEO power in the management team, measured by CEOs compensation scaled by the total compensation for the top 5 named officers, on meeting or beating analyst earnings forecast and find a positive association between CEO power and the likelihood of MBE. Through a statistical approach to identify individual option grants that were likely to be manipulated, CEO integrity is defined, and backdating CEOs are related to a higher likelihood of MBE (Jia, 2013). Although Doyle et al. (2013) do not focus on CEO specifically, they find that managers tend to manage the actual definition of earnings and report non-GAAP exclusions to meet or beat earnings forecasts from analysts.

Although research has not tested the link between CEOs' international experience and the likelihood of MBE, we would expect a negative association since CEOs' international experience would restrict their behaviour of managing earnings to meet or beat earnings forecast.

*H2: CEOs with international experience are associated with less likelihood of meeting or beating analyst earnings forecasts.*

### ***II.2.3 CEO and Conditional Conservatism***

Research on CEO and conditional conservatism is based on the US setting. Female CEOs are demonstrated to be related to more conditional conservatism (Ho et al., 2015; Palvia et al., 2015). Ahmed and Duellman (2013) study the behaviour of overconfident CEOs in the US and find that these overconfident CEOs tend to delay loss recognition and use less conservative

accounting, resulting in less conditional conservatism. Based on a sample from Standard and Poor's ExecuComp database, Brockman et al. (2015) demonstrate that firms with higher CEO compensation risk, which is measured by the CEO's option compensation sensitivity to stock return volatility, tend to use more timely loss recognition, a typical measure of more conditional conservatism. Although Kravet (2014) does not research the relationship of the CEO and conditional conservatism, his research presents a negative relation between conditional conservatism and risky investments made by the managers. He argues that managers under more conservative accounting make less risky acquisitions.

Although research has not shed light on the relation between CEOs' international experience and conditional conservatism, CEOs' international experience is supposed to be related to less earnings management theoretically, which signifies more conditional conservatism.

*H3: CEOs with international experience are associated with more conditional conservatism.*

### **II.3 Data and Sample**

#### ***II.3.1 Data***

We hand-collect the characteristic information of the CEOs in the Chinese stock markets, such as age, international study experience, international work experience and others. Financial data are mainly from the *China Stock Market and Accounting Research* (CSMAR) database, and some of the firm-specific and manager's demographic data, such as ownership structure, and the age of CEOs, are hand-collected. As the internationalization of Chinese GAAP was carried out in 2007 in China, and due to data availability when we started this research in 2015, a data period from 2007 to 2014 was preliminarily selected. Considering the effect of the world economic crisis from 2008 to 2009, a data sample from 2010 to 2014 was finally selected, in which listed firms till the end of 2013 in the Chinese stock markets are chosen, and newly IPO firms in 2014 are excluded.

As shown in Table II-1, 11,487 firm-year observations are first collected. 3,598 observations are lost due to their subsidiary status. As single entities hold more than 50% of the shares in these firms, their financial decisions could be strongly affected by the single entities, CEOs' influence could be thus strongly restricted. We also exclude observations in the financial

service industry, observations in the public utility industry, and observations with a CEO turnover during a year, which could significantly influence earnings management.

We then apply the industry-classification standards implemented by CSRC in 2012<sup>3</sup> (Jiang et al., 2013). The remaining 6,472 observations are classified into industry-year groups according to their years and industries. In this paper, CEOs with international experience once studied in a foreign college/university or worked in a foreign company abroad. Some classified industry-year groups possess only firm-year observations without internationally experienced CEOs; 1,936 observations are therefore lost. Industry-year groups with less than 12 observations are further dropped to ensure enough observations to calculate discretionary accruals, which leads to a loss of 318 observations. 13 observations are dropped due to data unavailability of control variables. At last, a sample of 4,205 observations is left.

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<sup>3</sup> CSRC (2012), see in reference.

Table II-1: Sample selection (discretionary accruals, meeting or beating analyst earnings forecasts, conditional conservatism)

Data selection	Firm-year observations discretionary accruals	Firm-year observations meeting or beating analyst earnings forecasts	Firm-year observations conditional conservatism
CEO data (2010-2014)		11487	
Less: subsidiary firms		(3598)	
Less: CEO turnover		(1062)	
Less: financial service industries and public utility industries		(355)	
Less: industry_year groups without internationally experienced CEOs		(1936)	
Less: industry_year groups with less than 12 observations		(318)	
Less: observations without information on growth due to the sales of the last year is 0		(11)	
Less: total assets in the year or in last year is 0		(2)	
		4205	
Propensity score matching	(2639)		
Final sample for discretionary accruals	1566		
Less: firms without or with only one analyst's following in a year		(1621)	
Less: industry_year groups without internationally experienced CEOs		(542)	
Less: industry_year groups with less than 12 observations		(42)	
Final sample for meeting or beating analysts' forecasts		2000	
Less: missing value of net income in the last year for the newly listed firms			(482)
Less: industry_year groups without internationally experienced CEOs			(35)
Final sample for conditional conservatism			3688

Note: Final sample for accrual-based test of loss recognition (Ball and Schivakumar, 2005) is the same as the final sample for discretionary accruals.

### ***II.3.2 Propensity Score Matching***

In this paper, three measures are adopted to measure earnings management: Discretionary accruals, meeting or beating analyst earnings forecast and conditional conservatism. In order to identify the comparable control observations without internationally experienced CEOs for the three different analyses, we use a propensity score matching method (Dehejia and Wahba, 2002; Li, 2013; Chen, Luo et al., 2015; Rosenbaum and Rubin, 1983). The dependent variable of the logit regression is the likelihood of a firm with an internationally experienced CEO, while the independent variables are those which we reasonably consider behaving in a well explainable way to predict the likelihood of a firm with an internationally experienced CEO. In our prediction, firm size matters while CEOs with international experience may have a higher likelihood to hold a CEO position in a smaller firm, and firms with more shares held by the state or state-owned corporations may deter the employment of a CEO with international experience.

With the propensity scores from the logit analysis, we apply the nearest neighbour matching to select out the ten nearest observations with replacement (Smith,1997; Beuselinck and Deloof, 2014). Because this replacement option allows one control observation to be matched to more than one treated observation, for example, this 10:1 nearest neighbour matching leaves a matched sample of 1,566 observations (167 treated and 1,399 controls) for the analysis of discretionary accruals. As the samples for the three types of analyses are different before propensity score matching, we run the propensity score matching three times; the results of these logit analyses are listed in Table II-2.

Table II-2: Predicting the likelihood of having a CEO with international experience

Variables	Discretionary Accruals	MBE	Conditional Conservatism
Firm size	0.0140(0.0693)	0.0491(0.0795)	-0.0285(0.0737)
Govshare	-1.7277*** (0.5367)	-0.6709(0.6288)	-0.8433(0.5466)
Constant	-2.8098(1.5092)	-3.4211(1.7898)	-2.0037(1.6121)
Include fixed industry effects	Yes	Yes	Yes
Number of observations	4205	2000	3688
Pseudo R <sup>2</sup>	0.0476	0.0302	0.0379

Note: Robust standard errors reported in parentheses.

MBE=Meeting or beating analyst earnings forecasts;

Govshare= Shares held by government or state-owned companies in percentage.

\* p<0.05, \*\*p<0.01, \*\*\* p<0.001 (two-tailed tests)

Results in Table II-2 suggest that propensity score matching is only needed to derive the final sample for the analysis of discretionary accruals, as the coefficient of Govshare is significant and negative only in the sample for discretionary accruals.

We also check the result of the propensity score matching to ensure that our matching balances the data between the treatment group and the control group. We compare the different significance of the selected independent variables in the logit analyses before and after the matching to confirm the validity of our matching. As shown in Table II-3, before the matching, the mean difference of firm size is insignificant, but we include it in the propensity score matching considering that small firms are more likely to have a CEO with international experience. The variable Govshare is statistically significant at a 0.1% level. After the matching, Govshare loses its significance, which indicates the sample after the propensity score matching is more balanced.

Table II-3: Mean values and mean difference (DA sample)

Variables	Before PSM(N=4205)			After PSM(N=1566)		
	Mean of treatment (N=167)	Mean of control (N=4038)	T-test of mean difference	Mean of treatment (N=167)	Mean of control (N=1399)	T-test of mean difference
Firm size	21.5378	21.6296	0.9634	21.5378	21.5254	-0.1345
Govshare	0.1059	0.1524	3.2788**	0.1059	0.1164	0.7977

Note: DA=Discretionary accruals;

PSM=Propensity score matching;

Govshare=Shares held by government or state-owned companies in percentage.

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001 (two-tailed tests)

### II.3.3 Control Variables

The control variables in Table II-4 are mainly extracted from the recent papers on earnings management and/or CEO characteristics (Ali and Zhang, 2015; Dutillieux et al., 2016; Chen et al., 2015; Jiang et al., 2013; Beuselinck and Deloof, 2014; Kuang et al., 2014; Francis et al., 2008; Badolato et al., 2014; Chen and Zhang, 2014). A variable GOVSHARE is added in consideration of the vital role of state-owned companies and government in China, which hold quite a portion of shares in the listed firms, and the research by Ding et al. (2007) concludes that private-owned listed firms tend to maximize their earnings and state-owned shareholders in a listed firm may mitigate earnings management.

Table II-4: Definition of control variables

<b>Variable</b>	<b>Definition</b>
SIZE	Natural logarithm of total assets at the end of the year
LEVERAGE	Total book value of debt normalized by total book value of assets
ROA	Net income divided by total assets at the beginning of the year
GROWTH	Growth on revenue in percentage
MBRATIO	Stock price divided by book value of equity per share
BIG4	Indicator variable equal to 1 if the auditor is a Big 4, and 0 otherwise
MAJORITY	Shares held by the biggest shareholder, expressed by percentage
INTLSHARE	Shares held by international shareholders, expressed by percentage
GOVSHARE	Shares held by state-owned corporations and government, expressed by percentage
LNAGE	Natural logarithm of CEO's age
DUALITY	An indicator equal to 1 if a CEO is the chairman of the board of directors, and 0 otherwise
CFO	Cash flow from operations/lagged total assets
ISSUE	1 if there is a private or public issue in the next year, and 0 otherwise

Note: Variables BIG4, MAJORITY, INTLSHARE, GOVSHARE, LNAGE, DUALITY and ISSUE are hand-collected, the other variables are from CSMAR database

In the analyses of discretionary accruals and meeting or beating analyst earnings forecast, the control variables in Table II-4 are used. As to the analysis of conditional conservatism, a time-series test of timeliness in loss recognition (Basu,1997; Ball and Shivakumar,2005; Banker et al.,2016) is applied, with specified control variables included.

## II.4 CEOs' International Experience and Discretionary Accruals

### II.4.1 Measurement of Discretionary Accruals

We use a performance-adjusted modified Jones (1991) model to estimate discretionary accruals (Dutillieux et al., 2016; Asthana et al., 2015; Kothari et al., 2005), as shown in function (1).

$$\frac{TA_{i,t}}{ASSETS_{i,t-1}} = \delta_0 \left( \frac{1}{ASSETS_{i,t-1}} \right) + \delta_1 \frac{(\Delta REV_{i,t} - \Delta AR_{i,t})}{ASSETS_{i,t-1}} + \delta_2 \frac{PPE_{i,t}}{ASSETS_{i,t-1}} + \delta_3 ROA_{i,t} + \varepsilon_{i,t} \quad (1)$$

In function (1), *total accruals* (TA) are calculated by the difference between operating income and cash flow from operations (Fang and Jin, 2011).  $\Delta REV$ ,  $\Delta AR$  and  $PPE$  are calculated in the same way as DeFond and Park (1997) and Dechow et al. (1995), in which  $\Delta REV$  refers to the change of revenues from year t-1 to year t while  $\Delta AR$  is the change of accounts receivable from year t-1 to year t and  $PPE$  is the propriety, plant and equipment. All these three variables are scaled by lagged total assets before the regressions to estimate discretionary accruals. The sample before propensity score matching includes 4,205 observations, categorized into 76 industry-year groups according to the industry-classification standards (CSRC, 2012<sup>4</sup>) and years. Based on the regression on each industry-year group, we obtain discretionary accruals accordingly. In this paper, the *absolute value of the discretionary accruals* (ABSDA) is taken to measure earnings management since the magnitude of earnings management is much more to our concern than the direction of earnings management.

$$ABSDA_{i,t} = \beta_0 + \beta_1 INTLEXP_{i,t} + Controls_{i,t} + year + industry + \varepsilon_{i,t} \quad (2)$$

With the absolute value of discretionary accruals, the main regression of function (2) is run to estimate the influence of CEOs with international experience on discretionary accruals.  $INTLEXP$  is defined as 1 if a CEO had international experience before, and 0 otherwise.

### II.4.2 Descriptive Analysis

As stated before, we use propensity score matching to reduce the sample with 4,205 observations into 1,566 observations, of which 167 observations are with CEOs who have international experience. We also winsorise all the continuous variables at 1% level on both

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<sup>4</sup> CSRC (2012), seen in reference.

sides to avoid the effect from outliers. From Table II-5, the mean value of ABSDA (0.0544) is more than the median one (0.0391), which indicates that firms in the last quartile engage in earnings management to quite a significant extent. The mean values of MBRATIO, INTLSHARE and GOVSHARE are larger than their median values, which are understandable from their distributions of numerical values after the 75% quartile.

Table II-5: Descriptive statistics (N=1566)

Variable	Mean	Median	25% quartile	75% quartile	Standard deviation	Min	Max
ABSDA	0.0544	0.0391	0.0184	0.0735	0.0521	0.0010	0.2795
INTLEXP	0.1066	0.0000	0.0000	0.0000	0.3088	0.0000	1.0000
SIZE	21.5281	21.4250	20.6897	22.1211	1.1082	19.1512	24.8245
LEVERAGE	0.4107	0.3961	0.2262	0.5889	0.2299	0.0281	0.9483
ROA	0.0600	0.0457	0.0157	0.0930	0.0764	-0.1490	0.3600
GROWTH	0.1639	0.1287	-0.0206	0.2882	0.3599	-0.7362	2.1435
MBRATIO	4.1454	2.8774	1.9362	4.4594	4.7115	0.6753	36.1153
BIG4	0.0345	0.0000	0.0000	0.0000	0.1825	0.0000	1.0000
MAJORITY	0.3092	0.3021	0.2306	0.3897	0.1013	0.0899	0.4960
INTLSHARE	0.0371	0.0000	0.0000	0.0000	0.1011	0.0000	0.5616
GOVSHARE	0.1149	0.0000	0.0000	0.2270	0.1597	0.0000	0.4967
LNAGE	3.8696	3.8712	3.7842	3.9512	0.1356	3.4657	4.1744
DUALITY	0.2912	0.0000	0.0000	1.0000	0.4545	0.0000	1.0000
CFO	0.0378	0.0344	-0.0100	0.0886	0.0927	-0.2615	0.3287
ISSUE	0.1488	0.0000	0.0000	0.0000	0.3560	0.0000	1.0000

Note: ABSDA: Absolute value of discretionary accruals.

INTLEXP: 1 if CEOs are with international study or work experience, 0 otherwise.

For definition of other variables see in Table II-4.

### II.4.3 Multiple Regression Analysis

Table II-6 depicts the results from running function (2). Columns 2 and 3 indicate that INTLEXP has no significant relation with earnings management, which concludes that CEOs with international experience have no difference toward earnings management, compared to those without any international experience.

We then separate the 167 observations with internationally experienced CEOs into three subsamples: INTLSTUDY (100 observations) refers to CEOs with international study experience only; INTLWORK (17 observations) refers to CEOs with international work experience only; INTLSTUDYWORK (50 observations) refers to CEOs with both

international study and work experience. As INTLWORK has only 17 observations, which is too small a sample for analysis, analysis on INTLWORK is not carried out.

From columns 4 and 5 of Table II-6, CEOs with international study experience still have no significantly different tendency towards earnings management compared to CEOs without any international experience. This result is consistent with the regression results on the whole sample. However, CEOs with both international study and work experience are significantly and negatively related to earnings management at 5% level, indicated by the p-value of INTLEXP (0.017) in columns 7. This effect is also strong from an economic point of view: Compared to CEOs without any international experience, CEOs with both international study and work experience help reduce 30.14% ( $-0.0164/0.0544$ ) of the absolute discretionary accruals on average. It concludes that only CEOs with both types of international experience tend to restrain earnings management in the listed firms in China. This may be due to two reasons: The knowledge from the practices in a foreign company can be directly and effectively transformed into the current CEO's position in China. Besides, CEOs with both types of international experience have an average experience of 13.02 years, much longer than CEOs with only study experience, which is 2.19 years.

The effects of control variables ROA and CFO are stable among the three regressions. Higher ROA is related to more earnings management at a significant level of 5%, which conforms with prior research by Kuang et al. (2014) and Ali and Zhang (2015). Consistent with Ali and Zhang (2015), CFO has a significant mitigating effect on earnings management.

#### ***II.4.4 Sensitivity Analysis***

Research on earnings management (Asthana et al., 2015; Hribar and Collins, 2002) commonly uses the difference between net income and cash flow from operations to calculate total accrual in European and US settings. We follow this route to recalculate the total accruals and the corresponding discretionary accruals to test the robustness of the results in Table II-6. With the newly calculated discretionary accruals, function (2) is rerun, and the results in Table II-7 conforms with those in Table II-6.

Table II-6: Regression of discretionary accruals

Dependent variable	INTLEXP		INTLSTUDY		INTLSTUDYWORK	
	coef.	t-value (p-value)	coef.	t-value (p-value)	coef.	t-value (p-value)
INTLEXP	-0.0034	-0.85 (0.394)				
INTLSTUDY			0.0017	0.31 (0.754)		
INTLSTUDYWORK					-0.0164	-2.39 (0.017)**
SIZE	-0.0042	-2.32 (0.021)**	-0.0059	-2.48 (0.013)**	0.0010	0.38 (0.701)
LEVERAGE	0.0240	2.56 (0.011)**	0.0325	2.60 (0.010)***	0.0042	0.30 (0.763)
ROA	0.1917	6.62 (0.000)***	0.1909	5.23 (0.000)***	0.1803	4.22 (0.000)***
GROWTH	0.0055	1.22 (0.221)	0.0112	2.06 (0.040)**	-0.0023	-0.30 (0.762)
MBRATIO	-0.0004	-1.03 (0.302)	-0.0008	-1.51 (0.131)	0.0006	0.72 (0.472)
BIG4	0.0002	0.03 (0.977)	0.0038	0.49 (0.626)	-0.0196	-1.05 (0.292)
MAJORITY	0.0025	0.19 (0.852)	0.0057	0.33 (0.741)	-0.0207	-0.89 (0.375)
INTLSHARE	0.0180	1.40 (0.162)	0.0134	0.67 (0.500)	0.0454	2.46 (0.014)**
GOVSHARE	0.0006	0.06 (0.951)	-0.0010	-0.08 (0.938)	-0.0145	-0.80 (0.422)
LNAGE	-0.0009	-0.09 (0.931)	0.0040	0.32 (0.746)	-0.0108	-0.59 (0.556)
DUALITY	-0.0041	-1.42 (0.155)	-0.0053	-1.40 (0.163)	-0.0075	-1.69 (0.091)*
CFO	-0.1429	-4.86 (0.000)***	-0.1321	-3.49 (0.001)***	-0.1650	-3.58 (0.000)***
ISSUE	0.0024	0.70 (0.487)	0.0017	0.38 (0.705)	0.0075	1.36 (0.174)
Industry fixed effects	Included		Included		Included	
Year fixed effects	Included		Included		Included	
Intercept	0.1526	2.96 (0.003)***	0.1497	2.34 (0.02)**	0.1018	1.19 (0.234)
N=	1566		997		531	
Adj. R	12.78%		12.41%		14.25%	
F-Stat.	4.12		3.14		3.26	
Prob(F-Stat.)	0.0000		0.0000		0.0000	

Notes: t-Statistics are based on standard errors, which are adjusted for heteroscedasticity.

\*Significance at the 10% levels, using a two-tailed test.

\*\*Significance at the 5% levels, using a two-tailed test.

\*\*\*Significance at the 1% levels, using a two-tailed test.

ABSDA= Absolute value of discretionary accruals.

INTLEXP: 1 if CEOs are with international study or work experience, 0 otherwise.

INTLSTUDY: 1 if CEOs are with international studying experience only, 0 if CEOs are without any international experience.

INTLSTUDYWORK: 1 if CEOs are with both international studying and work experience, 0 if CEOs are without any international experience.

For definition of other variables see in Table II-4.

Table II-7: Sensitivity test

Dependent variable	INTLEXP		INTLSTUDY		INTLSTUDYWORK	
	coef.	t-value (p-value)	coef.	t-value (p-value)	coef.	t-value (p-value)
ABSDA						
INTLEXP	-0.0022	-0.51 (0.610)				
INTLSTUDY			0.0038	0.62 (0.535)		
INTLSTUDYWORK					-0.0133	-1.73 (0.085)*
SIZE	-0.0039	-2.23 (0.026)**	-0.0047	-2.10 (0.036)**	-0.0003	-0.12 (0.907)
LEVERAGE	0.0176	1.86 (0.064)*	0.0223	1.87 (0.061)*	0.0038	0.25 (0.805)
ROA	0.1839	5.45 (0.000)***	0.1827	4.06 (0.000)***	0.2111	4.35 (0.000)***
GROWTH	0.0117	2.05 (0.040)**	0.0188	2.62 (0.009)***	-0.0030	-0.37 (0.710)
MBRATIO	0.0004	0.85 (0.395)	0.0003	0.52 (0.603)	0.0005	0.83 (0.409)
BIG4	0.0038	0.55 (0.582)	0.0055	0.66 (0.508)	-0.0078	-0.42 (0.673)
MAJORITY	0.0017	0.13 (0.898)	0.0055	0.31 (0.758)	-0.0277	-1.20 (0.231)
INTLSHARE	0.0238	1.68 (0.092)*	0.0170	0.79 (0.428)	0.0442	2.16 (0.031)**
GOVSHARE	0.0068	0.71 (0.476)	0.0113	0.87 (0.386)	-0.0081	-0.45 (0.653)
LNAGE	0.0020	0.19 (0.848)	0.0059	0.44 (0.660)	-0.0145	-0.76 (0.447)
DUALITY	-0.0026	-0.86 (0.389)	-0.0017	-0.41 (0.679)	-0.0077	-1.69 (0.092)*
CFO	-0.1407	-4.43 (0.000)***	-0.1334	-3.21 (0.001)***	-0.1706	-3.55 (0.000)***
ISSUE	0.0014	0.40 (0.692)	-0.0024	-0.53 (0.595)	0.0121	2.10 (0.036)**
Industry fixed effects		Included		Included		Included
Year fixed effects		Included		Included		Included
Intercept	0.1275	2.36 (0.018)**	0.1070	1.57 (0.117)	0.1437	1.68 (0.093)*
N=		1566		997		531
Adj. R		12.99%		12.77%		16.28%
F-Stat.		4.06		3.30		3.53
Prob(F-Stat.)		0.0000		0.0000		0.0000

Notes: t-Statistics are based on standard errors, which are adjusted for heteroscedasticity.

\*Significance at the 10% levels, using a two-tailed test.

\*\*Significance at the 5% levels, using a two-tailed test.

\*\*\*Significance at the 1% levels, using a two-tailed test.

ABSDA= Absolute value of discretionary accruals.

INTLEXP: 1 if CEOs are with international study or work experience, 0 otherwise.

INTLSTUDY: 1 if CEOs are with international studying experience only, 0 if CEOs are without any international experience.

INTLSTUDYWORK: 1 if CEOs are with both international studying and work experience, 0 if CEOs are without any international experience.

For definition of other variables see in Table II-4.

## II.5 CEOs' International Experience and Meeting or Beating Analyst earnings forecast

### II.5.1 Measurement of MBE

With function (3) below, we calculate the difference (DIFF\_EPS) between the actual *earnings per share* (EPS) and the median value of EPS from analyst earnings forecasts (An, Lee and Zhang, 2014; Ahmed, Neel and Wang, 2013) in order to define MBE, since median values are less sensitive to outliers. We exclude observations with only one analyst's earnings forecast in a year (An, Lee and Zhang, 2014; Mendenhall, 2004) to reduce deviations from EPS forecasts. Consistent with prior research (Ahmed, Neel and Wang, 2013; Filzen and Peterson, 2015; Brown, 2015), a dummy variable DUM\_DIFF\_EPS, measurement of MBE, is defined as 1 when DIFF\_EPS is larger or equal to 0, and 0 otherwise. Function (4) is the main analysis regression.

$$DIFF\_EPS_{i,t} = \text{Reported } EPS_{i,t} - \text{Median Analysts' Forecast}_{i,t} \quad (3)$$

$$DUM\_DIFF\_EPS_{i,t} = \beta_0 + \beta_1 INTLEXP_{i,t} + \text{Controls} + \text{year} + \text{industry} + \varepsilon_{i,t} \quad (4)$$

### II.5.2 Descriptive Statistics

The sample for the MBE analysis includes 2,000 observations, of which 108 observations are CEOs with international experience. Since all 108 observations in the treatment group are distributed after the 75% quartile of DUM\_DIFF\_EPS, there is no doubt that the mean value of DUM\_DIFF\_EPS is greater than the median one, which is zero. The distribution of MBRATIO, INTLSHARE and GOVSHARE is quite similar to that in the sample's descriptive statistics for discretionary accruals.

Table II-8: Descriptive statistics (MBE, N=2000)

Variable	Mean	Std	Min	P25	Median	P75	Max
DUM_DIFF_EPS	0.2120	0.4088	0.0000	0.0000	0.0000	0.0000	1.0000
INTLEXP	0.0540	0.2261	0.0000	0.0000	0.0000	0.0000	1.0000
SIZE	21.8764	1.2222	19.8655	20.9597	21.6527	22.5935	25.3847
LEVERAGE	0.3921	0.2126	0.0301	0.2185	0.3850	0.5603	0.8434
ROA	0.0794	0.0696	-0.0659	0.0339	0.0642	0.1072	0.3568
GROWTH	0.2101	0.2705	-0.3937	0.0488	0.1848	0.3438	1.1831
MBRATIO	3.4979	2.3164	0.7692	1.9120	2.8710	4.3160	12.8913
BIG4	0.0655	0.2475	0.0000	0.0000	0.0000	0.0000	1.0000
MAJORITY	0.3265	0.1024	0.0860	0.2470	0.3332	0.4101	0.4966
INTLSHARE	0.0393	0.0977	0.0000	0.0000	0.0000	0.0000	0.4943
GOVSHARE	0.1415	0.1812	0.0000	0.0000	0.0196	0.2981	0.5842
LNAGE	3.8704	0.1295	3.5114	3.7842	3.8712	3.9512	4.1972
DUALITY	0.3225	0.4676	0.0000	0.0000	0.0000	1.0000	1.0000
CFO	0.0453	0.0988	-0.2561	-0.0041	0.0448	0.0990	0.3307
ISSUE	0.1525	0.3596	0.0000	0.0000	0.0000	0.0000	1.0000

Note: MBE: Meeting or beating analyst earnings forecast.

DUM\_DIFF\_EPS: 1 if the difference between actual ESP and the median value of EPS from analysts' forecasts is no less than 0, 0 otherwise.

INTLEXP: 1 if CEOs are with international study or work experience, 0 otherwise.

For definitions of other variables see in Table II-4.

### II.5.3 Multiple Regression Analysis

Table II-8 reports the results of the probit analyses of MBE. The main finding is that CEOs with international experience have no incentive to meet or beat analyst earnings forecasts, even after we follow the method of analysing discretionary accruals to divide the whole sample into three subsamples according to different types of international experience and rerun the probit analysis on MBE. The treatment group with CEOs with international work experience is ignored due to insufficient observations (13 observations). It seems that we have found contradicted results between the analysis for discretionary accruals and the analysis for MBE that CEOs with both international study and international work experience do help restrain earnings management through discretionary accruals. However, they have no intention to meet or beat analyst earnings forecasts. Two factors may have played important roles, resulting in such a contradiction. The top management teams in Chinese listed firms may not care about the analyst earnings forecasts because these earnings forecasts from analysts lead to no significant response from the institutional investors in China (Ding et al., 2014). Besides, the analysts in China may have more biases in their forecast due to the limited information in the

less-developed financial market, and their biased opinions again influence other analysts (Zhou and Wu, 2016).

Moreover, firms with high growth are more likely to meet or beat analyst earnings forecasts, as indicated by the coefficients and the significance of ROA and GROWTH. Besides, firms audited by Big 4 or firms with a higher amount of cash flow from operations are inclined to meet or beat analyst earnings forecasts.

#### ***II.5.4 Sensitivity Analysis***

When calculating the DIFF\_EPS, Filzen and Peterson (2015) use the difference between the actual EPS and the mean value of EPS from analysts' forecasts. We also follow this way to define the DUM\_DIFF\_EPS as one if the difference between the actual EPS and the mean value of analysts' forecasted EPS is larger or equal to zero, and zero otherwise. The probit regression is rerun, and the result on INTLEXP (Z-value=-0.47) is also not significant, which conforms with the result in column 2 of Table II-9.

### **II.6 CEOs' International Experience and Conditional Conservatism**

#### ***II.6.1 Measurement of Conditional Conservatism***

We adopt time-series test of timeliness in loss recognition to evaluate conditional conservatism (Basu,1997; Ball and Shivakumar, 2005, Banker et al., 2016), as shown in function (5).

$$\begin{aligned} \Delta NI_{i,t} = & \beta_0 + \beta_1 D\Delta NI_{i,t-1} + \beta_2 \Delta N_{i,t-1} + \beta_3 D\Delta NI_{i,t-1} * \Delta NI_{i,t-1} + \beta_4 INTLEXP_{i,t} + \\ & \beta_5 D\Delta NI_{i,t-1} * INTLEXP_{i,t} + \beta_6 \Delta N_{i,t-1} * INTLEXP_{i,t} + \beta_7 D\Delta NI_{i,t-1} * \Delta NI_{i,t-1} * INTLEXP_{i,t} + \\ & \beta_8 D\Delta S_{i,t} + \beta_9 \Delta S_{i,t} + \beta_{10} D\Delta S_{i,t} * \Delta S_{i,t} + year + industry + \varepsilon_{i,t} \end{aligned} \quad (5)$$

Table II-9: Probit regression of MBE

Dependent variable	INTLEXP	INTLSTUDY	INTLSTUDYWORK
DUM_DIFF_EPS	Coefficient (standard deviation)		
	0.1003 (0.1564)		
INTLEXP		0.0607 (0.2115)	
INTLSTUDY			-0.0581 (0.2660)
INTLSTUDYWORK			
SIZE	-0.1378*** (0.0502)	-0.1306** (0.0563)	-0.0890 (0.0684)
LEVERAGE	1.5707*** (0.3038)	1.4061*** (0.3381)	1.1554*** (0.4038)
ROA	8.5754*** (0.8186)	8.0647*** (0.8957)	7.7126*** (1.0129)
GROWTH	0.7080*** (0.1409)	0.5697*** (0.1567)	0.8862*** (0.1923)
MBRATIO	-0.0855*** (0.0238)	-0.0868*** (0.0271)	-0.0428 (0.0286)
BIG4	0.6163*** (0.1555)	0.6230*** (0.1710)	0.7251*** (0.2395)
MAJORITY	-0.0162 (0.3686)	0.1820 (0.4094)	0.1541 (0.4885)
INTLSHARE	-0.5814 (0.3883)	-0.7214 (0.4661)	-0.1133 (0.5030)
GOVSHARE	0.2922 (0.2316)	0.0673 (0.2555)	0.3117 (0.3221)
LNAGE	-0.1931 (0.2866)	-0.0977 (0.3263)	-0.169 5(0.3893)
DUALITY	0.0000 (0.0848)	-0.0194 (0.0961)	0.0335 (0.1069)
CFO	1.1501*** (0.3980)	1.1227** (0.4426)	1.0604** (0.5342)
ISSUE	-0.0027 (0.1014)	0.0074 (0.1145)	-0.0190 (0.1274)
Constant	1.8475(1.5759)	1.4757(1.7036)	0.4475(2.1736)
Fixed industry effects	Included	Included	Included
Fixed year effects	Included	Included	Included
Number of observations	1986	1582	1169
Pseudo R <sup>2</sup>	0.2012	0.1937	0.2114

Notes: Z-Statistics are based on standard errors, which are adjusted for heteroscedasticity.

\*Significance at the 10% levels, using a two-tailed test.

\*\*Significance at the 5% levels, using a two-tailed test.

\*\*\*Significance at the 1% levels, using a two-tailed test.

MBE: Meeting or beating analysts' forecasts.

DUM\_DIFF\_EPS: 1 if the difference between the actual EPS and median value of analysts' forecasting EPS is larger or equal to 0, and 0 otherwise.

INTLEXP: 1 if CEOs are with international study or work experience, 0 otherwise.

INTLSTUDY: 1 if CEOs are with international studying experience only, 0 if CEOs are without any international experience.

INTLSTUDYWORK: 1 if CEOs are with both international studying and work experience, 0 if CEOs are without any international experience.

For definition of other variables see in Table II-4.

where  $\Delta NI_{i,t}$  is the change in net income from year t-1 to t scaled by the total assets in year t-1 and  $\Delta NI_{i,t-1}$  is the change in net income from year t-2 to t-1 scaled by the total assets in year t-2.  $D\Delta NI_{i,t-1}$  is a dummy variable which is defined as 1 if the change in income from year t-

2 to t-1 is negative, and 0 otherwise. If there is a timely loss recognition,  $\beta_3$  tends to be negative. For  $\beta_6$ , which reflects the incremental effect in gain recognition of having CEOs with international experience than having CEOs without international experience, we have no prediction from the hypothesis. As we use timely loss recognition to reflect conditional conservatism,  $\beta_7$  is much more to our concern, and according to our main hypothesis, we are not sure if CEOs with international experience could result in more timely loss recognition, which results in no prediction of  $\beta_7$ . As Banker et al. (2016) point out that cost stickiness plays an important role in explaining conditional conservatism, change in sales is also added, in which  $\Delta S_{i,t}$  is the change in sales from year t-1 to t and  $D\Delta S_{i,t}$  is defined as 1 if  $\Delta S_{i,t}$  is less than 0, and 0 otherwise.

### ***II.6.2 Multiple Regression Analysis***

As Table II-10 depicts,  $\beta_3$  is significantly negative at 1% level in all the three regressions, which is consistent with our prediction that losses are timelier recognised than gains.  $\beta_6$  is insignificant, revealing that firms that have CEOs with international experience have no declination to recognise gains timelier. The significance of  $\beta_7$ , which indicates the additional effect of having a CEO with international experience on timely loss recognition, depends on different kinds of international experience.  $\beta_7$  is positively significant at 5% level when CEOs have international study experience only, indicating that CEOs with international study experience only are less likely to recognise loss timely, which is considered less conditional conservatism.

Ball and Schivakumar (2005) also use an accrual-based test of loss recognition to test conditional conservatism. We also run this test to check the above test, the sample is the same as the one for the analysis of discretionary accruals, and the result indicates no significant influence of CEOs' international experience on timely loss recognition.

Table II-10: Regression of conditional conservatism

	INTLEXP		INTLSTUDY		INTLSTUDYWORK	
	coef.	t-value (p-value)	coef.	t-value (p-value)	coef.	t-value (p-value)
$\beta_1$	-0.0118	-5.35 (0.000)***	-0.0119	-4.84 (0.000)***	-0.0132	-4.20 (0.000)***
$\beta_2$	-0.0589	-3.15 (0.002)***	-0.0878	-4.20 (0.000)***	-0.0271	-1.00 (0.319)
$\beta_3$	-0.6490	-17.05 (0.000)***	-0.5970	-14.28 (0.000)***	-0.7343	-12.98 (0.000)***
$\beta_4$	0.0054	0.72 (0.469)	0.0065	0.70 (0.484)	0.0026	0.18 (0.856)
$\beta_5$	-0.0035	-0.30 (0.763)	0.0035	0.23 (0.814)	-0.0040	-0.17 (0.864)
$\beta_6$	0.0546	0.43 (0.664)	0.1110	0.72 (0.473)	-0.0315	-0.14 (0.886)
$\beta_7$	0.2798	1.24 (0.216)	0.6711	2.20 (0.028)**	-0.1086	-0.19 (0.846)
$\beta_8$	-0.0260	-11.71 (0.000)***	-0.0251	-10.13 (0.000)***	-0.0275	-8.88 (0.000)***
$\beta_9$	0.0000	4.68 (0.000)***	0.0000	4.04 (0.000)***	0.0000	4.84 (0.000)***
$\beta_{10}$	0.0000	2.60 (0.009)***	0.0000	1.68 (0.093)*	0.0000	1.31 (0.191)
Industry fixed effects		Included		Included		Included
Year fixed effects		Included		Included		Included
Intercept	0.0185	3.16 (0.002)***	-0.0058	-0.63 (0.527)	0.0301	4.01 (0.000)***
N=		3688		3090		1643
Adj. R		19.54%		18.96%		21.80%
F-Stat.		28.98		24.31		22.80
Prob(F-Stat.)		0.0000		0.0000		0.0000

Notes:

\*Significance at the 10% levels, using a two-tailed test.

\*\*Significance at the 5% levels, using a two-tailed test.

\*\*\*Significance at the 1% levels, using a two-tailed test.

INTLEXP: 1 if CEOs are with international study or work experience, 0 otherwise.

INTLSTUDY: 1 if CEOs are with international studying experience only, 0 if CEOs are without any international experience.

INTLSTUDYWORK: 1 if CEOs are with both international studying and work experience, 0 if CEOs are without any international experience.

For definitions of  $\beta_1$  to  $\beta_{10}$  see in function (5).

## II.7 Conclusion

As more returnees join the management teams in Chinese listed firms, researchers become more interested in the effects or contributions of their international talents. This paper traces this direction, attempting to evaluate the influence of CEOs' international experience on earnings management.

Although no relation is found between CEOs' international experience and earnings management in general, CEOs with international study and work experience do have a significant restraining effect on earnings management. However, CEOs may not care about analysts' forecasts due to analysts' inaccurate forecasts in the immature Chinese stock markets (Zhou and Wu, 2016) and the insignificant response from Chinese institutional investors to those forecasts when they make investment decisions (Ding et al., 2014). Consistent with this prediction, we find that CEOs with international experience have no significant incentive to meet or beat analyst earnings forecasts. As to conditional conservatism, only CEOs with international study experience alone are related to less conditional conservatism.

Our evidence suggests that CEOs with both international study and work experience significantly restrain earnings management through discretionary accruals. However, due to limited observations of CEOs with international work experience only, we cannot test if this type of CEO is significantly and negatively related to earnings management. As more returnees join the CEOs' team in Chinese listed firms, research can further test if CEOs' international work experience is more valuable in curbing earnings management than their international study experience.

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### **III. Incentives and characteristics of the board secretary and disclosure quality: Evidence from China's listed firms**

Siqi Zhao\*

**Abstract:** This study examines the association between the characteristics of the board secretary and firms' disclosure quality, based on China's listed firms on the Shenzhen Stock Exchange from 2012 to 2016. The characteristics examined in this research decompose into four categories: tenure, stock-based incentives, and financial work experience. To measure disclosure quality, four proxies are employed: discretionary accruals, management forecasts accuracy, properties of earnings preannouncements, and disclosure transparency score graded by SZSE. As it reveals, tenure and stock-based incentives display more substantial evidence of influencing disclosure quality proxied by four measurement categories, but in the opposite direction to each other. Financial work experience plays a limited role in earnings preannouncement reports. Overall, the results indicate the association between the characteristics of the board secretary with disclosure quality.

**Key words:** board secretary, tenure, stock-based incentives, insider trading, financial work experience, disclosure quality, accrual-based earnings management, management forecast, earnings preannouncement, disclosure transparency score.

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### III.1 Introduction

The topic of top management team member is scrutinized by research on corporate governance and human capital, this research is in the overlapping area of corporate governance, agency theory and characteristics of top managers. Two streams of theories are most relevant to the study on board secretary: agency theory, dealing with the conflicts between shareholders and the management team (Jensen and Meckling, 1976; Fama, 1980); and upper echelons theory, emphasizing the managerial background characteristics (Hambrick and Mason, 1984; Hambrick, 2007). Piles of extant literature support the standpoint that effective corporate governance contributes to alleviation of agency problem and improving earnings quality (Firth et al., 2007; Lai and Tam, 2017; and others). In the context of China's listed firms, higher corporate governance quality has been demonstrated to effectively mitigate earnings manipulation, hence, to improve disclosure quality and add firm value (Habbash et al., 2014; Sengupta and Zhang, 2015; Lai and Tam, 2017). While, as independent board of directors received intensive attentions, another crucial component of China's corporate governance system- board secretary, seldom falls into the scope of discussion.

Board secretary system<sup>5</sup> was passively transplanted in China's listed companies from the UK. McNulty and Stewart (2015), discussing the companies secretary in the UK listed firms<sup>6</sup>, summarise that company secretaries contribute to developing governance space by taking responsibility for regulatory compliance, engaging in information flows, board processes and outcomes. In practice, board secretary has gradually been entitled to more rights and responsibilities than its foreign predecessors. Under China's setting, board secretary is required to be recommended and designated by the board of directors, and responsible to the listed company and the board of directors. Their duties, other than advocating for collective

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<sup>5</sup> In the early 1990s, the system of board secretary was introduced from common law countries to China. China Security Regulation Committee (CSRC) enacted the "Guidelines for the Articles of Association of Listed Companies" in 1997. As written into the "Corporate Law" in 2005, the board secretary system is finally established in legal form. The security law stipulates that the board secretary should be recommended and designated by the board of directors. Both Shanghai and Shenzhen security markets demands all listed company to establish an information disclosure department under the responsibility of the board secretary.

<sup>6</sup> As documented by McNulty and Stewart (2015), company secretary is statutorily mandated for the listed public companies in the UK (Companies Act 2006, section 271). The UK Corporate Governance Code requires that the secretary is to be appointed and can only be removed by the board itself. The executive management cannot therefore hire or fire the secretary. In addition, there is also a regulatory responsibility for information flows to the board, and director induction and professional development.

conscience, that are relevant to information disclosure<sup>7</sup> could be summarised and presented as follows: (1) responsible for the company's information disclosure and compliance with respective regulations, (2) responsible for the company's investor relationship and shareholders' information management, (3) monitor and report violations to the stock exchanges. In all, the role of board secretary complements corporate governance in China's listed firms, and they take up the responsibility for disclosing corporate information to regulators, investors and other outside stakeholders, such as analysts.

However, almost all research in the relation of disclosure quality and top manager's characteristics has concentrated on the role of CEO, CFO and independent directors, (Jiang et al., 2013; Kwak et al., 2012; and others). Therefore, the purpose of this paper is to explore the relation between characteristics of board secretary and firms' information disclosure quality. Specifically, the investigation targets on three factors regarding to board secretary: stock-based incentives, tenure and financial work experience.

As defined by agency theory, the board secretary system brings about agency problem by introducing a role designated by the board to the top management team. To alleviate the problem, one strategy is to align management incentives with the interests of shareholders (e.g. Jensen and Meckling, 1976; Cheng and Warfield, 2005; Beyer et al., 2010). One way of alignment is a compensation package consists of cash salary and firm's stocks and/or stock options. As intensively documented by prior studies, this approach has been demonstrated to have mixed results. Some highlight that the alignment alleviates agency problems (Core and Guay, 2002; Beyer et al., 2010; Choi and Kim, 2017), on the contrary, it triggers managers to ignore firm's long-term value to pursue short-term personal interest (Cheng and Warfield, 2005; Bergstresser and Philippon, 2006; Sengupta and Zhang, 2015). In the same vein of stock-based incentives studies, this paper measures the incentive as the ratio of money change

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<sup>7</sup> In support of board secretaries, the rules further require the listed companies to provide facilities for the board secretaries to perform their duties. Directors, supervisors, and other senior management personnel should support and cooperate with the board secretary in information disclosure and ensure financial and operational conditions relating to the information disclosure accessible to the board secretary. Besides, in terms of disclosure affairs, CSRC issued rules that CEO and CFO are responsible for the authenticity, accuracy, completeness, timeliness and fairness of periodic financial report disclosure (annual and semi-annual financial reports); managers and board secretary should undertake the main responsibility of interim reports, including unaudited quarterly reports; specifically, the enforcement of disclosure is among the board secretary's duties. Even though the ultimate responsibility is undertaken by CEO and CFO, however in most cases, violation of criteria leads to punishment upon inside directors and top managers, including board secretary. Hence, board secretaries are stimulated to improve disclosure quality so as to avoid penalty.

in the value of stockholdings caused by one percentage change in the company stock price to the total compensation consists of both equity and cash part (Bergstresser and Philippon, 2006; Sengupta and Zhang, 2015), to examine whether stock-based incentives of board secretary are associated with disclosure quality.

As China's financial market develops, board secretaries gain more power in listed companies. To quantify the unobservable power, prior studies measure power mainly as to proxies: tenure (expert power) (Lee et al., 2012; DeBoskey et al., 2019), and duality (structural power) (Daily and Johnson, 1997). This paper uses tenure, the length of time period board secretary serves in that position, since in practice they never occupy director of board in listed firms in China. Prior research demonstrate that powerful CEOs prefer less accrual-based earnings management (Cheng and Leung., 2012), less likelihood of voluntary earnings disclosure (Lee et al., 2012) and more optimistic tones of management forecast (DeBoskey et al. (2019). The expert power of a top manager comes from longer tenure because longer service earns them comprehensive understanding of the company's operating environment. Particularly, expertise of board secretary consists of knowledge about long-term financial disclosure environment, investor relationships, and regulation compliance, thus indicating this power dimension to be a direct function of positional tenure (Lewellyn and Muller-Kahle, 2012). Following recent studies that establish an association between managerial power and disclosure quality (e.g. Lee et al., 2012; DeBoskey et al., 2019), this research attempts to fill the void in board secretary studies with an investigation on the relation between power of board secretary and disclosure quality.

Given that board secretary is only allowed to compete for this position with a certain certificate<sup>8</sup> and regular trainings, which have them stand on the same starting line, extra ability could be probably gained through former work experience. Expertise (former work experience) is reported to be associated with more sophisticated financial information

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<sup>8</sup> According to the "Rules Governing the Listing of Shares on Shenzhen Stock Exchange (2012 amendment)" Article 3.2.4, the secretary of the board of directors shall ... obtain a qualification certificate for the secretary of the board of directors issued by the Shenzhen Stock Exchange. According to the "Guidelines for Disclosure of Information by Listed Companies on Shenzhen Stock Exchange No. 7" Article 18, the Exchange shall hold various types of training for secretaries of the board of directors annually. The secretary of the board of directors and the securities representative of the listed company shall attend the foregoing training course at least once every two years. Article 19, the Shenzhen Stock Exchange may disqualify the secretary of the board of directors and the representative of securities affairs if they ... failing to attend the training of the secretary of the Shenzhen Stock Exchange for two consecutive years.

reporting skills, resulting in diverse disclosure style and quality (e.g. Bamber et al. 2010; Jiang et al., 2013). Former study on board secretary only indicates the association between accounting expertise and disclosure quality (Xing et al., 2019), ignoring financial expertise. Therefore, this paper investigates financial expertise, arguing its better ability-enriching characteristics over accounting expertise. Financial work experience is defined as a dummy, that equals one if the board secretary used to work in investment firms, financial firms or institutes, where they acquired experience in corporate finance and financial markets.

Prior studies investigated into public firms' disclosure quality and established proxies to measure it (e.g. Nagar et al., 2003; Bamber et al., 2010; and others). In line with studies on disclosure quality, the proxies employed by this research are categorised into four: (1) accrual-based earnings management (e.g. Bergstresser and Philippon, 2006), (2) management forecast accuracy (e.g. Bamber et al., 2010), (3) likelihood and frequency of management earnings preannouncement (e.g. Nagar et al., 2003), and (4) disclosure transparency score<sup>9</sup> assessed and issued by Shenzhen Stock Exchange (henceforth SZSE) (e.g. Yang et al., 2020). Based on the attributes of each proxy, different methods of regression are employed to suit with respective dependent variables. For the first two measurements, pooled OLS regression is used. A Probit model is chosen to test the dummy variable–likelihood of earnings preannouncements. The frequency of disclosure is a non-negative number, so a Negative Binomial model is employed. Finally, the disclosure transparency score matches with an Ordered Logistic model. Because the disclosure index is only limited to public firms listed on SZSE, for convenience of comparative analysis between different dependent variables, the sample constitutes of non-financial public firms on SZSE from 2012 to 2016. To alleviate endogeneity problems, an instrumental variable approach and propensity score matching are used.

Empirical evidence supports the idea that characteristics of board secretary are associated with disclosure quality (Xing et al., 2019). Stock-based incentives display significant influence on

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<sup>9</sup> In 2005, the Shenzhen Stock Exchange implemented the "Information Disclosure Assessment Measures for Listed Companies on Shenzhen Stock Exchange" and started to rate the quality of information disclosure of listed companies, while the Shanghai Stock Exchange started this work in 2016. In 2011, the Shenzhen Stock Exchange revised the "Information Disclosure Assessment Measures for Listed Companies on Shenzhen Stock Exchange", adopting a plus-or-minus score model, that is, adding or deducting points on the basis of a unified assessment benchmark score. The final rating of the listed companies is a combination of the score and negative indicators. The basic score of information disclosure assessment of listed companies is 100 points, and the final rating falls into four grades from high to low: A, B, C and D. The number of companies with A rating account for no more than 25% of the total number of companies assessed.

earnings management and management earnings forecasts. Larger stock-based incentives are associated with upward accrual-based earnings management, and an increase in the likelihood and number of earnings preannouncement issuance. The longer a board secretary serves the firm, the less upward discretionary accruals and more accurate management forecast they tend to provide; while longer tenure inhibits the likelihood and frequency of earnings forecasts. Disclosure transparency, indicated by SZSE transparency score, is improved with board secretary who experiences a longer employment. The results suggest that board secretary's familiarity and power in the firm boost their reporting capability, consistent with former studies (Daily and Johnson., 1997; DeBoskey et al., 2019), arguing that tenure represents expertise power, and that both the reduction in earnings management and disclosure inclination result from the familiarity with firm capabilities, operations and disclosure environment. The influences of financial work experience are limited to earnings forecast preannouncements. The results indicate that a board secretary who used to work in finance industry has less tendency in issuing preannouncement, thus a smaller number of issuances. The effect of financial work experience resembles that of tenure, the reluctance of issuing earnings forecast preannouncement could come from their knowledge of financial market and discretionary operations on market anticipation. The results hold after controlling for the ratio of stock-based compensation ratio and tenure of CEO, and other financial controls.

This study contributes to three aspects. First, it contributes to the literature in the field of top managers. My results provide insights beyond studies that have CEOs at centre and extend top manager studies to board secretary who takes up senior position in top management team, playing an important role in disclosing corporate information. This research extends the study mainly of Bergstresser & Philippon (2006), Sengupta & Zhang (2015) and DeBoskey et al. (2019). Second, this research expands the demographic characteristics of board secretary to a wider range, extending the study by Xing et al. (2019) by investigating on tenure, stock-based incentives, and financial work experience. Third, this paper enriches literature of disclosure index. Similar with its peers, SZSE disclosure transparency score enjoys a long history and comprehensive metric. However, it receives few attentions from studies on China's listed firms. This paper provides original evidence that the tenure and stock-based incentives of board secretary are positively associated with SZSE score, suggesting the use of disclosure index and offering a comparative study between different proxies in that setting.

The remainder of the paper is organized as follows. Section III.2 presents the related theories. Section III.3 contains literature review and the development of hypotheses. Section III.4 includes the sample selection and variable explanations, as well as research design. Section III.5 presents descriptive statistics and summarizes the empirical results. Section III.6 provides approaches to address endogeneity concerns. Finally, Section III.7 concludes.

## **III.2 Literature Review and Hypothesis Development**

### ***III.2.1 Stock-based compensation and disclosure quality***

Numerous studies have attempted to explain the efficacy of alignment of interest, through equity holdings, between insiders, like managers and board members, and the outside shareholders (e.g. Cheng and Warfield, 2005; Beyer et al., 2010; Kim et al., 2019). However, scholars have long debated the impact of stock-based incentives on earnings quality and disclosure quality (Nagar et al., 2003; Bergstresser and Philippon, 2006; Sengupta and Zhang, 2015; and others). Some researchers support the success of the alignment of interest in mitigating the agency problem (e.g. Nagar et al., 2003), in contrast, others concede that this attempt is a failure (e.g. Cheng & Warfield, 2005).

Existent literature on this topic mainly selects between two measurements of stock-based incentives. Some research simply used the number of stockholdings to measure the incentive (Kim et al., 2019), while others used an incentive ratio (e.g. Bergstresser and Philippon, 2006; Beyer et al., 2010; Sengupta and Zhang, 2015). A few research uses the incentive ratio<sup>10</sup> (Bergstresser and Philippon, 2006) as a measurement of incentives, taking advantage of its property that is less scale dependent than other measurements, such as equity holding, that based on the money value of the equity (Sengupta and Zhang, 2015).

Prior research investigated whether and how top managers are motivated by stock-based compensation, and its association with accrual-based earnings management (e.g. Bergstresser and Philippon, 2006; Choi and Kim, 2017), and the quantity and quality of management's earnings forecasts (e.g. Beyer et al., 2010; Sengupta and Zhang, 2015). Bergstresser and Philippon (2006) demonstrate that the more closely the CEO's potential total compensation is

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<sup>10</sup> See III.4.2, the description of stock-based incentives ratio and its calculation equation.

tied to the value of stock and option holdings, the more inclined they are to use discretionary accruals to manipulate reported earnings. Cheng and Warfield, (2005) documented that CEO's incentive pay (in the form of option/stock holding) results in an increased likelihood of abnormal accruals. Extending the examination to CFO, Jiang et al. (2010) find that discretionary accruals and the likelihood of beating analyst forecasts are more sensitive to CFO stock-based incentives than to that of CEO. Another stream of literature examines the association between stock-based incentives and the properties of management forecasts. Nagar et al. (2003) demonstrate that higher compensation sensitivity to stock price is associated with higher management disclosure frequency, helping align the interest of CEOs with outside shareholders and further mitigating the disclosure agency problem. Sengupta and Zhang (2015) present empirical evidence of a positive relation between outside directors' incentive ratio and management frequency, supporting the argument that incentive pay motivates directors to monitor the firm, thus encouraging the firm to improve disclosure occurrence and frequency. Combining the two streams, Kim et al. (2019) examines the effect of incentive pay of CEO and outside directors on the likelihood and frequency of management forecast disclosure, suggesting that the two systems act as a substitute for the other, i.e., one mechanism is redundant when the other is already in place, only bringing about marginal improvement in the quantity and quality of management forecast.

One study on board secretary based on Chinese market, conducted by Xing et al. (2019), provides supportive evidence of the positive effect of board secretaries' equity holdings on the reduction of information asymmetry by issuing more quarterly and annually voluntary management forecasts for the sake of outside investors. However, measuring equity holding as stock-based incentives suffers from being dependent on the value of stocks. Although deficient to some extent, this research gave a hint about the relation between stock-based incentives of board secretary and disclosure quality. Given the relations implied by previous studies, incentives of board secretary reasonably influence the disclosure quality, the first hypothesis is presented as follows:

*H1. Ceteris paribus, board secretary stock-based compensation incentive is associated with disclosure quality.*

### *III.2.2 Tenure and disclosure quality*

Recent research offers a range of empirical analysis of the relation between manager's power and disclosure quality (DeBoskey et al., 2019; and others). Yet "power" cannot be observed directly, it is measured through quantifiable factors, reflecting the source of their power (Lee et al., 2012; DeBoskey et al., 2019). Prior studies measure power of managers, primarily of CEOs, mainly as to proxies: tenure (expert power) and duality (structural power) (Daily and Johnson, 1997). Given the board secretary system in China's setting, it is reasonable to focus on tenure other than duality, because in practice a director of board seldom serves as board secretary simultaneously. The literature of corporate governance studies establishes the effect of independent directors and board monitoring on disclosure quality, suggesting that updated corporate governance system effectively moderates the influence of CEOs on earnings management (Lai and Tam, 2017) and improves forecast occurrence and frequency (Ajinkya et al., 2005). Compared to independent board of directors, which are thoroughly examined, the board secretary only picks up academic steam recently.

Apart from complementing corporate governance, board secretary system scales up the top management team by including a board secretary. However, most prior research about power of top managers focuses on CEOs and draws different conclusions. Some research demonstrates that powerful CEOs prefer risk-taking activities (Lewellyn and Muller-Kahle, 2012), while others argue that they show risk-averse preferences (Cheng and Leung, 2012; Lee et al., 2012). It is demonstrated that there is a significant negative association between power and accrual-based earnings management (Cheng and Leung, 2012), and between power and less likelihood of voluntary earnings disclosure (Lee et al., 2012). Based on a sample of China's listed firms, Cheng and Leung (2012) find that CEO with longer tenure tends to report earnings of higher quality, evidenced by a reduction in discretionary accruals measured by two traditional proxies<sup>11</sup>. Lee et al. (2012) document a negative relationship between CEO tenure and the possibility of management forecast issuance. Both reduction in earnings management and forecasts provides evidence to support the assumption of the risk-averse preference of a powerful CEO. In addition, DeBoskey et al. (2019) examine the relation between tenure of

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<sup>11</sup> Two measurements used by Cheng and Leung (2012): the first is modified Jones model (Dechow et al., 1995), the second is the performance-matched discretionary accrual model of Kothari et al. (2005). This paper employs the latter model to calculate discretionary accruals as the first proxy of disclosure quality.

CEO and the tone of earnings announcement, indicating that tenure is positively associated with the tone, measured as positive words used in the earnings management. While conventional studies argue that CEOs wield paramount power over decisions within the corporate, some research challenges such argument by testing the role of other top managers, implying that top managers and directors have an influence, independent from CEO, on earnings management and voluntary disclosure quality (Jiang et al., 2010; Baker et al., 2019).

The expert power of a top manager comes from longer tenure because longer service earns them comprehensive understanding of the company's operating environment, thus indicating that this power dimension to be a direct function of positional tenure (Lewellyn and Muller-Kahle, 2012). Managers with longer tenure possess a comprehensive understanding of the company's internal operating system and external environment. For a CEO, the expertise consists of knowledge primarily on the industry, peer competition, supply chain, and so on; while for a board secretary, of long-term financial disclosure environment, investor relationships, and regulation compliance.

Since recent studies established that managerial power is associated with earnings and disclosure quality (e.g. Lee et al., 2012; DeBoskey et al., 2019), it is then tenable to assume that the extent to which the board secretaries fulfil their duty depends on individual power. The more powerful a board secretary is, the less they are influenced by managers of higher position, and the better they fulfil their duty. Considering that different measurements of disclosure quality are interpreted with contradictory meanings, the second hypothesis is proposed with no direction, but to test the significance of association between the tenure of board secretary and disclosure quality.

*H2. Ceteris paribus, board secretary's tenure is associated with disclosure quality.*

#### ***III.2.3 Financial work experience***

Research in upper echelons theory has long focused on the effects of top managers' demographic characteristics on earnings quality as well as disclosure quality (e.g. Bamber et al., 2010; Wang et al., 2015).

Generally, studies highlight the work experience of CEOs, CFOs and outside directors, rather than that of board secretary. Bamber et al. (2010) show that top managers' professional experience influences management earnings forecasts. Since board secretaries are among top management team and are legally responsible for information disclosure by law, it is assumed that their demographic characteristics affect their behaviour in management forecasts. Jiang et al. (2013) find that CEO's financial experience impacts real earnings management negatively, yet no significant evidence supports an influence on accrual-based earnings management. They also confirm that financial experience helps CEO provide more precise earnings information and thus higher quality financial statements. Another research by Wang et al. (2015) focus on outside directors and their industry expertise, demonstrate that independent directors' ability to monitor the board is enhanced by industry expertise. In contrast, findings based on a China sample of Habbash et al. (2014) demonstrate that financial or accounting expertise of independent directors or supervisors show only marginal effect on constraining earnings management. Their conclusions suggest that the independent directors system and supervisory board in China's listed firms failed to perform its designed function, specifically to monitor and restrain earnings manipulation.

A few studies tap into the topic of board secretary. Xing et al. (2019) find that board secretary's legal and accounting expertise imposes impact on the quality of management earnings forecasts, measured by occurrence, frequency, precision and accuracy. However, they failed to clear the role of financial expertise, proxied as financial work experience, as fulfilment of board secretaries' duty requires knowledge about corporate finance and stock market. Although CEOs exert more power over the preparation of financial reports and the ultimate responsibility of its quality, board secretaries are involved in the preparation and publishment of quarterly reports and earnings forecast preannouncements, which are a main source of stock price fluctuation caused by investors perception of the information conveyed by foregoing reports. Compared with accounting work experience, financial expertise gives top managers a comprehensive grasp of the firm's financial conditions, more importantly, a deeper understanding of stock market. Thus, the last hypothesis tests the effect of financial work experience on disclosure quality. It is presented as follows.

*H3. Ceteris paribus, board secretary with financial work experience is associated with disclosure quality.*

### III.3 Research design

#### III.3.1 Dependent variables

##### *Accrual-based earnings management*

Accrual-based earning management has been intensively investigated in the past three decades and several models have been established to identify discretionary accrual, modified from Jones model (Jones, 1992). Mouselli et al. (2012) find a positive association between accruals quality and disclosure quality, that is, higher disclosure quality engages less in earnings management. Following such finding, this paper incorporates the performance-matching modified Jones model to calculate discretionary accruals (Kothari et al., 2005).

$$TA_{it} = \alpha + \beta_1 \left( \frac{1}{TASSETS_{it-1}} \right) + \beta_2 \frac{\Delta SALES_{it}}{TASSETS_{it-1}} + \beta_3 \frac{PPE_{it}}{TASSETS_{it-1}} + \beta_4 ROA_{it} + \varepsilon_{it} \quad (1)$$

In model (1),  $TA_{it}$  is the total accruals calculated from income sheet as the difference between net income and operating cash flow firm-year observations; and discretionary accrual (DACC) is measured by the residuals of the equation.

##### *Management forecast accuracy*

Direct measurements that are frequently used in previous studies contains management forecast accuracy. Management forecast accuracy is considered as an important indication of disclosure quality by boards (e.g. Ajinkya et al. 2005; Hui and Matsunaga, 2015) and computed by the absolute difference between the mean of management forecast of annual earnings and actual reported earnings. The difference is first deflated by share price at the beginning of the year and then multiplied by -1 to convert the variable into one that positive coefficient indicates an improvement in accuracy. Therefore, a negative coefficient of any testing variable is suggestive of a relation with better disclosure quality.

$$ACCURACY = -1 \times \frac{|mean\ of\ management\ forecast\ EPS - actual\ EPS|}{Beginning-of-fiscal-year\ stock\ price} \times 100 \quad (2)$$

##### *Voluntary earnings preannouncement properties*

A series of research employed several measurements of voluntary management forecast properties to proxy disclosure quality and provided significant evidence between them and a range of explanatory variables (e.g. Ajinkya et al., 2005; Bamber et al., 2010; Baik et al., 2011;

Kim et al., 2019). As each single measurement of management’s earnings forecast captures only one dimension of a firm’s overall disclosure quality, this paper chooses two commonly used proxies to measure the properties of earnings preannouncements: (1) LIKELIHOOD, a binary variable equals 1 when a firm issues at least one earnings preannouncement during the year and 0 otherwise, (2) FREQUENCY, the number of earnings preannouncements in the fiscal year.

#### *Transparency score marked by Shenzhen Stock Exchange*

Prior studies employ scores made by an official system as a proxy for disclosure quality. For instance, in American setting, AIMR (Association for Investment Management Research) ratings is testified to be advantageous over self-constructed index (Helfin et al., 2015). Liou et al. (2017) used IDTRS, a Taiwanese disclosure and transparency rating to proxy disclosure quality. Similar to Yang et al. (2020), the disclosure ranking grades, constructed and issued officially by SZSE, is used to measure disclosure quality (SZSCORE), as it provides desirable features: covering all listed firms on SZSE, and are less subject to the selection bias critics compared to AIMR. In this paper, the transparency score is set from 1 to 4, correspondent to SZSE grade from D to A, where A represents the best quality of the disclosure performance.

### ***III.3.2 independent variables***

#### *Stock-based incentives ratio*

A practical measurement to identify stock-based incentives of managers is the stock-based incentives ratio, constructed by Bergstresser and Philippon (2006). The first step is to construct a variable that shows how one percentage point increase in the company stock price affect the money change in the value of board secretary’s total compensation.

$$ONEPCT_{i,t} = 0.01 \times STOCK\ PRICE_{i,t} \times (SHARES_{i,t} + OPTIONS_{i,t}) \quad (3)$$

In equation <sup>12</sup> (2),  $STOCK\ PRICE_{i,t}$  is the company’s closed share price at the year end,  $SHARES_{i,t}$  is the number of shares possessed by the manager, and  $OPTIONS_{i,t}$  is the number

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<sup>12</sup> The number of shares equals the sum of stock and option holdings. The underlying assumption is delta=1 for options, that is, a dollar increase in the price of a firm’s shares translates one-for-one to the value of an option. The assumption is approximately true for deep-in-the-money options, while less accurate for out-of-the-money

of options held by the manager. The incentive ratio is  $ONEPCT_{i,t}$  normalized by certain manager's total compensation, which identifies the ratio of relative change in total compensation caused by one percentage change in the value of equity a manager has.

$$INCENT_{i,t} = ONEPCT_{i,t} / (ONEPCT_{i,t} + SALARY_{i,t} + BONUS_{i,t}) \quad (4)$$

#### *Tenure of board secretary*

Tenure of a top manager is used as a proxy for power. Prior research displayed a relation between tenure of CEO and management forecast properties (Lee et al., 2012; DeBoskey et al., 2019). In line with them, this paper employs tenure as explanatory variable, yet using a modified measurement: the number of months of employment instead of years<sup>13</sup>. If the board secretary was replaced during a firm-year, we use the characteristics of the board secretary holding the position at the year-end to construct these variables (the same on variables below).

#### *Financial work experience*

As Bamber et al. (2010) demonstrate that financial work experience of top managers in American firms associate with higher management forecast accuracy and less frequency, this paper examines whether and how financial working background of board secretary affects disclosure quality. In this research, financial work experience is defined as a dummy variable, equals 1 if the board secretary ever worked in finance industry before entering the listed firm as board secretary, and 0 otherwise. Because of the limitation of the demographic information provided in the annual financial reports, the definition of the work experience is relatively broad—one who has ever worked in a financial firm or institution, such as policy bank, commercial bank, investment bank, insurance company, securities or brokerage company, future brokerage company, investment management company, fund management company, trust company, securities registration and settlement company, security exchange.

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options (McAnally et al., 2008). However, subjected to detailed description of each option, this paper assumes that for all options has a delta=1.

<sup>13</sup> The measurement is based on month instead of years aims to avoid 0 that arises under two situations: 1. Some firms are listed for less than one year; 2. Some board secretaries serve in this position for less than one year.

### ***III.3.3 Control variables***

Quite a few variables are already tested to be significantly related to disclosure quality by prior research, conventional variables are controlled in this paper and the construction of the control variables are presented (see Appendix Table III-A.). They are clustered by attributes into two types: firm-specific variables and CEO's demographic variables. Firm-specific variables have been long demonstrated to be associated with disclosure quality (e.g. Ajinkya et al., 2005; Conyon and He, 2011). To capture the firm characteristics, commonly used significant factors are taken into the regression. Firm size (SIZE) is documented to influence voluntary disclosure quality (Baginski and Hassell, 1997; Wang et al., 2015), computed as the logarithmic value of total asset at the beginning of the fiscal year. As Lai and Tam (2017) find that the longer since the company was incorporated, the better the disclosure quality, FIRMAGE is considered in the research. Leverage (LEVERAGE) is controlled for it captures the motivation caused by debt covenant violation to manipulate earnings, and decrease disclosure quality (Hui and Matsunaga, 2015). Growth (GROWTH), measured as the percentage of growth in revenue, is evident in influencing earnings and disclosure quality (e.g. Cheng and Warfield, 2005). Market-to-book value, stock market price divided by book value of equity (MBRATIO), is controlled to account for a firm's growth (Beneish and Vargus, 2002; Hui and Matsunaga, 2015). ROA represents the profitability, measured as the ratio of net income to asset (Wang et al., 2015). Further, I include several variables with respect to ownership structure that relate to the disclosure quality. Those are, the total number of shareholders (SHAREHOLDER), the ratio of marketable shares to the sum of total shares (tradable and non-tradable shares) of the firm (FLOATRATIO), the ratio of shares held by institutional investors (INSTHOLDER). They are predicted to be positively associated with disclosure quality according to literature (Ajinkya et al., 2005; Firth et al. 2007; Hui and Matsunaga, 2015). A widely controlled variable that captures the external auditing environment and the reliability of financial reporting is Big 4, it is included in this paper as a dummy variable (BIG4) to measure whether the auditing firm is one of the Big 4 (Bird et al., 2016). The number of analysts following the firm (FOLLOWER) are also taken into consideration (Baginski and Hassell, 1997; Sengupta and Zhang, 2015). One variable that reflects corporate governance and directly influence disclosure quality is included: INDPD is measured as the independent directors in the board,

documented to have significantly positive influence on disclosure quality (Ajinkya et al., 2005).

Literature documents a positive relationship between CEO's incentive pay and earnings management (Cheng and Warfield, 2005; Bergstresser and Philippon, 2006), therefore the stock-based incentives ratio of CEO to control its influence on the dependent variables. Two commonly used measures of CEO power are included here: (1) DUALITY is a dummy variable that equals 1 if the CEO sits as the chairman in the board and 0 otherwise, (2) Tenure\_CEO, is measured as the number of the months CEO serves in this position (Lee et al., 2012; DeBoskey et al., 2019). Industry-specific characteristics expose firms to different earnings management level and information asymmetry, and further influence their disclosure policies and quality. Therefore, industry dummies are included, defined according to CRSC (China Securities Regulatory Commission) Industry Classification of Listed Companies (2012 Revision).

### ***III.3.4 Research design***

To have a better understanding of the effect of the assumed aspects of the board secretary on disclosure quality, pooled OLS regression method is employed to investigate the relations. Model (5) is used to test hypotheses.

$$Disclosure\ quality_{i,t} = \beta_0 + \beta_1 Board\ secretary\ characteristics_{i,t} + \beta_m Control\ variables_{i,t} + Year + Industry + \varepsilon \quad (5)$$

where disclosure quality measured in four aspects: (1) accrual-based accounting management: discretionary accruals (DACC), (2) management forecast accuracy (ACCURACY), (3) voluntary earnings preannouncements: occurrence (LIKELIHOOD), frequency (FREQUENCY), (4) transparency score graded by SZSE (SZSCORE).

For equation (1), different model is applied to different dependent variable based on their numerical attributes. DACC, ACCURACY, as consecutive variable, uses pooled OLS regressions in the empirical part. A Probit model is employed to examine LIKELIHOOD, as it is a dummy variable. A negative binominal model is conducted to FREQUENCY, for that

it is non-negative integer. SZSCORE, a variable representing four rankings, is tested using an ordered logistic model.

#### **III.4 Descriptive statistics and empirical results**

##### ***III.4.1 Sample selection***

This research is conducted based on the data from the following resources: financial and analysts forecast related information is obtained from the CSMAR (China Stock Market and Accounting Research) database, top management team members' profiles hand-collected from annual financial statements and finance.sina.com. The collecting process begins with all public firms listed on the main board of Shenzhen Stock Exchange, ranging from 2012 to 2016 (9168 firm-year observations) and excluding: (1) firms entitled with ST, \*ST, SST, S\*ST\* (Special Treatment, indicating firms are experiencing financial distress) and (2) financial firms, resulting in 7956 firm-year observations. Further with missing top management team information, 2035 observations are excluded. After matching with all firm-specific data, 727 observations are excluded. To test the hypotheses under four dependent variable categories, dataset including independent variables and control variables are matched with different dependents variables. As is displayed in Table III-1, only sample for dependent discretionary accruals shrinks by 1, resulting in 5193 firm-year observations. The size of the other three sample sets remains the same, that is 5194 firm-year observations for investigation on the quality and quantity of voluntary disclosure of management earnings forecasts and SZSE official transparency rating.

Table III-1: Sample compilation

	Number of firm-year observations
Firms listed on Shenzhen A-share market	9168
Excluding (1) (2)	7956
With missing board secretary	(2035)
With missing firm-specific data	(727)
Observations (independent and control variables)	5194
Missing data in dependent variables	
DACC	(1) 5193
Management forecast accuracy	(0) 5194
Voluntary earnings preannouncements	(0) 5194
Transparency rating	(0) 5194

#### *III.4.2 Descriptive statistics and correlation analysis*

Table III-2 reports descriptive statistics for all variables. All continuous variables are winsorised at 1% and 99%. ACCURACY is ranging from -10.939 to -0.010, meaning the difference between the median of management forecasts ranges from 10.939 to 0.010 percentage of beginning-of-fiscal-year stock price. The average number of such issuance is 1.682, and maximal 5. During the fiscal year, firm-year observations voluntarily report good news of earnings for an average of 2.444 times. The official SZSE transparency ratings concentrate between the first and third quantile, resulting an average score of 3.123.

TENURE\_BS ranges from 1 month to 166 months, with an average of 48 months (4 years). INCENT\_BS displays a median value of zero, indicating that less than half of the board secretaries holds equity. Furthermore, mean value of 0.139 suggests that the proportion is above 50% yet below 75%. In the last two tables, such proportion drops below 50%. The mean of FIN is 0.112, suggesting that only one ninth of the observations possess a board secretary with financial experience.

Bivariate correlations between all testing variables are reported in Table III-3. Under both correlation tests, coefficients are statistically significant at the 0.01 level for two-tailed tests. Generally, no correlation between any two variables stands out in the tables: they stay in a lower level, the maximum exists between SIZE and LEVERAGE, equals 0.56; and between LEVEREAGE and ROA, equals -0.56.

### ***III.4.3 Empirical results***

#### *Accrual-based earnings management*

I begin by investigating whether there is a relation between the independent variables and discretionary accruals. Table III-4 reports the results of the pooled OLS regression on discretionary accruals, with year and industry controlled.

Column (1) reports the test of H1, that stock-based incentives of board secretary is demonstrated to have a positive effect on discretionary accruals meaning that one percent rise in the firm stock price causes upward accruals manipulation. It is consistent with Bergstresser and Philippon (2006), Cheng and Warfield (2005) that top managers, whose compensation package value is exposed to the fluctuation of the firm stock price, are more inclined to manipulate accruals upward. The result holds after controlling for CEO's stock-based incentives, which also has a significantly positive effect on accrual-based earnings management. In comparison, the coefficient of INCENT\_BS is larger than that of INCENT\_CEO. Therefore, another conclusion can be drawn that the magnitude of discretionary accruals is more sensitive to the incentive of the board secretary than CEO, which in line with Jiang et al. (2010), who examine the incentive of CFO with that of CEO being controlled. Furthermore, the result in this paper extended the coverage of managers' incentive by including board secretary under a Chinese setting.

Table III-2: Descriptive Statistics

Variable	N	Mean	Std	Min	P25	Median	P75	Max
DACC	5193	0.002	0.091	-0.283	-0.046	0.004	0.053	0.279
ACCURACY	5194	-1.283	1.654	-10.939	-1.576	-0.784	-0.330	-0.010
LIKELIHOOD	5194	0.578	0.494	0	0	1	1	1
FREQUENCY	5194	1.682	1.738	0	0	1	4	5
SZSCORE	5194	3.123	0.583	1	3	3	3	4
TENURE_BS	5194	48.564	37.553	1	18	41	71	166
INCENT_BS	5194	0.139	0.235	0.000	0.000	0.000	0.193	0.934
FIN	5194	0.112	0.316	0	0	0	0	1
SIZE	5194	21.707	1.080	19.760	20.922	21.548	22.289	25.157
LEVERAGE	5194	0.386	0.203	0.042	0.219	0.370	0.538	0.841
MBRATIO	5194	4.141	2.990	0.798	2.138	3.260	5.224	17.570
GROWTH	5194	0.195	0.415	-0.495	-0.020	0.118	0.292	2.484
ROA	5194	0.043	0.047	-0.126	0.016	0.039	0.067	0.187
FIRMAGE	5194	14.864	5.339	5.000	11.000	15.000	19.000	28.000
FLOATRATIO	5194	0.716	0.250	0.205	0.513	0.745	0.981	1.000
THOLDERS	5194	10.147	0.855	8.332	9.545	10.106	10.704	12.345
INSTHOLDER	5194	0.073	0.071	0.000	0.017	0.052	0.109	0.316
INDPD	5194	3.159	0.525	2.	3	3	3	5
FOLLOWER	5194	8.290	8.701	0	1	5	13	38
BIG4	5194	0.028	0.165	0	0	0	0	1
TENURE_CEO	5194	44.257	34.409	1	15	37	67	144
INCENT_CEO	5194	0.361	0.411	0.000	0.000	0.084	0.852	0.995
DUALITY	5194	0.318	0.466	0	0	0	1	1

Note: The variable definitions are given in Appendix Table-III.A. SIZE and THOLDERS are the logarithm of the original value. All continuous variables are winsorised at 1% and 99%.

Table III-3: Pearson and Spearman correlation analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
TENURE_BS		0.16 ***	-0.06 ***	0.13 ***	0.04 ***	-0.05 ***	-0.04 ***	-0.01 ***	0.10 ***	0.19 ***	0.13 ***	0.05 ***	0.03 **	-0.00 ***	0.04 ***	0.21 ***	-0.08 ***	-0.06 ***
INCENT_BS	0.07 ***		-0.02 ***	-0.15 ***	-0.18 ***	0.21 ***	0.16 ***	0.23 ***	-0.15 ***	-0.26 ***	-0.16 ***	0.14 ***	-0.03 *	0.24 ***	-0.06 ***	0.08 ***	0.44 ***	0.13 ***
FIN	-0.06 ***	-0.03 **		0.01 ***	-0.02 ***	0.02 ***	0.04 ***	0.05 ***	-0.04 ***	-0.03 **	-0.00 ***	0.01 ***	-0.03 *	0.02 ***	0.01 ***	-0.01 *	0.02 *	0.01 ***
SIZE	0.15 ***	-0.18 ***	0.01 ***		0.56 ***	-0.40 ***	-0.06 ***	-0.14 ***	0.22 ***	0.34 ***	0.61 ***	0.16 ***	0.23 ***	0.20 ***	0.20 ***	0.02 ***	-0.25 ***	-0.19 ***
LEVERAGE	0.05 ***	-0.15 ***	-0.02 *	0.42 ***		-0.19 ***	0.01 ***	-0.41 ***	0.23 ***	0.32 ***	0.34 ***	0.05 ***	0.15 ***	-0.05 ***	0.10 ***	-0.05 ***	-0.24 ***	-0.11 ***
MBRATIO	-0.08 ***	0.16 ***	0.05 ***	-0.32 ***	-0.07 ***		0.17 ***	0.25 ***	-0.02 ***	-0.14 ***	-0.20 ***	0.21 ***	-0.17 ***	0.12 ***	-0.10 ***	0.04 ***	0.25 ***	0.14 ***
GROWTH	-0.02 *	-0.01 ***	-0.00 ***	-0.01 ***	0.02 ***	0.06 ***		0.30 ***	-0.10 ***	-0.21 ***	-0.14 ***	0.23 ***	-0.02 **	0.26 ***	-0.03 **	0.02 **	0.17 ***	0.05 ***
ROA	0.00 ***	0.09 ***	0.03 *	-0.05 ***	-0.56 ***	0.05 ***	0.02 ***		-0.10 ***	-0.24 ***	-0.22 ***	0.22 ***	-0.03 *	0.47 ***	0.03 **	0.06 ***	0.21 ***	0.05 ***
FIRMAGE	0.15 ***	-0.15 ***	-0.03 **	0.22 ***	0.19 ***	0.03 **	0.03 **	-0.04 ***		0.25 ***	0.29 ***	0.02 ***	0.10 ***	-0.15 ***	0.11 ***	-0.05 ***	-0.26 ***	-0.14 ***
FLOATRATIO	0.24 ***	-0.26 ***	-0.03 **	0.32 ***	0.26 ***	-0.07 ***	-0.04 ***	-0.11 ***	0.23 ***		0.41 ***	0.01 ***	0.10 ***	-0.14 ***	0.08 ***	0.07 ***	-0.44 ***	-0.18 ***
THOLDERS	0.15 ***	-0.19 ***	-0.00 ***	0.64 ***	0.27 ***	-0.13 ***	-0.02 ***	-0.10 ***	0.28 ***	0.42 ***		-0.13 ***	0.18 ***	-0.05 ***	0.14 ***	0.00 ***	-0.24 ***	-0.14 ***
INSTHOLDER	0.04 ***	0.09 ***	-0.01 ***	0.14 ***	0.02 ***	0.12 ***	0.02 ***	0.11 ***	0.01 ***	0.04 ***	-0.14 ***		0.04 ***	0.53 ***	0.05 ***	0.08 ***	0.10 ***	0.00 ***
INDPD	0.04 ***	-0.05 ***	-0.03 **	0.26 ***	0.11 ***	-0.11 ***	-0.01 ***	0.00 ***	0.09 ***	0.10 ***	0.21 ***	0.03 **		0.06 ***	0.04 ***	-0.01 ***	-0.09 ***	-0.10 ***
FOLLOWER	-0.01 ***	0.16 ***	0.01 ***	0.23 ***	-0.04 ***	0.04 ***	0.01 ***	0.21 ***	-0.13 ***	-0.07 ***	-0.02 ***	0.48 ***	0.06 ***		0.09 ***	0.09 ***	0.20 ***	0.04 ***
BIG4	0.08 ***	-0.08 ***	0.01 ***	0.27 ***	0.07 ***	-0.07 ***	-0.01 ***	0.02 ***	0.10 ***	0.07 ***	0.17 ***	0.04 ***	0.07 ***	0.11 ***		0.01 ***	-0.08 ***	-0.07 ***
TENURE_CEO	0.21 ***	0.04 ***	-0.01 ***	0.05 ***	-0.02 *	0.00 ***	-0.03 **	0.04 ***	-0.02 *	0.13 ***	0.05 ***	0.07 ***	0.01 ***	0.09 ***	0.02 ***		0.22 ***	0.22 ***
INCENT_CEO	-0.14 ***	0.42 ***	0.03 **	-0.29 ***	-0.23 ***	0.15 ***	0.03 *	0.09 ***	-0.29 ***	-0.43 ***	-0.29 ***	0.07 ***	-0.12 ***	0.14 ***	-0.10 ***	0.17 ***		0.39 ***
DUALITY	-0.09 ***	0.14 ***	0.01 ***	-0.17 ***	-0.08 ***	0.09 ***	0.02 ***	0.00 ***	-0.14 ***	-0.17 ***	-0.13 ***	-0.01 ***	-0.09 ***	0.02 ***	-0.07 ***	0.20 ***	0.41 ***	

Note: Pearson correlations are shown above the diagonal. Spearman correlations are shown below the diagonal. All variables are winsorised at the 1% and 99% percentile. \*\*\*, \*\*, \* Significance at the 1%, 5% and 10% level (two-tailed test).

Column (2) tests H2. As the coefficient shows, TENURE\_BS has a significantly negative effect on discretionary accruals. As illustrated by studies on tenure of managers, the length of tenure embodies expertise power. A manager accumulates knowledge and apprehension of the firm's financial, operational, and market-related status and circumstance, as service term extends. The comprehensive understanding of the firm wins a board secretary sophisticated discretion over audited financial information disclosure.

Column (3) shows no evidence of significant effect of FIN on discretionary accruals. All signs of coefficients hold when explanatory variables are put in the same regression (see Column 4). Control variables are corroborated to be same as previous literature.

#### *Management forecast properties*

Panel (1) to (3) in Table III-5 tests H1, 2 and 3, using management earnings forecast accuracy as the proxy of disclosure quality. According to Table III-5, management forecast accuracy is positively related to TENURE\_BS. The longer board secretary works in the firm, the better they understand the financial status of the firm, thus helping issue more accurate forecast (Lee et al., 2012; DeBoskey et al., 2019). Other variables with significant coefficients favour the implication by previous studies. For example, SIZE have a negative effect on management forecast accuracy, predicted as Baginski and Hassell (1997). LEVERAGE and FIRMAGE are confirmed to exacerbate management forecast quality, positively associated with accuracy and negative with dispersion, which is consistent with what Hui and Matsunaga (2015), Lai and Tam (2017) find, respectively.

The results are shown in Table III-6 and 7, testing H1, 2 and 3 by using likelihood and frequency of management earnings forecast, respectively. Because of the attributes of the dependent variables, different models are applied to respective proxies for disclosure quality. LIKELIHOOD is a binomial variable to measure whether there is at least one earnings forecast during the fiscal year, therefore, a Probit model is used. The number of earnings forecasts is calculated to construct FREQUENCY, which is a non-negative discrete variable. Considering that the variation of FREQUENCY is twice the value of its expectation, I employ a negative binomial model.

Table III-4: Results of baseline model on discretionary accruals

	(1)	(2)	(3)	(4)
	DACC	DACC	DACC	DACC
INCENT_BS	0.024*** (4.297)			0.027*** (4.809)
TENURE_BS		-0.068** (-2.074)		-0.097*** (-2.908)
FIN			0.001 (0.243)	0.002 (0.383)
SIZE	-0.006** (-2.421)	-0.006** (-2.482)	-0.006** (-2.495)	-0.006** (-2.431)
LEVERAGE	0.019** (2.002)	0.018* (1.901)	0.018* (1.953)	0.018** (1.962)
MBRATIO	-0.002*** (-2.719)	-0.002*** (-2.656)	-0.002*** (-2.585)	-0.002*** (-2.878)
GROWTH	-0.030*** (-5.867)	-0.030*** (-5.902)	-0.030*** (-5.878)	-0.030*** (-5.900)
ROA	0.449*** (12.356)	0.458*** (12.656)	0.455*** (12.529)	0.452*** (12.446)
FIRMAGE	-0.000** (-1.965)	-0.000* (-1.918)	-0.001** (-2.060)	-0.000* (-1.730)
FLOATRATIO	-0.023*** (-3.573)	-0.023*** (-3.586)	-0.024*** (-3.816)	-0.021*** (-3.219)
THOLDERS	0.005** (2.203)	0.005** (2.176)	0.005** (2.107)	0.005** (2.330)
INSTHOLDER	0.049** (2.257)	0.050** (2.316)	0.049** (2.234)	0.052** (2.406)
INDPD	-0.002 (-0.779)	-0.001 (-0.650)	-0.001 (-0.622)	-0.002 (-0.811)
FOLLOWER	0.000 (0.235)	0.000 (0.494)	0.000 (0.554)	0.000 (0.124)
BIG4	-0.020*** (-3.056)	-0.021*** (-3.143)	-0.021*** (-3.213)	-0.019*** (-2.932)
TENURE_CEO	-0.031 (-0.868)	-0.018 (-0.506)	-0.033 (-0.944)	-0.008 (-0.225)
INCENT_CEO	0.010*** (2.617)	0.014*** (3.804)	0.015*** (3.888)	0.009** (2.318)
DUALITY	0.001 (0.273)	-0.000 (-0.010)	0.000 (0.108)	0.000 (0.122)
_cons	0.063 (1.434)	0.067 (1.530)	0.068 (1.544)	0.062 (1.415)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	5193	5193	5193	5193
R-sq	0.189	0.187	0.186	0.190
Adj. R-sq	0.183	0.181	0.180	0.184
F-stat	28.3	28.3	27.9	27.4

Table III-4 presents the results of OLS regression on discretionary accruals, with year and industry effect controlled.  $DACC = \beta_0 + \beta_1 \text{Board Secretary Characteristics}_{i,t} + \beta_m \text{Control variables}_{i,t} + \text{Year} + \text{Industry} + \varepsilon$ . Where DACC is calculated as the residual of the following performance-matching modified Jones model (Kothari et al., 2005).  $TA_{it} = \alpha + \beta_1 \left( \frac{1}{TASSETS_{it-1}} \right) + \beta_2 \frac{\Delta SALES_{it}}{TASSETS_{it-1}} + \beta_3 \frac{PPE_{it}}{TASSETS_{it-1}} + \beta_4 ROA_{it} + \varepsilon_{it}$ . Board secretary characteristics consist of INCENT\_BS, TENURE\_BS and FIN, where INCENT\_BS is measured as  $INCENT_{i,t} = ONEPCT_{i,t} / (ONEPCT_{i,t} + SALARY_{i,t} + BONUS_{i,t})$ ; TENURE\_BS is the number of months board secretary is in employment, divided by 1000; and FIN is a dummy variable of whether or not worked in a financial firm or institution. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

INCENT\_BS is significantly positive across the two tables; the more sensitive of board secretary's compensation package to stock price, the more inclined they are to issue management forecasts and to increase the issuance frequency. The first two results are consistent to Xing et al. (2019), who also find a positive relation between board secretary stockholding and occurrence, frequency of management annual and quarterly reports.

TENURE\_BS negatively impacts both the likelihood and number of quick reports, which agrees with the findings of Lee et al. (2012) on CEO. However, the explanation differs, based on the role of board secretary. The longer board secretary serves in the top management team, the less likely they are to choose earnings preannouncement as a channel to communicate with investors. The accumulated knowledge and understanding of the firm make them more conservative in disclosure of private information, a consequent of using more discretion.

The signs of FIN depict another picture with regard to work experience. The coefficients are significantly negative in both tables, indicating a lower disclosure quality measured by the likelihood and frequency of management forecast issuances. Board secretary who used to work in financial industry before they joined the listed firm shows a higher tendency to reduce supply of information. One explanation could be based on the pursuit of personal wealth, a familiarity of financial market and principles enables them to gain informative advantage over outsiders. Another comes from Bamber et al. (2010), whose research shows a negative relation between manager's financial working background, justifying the fewer number of management earnings forecasts results from those manager's adoption of conservative disclosure styles.

Table III-5: Results of baseline model on management forecast accuracy

	(1) ACCURACY	(2) ACCURACY	(3) ACCURACY	(4) ACCURACY
INCENT_BS	-0.000 (-0.001)			-0.035 (-0.437)
TENURE_BS		1.151* (1.822)		1.211* (1.877)
FIN			0.040 (0.627)	0.046 (0.712)
SIZE	-0.252*** (-4.900)	-0.252*** (-4.913)	-0.254*** (-4.918)	-0.254*** (-4.935)
LEVERAGE	-1.234*** (-6.297)	-1.227*** (-6.281)	-1.231*** (-6.277)	-1.224*** (-6.270)
MBRATIO	0.018 (1.208)	0.019 (1.271)	0.018 (1.188)	0.019 (1.266)
GROWTH	-0.120 (-1.590)	-0.119 (-1.576)	-0.121 (-1.597)	-0.120 (-1.585)
ROA	0.009 (0.007)	-0.040 (-0.033)	-0.001 (-0.001)	-0.045 (-0.037)
FIRMAGE	-0.011** (-2.559)	-0.012*** (-2.693)	-0.011** (-2.551)	-0.012*** (-2.684)
FLOATRATIO	0.012 (0.096)	-0.011 (-0.085)	0.012 (0.095)	-0.014 (-0.112)
THOLDERS	0.138*** (3.360)	0.135*** (3.281)	0.138*** (3.365)	0.135*** (3.276)
INSTHOLDER	0.587 (1.558)	0.555 (1.471)	0.593 (1.571)	0.560 (1.475)
INDPD	-0.008 (-0.168)	-0.008 (-0.155)	-0.007 (-0.153)	-0.006 (-0.127)
FOLLOWER	-0.006* (-1.866)	-0.006* (-1.807)	-0.006* (-1.849)	-0.006* (-1.759)
BIG4	-0.390*** (-2.687)	-0.398*** (-2.738)	-0.391*** (-2.695)	-0.400*** (-2.754)
TENURE_CEO	0.898 (1.375)	0.641 (0.964)	0.904 (1.385)	0.629 (0.946)
INCENT_CEO	0.078 (1.219)	0.083 (1.318)	0.078 (1.233)	0.090 (1.384)
DUALITY	0.093** (1.974)	0.099** (2.085)	0.093** (1.967)	0.098** (2.077)
_cons	3.303*** (3.621)	3.310*** (3.637)	3.314*** (3.632)	3.329*** (3.652)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	5194	5194	5194	5194
R-sq	0.176	0.177	0.176	0.177
Adj. R-sq	0.171	0.171	0.171	0.171
F-stat	21.3	21.2	21.2	20.2

Table III-5 presents the results of OLS regression on management forecast accuracy, with year and industry effect controlled. Management forecast accuracy is calculated as the following equation.

$$ACCURACY = -1 \times \frac{[\text{mean of management forecast EPS} - \text{actual EPS}]}{\text{Beginning-of-fiscal-year stock price}} \times 100.$$

Board secretary characteristics consist of INCENT\_BS, TENURE\_BS and FIN, where INCENT\_BS is measured as  $INCENT_{i,t} = ONEPCT_{i,t} / (ONEPCT_{i,t} + SALARY_{i,t} + BONUS_{i,t})$ ; TENURE\_BS is the number of months board secretary is in employment, divided by 1000; and FIN is a dummy variable of whether or not worked in a financial firm or institution. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

Table III-6: Results of baseline model on the likelihood of earnings preannouncement issuance

	(1) LIKELIHOOD	(2) LIKELIHOOD	(3) LIKELIHOOD	(4) LIKELIHOOD
INCENT_BS	0.234*** (2.592)			0.282*** (3.075)
TENURE_BS		-1.443*** (-2.786)		-1.807*** (-3.416)
FIN			-0.144** (-2.427)	-0.144** (-2.417)
SIZE	-0.012 (-0.335)	-0.013 (-0.376)	-0.009 (-0.249)	-0.007 (-0.202)
LEVERAGE	-0.319** (-2.236)	-0.332** (-2.326)	-0.337** (-2.359)	-0.340** (-2.383)
MBRATIO	0.052*** (5.204)	0.052*** (5.202)	0.054*** (5.407)	0.051*** (5.145)
GROWTH	0.380*** (6.833)	0.377*** (6.710)	0.381*** (6.780)	0.378*** (6.780)
ROA	-5.385*** (-9.910)	-5.273*** (-9.696)	-5.289*** (-9.726)	-5.301*** (-9.750)
FIRMAGE	0.041*** (9.934)	0.041*** (10.042)	0.040*** (9.854)	0.042*** (10.118)
FLOATRATIO	-0.441*** (-4.635)	-0.425*** (-4.442)	-0.455*** (-4.787)	-0.404*** (-4.210)
THOLDERS	-0.134*** (-4.026)	-0.133*** (-4.013)	-0.137*** (-4.115)	-0.131*** (-3.944)
INSTHOLDER	-0.352 (-1.099)	-0.323 (-1.009)	-0.378 (-1.183)	-0.320 (-0.994)
INDPD	-0.055 (-1.474)	-0.053 (-1.419)	-0.054 (-1.465)	-0.059 (-1.596)
FOLLOWER	-0.002 (-0.709)	-0.002 (-0.563)	-0.002 (-0.570)	-0.003 (-0.895)
BIG4	-0.028 (-0.243)	-0.029 (-0.255)	-0.037 (-0.324)	-0.014 (-0.121)
TENURE_CEO	-1.598*** (-2.847)	-1.307** (-2.271)	-1.642*** (-2.920)	-1.221** (-2.122)
INCENT_CEO	-0.104* (-1.704)	-0.066 (-1.120)	-0.058 (-0.996)	-0.121* (-1.960)
DUALITY	0.093** (2.103)	0.080* (1.823)	0.089** (2.023)	0.086* (1.957)
_cons	2.324*** (3.728)	2.359*** (3.787)	2.329*** (3.730)	2.279*** (3.663)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	5183	5183	5183	5183
Pseudo R-sq	0.087	0.087	0.087	0.090
Wald Chi-sq	520.6	514.5	514.2	533.7

Table III-6 presents the results of a Probit regression on the likelihood of management earnings forecast issuance, with year and industry effect controlled. LIKELIHOOD is a binary variable equals 1 when a firm issues at least one earnings preannouncement during the year and 0 otherwise. Board secretary characteristics consist of INCENT\_BS, TENURE\_BS and FIN, where INCENT\_BS is measured as  $INCENT_{i,t} = ONEPCT_{i,t} / (ONEPCT_{i,t} + SALARY_{i,t} + BONUS_{i,t})$ ; TENURE\_BS is the number of months board secretary is in employment, divided by 1000; and FIN is a dummy variable of whether or not worked in a financial firm or institution. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

Table III-7: Results of baseline model on the number of management forecast issuances

	(1) FREQUENCY	(2) FREQUENCY	(3) FREQUENCY	(4) FREQUENCY
INCENT_BS	0.199*** (3.228)			0.241*** (3.852)
TENURE_BS		-1.261*** (-2.887)		-1.622*** (-3.609)
FIN			-0.111** (-2.281)	-0.110** (-2.241)
SIZE	-0.020 (-0.719)	-0.022 (-0.811)	-0.017 (-0.622)	-0.018 (-0.651)
LEVERAGE	-0.348** (-3.228)	-0.353** (-3.288)	-0.362** (-3.367)	-0.364** (-3.394)
MBRATIO	0.039*** (6.726)	0.039*** (6.674)	0.041*** (7.030)	0.038*** (6.510)
GROWTH	0.229*** (7.408)	0.229*** (7.346)	0.230*** (7.433)	0.230*** (7.439)
ROA	-4.111*** (-10.522)	-3.989*** (-10.230)	-4.024*** (-10.309)	-4.021*** (-10.299)
FIRMAGE	0.028*** (8.687)	0.028*** (8.847)	0.027*** (8.506)	0.028*** (8.957)
FLOATRATIO	-0.421*** (-5.782)	-0.413*** (-5.656)	-0.432*** (-5.942)	-0.382*** (-5.197)
THOLDERS	-0.187*** (-7.145)	-0.187*** (-7.132)	-0.191*** (-7.279)	-0.184*** (-7.005)
INSTHOLDER	-0.406 (-1.645)	-0.384 (-1.550)	-0.427* (-1.716)	-0.372 (-1.491)
INDPD	-0.015 (-0.485)	-0.011 (-0.372)	-0.013 (-0.432)	-0.017 (-0.562)
FOLLOWER	-0.000 (-0.096)	0.000 (0.036)	0.000 (0.092)	-0.001 (-0.302)
BIG4	-0.013 (-0.111)	-0.011 (-0.093)	-0.023 (-0.199)	0.000 (0.004)
TENURE_CEO	-1.070** (-2.205)	-0.797 (-1.607)	-1.104** (-2.272)	-0.736 (-1.485)
INCENT_CEO	0.000 (0.008)	0.027 (0.606)	0.035 (0.791)	-0.017 (-0.368)
DUALITY	0.070** (2.081)	0.062* (1.844)	0.067** (1.990)	0.063* (1.878)
_cons	2.863*** (5.835)	2.924*** (5.986)	2.881*** (5.869)	2.845*** (5.833)
lnalpha	-0.443*** (-8.199)	-0.442*** (-8.187)	-0.441*** (-8.170)	-0.454*** (-8.334)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	5194	5194	5194	5194
Pseudo R-sq	0.035	0.035	0.035	0.036
Wald Chi-sq	917.6	931.1	913.6	930.7

Table III-7 presents the results of a negative binomial regression on the likelihood of management earnings forecast issuance, with year and industry effect controlled. FREQUENCY is measured as the number of earnings preannouncements in the fiscal year. Board secretary characteristics consist of INCENT\_BS, TENURE\_BS and FIN, where INCENT\_BS is measured as  $INCENT_{i,t} = ONEPCT_{i,t} / (ONEPCT_{i,t} + SALARY_{i,t} + BONUS_{i,t})$ ; TENURE\_BS is the number of months board secretary is in employment, divided by 1000; and FIN is a dummy variable of whether or not worked in a financial firm or institution. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

*Disclosure transparency score*

Table III-10 reports the results with dependent variables SZSCORE, exploring the relation between the independent variables and disclosure transparency score. SZSCORE is an ordered variables ranging from 1 to 4, meaning D to A degrees of disclosure transparency assessed by SZSE. In separate regressions on each independent variable, TENURE and INCENT\_BS display significant positive coefficients, indicating their positive effect on entitling the firm a better score and disclosure quality. Longer employment period and stock-based compensation enhance the board secretary's ability and incentives to improve the disclosure environment and quality. Since no prior research ever touch the relation of any variables and disclosure transparency score, this paper assumes that the driven motivation lies in the managers pursuit of personal wealth based on stock holding, therefore they improve the disclosure quality assessed by the security market to build a better image and to acquire credibility from outsiders. The credibility in return could gain them profit from the price movement, benefiting from predictability of future information disclosure. That also confirms prior findings about the alignments of the interest of insiders with outsiders, consistent with Nagar et al. (2003).

Longer tenure, indicating a more comprehensive knowledge of firm, favors board secretary to both comply with security market disclosure-related regulations and issue publications of better quality. Financial work experience bears no significant association with the transparency score.

LEVERAGE, reports a significant negative coefficient, corroborating the study of Hui and Matsunaga (2015), suggesting a decrease in score associated with higher leverage. The positive sign of ROA also agrees with Hui and Matsunaga (2015), showing that a better profitability enhances the disclosure transparency.

Table III-8: Results of baseline model on SZSE disclosure transparency score

	(1) SZSCORE	(2) SZSCORE	(3) SZSCORE	(4) SZSCORE
INCENT_BS	0.391** (2.556)			0.254 (1.643)
TENURE_BS		4.460*** (5.088)		4.155*** (4.697)
FIN			-0.114 (-1.115)	-0.082 (-0.803)
SIZE	0.411*** (7.182)	0.409*** (7.153)	0.412*** (7.188)	0.413*** (7.206)
LEVERAGE	-1.102*** (-4.733)	-1.088*** (-4.675)	-1.122*** (-4.816)	-1.088*** (-4.670)
MBRATIO	-0.042*** (-2.741)	-0.037** (-2.405)	-0.040*** (-2.587)	-0.038** (-2.459)
GROWTH	-0.305*** (-3.660)	-0.301*** (-3.602)	-0.304*** (-3.636)	-0.300*** (-3.588)
ROA	13.904*** (15.749)	13.856*** (15.623)	14.011*** (15.799)	13.850*** (15.591)
FIRMAGE	-0.011 (-1.569)	-0.013* (-1.949)	-0.011* (-1.652)	-0.013* (-1.925)
FLOATRATIO	0.306* (1.880)	0.190 (1.156)	0.283* (1.740)	0.213 (1.295)
THOLDERS	-0.148*** (-2.687)	-0.162*** (-2.937)	-0.153*** (-2.776)	-0.160*** (-2.885)
INSTHOLDER	0.411 (0.802)	0.280 (0.546)	0.386 (0.754)	0.282 (0.548)
INDPD	0.114* (1.833)	0.121* (1.938)	0.117* (1.872)	0.116* (1.862)
FOLLOWER	0.029*** (6.108)	0.031*** (6.487)	0.030*** (6.309)	0.030*** (6.282)
BIG4	0.170 (0.898)	0.129 (0.671)	0.154 (0.814)	0.143 (0.743)
TENURE_CEO	3.019*** (3.181)	2.048** (2.135)	2.958*** (3.117)	2.131** (2.216)
INCENT_CEO	-0.117 (-1.114)	-0.024 (-0.236)	-0.041 (-0.404)	-0.072 (-0.685)
DUALITY	-0.121 (-1.611)	-0.109 (-1.448)	-0.129* (-1.705)	-0.106 (-1.401)
cut1	4.184*** (4.138)	4.078*** (4.040)	4.136*** (4.089)	4.161*** (4.109)
cut2	6.791*** (6.816)	6.691*** (6.725)	6.742*** (6.764)	6.776*** (6.791)
cut3	10.819*** (10.754)	10.730*** (10.678)	10.766*** (10.694)	10.817*** (10.734)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	5194	5194	5194	5194
Pseudo R-sq	0.116	0.118	0.115	0.118
Wald Chi-sq	866.3	867.8	853.6	872.6

Table III-8 presents the results of an ordered logistic regression on the likelihood of management earnings forecast issuance, with year and industry effect controlled. SZSCORE is an ordered variables ranging from 1 to 4, meaning D to A degrees of disclosure transparency assessed by SZSE. Board secretary characteristics consist of INCENT\_BS, TENURE\_BS and FIN, where INCENT\_BS is measured as  $INCENT_{i,t} = ONEPCT_{i,t} / (ONEPCT_{i,t} + SALARY_{i,t} + BONUS_{i,t})$ ; TENURE\_BS is the number of months board secretary is in employment, divided by 1000; and FIN is a dummy variable of whether or not worked in a financial firm or institution. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

#### ***III.4.4 Sensitivity analysis***

Sensitivity analysis is conducted by replacing management forecast frequency with the tone of the forecast: the number of issuances containing good news (e.g. Beyer et al., 2010). The alternative variable captures one more dimension of a firm's disclosure quality, to enhance the power of explanation. GOODNEWS is defined as the number of earnings preannouncements with any description of the earnings among "Turn loss into profit", "continue to profit", "profit increases greatly", "profit increase slightly".

Across the whole sample, GOODNEWS are positive integers ranging from 0 to 6. Because of similar value of expectation and variation, a Poisson model is used to test the robustness analysis. Results in Appendix Table-B1 show that GOODNEWS are significantly related to stock-based incentives and financial work experience. Both factors are positively related to the number of management forecasts with a positive tone. The coefficient of INCENT\_BS is consistent with that in the baseline regression. FIN gains significance against baseline test, indicating that board secretary with financial expertise shows more tendency toward the issuance of good news than toward the overall frequency of management forecasts issuance.

#### **III.5 Endogeneity analyses**

Studies recorded the endogeneity problems caused by the omitted variables and self-selection bias in the study of top manager characteristics (e.g. Beyer et al., 2010; Sengupta and Zhang, 2015; Wang et al., 2015; Wang et al., 2019). To alleviate the concern of endogeneity problems, instrumental variables approach and propensity score matching are employed. Results under both methods confirm the robustness of main regressions.

##### ***III.5.1 Instrumental variable analysis***

In the analysis using demographic characteristic as independent variable, most cases suffer endogeneity problem caused by omitted variables or self-selection bias. This paper chooses tenure and stock-based incentives of the board secretary, thus probably introducing omitted variable concern. This paper attempts to deal with the endogeneity concerns by using an instrumental variable approach. For the variables to present tenure, I select age of board

secretary (AGE) (Sengupta and Zhang, 2015), the final educational level (EDUC), and member of the board (BSBOARD, dummy variable) as the instruments. As board secretary gets older, they tend to have longer tenure. Also, a better educational level would help them hold the position and get well compensated. The position in the board of directors is also a sign of power in the listed firms. On one hand, there is neither theory nor prior research demonstrates an association between any one of these instrumental variables and a firm's disclosure quality. On the other, no statistical parameter from regression shows the relation between instrumental and dependent variables. The regressions also pass Hansen J statistic and weak identification test.

A two-stage model is employed. In the first stage, regress TENURE\_BS on instrumental variables and other explanatory and control variables. The second stage is to replace TENURE\_BS with the fitted value of the dependent variables in the first stage, and then run models of different measurements of disclosure quality accordingly. The results are displayed in Appendix, Table B2.1 and B2.2. In Table B2.2, the results of first stage are reported in the middle of each column, under different dependent variables respectively. All three instruments are significantly positively related to TENURE\_BS at 0.05 level. The coefficients for TENURE\_BS is significantly negative with LIKELIHHOD and FREQUENCY, consistent with the results in baseline tests. In general, the instrumental variable analysis indicates the robustness of regressions on management forecast occurrence and frequency.

#### ***III.5.2 Propensity score matching***

My second concern about endogeneity problem rises from financial work experience of board secretary, which causes self-selection bias. A few characteristics of the listed firm potentially caused the recruitment of a board secretary with financial work experience. Firm-specific and the two-tier board system characteristics are considered in the process of selecting and appointing a board secretary with financial work experience. To alleviate the self-selection bias, this paper employs a propensity score matching method.

First, to calculate propensity score of treatment variable FIN using a Probit model. I select the following variables as the factors that influence the possibility of recruiting a board secretary with financial background: SIZE LEVERAGE MBRATIO GROWTH ROA FIRMAGE INSTHOLDER INDPD TENURE\_CEO SUPERVISOR (see definitions in Appendix Table-

III.A), and with year and industry effect being controlled. Considering the size of the sample and the number of treatments, a one-to-five nearest neighbourhood matching with a calliper size of less than 0.05 with replacement is performed. The results of covariate balance check before and after matching show a more balanced panel of control variables, the t-test of difference falls into insignificance (See Appendix Table III-B3.3).

Table III-B3.1 and B3.2 reports the results after propensity score matching, showing only strong evidence of negative relation with likelihood and frequency of management forecast. All the results stay with baseline analysis in terms of extent, direction and significance, confirming the robustness of the main regressions and relieving from endogeneity problem.

## III.6 Conclusions

Board secretary is mandatorily set up as a member of top management team to undertake responsibility mainly for information disclosure in Chinese listed firms, as a method to complement and improve corporate governance. The main role of board secretary is to fulfil the duty of regulation compliance and information disclosure. Although corporate governance structure and top managers, such as CEO and CFO, are intensively investigated by prior research, few focuses on the role of board secretary. Disclosure quality also presents frequently in literature to be influenced by characteristics and incentives of top managers; however, there is a vacancy in the study of incentive and characteristics of board secretary and disclosure quality. In line with agency theory that solve the problem between insiders and outsiders, and upper echelons theory that concentrates on the demographics of top managers, this paper employs measurements represent stock-based incentives, tenure and financial work experience, respectively. As with previous studies, disclosure quality is proxied by four most frequently used measurements: (1) accrual-based earnings management (discretionary accruals), (2) management forecast accuracy, (3) likelihood and frequency of earnings forecast preannouncement, and (4) disclosure transparency score assessed by SZSE. Therefore, this study attempts to fill the gap in the literature by examining the association between three measurements of board secretary's characteristics and firms' disclosure quality. Considering the publication and availability of an official transparency score, my sample includes the non-financial listed firms on SZSE from 2012-2016.

Evidence shows that characteristics of board secretary are associated with disclosure quality. The results of tenure provide further evidence for risk-averse preference of managers caused by their longer entrenchment. Longer tenured board secretary is associated with less upward discretionary accruals and better SZSE transparency score, whereas inhibits the likelihood and frequency of the firm to issue earnings forecast preannouncements. In contrast to tenure, larger stock-based incentives have a positive relation to upward accrual-based earnings management and an increase in the likelihood and number of earnings preannouncement issuance. The influences of financial work experience on disclosure quality are limited to earnings forecast preannouncements. The results indicate that finance expertise has a negative influence on board secretary's tendency to issue preannouncement, and the number of issuances. The results hold after controlling for stock-based incentives ratio and tenure of CEO, and other firm-specific and demographic factors.

This study is limited in several aspects, yet also provide ideas for future studies. First, the current sample is constrained by the collection and dimensions of data. For example, in the construction of stock-based incentives ratio, calculations regarding to options are suffering unavailability of information about exercise period and exercise price. Second, this study only examines listed firms on Shenzhen Stock Exchange from 2012 to 2016, primarily for the reason that during this period of time, SZSE establish a transparency score assessment system. In comparison, Shanghai Stock Exchange took its first step much later and the time period of disclosure is too short to investigate. The change of board secretary may introduce causality issue, future studies can also examine the effect of board secretary's turnover.

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### III.8 Appendix

Table III-A: Explanation of variables used in the models

Variables	Explanation	Source
<b>Dependent variables</b>		
DACC	Performance-matching modified Jones model (Kothari et al., 2005) DACC is measured by the residual generated from the regression below. $TA_{it} = \alpha + \beta_1(1/TASSETS_{it-1}) + \beta_2 \Delta SALES_{it}/TASSETS_{it-1} + \beta_3 PPE_{it}/TASSETS_{it-1} + \beta_4 ROA_{it} + \varepsilon_{it}$	CSMAR
ACCURACY	Management forecast accuracy: the absolute difference between the first management forecast of earnings per share and actual year-end earnings per share divided by the beginning-of-the-year stock price.	CSMAR
LIEKLIHOOD	Equals 1 if there is at least one preannouncement of earning, otherwise 0.	CSMAR
FREQUENCY	The number of preannouncements of earnings during the fiscal year.	CSMAR
SZSCORE	The disclosure transparency score issued by SZSE.	www.szse.cn
GOODNEWS	The number of preannouncements of earnings including any prediction type among “Turn loss into profit”, “continue to profit”, “profit increases greatly”, “profit increase slightly”.	CSMAR
<b>Explanatory variables</b>		
TENURE_BS	The number of months the board secretary serves in the firm at the end of fiscal year.	FP
INCENT_BS	Percentage change of board secretary’s compensation package by one percentage point increase in firm’s stock price. $INCENTIVE_{it} = ONEPCT_{it}/(ONEPCT_{it} + SALARY_{it} + BONUS_{it} + OPTION_{it})$	CSMAR/ FP
FIN	Dummy variable equals 1 if the board secretary has financial work experience, and 0 otherwise.	FP
<b>Control variables</b>		
<i>Firm-specific</i>		
SIZE	Logarithmic value of total beginning-of-the-year asset.	CSMAR
FIRMAGE	The number of years since the company was incorporated.	CSMAR
LEVERAGE	Debt to asset ratio: Total book value of debt normalized by total book value of end-of-the-year asset.	CSMAR
MBRATIO	Market-to-book ratio: stock market price divided by book value of end-of-the-year equity.	CSMAR
GROWTH	Percentage of growth in revenue compared to the previous fiscal year.	CSMAR
ROA	Earnings divided by total end-of-the-year assets.	CSMAR

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FLOATRATIO	The ratio of marketable shares to the total shares at the end of fiscal year.	CSMAR
THOLDER	Number of common shareholders (in thousands) at the end of the year.	CSMAR
INSTHOLDER	Ratio of shares held by institutional shareholders.	CSMAR
FOLLOWER	The number of analysts who follow the firm in the accounting year.	CSMAR
BIG4	Dummy variable equals 1 if the firm is audited by a Big 4, and 0 otherwise.	CSMAR
INDPD	The number of independent directors in the board.	FP
<b>Demographic</b>		
DUALITY	Dummy variable equals 1 if the firm's CEO is also the chair of board, and 0 otherwise. $INCENTIVE_{i,t} = ONEPCT_{i,t} / (ONEPCT_{i,t} + SALARY_{i,t} + BONUS_{i,t})$	FP
INCENT_CEO	percentage change of CEO's compensation package by one percentage point increase in firm's stock price.	FP
TENURE_CEO	Percentage of CEO compensation to an aggregated compensation of top five executives in the management team.	FP
<b>Instrumental Variables</b>		
AGE	The age of board secretary at the end of the fiscal year.	FP
EDUC	The level of board secretary's last educational degree.	FP
BSBOARD	Dummy variable equals 1 if the board secretary is a member on the board of directors.	FP
<b>Propensity score matching</b>		
SUPERVISOR	The number of members on the supervisory board at the end of the year.	FP

Note: CSMAR is short for China Stock Market & Accounting Research Database. FP is abbreviated from "Financial Report", including annual financial statement, quarterly financial report and quick report.

Table III-B1: Results of baseline model on good news

	(1) GOODNEWS	(2) GOODNEWS	(3) GOODNEWS	(4) GOODNEWS
TENURE_BS	0.104*** (3.264)			0.122*** (3.710)
INCENT_BS		-0.208 (-0.796)		-0.370 (-1.371)
FIN			0.046* (1.844)	0.052** (2.050)
SIZE	-0.073*** (-4.258)	-0.074*** (-4.281)	-0.075*** (-4.384)	-0.075*** (-4.367)
LEVERAGE	0.343*** (4.929)	0.339*** (4.870)	0.345*** (4.954)	0.347*** (4.977)
MBRATIO	-0.012*** (-3.074)	-0.012*** (-2.967)	-0.012*** (-3.015)	-0.013*** (-3.247)
GROWTH	0.137*** (6.642)	0.135*** (6.529)	0.135*** (6.549)	0.136*** (6.585)
ROA	3.141*** (11.481)	3.180*** (11.602)	3.161*** (11.551)	3.133*** (11.467)
FIRMAGE	-0.013*** (-6.720)	-0.013*** (-6.741)	-0.013*** (-6.745)	-0.012*** (-6.572)
FLOATRATIO	-0.097** (-2.128)	-0.101** (-2.203)	-0.105** (-2.318)	-0.090* (-1.958)
THOLDERS	0.016 (1.018)	0.015 (0.973)	0.015 (0.939)	0.018 (1.120)
INSTHOLDER	0.586*** (4.252)	0.586*** (4.228)	0.587*** (4.237)	0.610*** (4.393)
INDPD	-0.021 (-1.129)	-0.018 (-0.984)	-0.017 (-0.935)	-0.020 (-1.077)
FOLLOWER	0.008*** (6.157)	0.008*** (6.396)	0.008*** (6.466)	0.007*** (6.105)
BIG4	-0.028 (-0.415)	-0.035 (-0.511)	-0.037 (-0.545)	-0.030 (-0.441)
TENURE_CEO	0.701** (2.555)	0.740*** (2.643)	0.704** (2.569)	0.797*** (2.843)
INCENT_CEO	0.097*** (3.703)	0.115*** (4.558)	0.115*** (4.557)	0.092*** (3.500)
DUALITY	-0.012 (-0.608)	-0.015 (-0.759)	-0.014 (-0.716)	-0.013 (-0.678)
_cons	1.951*** (6.333)	1.962*** (6.366)	1.985*** (6.433)	1.965*** (6.365)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	4771	4771	4771	4771
Pseudo R-sq	0.053	0.053	0.053	0.053
Wald Chi-sq	1141.2	1121.4	1123.4	1151.3

Table III-B1 presents the results of a Poisson regression on the number of management earnings forecast with positive tone, with year and industry effect controlled. GOODNEWS is defined as the number of earnings preannouncements with any description of the earnings among “Turn loss into profit”, “continue to profit”, “profit increases greatly”, “profit increase slightly”. Board secretary characteristics consist of INCENT\_BS, TENURE\_BS and FIN, where INCENT\_BS is measured as  $INCENT_{i,t} = ONEPCT_{i,t} / (ONEPCT_{i,t} + SALARY_{i,t} + BONUS_{i,t})$ ; TENURE\_BS is the number of months board secretary is in employment, divided by 1000; and FIN is a dummy variable of whether or not worked in a financial firm or institution. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

Table III-B2.1: Instrumental variable analysis

	(1) TENURE_BS	(2) DACC	(3) TENURE_BS	(4) ACCURACY
TENURE_BS		-0.090 (-0.896)		-2.187 (-1.220)
AGE	0.002*** (23.229)		0.002*** (24.164)	
EDUC	0.002** (1.994)		0.002** (2.044)	
BSBOARD	0.005*** (4.581)		0.005*** (4.621)	
INCENT_BS	0.018*** (8.794)	0.027*** (4.192)	0.018*** (7.833)	0.073 (0.755)
FIN	-0.005*** (-3.719)	0.002 (0.429)	-0.005*** (-3.401)	0.031 (0.476)
_cons	-0.056*** (-3.426)	0.062 (1.632)	-0.056*** (-3.673)	3.285*** (3.600)
Controls	Included	Included	Included	Included
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	5193	5193	5194	5194
R-sq	0.252	0.190	0.252	0.172
Adj. R-sq	0.247	0.184	0.247	0.166
F-stat	46.1	32.5	44.6	20.1

Table III-B2.1 presents the results of 2SLS regression. In the first stage, TENURE\_BS is explained by instrumental variables: AGE, BSBOARD, EDUC, and control variables (see Columns (1) and (3)). In the second stage, TENURE\_BS is replaced by the predicted value from the first stage, entering OLS regressions respectively on discretionary accruals and management forecast accuracy, with year and industry effect controlled (see Columns (2) and (4)). All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

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Table III-B2.2: Instrumental variable analysis

	(1) LIKELIHOOD	(2) FREQUENCY	(3) SZSCORE
TENURE_BS	-3.067* (-1.905)	-1.489*** (-2.998)	4.492*** (4.937)
INCENT_BS	0.321*** (3.114)	0.189** (2.575)	0.386** (2.515)
FIN	-0.149** (-2.534)	-0.102** (-1.982)	-0.100 (-0.972)
_cons	2.259*** (3.670)	2.850*** (5.500)	
	TENURE BS	TENURE BS	TENURE BS
AGE	0.002*** (24.208)	0.002*** (24.164)	0.002*** (24.196)
EDUC	0.002** (1.997)	0.002** (2.044)	0.002** (2.093)
BSBOARD	0.005*** (4.652)	0.005*** (4.621)	0.005*** (4.641)
INCENT_BS	0.018*** (7.748)	0.018*** (7.833)	0.018*** (7.859)
FIN	-0.005*** (-3.322)	-0.005*** (-3.401)	-0.005*** (-3.421)
_cons	-0.056*** (-3.694)	-0.056*** (-3.673)	-0.055*** (-3.615)
athrho2_1	0.046 (0.826)		
lnsigma2	-3.427*** (-348.879)		
lnalpha		-0.452*** (-8.585)	
cut1			4.217*** (4.165)
cut2			6.830*** (6.847)
cut3			10.873*** (10.790)
Controls	Included	Included	Included
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
N	5183	5194	5194
Wald chi-sq	567.4	660.4	876.255

Table III-B2.2 presents the results of 2SLS regression. In the first stage, TENURE\_BS is explained by instrumental variables: AGE, BSBOARD, EDUC, and control variables (see the middle part of each column). In the second stage, TENURE\_BS is replaced by the predicted value from the first stage, entering Probit, Negative binomial, and Ordered logistic regressions respectively on likelihood, frequency of management forecast accuracy, and SZSE disclosure transparency score, with year and industry effect controlled (see the upper part of each column). All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

Table III-B3.1: Propensity score matching

	(1) DACC	(2) ACCURACY
FIN	0.001 (0.216)	0.027 (0.390)
INCENT_BS	0.027*** (3.278)	0.093 (0.663)
TENURE_BS	-0.081 (-1.591)	0.456 (0.520)
_cons	0.066 (1.193)	3.427*** (3.600)
Controls	Included	Included
Year	Yes	Yes
Industry	Yes	Yes
N	2529	2535
R-sq	0.212	0.223
Adj. R-sq	0.200	0.212
F-stat	18.6	19.9

Table III-B3.1 presents the results of OLS regression, based on a matched sample after propensity score matching, with year and industry effect controlled. The model applies to both discretionary accrual and management forecast accuracy. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

Table III-B3.2: Propensity score matching

	(1) LIKELIHOOD	(2) FREQUENCY	(3) SZSCORE
FIN	-0.125** (-2.000)	-0.095* (-1.737)	-0.041 (-0.399)
INCENT_BS	0.438*** (3.350)	0.311*** (3.011)	0.560*** (2.664)
TENURE_BS	-2.352*** (-2.991)	-2.092*** (-3.002)	3.832*** (2.896)
_cons	1.863** (2.145)	2.734*** (3.769)	
lnalpha		-0.491*** (-6.277)	
cut1			5.124*** (3.582)
cut2			9.105*** (6.316)
Controls	Included	Included	Included
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
N	2532	2535	2535
Pseudo R-sq	0.098	0.041	0.124
Wald Chi-sq	337.3	364.0	529.6

Table III-B3.2 presents the results of Probit, Negative binomial, and Ordered logistic regressions, based on a matched sample after propensity score matching, with year and industry effect controlled. The models apply respectively to the likelihood, frequency of management forecast, and SZSE disclosure transparency score, with year and industry effect controlled (see the upper part of each column). All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

Table III-B3.3: Covariate Balance Check Before and After Matching

Covariate	Sample	DACC			ACCURACY			LIKELIHOOD			FREQUENCY			SZSCORE		
		%bias	t-test	p-value	%bias	t-test	p-value	%bias	t-test	p-value	%bias	t-test	p-value	%bias	t-test	p-value
SIZE	Unmatched	2.6	0.58	0.564	2.6	0.58	0.561	2.6	0.58	0.561	2.6	0.58	0.561	2.6	0.58	0.561
	Matched	-0.8	-0.14	0.890	-0.5	-0.09	0.930	-0.5	-0.09	0.930	-0.5	-0.09	0.930	-0.5	-0.09	0.930
LEVERAGE	Unmatched	-7.2	-1.63	0.102	-7.2	-1.64	0.102	-7.2	-1.64	0.102	-7.2	-1.64	0.102	-7.2	-1.64	0.102
	Matched	-4.6	-0.78	0.435	-4.2	-0.71	0.479	-4.2	-0.71	0.479	-4.2	-0.71	0.479	-4.2	-0.71	0.479
MBRATIO	Unmatched	12.8	3.17	0.002	12.8	3.17	0.002	12.8	3.17	0.002	12.8	3.17	0.002	12.8	3.17	0.002
	Matched	-1.2	-0.19	0.846	-0.9	-0.14	0.888	-0.9	-0.14	0.888	-0.9	-0.14	0.888	-0.9	-0.14	0.888
GROWTH	Unmatched	9.5	2.22	0.026	9.5	2.22	0.026	9.5	2.22	0.026	9.5	2.22	0.026	9.5	2.22	0.026
	Matched	-0.9	-0.15	0.882	-0.2	-0.03	0.980	-0.2	-0.03	0.980	-0.2	-0.03	0.980	-0.2	-0.03	0.980
ROA	Unmatched	14.8	3.37	0.001	14.8	3.37	0.001	14.8	3.37	0.001	14.8	3.37	0.001	14.8	3.37	0.001
	Matched	1.2	0.21	0.833	1.3	0.22	0.829	1.3	0.22	0.829	1.3	0.22	0.829	1.3	0.22	0.829
FIRMAGE	Unmatched	-8.0	-1.91	0.056	-8.0	-1.92	0.055	-8.0	-1.92	0.055	-8.0	-1.92	0.055	-8.0	-1.92	0.055
	Matched	0.4	0.06	0.949	-0.8	-0.14	0.888	-0.8	-0.14	0.888	-0.8	-0.14	0.888	-0.8	-0.14	0.888
FLOATRATIO	Unmatched	-8.6	-1.93	0.054	-8.6	-1.94	0.053	-8.6	-1.94	0.053	-8.6	-1.94	0.053	-8.6	-1.94	0.053
	Matched	0.0	0.01	0.996	1.0	0.16	0.871	1.0	0.16	0.871	1.0	0.16	0.871	1.0	0.16	0.871
THOLDERS	Unmatched	-0.1	-0.03	0.978	-0.1	-0.03	0.978	-0.1	-0.03	0.978	-0.1	-0.03	0.978	-0.1	-0.03	0.978
	Matched	-1.9	-0.33	0.741	-0.2	-0.04	0.970	-0.2	-0.04	0.970	-0.2	-0.04	0.970	-0.2	-0.04	0.970
INSTHOLDER	Unmatched	-1.8	-0.39	0.694	-1.8	-0.39	0.698	-1.8	-0.39	0.698	-1.8	-0.39	0.698	-1.8	-0.39	0.698
	Matched	-1.0	-0.18	0.861	-1.3	-0.22	0.830	-1.3	-0.22	0.830	-1.3	-0.22	0.830	-1.3	-0.22	0.830
INDPD	Unmatched	-10.2	-2.21	0.027	-10.2	-2.21	0.027	-10.2	-2.21	0.027	-10.2	-2.21	0.027	-10.2	-2.21	0.027
	Matched	2.0	0.36	0.719	4.2	0.76	0.450	4.2	0.76	0.450	4.2	0.76	0.450	4.2	0.76	0.450
FOLLOWER	Unmatched	3.7	0.84	0.399	3.7	0.85	0.396	3.7	0.85	0.396	3.7	0.85	0.396	3.7	0.85	0.396
	Matched	-4.8	-0.83	0.407	-5.8	-0.98	0.326	-5.8	-0.98	0.326	-5.8	-0.98	0.326	-5.8	-0.98	0.326
BIG4	Unmatched	1.7	0.40	0.690	1.7	0.40	0.689	1.7	0.40	0.689	1.7	0.40	0.689	1.7	0.40	0.689
	Matched	2.5	0.42	0.675	3.3	0.57	0.571	3.3	0.57	0.571	3.3	0.57	0.571	3.3	0.57	0.571
TENURE_CEO	Unmatched	-2.8	-0.64	0.521	-2.9	-0.65	0.513	-2.9	-0.65	0.513	-2.9	-0.65	0.513	-2.9	-0.65	0.513
	Matched	0.9	0.16	0.872	0.4	0.07	0.947	0.4	0.07	0.947	0.4	0.07	0.947	0.4	0.07	0.947
INCENT_CEO	Unmatched	8.2	1.89	0.059	8.2	1.90	0.058	8.2	1.90	0.058	8.2	1.90	0.058	8.2	1.90	0.058
	Matched	3.5	0.58	0.559	2.0	0.34	0.734	2.0	0.34	0.734	2.0	0.34	0.734	2.0	0.34	0.734
DUALITY	Unmatched	4.5	1.03	0.302	4.5	1.03	0.305	4.5	1.03	0.305	4.5	1.03	0.305	4.5	1.03	0.305
	Matched	0.5	0.09	0.931	-1.0	-0.17	0.862	-1.0	-0.17	0.862	-1.0	-0.17	0.862	-1.0	-0.17	0.862

## **IV. How does share pledging influence management and analyst forecast?**

### **Evidence from non-state-owned enterprises in China's stock market**

Siqi Zhao\*

**Abstract:** This paper examines the impact of share pledging on management and analyst forecast properties. The empirical analyses are based on a sample set consists of non-state-owned enterprises listed on China's A-share market from 2011 to 2018. Two types of share pledging are investigated: those made by controlling shareholders and those made against securities companies. Results obtained from fixed effect model present evidence that the occurrence of controlling shareholder's share pledging is positively associated with management forecast frequency and accuracy, while not significantly related to forecasting properties that involve analysts. However, detailed characteristics of share pledging, in terms of its value and ratio, are in negative relation to accuracy of analyst forecast (more biased) and relative optimism of managers (less optimistic of managers than analysts). The new regulation on share pledging absorbed securities companies as pledgee (loan provider) of the pledge contract, which scaled up the whole share pledging market patently and tremendously. Difference-in-difference models complemented with a propensity score matching method are used in this empirical analysis. It is demonstrated that the share pledging against securities companies is associated with more accurate analyst forecast and more optimistic managers forecast.

**Key words:** share-pledging, controlling shareholders, securities companies, management forecast frequency, management forecast bias, relative optimism, analyst forecast accuracy

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## IV.1 Introduction

As researchers documented, insider share pledging is a global phenomenon, as displayed by existing literature, it is legally operated in, but not limited to, US, Mainland China, Taiwan and India (e.g. Hwang et al., 2016; Bhatia et al., 2019; Cheng et al., 2020). Nonetheless, share pledging attracts limited academic attention. Among those based in countries other than China, prior research investigated (1) share repurchases under margin call in Taiwan (Chan et al., 2018), (2) the association between share pledging, personal wealth and firm risk-taking in the US (Dou et al., 2019), (3) the influence of share pledging on earnings management (Asija et al., 2014). Although the general practices of share pledging show no violent contrasts, its features and influences differentiate from country to country due to various institutional environment and economic development. Except for continuous share pledging operations of controlling shareholders, a new regulation that came into power in 2013 permitting securities companies to enter this business, substantially changed the size and structure of the whole share pledging market<sup>14</sup>. Recent studies based on China's listed firms deal mainly with the influence of share pledging on accrual-based earnings management (DeJong et al., 2020), firm's innovation (Pang and Wang, 2020) and analysts forecast accuracy (Kent et al., 2021). To fill the gap in the studies of share pledging and earnings forecast (by management and analysts), the specific objective of this research is to investigate the relationship between share pledging and management/analyst forecast, using data of China's listed non-stated-owned enterprises (henceforth NSOEs) during the period 2011-2018. Earnings forecast properties are proxied using four measurements: frequency and bias of management earnings forecast, analyst forecast accuracy, and relative optimism. I provide evidence that controlling shareholders share pledging is associated with management forecast frequency and accuracy, and the new regulation has significant effect on analyst forecast accuracy and relative optimism.

The nature of share pledging is a type of collateralized loan. The key items contained in a share-backed loan covenant are usually stipulated as: (1) market value of the pledged shares,

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<sup>14</sup> The ratio of shares pledged at securities companies rose from 1.516% in 2012 to 17.942% in 2013 and further rocketed to 40.891% in 2014. Until the end of 2018, this ratio increased to 56.729%.

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setting a reference price<sup>15</sup> to the collateralised shares, (2) pledge ratio<sup>16</sup>, the discount rate of the market value that granted to the borrower, (3) Warning line<sup>17</sup>, also called maintenance margin. (4) Liquidation line<sup>18</sup>, when reached, the lender is entitled to sell the pledged shares. The risky side of share-backed loan lies in margin call. The risk arises when the price of pledged share drops down to the maintenance margin, the borrower must either shore up the position by either paying down the debt or pledging more shares. In the advent of a default, when pledgors failed to meet the margin call requirement, their controlling rights would be impaired as the pledged shares are liquidated by the pledgee. When stock price suffers from downward pressure, the pledgor, if being an insider, are incentivised to stabilise it (DeJong et al., 2020; Wang et al., 2020).

In practice, pledgors are motivated by obvious benefits of share pledging rather than being halted by the latent margin call risk. As a worldwide phenomenon, share pledging facilitates shareholders' purpose on asset diversification and liquidity relaxation without losing the voting right, compared to sales. Meanwhile, share pledging assists pledgors to avoid tax loss, since taxes are imposed upon the gain in the sale of shares (Hwang et al., 2016). Though facing potential predicament, controlling shareholders of the firms utilise share pledging as a favourable channel of financing, making it rather popular. As shown in the following table, until the last trading day of 2018, there are 1522 out of 2063 NSOEs listed on China's A-share security market making share pledging<sup>19</sup>, at a ratio as high as 73.78%. Within the research period of this paper from 2011 to 2018, the number of NSOEs with share pledging rose from 362 to 1522, ratio to the total number of listed firms from 33.83% to 73.78%. The high ratio of listed firms with share pledging results from, first, the comparatively lower financing cost (interest rate) to ordinary bank loans. Another magnet drawing insiders to pledge shares in

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<sup>15</sup> When the borrower renews share pledging contracts, a new reference price is to set based on real-time market price. But the year-end value of the remaining pledged shares is calculated based on the stock price of the last trading day of the year.

<sup>16</sup> Taken China's security market as whole, the pledge ratio is between 30% to 50%. A-share listed firms usually enjoy a 50% rate.

<sup>17</sup> According to "Administrative Measures for Stock-Pledged Loans of Securities Companies", the warning line should be no lower than 135%. The warning price is calculated as the following equation:  
warning price=reference price×pledge ratio×warning line.

<sup>18</sup> According to "Administrative Measures for Stock-Pledged Loans of Securities Companies", the liquidation line should be no lower than 120%. The liquidation price is calculated as the following equation:  
liquidation price=reference price×pledge ratio×liquidation line.

<sup>19</sup> In this paper, the value of share pledging is measured as the net value at the end of fiscal year.

exchange for loans is the convenience of it compared to other insider trading practice, such as sale of shares.

Table IV-1: An overview of share pledging in China's A-share-listed NSOEs from 2011 to 2018

Year	Number of listed firms	Number of listed NSOEs	Number of listed NSOEs with share pledging	Ratio of listed NSOEs with share pledging (%)	Number of listed NSOEs with controlling shareholder pledging shares
2011	2320	1070	362	33.83	264
2012	2472	1160	457	39.40	311
2013	2468	1191	622	52.23	469
2014	2613	1288	750	58.23	593
2015	2827	1460	1022	70	833
2016	3052	1699	1191	70.10	985
2017	3485	2011	1504	74.79	1213
2018	3584	2063	1522	73.78	1263

Particularly, this paper focuses on NSOEs and excludes state-owned-enterprises (henceforth SOEs) that are listed on China's A-share security market. Ultimately controlled by a government department, listed SOEs are more strictly supervised and regulated than NSOEs: for instance, the appointment of managers and operations on shares require the approval from the government. Born without privileged supporting policy compared to its SOEs contemporaries, NSOEs are confronted with a narrower channel of financing exacerbated by China's underdeveloped financial market—banks preferred to issue loans to less risky government-backed SOEs. With the growing of share market, tradable shares are pervasively treated as a standard collateral for loans, based on its good liquidity. Thus, listed NSOEs inevitably take an advantage over its non-listed peers, to ease its finance distress by share pledging (Cheng et al., 2020). That share pledging is pervasive among listed firms deeply roots in the underdeveloped capital market, thus resulting in its distinctive popularity in China in contrast to other areas where overall credit system is well developed, and private companies can obtain credit support for financing. Therefore, the motivations of managers serve in NSOEs diverges from those in SOEs. In all, the special characteristics of SOEs excludes itself from this research, and NSOEs stand out being worth investigation.

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Among all kinds of insiders, controlling shareholders rather than other types of shareholders are investigated. Controlling shareholders exist in most listed firms in China<sup>20</sup> and play pivotal roles in the firms, controlling their operational and financial reporting decisions. The controlling over the firm benefits from different types of shareholdings<sup>21</sup> or persons acting in concert. The controlling shareholders wield their power over operational and financial decisions, as being mostly the largest shareholder (with an average ownership<sup>22</sup> of 36% tradable shares, and an average controlling ratio of 41%<sup>23</sup>) and as being the president of the board and/or the CEO (82.78%).

To maintain stock holding rights, especially voting rights during pledge period, controlling shareholders are motivated to keep good short-term performance and stable stock price, avoiding the probability of margin call. Research on share pledging covers several actions that engaged in stabilising the stock price: (1) less investment in innovation (Pang and Wang, 2020), (2) share repurchases (Chan et al., 2018), (3) higher firm value (Li et al., 2019) (3) upward earnings management (DeJong et al., 2020), (4) optimistically biased management earnings forecast (Wang et al., 2020). However, there is still insufficient study on the association between controlling shareholders' share pledging and management/analyst forecast properties.

Controlling shareholders are incentivised to reduce information asymmetry through management earnings forecast, which is documented as a main type of disclosure that affects market value of the firm (Beyer et al., 2010), thus a method to convey timely earnings information to markets and further to lower the crash risk (Hutton and Stocken, 2009). Prior research finds that firms with share pledging tend to optimistically bias management forecasts to avoid margin call risk (Wang et al., 2020). Analysts are active in markets by both receiving

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<sup>20</sup> Among Chinese domestic listed firms, NSOEs are usually controlled by the founding entrepreneur, his/her descendants or their family member. As documented by Dyck and Zingales (2004) and Zhang et al. (2013), larger private benefits of control are associated with collectivist cultures, less developed capital markets and more concentrated ownership, accompanied by more severe earnings management.

<sup>21</sup> The common ways that controlling shareholder controls the listed firm: direct control; pyramid structure; multiple voting rights; cross-shareholdings; multiple shareholdings.

<sup>22</sup> The ownership ratio of controlling shareholder is defined as the proportion of ownership of the listed firm's shares (in percentage), also known as cash flow rights. The ownership is the aggregated shareholding of the person taking control of the firm through concerted action, multiple shareholdings, and cross-shareholding. The calculation refers to the method of La Porta et al. (1999) and Claessens et al. (2000).

<sup>23</sup> Controlling ratio is measured as the percentage of actual/ultimate control over the firm instead of as the percentage of shares they own. The actual/ultimate control is defined as the control rights of the listed firm, also known as voting rights. The calculation refers to the method of La Porta et al. (1999) and Claessens et al. (2000).

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and offering information to the market. Of all kinds of analyst reports, earnings forecasts attract most outsiders' attentions and enhance stock price sensitivity (Amiram et al., 2016; Keskek and Tse, 2018). Share pledging bears complex characteristics: complicated cash flow prospect and accounting discretions, which cause difficulties to analysts. Under margin call pressure, listed firms with share pledge tend to manipulate both financial and non-financial information and operations, such as increased accrual-based and real earnings management (DeJong et al., 2020), and share pledging is evidenced to have detrimental effect on analyst forecast accuracy (Kent et al., 2021). However, no prior research examines relative optimism of managers against analysts, which this paper tries to shed light upon.

As the second part of empirical analysis, this paper examines the impact of the regulation of permitting securities companies as pledgees on management/analyst forecast. In May 2013, the two security exchanges and CSRC issued the "Measures for Stock Pledged Repurchase Transactions and Registration and Settlement Business (Trial)" (henceforth "2013 regulation"). On June 24, floor trade of share pledging business was officially launched and opened, share pledging business was traded through securities companies as a standardised financial product. Before that, pledgors enters contracts with banks, trusts and natural persons in an OTC market, with scarce supervision and therefore limited trading volume. The debut of the new regulation facilitates the process, enhance the security of pledges, thus having boosted the amount and value share pledging since (see Table IV-2).

Table IV-2: Share pledging of listed NSOEs at securities companies from 2011 to 2018

Year	Number of total A-share listed NSOEs	Number of NSOEs with share pledging at securities companies <sup>24</sup>	Ratio (%)
2011	1070	3	0.3
2012	1160	21	1.8
2013	1191	309	25.94
2014	1288	576	44.72
2015	1460	796	54.52
2016	1699	992	58.39
2017	2011	1336	66.43
2018	2063	1312	63.60

Chinese domestic securities companies traditionally undertake business operations such as investment banking (underwriting), research and brokerage. According to *Guidance of*

<sup>24</sup> A firm with shares pledged at securities companies, whose pledgor(s) not limited to controlling shareholders, is counted into this category.

*Information Barrier System of Securities Companies*, securities companies are required to establish information barrier between any different departments. But in practice, so insufficient effective isolation is established that information is still floating between different departments within the securities companies. The extra private information analysts gained from other affiliated departments could contribute to the improvement in accuracy. The implementation of the “2013 regulation” help securities companies expand share pledging market, meanwhile bring along competition pressure. Affiliated analysts are possibly tempted or demanded to issue optimistically biased reports to generate underwriting business or trading commissions (Gu et al. 2013; Keskek and Tse, 2018). On the contrary, issuing impartial forecast gain them credibility from clients (investors) (Brown et al., 2015), furthermore, enhance their reputation and career prospects (Hong and Kubik, 2003). Taken both streams of literature into consideration, it is still inconclusive how the regulation affect management and analyst forecast properties.

To testify the two hypotheses, this paper uses a sample of China’s listed NSOEs during the period 2011–2018. Fixed effect model and difference-in-difference model (plus propensity score matching method) are employed to examine the hypotheses and address the misspecification and endogeneity problem. Empirical results confirm the hypotheses in the following aspects. Employing a fixed effect model, I provide evidence that the event of share pledging (positive net value at the end of year) by the controlling shareholder is positively associated with the number of management forecast issuances (preannouncement), and the accuracy of management forecasts (less absolute value of bias away from the actual EPS), indicating that managers are more inclined to frequent disclosure of private information and issue more credible forecast to reduce information asymmetry. This result is in line with the research of Gong et al. (2021) that management earnings forecasts bias is positively associated with stock price crash risk. The net value of pledge shares and ratio of pledged to total tradable shares are associated with analysts forecast accuracy and relative optimism. DID and PSM-DID model are used to examine the influence of 2013 regulation shock. The two models serve as baseline model and a method to address endogeneity problem, respectively. Results demonstrate that analyst forecast accuracy is reacting positively (more accurate) to the event, and managers are more optimistic in forecasting EPS when the firm’s share pledging are

exclusively taken place at securities companies. It could be interpreted that analysts translate share pledging business with a certain firm into informative inputs into the forecasting process of this firm.

This paper contributes to current literature in several ways. First, this paper goes through the occurrence, value and ratio of share pledging, exploring the effect of different dimensions of share pledging on forecasts properties. Besides occurrence of share pledging (DeJong et al., 2020) and share pledging ratio (Kent et al., 2021), this paper examines the value of share pledging. The measurement using value has a direct economic explanation, compared to ratio, that larger market value of the pledged shares indicates relatively unsufferable margin call risk, which is only indirectly implied in the ratio. Second, compared to usual choice of OLS model in previous research, this paper uses fixed effect model and difference-in-difference model to explore the effect of share pledging and regulation shock. By employing these two models, it is implied to address omitted variable problem and self-selection problem. Third, this paper is the first one to explore the effect of the “2013 regulation”. The regulation is worth investigation for two reasons, one is the incredible increase in the volume of share pledging caused by it, the other is the involvement of analysts in securities companies. In addition to the public and private information, potential cross-department information transmission deepens analysts’ insight into research.

The rest of the paper is organized as follows. Section IV.2 reviews related prior literature and develops hypotheses. Section IV.3 presents variable explanations, as well as illustrates research design. Section IV.4 includes sample selection process, descriptive statistics and empirical analysis. Section IV.5 complements the research with a sensitivity analysis. Section IV.6 concludes.

## **IV.2 Literature review and Hypotheses**

Share pledging attracts a few academic attentions. Hwang et al. (2016) first make a cross-country study of share pledging and tap into regulations and qualitative analysis of its practice. Prior research, respectively based on different countries, already drew conclusions on share pledging. Margin call pressure initiates share repurchase in Taiwan (Chan et al., 2018). In the

US, share pledging are observed to be negatively associated with firm innovation (R&D expense) by Dou et al. (2019), while positively with firm risk (stock volatility) by Anderson et al. (2015). Asija et al. (2014) also find less R&D expenditure with share pledging, and furthermore, significantly less discretionary accruals made by continuing pledgers.

In China, NSOEs are more vulnerable to financial constraint compared to SOEs, due to their inferiority within the current financing system. At corporate governance level, as disclosed by most Chinese domestic listed NSOEs, ownership is so concentrated in the controlling shareholder that they have ability and incentive to wield their power over financial decisions. One study by Cheng et al. (2020) provides evidence that controlling shareholders collateralise their shares to finance their firms. However, share pledging brings about risks of margin call pressure when a drop in the stock price triggers demand for extra collateral and in extreme scenario, threatens the holding right (Chan et al., 2018; Anderson and Puleo, 2015). To maintain private benefits of control, controlling shareholders are motivated to keep short-term stock price stable, avoiding the probability of margin call (Pang and Wang, 2020), while contradictorily, long-term performance of the company lays at the core of controlling shareholders' interests (Cheng et al., 2020).

To depict how share pledging motivates management behaviour, some researchers cover this topic focusing on accrual-based and real earnings management and observe generally income-increasing earnings management (Asija et al., 2014; DeJong et al., 2020; Cheng et al., 2020). Management earnings forecasts is a crucial way to reduce information asymmetry, conveying private information to outsiders; management forecasts impact short-term reactions of financial market, without impairment of long-term performance. In addition, management earnings forecasts being unaudited voluntary disclosures gives insiders discretion over forecasting properties (Hirst et al., 2008). Beyer et al. (2010) measure that management earnings forecasts constitute approximately 55% influence of accounting information on stock return, and earnings preannouncements constitute 11%. Compared to annual report, management forecasts contained in preannouncements provide timely earnings information and enables stock prices to reflect the "real earnings", thereby lowering the crash risk (Hutton and Stocken, 2009). Gaynor and Kelton (2014) suggest that managers convince investors the credibility of their earnings forecast with consistency. So far, only Wang et al. (2020) provide

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evidence based on China's A-share listed firms about the tone of management earnings forecast, that controlling shareholders who pledge shares have strong incentives to optimistically bias management earnings forecast.

Besides managers, analysts, acting as intermediaries between listed firms and other outside investors, scrutinise intensive public and private information and provide professional analysis of firms' financial status and future performance. Among all kinds of analysis reports they issue, those concerning earnings forecasts attract pervasive attentions, reducing information asymmetry as well as enhancing stock price sensitivity (Amiram et al., 2016). As observed by several researchers, investors' security prices respond strongly to analyst earnings forecasts (Keskek and Tse, 2018). In term of motivation, their credibility, reputation and career development encourage analysts to generate more accurate reports (Hong and Kubik, 2003).

Financial and non-financial disclosure is treated as one important informative source of analysis on listed firms. However, manipulations of financial figures are involved as controlling shareholders attempt to avoid margin call risks (DeJong et al. 2020; Kent et al., 2021), such as more positive discretionary accruals, income-increasing real earnings management, and higher loss-avoiding non-recurring items (DeJong et al., 2020); and of impaired innovation efficiency (Pang and Wang, 2020). Greater financial and non-financial manipulations intuitively introduce more non-diversifiable information risks (Lambert et al. 2007). It is disputable whether analysts are aware of managers' manipulation, some argue that analysts recognise and try to offset the manipulation in their forecasts (Ota, 2011), while some point that analysts are unable to consistently identify loss-avoiding earnings management (Burgstahler and Eames, 2003). A wave of studies focuses on the relation between earnings quality and analyst forecast properties (e.g. Bilinski, 2014; Salerno, 2014). Salerno (2014) concludes that higher forecast accuracy is associated with higher earnings quality. Embong and Hosseini (2018) find that analysts trust the reported earnings and report forecasts with more accuracy and less dispersion.

Thus, prior literature provides an indirect link between share pledging and analyst forecast accuracy, it is not yet well identified. On one hand, share pledging decreases earnings quality, and earnings quality further affects analyst forecast properties. On the other hand, share pledging disclosure contains meaningful information about the current and future financial

performance of the firm. With the two statements combined, there should be some relation between share pledging and analyst earnings forecast accuracy. However, only share pledging ratio has documented to have a detrimental effect on analyst forecast accuracy (Kent et al., 2021).

As noted earlier, managers are often motivated to issue earnings forecasts to reduce the information asymmetry that exists between them and analysts and investors (Hirst et al., 2008). As another important informative resource, management earnings forecast information largely influence analysts' expectation about earnings (Ota, 2010; Hutton et al., 2012). Ota (2010) gives evidence based on Japanese data that management forecasts alone contribute to over 90% of changes in analyst forecasts, Hutton et al. (2012) attribute this to the comparatively better accuracy of management forecasts. While in the context of share pledging, both managers and analysts could bias their expectations and/or analysis driven by different motivations. Wang et al. (2020) find that firms with controlling shareholders' share pledging tend to issue more optimistically biased management forecasts to boost up stock price and avoid margin call risk. The biased management forecasts were put into analysts' black box to generate their forecasting output, yet it is unclear and lack of study how it comes out. Therefore, the relative optimism of managers to analysts stays in question, which this paper tries to shed light upon.

Hence, the first hypothesis is developed as following, investigating whether and how the occurrence, net value and ratio of controlling shareholders share pledging affect management and analyst forecast and their relative optimism on earnings forecast.

***H1. Management and analyst forecast properties are associated with the occurrence, net value and ratio of controlling shareholder's share-pledging behaviour.***

Under the new regulation on share pledging, the affiliation of analysts to securities company is likely to have an effect. *Guidance of Information Barrier System of Securities Companies* requires securities companies to establish information barrier between any different departments. On one hand, in practice, isolation between affiliated departments is not well-established and thus sharing information between department cannot be prohibited. On the

other hand, the implementation of the “2013 regulation” broadens the share pledging market and meanwhile intensifies competition between securities firms as they all desire for larger market share.

The new situation influences analysts in at least three ways. First, the cross-department extra private information could contribute to analysts’ research, thus enhancing their forecast accuracy (Zhang et al., 2020). Research department participates in the share pledge business by assessing the financial status of the firm, where they gathered firm-specific information. This pre-transaction assessment alleviates information asymmetry and imparts analysts more private material information.

Second, analysts then face contradictory requirements from firm’s management (share pledging business clients) and investing clients. To gain a larger market share motivate affiliated analysts to bias reports, as they would try to maintain business relationship with the listed firm that get share-based loans from them (Gu et al. 2013; Keskek and Tse, 2018). Conflicts of interest may incentivise analysts to release optimistically biased rating reports on listed firms, on purpose of gaining commission fees for the securities companies (Mola and Guidolin, 2009; Brown et al., 2015). Jackson (2005) observes a growing trading volume of the securities companies who analysts issue more optimistic reports. However, market participants are able to recognise optimistic bias of affiliated analysts (Michaely and Womack, 1999), an increase in credibility from investing clients is observed when analysts provide more objective forecasts and recommendations (Brown et al., 2015).

Third, self-development motivations weaken their motivation to protect the price of pledged stock against stumbling through optimistic forecasts. Being an employee, analysts weigh reputation and career prospects over other incentives. Their promotion, or being selected as star analyst, depends on market influence, specifically the quality of reports (Hong and Kubik, 2003). Biased forecasts are ineffective in increasing trade volume and market share for securities companies (Irvine, 2004), furthermore, analysts are rewarded by higher end-of-period reputations (Jackson, 2005). Thus, reputation mechanism may keep analysts independent from the pressure imposed by share pledging business to bias their reports.

Taken the additional evidence about analysts forecast behaviour, the “2013 regulation” is predicted to have an impact especially on forecast behaviours involving analysts, the direction and the extent of the effect are to be examined. The second hypotheses are constructed as following.

*H2a. After the implementation of “2013 regulation”, analysts forecast accuracy is likely to improve.*

*H2b. After the implementation of “2013 regulation”, analysts tend to be more optimistic compared to managers.*

### **IV.3 Research design**

#### *IV.3.1 Dependent variables*

In this paper, I include several variables to catch the aspects of decision-making process of the management team and the analysts that are following the firm, and one of which reflects the interaction of the two groups through a relative value.

##### *Management forecast frequency*

Forecasts of a firm’s financial figures vary with its managers updating their private information which occurs randomly and unpredictable. Therefore, the number of management forecast issuances, preannouncements excluding interim reports, reflects the willingness of managers to share the information or the necessity of disclosure. To test this, I define the frequency. To measure the number of issuances of management forecast, this paper follows prior research such as Nagar et al. (2003) and Ajinkya et al. (2005), computing FREQUENCY as the total incidence of forecasts:

$$\text{FREQUENCY} = \text{total number of preannouncements containing forecasts of EPS issued in the same fiscal year} \quad (1)$$

##### *Management forecast bias*

Management forecast bias is computed as an absolute value of the difference between the mean of management forecasts <sup>25</sup> and the actual EPS, the same as Ajinkya et al. (2005) did to calculate ERROR. When management forecast exhibits less bias, it is signalling that financial figures contained in the unaudited reports are more trustworthy, thus gaining confidence from outsiders to stabilise the firm's stock price.

$$BIAS = \frac{|mean\ of\ management\ forecast\ EPS - actual\ EPS|}{Beginning-of-fiscal-year\ stock\ price} \times 100 \quad (2)$$

*Analyst forecast accuracy*

Analyst forecast accuracy is computed following a series of research (e.g. Wang and Yu, 2019). It is constructed as the absolute difference between the mean of individual EPS forecasts and the actual EPS, deflated by the open stock price at the beginning of the year. A positive coefficient of independent variables indicates larger discrepancy between actual and analyst forecast of EPS, suggesting analysts made less accurate forecasts. When constructing this variable, forecasting report on EPS is only included when issued after the publication of annual report of previous fiscal year (usually released before the end of May). And only the last forecast made by the same analyst, or the same group of analysts is used in the calculation of the value. The computation of analyst forecast accuracy (ACCURARY) is as follows.

$$ACCURACY = \frac{|mean\ of\ analyst\ forecast\ EPS - actual\ EPS|}{Beginning-of-fiscal-year\ stock\ price} \times 100 \quad (3)$$

*Relative optimism (management over analyst forecast)*

As management forecast acts as one sort of informative input resource in the process of analyst forecast, management team thus is reasonably inclined to tweak or twist their forecast. Especially when controlling shareholders are pledging shares at securities companies, they are motivated to influence analysts. Therefore, the relative optimism of management team against analysts is computed as the difference between the management forecast<sup>26</sup> of EPS and that of analyst forecast. The positive value of OPTIMISM means management team is more optimistic than analysts about the EPS of this fiscal year, negative value means the opposite.

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<sup>25</sup> The mean value is calculated using forecast value of EPS contained in the preannouncement, excluding quarterly reports.

<sup>26</sup> The management forecast is the last preannouncement with forecast of the EPS in 4th quarter.

Thus, the positive coefficient of independent variables shows that management team release more optimistic forecasts, and negative coefficient shows an opposite behaviour.

$$OPTIMISM = \frac{\text{mean of management forecast EPS} - \text{mean of analyst forecast EPS}}{\text{Beginning-of-fiscal-year stock price}} \times 100. \quad (4)$$

### ***IV.3.2 Independent variables***

#### *Controlling shareholders' share pledging*

Both the occurrence of share-pledging and its scale play as the main explanator in this research. To measure controlling shareholders' share-pledging behaviour, I introduced the first one PLEDGE\_CTRL, defined as a dummy variable equals 1 if the controlling shareholder of the firm holds a positive value of share-pledging at the end of the fiscal year, and 0 otherwise. The second variable PLGVAL\_CTRL is consecutive, computed as the total net value of the share-pledging remaining at the end of the fiscal year. The net value of share-pledging is calculated as the net number of pledged shares multiplied by the close price of the last trading day of the year. PLGRAT\_CTRL is calculated as the ratio of the shares pledged by the controlling shareholder to the total tradable shares of the firm.

#### *Share pledging at securities companies*

To investigate the influence of the new regulation allowing securities companies to be pledgees for share-pledging, this paper measures the treatment group (PLEDGE\_BRK=1) as firms that all share-pledging activities are interacted with securities companies and control group (PLEDGE\_BRK=0) as those without any share-pledging. First, calculate the net number of shares pledged at securities companies at the end of the fiscal year. Then assign value 1 to the firm-year observations if having a positive net number, and 0 to those having none.

### ***IV.3.3 Control variables***

This paper controls for variables that are identified to be significantly related to management and analyst forecast properties in existent literature (e.g. Nagar et al., 2003; Hutton et al., 2012). First, firm-specific factors are considered, including firm size (SIZE), financial leverage (LEVERAGE), return on assets (ROA), annual sales growth rate (GROWTH),

market-to-book ratio (MBRATIO). They are documented in literature to exhibit significant association with management and/or analyst earnings forecast properties (Baginski and Hassell., 1997; Rogers and Stocken., 2005; Hurwitz, 2018; Bozanic et al., 2018 and so forth). In the second category of control variables come those relevant to characteristics of share and shareholders of the firm. FLOATRATIO measures the ratio of tradable shares to the total number of shares. OWNRATIO is defined as the shares held by the actual controller of the firm (Wang and Yu, 2019). THOLDERS is defined as the logarithm of total number of shareholders at the end of fiscal year. INSTHOLDER represents the ratio of shares held by institutional investors (Qiang et al., 2013). Besides, as studies show the evidence, the number of analysts following a firm (FOLLOWER) is also considered (Qiang et al., 2013; Chang and Choi, 2017). DUAL, a corporate governance factor, is a dummy variable equals 1 if the controlling shareholder undertakes the role of director or CEO in the firm, and 0 otherwise. The definitions of all variables in this study are summarized in Appendix Table IV-A.

#### ***IV.3.4 Methodology***

The sample in this research is probably suffering two endogeneity problems: omitted variable and self-selection bias. The latter one emerges when the firm attempts to influence management and analyst forecast: (1) controlling shareholders are motivated to make share pledging, or (2) pledge shares at securities companies.

To alleviate the problem of omitted variables with panel data, a fixed effect model is employed to test hypothesis 1. Although the regression is conducted using an unbalanced panel data set, within estimator of fixed-effect model is efficient (Wooldridge, 2010). Hausman test rejects the random effect and supports the adequacy of fixed-effect model. To test in the same analysis whether the self-selection bias exists, a propensity score matching method is used. As an alternative way of addressing self-selection bias in this situation, a balanced sample is constructed, on which time-varying difference-in-difference method is conducted (see IV.5 Sensitivity analysis).

Because in 2013 a new regulation is introduced, that securities companies are allowed to accept tradable shares as loan collateral, this regulation is treated as a shock. To avoid the bias introduced by inaccurately specified model, and simultaneously minimise standard errors,

prior researchers suggested a combination of matched sampling and regression adjustment (Abadie, 2005). Thus, to test the effect of a regulation, a traditional two-period difference-in-difference (henceforth DID) model is used, with additional test based on a matched sample using propensity score matching method (PSM-DID).

In propensity score matching, the treatment variables in two models are PLEDGE\_CTRL and PLEDGE\_BRK, respectively. The matching variables are all the control variables, and SEASONAL, a dummy variable equals 1 if the firm made seasonal stock issuance during the year, and 0 otherwise. To preserve the characteristics of a balanced panel, the propensity score is drawn from the residual of a logit regression of PLEDGEs on matching variables in year 2013. In this year, a nearest neighborhood matching method is used to generate a control group for treatments. Limited by the number of observations, one-to-one matching method is adopted for time-varying DID and multiple time-period standard DID models, while one-to-three matching method for two-period DID model, with caliper of less than 0.03 and no replacement. Fixed-effect model and DID models will then be regressed again using the matched sample. Results of the before- and after-matching regressions will be explained in next section.

As is illustrated above, the research models to test all hypotheses are shown as follows, respectively. To test hypothesis 1, the fixed effect model is:

$$\text{Forecast Properties} = \beta_0 + \beta_1 \text{PLEDGE\_CTRL}_{i,t} + \beta_m \text{CONTROL}_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t} \quad (5a)$$

$$\text{Forecast Properties} = \beta_0 + \beta_1 \text{PLGVAL\_CTRL}_{i,t} + \beta_m \text{CONTROL}_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t} \quad (5b)$$

$$\text{Forecast Properties} = \beta_0 + \beta_1 \text{PLGRAT\_CTRL}_{i,t} + \beta_m \text{CONTROL}_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t} \quad (5c)$$

Where in equation 5b and 5c, only observations with share pledging are included, to test the influence of the market value of the shares pledged and its ratio to the total tradable shares of the firm.

To test hypotheses 2, I use a traditional difference-in-difference models to examine the effect of the 2013 regulation to enclose securities companies as pledgee of share pledging. The sample tested by this model ranges from 2012 to 2013, that is, this model tests the effect of the regulation in 2013 against one year before the regulation.

$$\text{Forecast Properties} = \beta_0 + \beta_1 TREAT_{i,t} + \beta_2 POST_{i,t} + \beta_3 TREAT \times POST_{i,t} + \beta_m CONTROL_{i,t} + \varepsilon_{i,t} \quad (6)$$

Where  $TREAT_{i,t}$  is defined as 1 if the firm pledges its share against a securities company in year 2013, and 0 otherwise.  $POST_{i,t}$  is defined as 1 if the firm pledges its share against a securities company for the first time in year 2013. The coefficient of interactive term  $TREAT_{i,t} \times POST_{i,t}$  is the key parameters of interest. It represents the difference-in-difference effect of the “2013 regulation”, that is how much the average outcome of the treatment group has changed after the treatment, compared to the average outcome of the same group without regulation. The coefficient of  $TREAT_{i,t}$  represents the difference between the treatment and the control group before the regulation. The coefficient of  $POST_{i,t}$  represents how much the average outcome of the control group has changed in the post-regulation period.

#### IV.4 Empirical results

##### IV.4.1 Data and sample selection

This paper uses a sample from including only NSOEs listed on the main board of China’s two security markets: Shanghai and Shenzhen security market (SSE and SZSE). Financial data published on annual and quarterly financial statements and data related to institutional investors and analyst forecast are acquired from China Stock Market and Accounting Research (CSMAR). Share pledging data is acquired from open resource of SSE and SZSE website. The selection initiates with all public firms ranging from 2013 to 2018 and excluding: (1) SOEs (state-owned firms are impossible to lose the control right), (2) financial firms and (3) firms entitled with ST, \*ST, SST, S\*ST\* (Special Treatment, indicating firms are experiencing financial distress). First, 11905 firm-year NSOE observations are acquired from the database. Second, leave out those with missing data for control variables, 11894 observations remain. Then match the sample set with dependent variables in four categories, then construct four different sample set for four testing method. Sample 1 is unbalanced panel data used for fixed effect model testing hypothesis 1. As an alternative regression method, time-varying DID model is based on sample 2, a balanced data sample which includes firms (ranging from 2011-2018) either without any share-pledging or with share-pledging in any year and years

afterwards. Therefore, comparing to sample 1, sample 2 loses observations drastically, because of being subject to strict criteria on share-pledging activity.

Table IV-3: Sample selection

	Number of firm-year observations			
NSEs (excluding special treatment and financial firms)	11905			
Observations with any missing control variable	11894			
With dependent variables	Frequency	Bias	Accuracy	Optimism
Sample 1 (unbalanced)	11588	7981	7803	5599
Sample 2 (balanced)	4656	2408	1616	880

#### *IV.4.2 Descriptive statistics and correlation matrix*

Table IV-4 summarises the descriptive statistics of the whole sample. To mitigate the influence of outliers, all the continuous variables are winsorised at the 1% and 99% levels. FREQUENCY ranges from 1 to 5, with a mean value of 3.692, indicating the average number of issuances of management forecast is about 3.7. The absolute values of management forecast accuracy (BIAS) averages at 0.063, meaning that the difference between management forecast and actual EPS is 0.063% of the beginning-of-fiscal-year stock price. The mean and median value of OPTIMISM are both less than zero, showing that management teams are overall less optimistic than analysts. In terms of ACCURACY, analyst forecast deviates from the actual EPS at an average of 1.885% of the beginning-of-fiscal-year stock price. In the overall sample, 51.3% of firm-year observations are involved in controlling shareholders' share-pledging during the whole period, while 45.6% of those decided to pledge against securities companies after the regulation shock. The results of the covariate balance check before and after propensity score matching on treatment variable PLEDGE\_CTRL and PLEDGE\_BRK are displayed in Appendix IV-B1 to B4 and IV-B5, respectively.

Table IV-5 reports Pearson and Spearman correlations. Not surprisingly, the correlation between PLEDGE\_CTRL and PLGVAR\_CTRL and PLGRAT\_CTRL are highly positively correlated, where the former dummy variable is generated as one when the latter ones have positive value. SIZE and THOLDERS display the strongest correlation (0.57).

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Table IV-4: Descriptive statistics

Variable	N	Mean	Std	Min	P25	Median	P75	Max
FREQUENCY	11588	3.692	0.771	1	3	4	4	5
BIAS	7981	0.063	0.137	0.000	0.000	0.011	0.067	0.935
ACCURACY	7803	1.885	2.865	0.000	0.291	0.832	2.188	17.179
OPTIMISM	5599	-0.174	0.239	-1.336	-0.243	-0.110	-0.032	0.215
PLEDGE_CTRL	11588	0.513	0.500	0	0	1	1	1
PLEDGE_BRK	11588	0.456	0.498	0	0	0	1	1
PLGVAL_CTRL	11588	10.501	10.274	0.000	0.000	17.850	20.542	23.083
PLGRAT_CTRL	11588	0.096	0.142	0.000	0.000	0.013	0.154	0.635
SIZE	11588	21.682	1.039	19.568	20.908	21.580	22.317	24.843
LEVERAGE	11588	0.364	0.196	0.044	0.204	0.343	0.500	0.860
ROA	11588	0.053	0.060	-0.208	0.022	0.050	0.084	0.230
GROWTH	11588	0.215	0.459	-0.552	0.000	0.126	0.305	3.004
MBRATIO	11588	3.970	3.256	0.000	1.989	3.040	4.868	19.774
FLOATRATIO	11588	0.638	0.275	0.132	0.390	0.642	0.917	1.000
FOLLOWER	11588	7.692	8.949	0	1	4	12	40
THOLDERS	11588	10.048	0.799	8.326	9.476	9.994	10.584	12.088
INSTHOLDER	11588	0.118	0.174	0.000	0.013	0.053	0.135	0.788
OWNRATIO	11588	0.355	0.166	0.025	0.229	0.343	0.473	0.740
DUAL	11588	0.829	0.377	0	1	1	1	1

Note: The variable definitions are given in Appendix Table IV-A. PLGVAL\_CTRL, SIZE and THOLDERS are the logarithm of the original value.

Table IV-5: Pearson and Spearman correlation analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) PLEDGE_BRK		0.55 ***	0.54 ***	0.51 ***	0.12 ***	0.08 ***	-0.08 ***	0.12 ***	0.10 ***	0.00	-0.01	0.07 ***	-0.19 ***	0.03 ***	0.10 ***
(2) PLEDGE_CTRL	0.55 ***		0.92 ***	0.92 ***	0.19 ***	0.19 ***	-0.14 ***	0.12 ***	0.01	0.12 ***	0.01	0.13 ***	-0.02 **	-0.01	0.04 ***
(3) PLGVAL_CTRL	0.55 ***	1.00 ***		0.96 ***	0.30 ***	0.22 ***	-0.10 ***	0.15 ***	0.04 ***	0.13 ***	0.08 ***	0.19 ***	0.04 ***	0.01	0.01
(4) PLGRAT_CTRL	0.38 ***	0.66 ***	0.70 ***		0.20 ***	0.21 ***	-0.16 ***	0.11 ***	-0.00	0.14 ***	-0.01	0.12 ***	-0.01	0.02 **	0.01
(5) SIZE	0.11 ***	0.18 ***	0.21 ***	0.16 ***		0.49 ***	-0.08 ***	0.16 ***	-0.33 ***	0.30 ***	0.32 ***	0.57 ***	0.19 ***	-0.13 ***	-0.12 ***
(6) LEVERAGE	0.06 ***	0.17 ***	0.18 ***	0.19 ***	0.49 ***		-0.38 ***	0.08 ***	-0.11 ***	0.32 ***	-0.03 ***	0.32 ***	0.08 ***	-0.18 ***	-0.16 ***
(7) ROA	-0.08 ***	-0.12 ***	-0.11 ***	-0.12 ***	-0.03 ***	-0.36 ***		0.24 ***	0.26 ***	-0.35 ***	0.43 ***	-0.24 ***	0.13 ***	0.22 ***	0.16 ***
(8) GROWTH	0.09 ***	0.09 ***	0.10 ***	0.08 ***	0.12 ***	0.09 ***	0.18 ***		0.06 ***	-0.05 ***	0.23 ***	-0.07 ***	0.15 ***	0.02 **	0.06 ***
(9) MBRATIO	0.06 ***	-0.01	0.00	-0.01	-0.32 ***	-0.02 ***	0.15 ***	0.04 ***		-0.16 ***	0.11 ***	-0.19 ***	-0.03 ***	0.12 ***	0.09 ***
(10) FLOATRATIO	0.02 *	0.13 ***	0.14 ***	0.13 ***	0.29 ***	0.32 ***	-0.28 ***	-0.08 ***	-0.10 ***		-0.10 ***	0.44 ***	0.10 ***	-0.46 ***	-0.33 ***
(11) FOLLOWER	-0.03 ***	-0.01	0.01	-0.04 ***	0.35 ***	0.00	0.36 ***	0.10 ***	0.04 ***	-0.03 ***		-0.05 ***	0.45 ***	0.08 ***	0.13 ***
(12) THOLDERS	0.07 ***	0.13 ***	0.14 ***	0.09 ***	0.57 ***	0.32 ***	-0.20 ***	-0.05 ***	-0.13 ***	0.45 ***	-0.02 *		-0.08 ***	-0.30 ***	-0.20 ***
(13) INSTHOLDER	-0.29 ***	-0.11 ***	-0.10 ***	-0.04 ***	0.05 ***	0.05 ***	0.10 ***	0.04 ***	-0.09 ***	-0.01	0.26 ***	-0.10 ***		-0.13 ***	-0.06 ***
(14) OWNRATIO	0.02 **	-0.02 **	-0.02 *	0.06 ***	-0.11 ***	-0.18 ***	0.21 ***	-0.01	0.05 ***	-0.47 ***	0.06 ***	-0.30 ***	-0.06 ***		0.30 ***
(15) DUAL	0.10 ***	0.04 ***	0.04 ***	-0.03 ***	-0.12 ***	-0.17 ***	0.13 ***	0.01	0.02 *	-0.32 ***	0.09 ***	-0.21 ***	-0.07 ***	0.30 ***	

Note: Pearson correlations are shown above the diagonal. Spearman correlations are shown below the diagonal. All variables are winsorised at the 1% and 99% percentile. \*\*\*, \*\*, \* Significance at the 1%, 5% and 10% level (two-tailed test).

### ***IV.4.3 Multivariate analysis***

#### *Share pledging of controlling shareholders*

This part analyses the effect of share-pledging on forecast properties of managers and analysts. Table IV-6.1, 6.2, 6.3 and 6.4 present the results of the fixed effect model on the proxies of management and analyst forecast, with an unmatched sample and a matched sample using propensity score matching method, respectively. To test Hypothesis 1, a fixed effect model is employed as foregoing equations (5a) (5b) and (5c). Columns (1) to (3) report results based on unmatching sample, while columns (4) to (6) report results from regressions on a sample after propensity score matching. The results of the covariate balance check before and after propensity score matching on treatment variable PLEDGE\_CTRL are displayed in Appendix Table IV-C1 to C4.

Results in Table IV-6.1 Column (1) and (4) are gained from regressing on equation (5a), testing one part of hypothesis 1. Both coefficients in two columns indicate a significantly positive effect of the occurrence of share-pledging on the number of management forecast issuances. The occurrence of controlling shareholders' share-pledging boosts the number of preannouncements containing a forecast of EPS by 0.1603 more than firms without share-pledging in a certain year. Results in column (2) and (5) are gained from regressing on model (5b), testing the continuous variable PLGVAL\_CTRL which measures the value of controlling shareholders' share pledging. Results in column (3) and (6) are gained from regressing on model (5b), testing the continuous variable PLGRAT\_CTRL which measures the ratio of shares pledged by controlling shareholders to the whole shares of the firm. However, the results in columns (2) and (5), (3) and (6) display no evidence that the value and ratio of share-pledging play a significant role in influencing management forecast frequency. This suggests that the existence of net positive shares pledged by the controlling shareholder increases the managers incentives to issue preannouncements. As assumed and implied by signalling theory, managers are more inclined to translate their private information into preannouncements with forecast of EPS, on purpose of building confidence among outside shareholders and stabilising stock price. Column (4) to (6) exhibit results of fixed effect model obtained after propensity score matching. The direction and significance of the coefficients remain the same, suggesting the robustness of the results gained from the unmatched sample.

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Table IV-6.2 exhibit the influence of share pledging on the accuracy of management forecasts, measured as the absolute value of bias away from the actual EPS. As the coefficient of PLEDGE\_CTRL in Columns (1) shows, the action of share pledging statistically significantly reduces the bias of managers' forecast, that is 1.73% of the beginning-of-fiscal-year stock price less than those without controlling shareholder pledging shares. However, like management forecast frequency, managers' forecast bias is inconclusively affected by the net value and ratio of controlling shareholder's share pledging (see Columns (2) and (3)). Propensity score matching analysis shows similar results, compared with no-share-pledging firms, managers of those with controlling shareholder's share pledging make less biased forecasts, an extent of 1.84% (insignificantly different from 1.73%) of the beginning-of-fiscal-year stock price (see Column (4)). This result is consistent with the conclusion of Gong et al. (2021) about Chinese listed firms from 2012 to 2018, that management earnings forecasts bias is positively associated with stock price crash risk. Therefore, to avoid margin call pressure induced by stumbling stock price, management team tend to produce more accurate forecast on EPS.

The results in Table IV-6.3 show regression on ACCURACY. Column (1) exhibit insignificant coefficient, suggesting that the occurrence of controlling shareholder's share pledging itself makes no influence on the analyst forecast accuracy. However, as Columns (2) and (3) suggest, hypothesis 1 is partly confirmed. The net value of the share pledging and the ratio of share pledging to total tradable shares are positively associated with analyst forecast accuracy. Although it makes no difference whether a firm's controlling shareholder pledge shares, it introduces redundancy into the forecasting process of analysts. One unit of end-of-the-year net value of share pledging exacerbates the forecast accuracy by 16.19% of the beginning-of-fiscal-year stock price of the firm, while a one percentage increase in the ratio of share pledging to total tradable shares boosts the bias of analyst forecast by 1.5351% of the beginning-of-fiscal-year stock price of the firm. Propensity score matching results support the analysis above, without changing the direction and significance of the coefficients, yet showing a slightly stronger effect than that indicated by fixed effect model without matching. The reduced accuracy of analyst forecasts (see Columns (3) and (6)) is consistent with

conclusions of Kent et al. (2021) that share pledging ratio are negatively associated with analyst forecast accuracy.

Table IV-6.4 displays results for OPTIMISM, measuring the relative optimism of forecasts made by managers and analysts. As Columns (2) and (3) suggest, on condition that firm's controlling shareholders pledge shares, managers tend to issue less optimistic forecasts than analysts as the value of share pledging and the ratio of that to total tradable shares increase. The relative optimism drops by 1.81% of the beginning-of-fiscal-year stock price of the firm and 16.98% respectively in two cases. The significant coefficient provides evidence of the existence of a gap between analyst and management forecast, suggesting that analyst forecasts fail to confirm management forecast. According to Lambert et al. (2007) and Burgstahler and Eames (2003), this disconfirmation suggests non-diversifiable information risks and analysts are unable to consistently identify them. Combined with Table IV-6.1 and 6.2, results indicate that managers are inclined to disclose their private information by increasing frequency of issuance, reducing forecast bias and staying less optimistic than analysts. This is consistent with Cheng et al. (2020) who establish that controlling shareholders emphasize on firm's long-term performance, while contradicting Wang et al. (2020) who argue that controlling shareholders with share pledging have strong incentives to optimistically bias management earnings forecast.

#### *The effect of regulation shock in 2013*

Table IV-7 presents the results of the difference-in-difference model on the proxies of management and analyst forecast, with an unmatched sample and a matched sample using propensity score matching method, respectively. Results in columns (1) (3) (5) (7) are gained from regressing on unmatched sample, while columns (2) (4) (6) (8) are based on a matched sample using propensity score matching method. The results of the covariate balance check before and after propensity score matching on treatment variable PLEDGE\_BRK are displayed in Appendix Table IV-C5.

Table IV-6.1: Results of baseline fixed effect model, before and after matching

	FREQUENCY					
	(Unmatched Sample)			(PSM Sample)		
	(1)	(2)	(3)	(4)	(5)	(6)
PLEDGE_CTRL	0.1603*** (9.0724)			0.1377*** (5.6023)		
PLGVAL_CTRL		0.0104 (1.2217)			0.0197 (1.3944)	
PLGRAT_CTRL			0.0565 (0.9975)			0.0559 (0.6316)
SIZE	0.0588*** (2.9047)	0.0214 (0.8766)	0.0271 (1.1534)	0.0897*** (3.2569)	0.0197 (0.5233)	0.0312 (0.8635)
LEVERAGE	-0.0266 (-0.3889)	0.1399* (1.6970)	0.1324 (1.6073)	0.1781** (2.0361)	0.1479 (1.2005)	0.1388 (1.1350)
ROA	-1.7259*** (-11.9074)	-0.9880*** (-6.0782)	-0.9774*** (-6.0378)	-1.2671*** (-6.8285)	-1.2700*** (-4.6704)	-1.2387*** (-4.5866)
GROWTH	0.1301*** (10.8506)	0.0368** (2.5143)	0.0369** (2.5175)	0.0994*** (5.9597)	0.0843*** (3.0264)	0.0842*** (3.0273)
MBRATIO	-0.0114*** (-3.7239)	-0.0104*** (-2.8660)	-0.0098*** (-2.7628)	-0.0143*** (-3.4917)	-0.0197*** (-3.4680)	-0.0187*** (-3.3293)
FLOATRATIO	0.4761*** (11.5794)	0.0961** (1.9733)	0.0941* (1.9316)	0.3281*** (6.1614)	0.1624** (2.2395)	0.1640** (2.2572)
FOLLOWER	0.0030*** (2.7119)	0.0032** (2.3159)	0.0034** (2.4248)	0.0027* (1.7601)	0.0058** (2.4507)	0.0060** (2.5420)
THOLDERS	-0.1154*** (-6.4784)	0.0104 (0.5567)	0.0101 (0.5366)	-0.1430*** (-6.1232)	-0.0075 (-0.3027)	-0.0070 (-0.2761)
INSTHOLDER	0.0776 (1.2555)	0.0808 (1.0151)	0.0866 (1.0908)	-0.0364 (-0.4417)	0.0778 (0.7736)	0.0902 (0.8988)
OWNRATIO	0.0954 (1.0152)	-0.0194 (-0.1717)	-0.0229 (-0.2022)	0.0268 (0.2358)	-0.0159 (-0.0966)	-0.0128 (-0.0784)
DUAL	0.0552** (2.1826)	0.0415 (1.2824)	0.0418 (1.2907)	0.0823*** (2.6235)	0.1135** (2.4577)	0.1135** (2.4733)
_cons	3.0948*** (7.3210)	2.9122*** (5.7113)	2.9875*** (5.8293)	2.8277*** (5.0113)	2.8231*** (3.6225)	2.9400*** (3.7598)
Firm-Fixed_Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Num. of Obs.	11588	5944	5944	6785	3384	3384
Within R-square	0.1115	0.0277	0.0276	0.0889	0.0461	0.0452

Table IV-6.1 presents the results of the fixed effect model on the frequency of management forecast, with an unmatched sample and a matched sample using propensity score matching method, respectively. Results in column (1) and (4) are gained from regressing on model (5a), testing the dummy variable PLEDGE\_CTRL, that is, the effect of the occurrence of controlling shareholders' share pledging on management forecast frequency.  $Forecast\ Properties = \beta_0 + \beta_1 PLEDGE\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5a). Results in column (2) and (5) are gained from regressing on model (5b), testing the continuous variable PLGVAL\_CTRL, that is, the effect of the value of controlling shareholders' share pledging on management forecast frequency among the firms with shares pledged.  $Forecast\ Properties = \beta_0 + \beta_1 PLGVAL\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5b). Results in column (3) and (6) are gained from regressing on model (5c), testing the continuous variable PLGRAT\_CTRL, that is, the effect of the ratio of shares pledged by controlling shareholders to the whole shares of the firm on management forecast frequency among the firms with shares pledged.  $Forecast\ Properties = \beta_0 + \beta_1 PLGRAT\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5c). All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

Table IV-6.2: Results of baseline fixed effect model, before and after matching

	BIAS					
	(Unmatched Sample)			(PSM Sample)		
	(1)	(2)	(3)	(4)	(5)	(6)
PLEDGE_CTRL	-0.0173*** (-3.9476)			-0.0269*** (-3.6831)		
PLGVAL_CTRL		-0.0046 (-1.3203)			-0.0048 (-0.9901)	
PLGRAT_CTRL			-0.0347 (-1.4364)			-0.0144 (-0.4650)
SIZE	0.0154** (2.0030)	0.0140 (1.0887)	0.0114 (0.8934)	0.0193* (1.8001)	0.0069 (0.4181)	0.0038 (0.2263)
LEVERAGE	0.0708** (2.4133)	0.0362 (0.8716)	0.0393 (0.9469)	0.0510 (1.3256)	0.0359 (0.8018)	0.0403 (0.8686)
ROA	-0.5902*** (-7.1068)	-0.8367*** (-6.9509)	-0.8412*** (-6.9846)	-0.3766*** (-3.6784)	-0.2577 (-1.6117)	-0.2626* (-1.6469)
GROWTH	-0.0069 (-1.1333)	-0.0074 (-0.9181)	-0.0075 (-0.9260)	-0.0136 (-1.4788)	-0.0213** (-2.0443)	-0.0212** (-2.0316)
MBRATIO	0.0008 (0.7042)	-0.0000 (-0.0059)	-0.0003 (-0.1526)	0.0034** (2.2363)	0.0012 (0.5815)	0.0009 (0.4247)
FLOATRATIO	-0.0525*** (-4.1574)	-0.0448* (-1.9487)	-0.0432* (-1.8905)	-0.0633*** (-3.8341)	-0.0321 (-1.1227)	-0.0326 (-1.1405)
FOLLOWER	0.0000 (0.1431)	0.0009* (1.6508)	0.0009 (1.5245)	-0.0003 (-0.6773)	0.0008 (1.1608)	0.0007 (1.0635)
THOLDERS	0.0048 (1.1086)	-0.0025 (-0.3264)	-0.0022 (-0.2833)	0.0074 (1.0732)	0.0003 (0.0354)	0.0003 (0.0324)
INSTHOLDER	0.0075 (0.6128)	0.0173 (0.6080)	0.0151 (0.5300)	-0.0029 (-0.1271)	0.0134 (0.4251)	0.0098 (0.3076)
OWNRATIO	-0.0100 (-0.2991)	-0.0008 (-0.0154)	0.0021 (0.0407)	0.0092 (0.1916)	0.0065 (0.0964)	0.0045 (0.0668)
DUAL	0.0027 (0.2259)	-0.0041 (-0.2296)	-0.0041 (-0.2291)	-0.0129 (-0.9344)	-0.0192 (-0.8377)	-0.0190 (-0.8312)
_cons	-0.2749* (-1.7336)	-0.0874 (-0.3329)	-0.1200 (-0.4603)	-0.3755* (-1.7570)	0.0259 (0.0733)	0.0024 (0.0069)
Firm-Fixed_Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Num. of Obs.	7981	4186	4186	4168	2052	2052
Within R-square	0.0740	0.1142	0.1144	0.0534	0.0194	0.0184

Table IV-6.2 presents the results of the fixed effect model on the bias of management forecast, with an unmatched sample and a matched sample using propensity score matching method, respectively. Results in column (1) and (4) are gained from regressing on model (5a), testing the dummy variable PLEDGE\_CTRL, that is, the effect of the occurrence of controlling shareholders' share pledging on management forecast frequency.  $Forecast\ Properties = \beta_0 + \beta_1 PLEDGE\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5a). Results in column (2) and (5) are gained from regressing on model (5b), testing the continuous variable PLGVAL\_CTRL, that is, the effect of the value of controlling shareholders' share pledging on management forecast frequency among the firms with shares pledged.  $Forecast\ Properties = \beta_0 + \beta_1 PLGVAL\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5b). Results in column (3) and (6) are gained from regressing on model (5c), testing the continuous variable PLGRAT\_CTRL, that is, the effect of the ratio of shares pledged by controlling shareholders to the whole shares of the firm on management forecast frequency among the firms with shares pledged.  $Forecast\ Properties = \beta_0 + \beta_1 PLGRAT\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5c). All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

Table IV-6.3: Results of baseline fixed effect model, before and after matching

	ACCURACY					
	(Unmatched Sample)			(PSM Sample)		
	(1)	(2)	(3)	(4)	(5)	(6)
PLEDGE_CTRL	0.0005 (0.0044)			-0.0284 (-0.1769)		
PLGVAL_CTRL		0.1619** (2.4326)			0.2695*** (2.7717)	
PLGRAT_CTRL			1.5351*** (3.3823)			1.9225*** (2.9171)
SIZE	0.2298 (1.4438)	-0.1490 (-0.6492)	-0.0524 (-0.2277)	0.6086** (2.2648)	0.5910* (1.7362)	0.7455** (2.1626)
LEVERAGE	0.0702 (0.1316)	-0.1436 (-0.1985)	-0.2863 (-0.3953)	-0.0609 (-0.0741)	-0.7079 (-0.5844)	-1.0311 (-0.8559)
ROA	-20.0266 ***	-24.6883 ***	-24.4676 ***	-15.1581***	-5.6799	-5.4889
GROWTH	(-10.6664) -0.2718** (-2.5085)	(-10.0434) 0.0068 (0.0461)	(-9.9273) 0.0053 (0.0359)	(-5.2990) -0.3171* (-1.6788)	(-1.4984) -0.4742 (-1.3749)	(-1.4474) -0.4535 (-1.3177)
MBRATIO	0.0251 (1.0805)	-0.0031 (-0.0964)	0.0092 (0.2895)	0.0414 (1.1617)	-0.0036 (-0.0664)	0.0214 (0.4062)
FLOATRATIO	-0.8133*** (-3.2929)	-0.9461** (-2.3120)	-1.0142** (-2.4909)	-0.8044** (-2.2453)	-0.6500 (-0.9935)	-0.7187 (-1.0989)
FOLLOWER	0.0382*** (5.5925)	0.0347*** (3.3531)	0.0363*** (3.5219)	0.0292*** (3.1237)	0.0095 (0.5747)	0.0103 (0.6211)
THOLDERS	0.5080*** (5.1246)	0.6885*** (4.7132)	0.6623*** (4.5198)	0.6284*** (4.0967)	0.7721*** (3.2304)	0.7360*** (3.1095)
INSTHOLDER	-0.5973* (-1.9571)	-0.9775 (-1.5715)	-0.9519 (-1.5276)	-1.2700** (-2.4783)	-0.9844 (-1.1802)	-0.9384 (-1.1167)
OWNRATIO	-0.5723 (-0.8609)	-1.0529 (-0.8796)	-1.2526 (-1.0457)	0.5943 (0.5406)	1.1861 (0.4785)	0.8762 (0.3487)
DUAL	0.0638 (0.3221)	0.4741 (1.5345)	0.4678 (1.5182)	-0.3154 (-1.0590)	0.4517 (0.9989)	0.4117 (0.9169)
_cons	-6.0887* (-1.8299)	-2.0636 (-0.4165)	-0.8397 (-0.1718)	-15.2166*** (-2.7698)	-22.5591*** (-3.0294)	-20.3186*** (-2.7126)
Firm-Fixed_Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Num. of Obs.	7803	4295	4295	4194	2002	2002
Within R-square	0.0972	0.1314	0.1335	0.0683	0.0447	0.0463

Table IV-6.3 presents the results of the fixed effect model on the accuracy of analyst forecast, with an unmatched sample and a matched sample using propensity score matching method, respectively. Results in column (1) and (4) are gained from regressing on model (5a), testing the dummy variable PLEDGE\_CTRL, that is, the effect of the occurrence of controlling shareholders' share pledging on management forecast frequency.  $Forecast\ Properties = \beta_0 + \beta_1 PLEDGE\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5a). Results in column (2) and (5) are gained from regressing on model (5b), testing the continuous variable PLGVAL\_CTRL, that is, the effect of the value of controlling shareholders' share pledging on management forecast frequency among the firms with shares pledged.  $Forecast\ Properties = \beta_0 + \beta_1 PLGVAL\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5b). Results in column (3) and (6) are gained from regressing on model (5c), testing the continuous variable PLGRAT\_CTRL, that is, the effect of the ratio of shares pledged by controlling shareholders to the whole shares of the firm on management forecast frequency among the firms with shares pledged.  $Forecast\ Properties = \beta_0 + \beta_1 PLGRAT\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5c). All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

Table IV-6.4: Results of baseline fixed effect model, before and after matching

	OPTIMISM					
	(Unmatched Sample)			(PSM Sample)		
	(1)	(2)	(3)	(4)	(5)	(6)
PLEDGE_CTRL	0.0077 (0.8255)			0.0054 (0.3921)		
PLGVAL_CTRL		-0.0181*** (-3.0577)			-0.0302*** (-2.9031)	
PLGRAT_CTRL			-0.1698*** (-4.2522)			-0.2406*** (-3.1360)
SIZE	-0.0061 (-0.4504)	0.0393* (1.8438)	0.0277 (1.3065)	-0.0481* (-1.8138)	-0.0155 (-0.3519)	-0.0354 (-0.8056)
LEVERAGE	0.0234 (0.4983)	-0.0550 (-0.7542)	-0.0387 (-0.5302)	0.0913 (1.2148)	0.0296 (0.2342)	0.0673 (0.5441)
ROA	2.8664*** (18.4589)	3.0644*** (15.0601)	3.0431*** (14.9130)	2.4028*** (9.0995)	1.7944*** (4.5501)	1.7779*** (4.6082)
GROWTH	0.0436*** (4.0921)	0.0142 (1.0157)	0.0140 (1.0021)	0.0642*** (3.4998)	0.1052*** (2.9216)	0.1043*** (2.9398)
MBRATIO	-0.0034 (-1.6084)	0.0030 (1.0396)	0.0016 (0.5566)	-0.0067** (-2.0324)	0.0015 (0.3046)	-0.0016 (-0.3137)
FLOATRATIO	0.0791*** (3.2582)	0.0906** (2.1308)	0.0968** (2.2690)	0.0843** (2.3129)	0.1308** (2.2240)	0.1360** (2.3244)
FOLLOWER	-0.0058*** (-9.8630)	-0.0061*** (-6.8799)	-0.0063*** (-7.2141)	-0.0053*** (-5.5606)	-0.0056*** (-3.2859)	-0.0058*** (-3.4031)
THOLDERS	-0.0609*** (-6.8714)	-0.0869*** (-6.2119)	-0.0840*** (-6.0069)	-0.0608*** (-3.9875)	-0.0968*** (-4.4512)	-0.0931*** (-4.2999)
INSTHOLDER	0.0416 (1.3934)	0.0521 (0.8442)	0.0467 (0.7559)	0.0635 (1.1595)	-0.0362 (-0.4473)	-0.0381 (-0.4699)
OWNRATIO	0.0403 (0.5864)	0.0068 (0.0611)	0.0234 (0.2098)	0.0342 (0.2589)	-0.1330 (-0.6279)	-0.1132 (-0.5294)
DUAL	-0.0149 (-0.8211)	-0.0273 (-0.9305)	-0.0268 (-0.9226)	-0.0138 (-0.4879)	0.0110 (0.2376)	0.0137 (0.3038)
_cons	0.2492 (0.8908)	-0.1146 (-0.2595)	-0.2331 (-0.5328)	1.1219* (1.9510)	1.4420 (1.4660)	1.2566 (1.2990)
Firm-Fixed_Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Num. of Obs.	5599	3120	3120	2718	1289	1289
Within R-square	0.2884	0.3525	0.3557	0.2194	0.2272	0.2336

Table IV-6.4 presents the results of the fixed effect model on the relative optimism of management and analyst forecast, with an unmatched sample and a matched sample using propensity score matching method, respectively. Results in column (1) and (4) are gained from regressing on model (5a), testing the dummy variable PLEDGE\_CTRL, that is, the effect of the occurrence of controlling shareholders' share pledging on management forecast frequency.  $Forecast\ Properties = \beta_0 + \beta_1 PLEDGE\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5a). Results in column (2) and (5) are gained from regressing on model (5b), testing the continuous variable PLGVAL\_CTRL, that is, the effect of the value of controlling shareholders' share pledging on management forecast frequency among the firms with shares pledged.  $Forecast\ Properties = \beta_0 + \beta_1 PLGVAL\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5b). Results in column (3) and (6) are gained from regressing on model (5c), testing the continuous variable PLGRAT\_CTRL, that is, the effect of the ratio of shares pledged by controlling shareholders to the whole shares of the firm on management forecast frequency among the firms with shares pledged.  $Forecast\ Properties = \beta_0 + \beta_1 PLGRAT\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \gamma t + \mu_i + \varepsilon_{i,t}$  (5c). All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

In Table IV-7 from Columns (1) to (4), no significant results are displayed for the regression on dependent variables FREQUENCY and BIAS. The insignificant coefficients, however, indicate that managers are more reluctant to disclose private information when controlling shareholders are pledging shares at securities companies, compared to the first scenario that takes all types of pledgees into consideration. And the results also demonstrate that before and after the regulation shock, these two managers forecasting properties remain unchanged.

Table IV-7 Columns (5) and (6) show how analysts reacts to the new regulation and the occurrence of share pledging contracts with securities companies. When investigating into only two time periods 2012 and 2013, the analyst forecast accuracy are reacting positively (more accurate) to the event. The activity of firms that its controlling shareholder pledging shares at securities companies conveys informative message that could be interpreted as efficient inputs into the forecasting models of analysts. The extent of the positive effect of the regulation shock on analyst forecast accuracy is 0.6507 of the beginning-of-fiscal-year stock price of the firm, acquired from a traditional DID model, as displayed Column (5); while 0.6518 displayed in Column (6), results of a PSM-DID model. The two results confirm hypothesis 2a. The comparison between the first two columns shows no significant difference, indicating the DID model itself are not subject to significant self-selection bias. Results confirms two streams of prior literature. First, it is consistent with Zhang et al. (2020) that analyst forecast accuracy benefit from private information flow within securities company. Second, instead of being motivated by conflict of interests, analysts are more inclined to keep credible and align their own interest with investing clients (Brown et al., 2015).

As Column (7) shows, the coefficient of TREAT\*POST is positive at  $p < 0.1$  level. When controlling shareholder of the firm pledged shares at securities companies only in 2013, the event is demonstrated to be associated with a higher optimism (0.0524 points) of management forecast on EPS than analysts. After propensity score matching to address the endogeneity problem, the result of interaction term holds at the same significant level, although slightly lower (see Column (8)). In all, results confirm the hypothesis 3c. Contradictory to Mola and Guidolin (2009) who argue that analysts release optimistically biased rating reports to earn commission fees from listed firms, my results confirm reputation theory and stay with Brown et al. (2015). This could be explained by prior demonstrations that analysts are rewarded by

reputations (Jackson, 2005); issuing biased forecasts are ineffective to bring about benefits (Irvine, 2004).

## **IV.5 Sensitive analysis**

### ***IV.5.1 Top ten shareholders instead of controlling shareholders***

The first sensitive analysis is conducted by adopting an alternative measurement of controlling shareholders. Three variables are investigated here: the occurrence of share pledging (PLG\_ALL); the aggregated value of share pledging (PLGVAL\_ALL); and the ratio to the total shares of share pledging (PLGRAT\_ALL) by top ten largest shareholders are calculated. The examination of alternative measurement also employs fixed effect model with an additional propensity score matching. As is shown in Table IV-B1 (in Appendix), the significance and direction of coefficients are similar but exhibit some differences. First, coefficients of PLG\_ALL are more significant under FREQUENCY and BIAS than in the baseline analysis. In addition, coefficients of the measurements of value and ratio turn significant. However, all coefficients of independent variables lose significance under dependents ACCURACY and OPTIMISM.

### ***IV.5.2 Time-varying difference-in-difference model***

The second method of sensitive analysis adopts a new model to examine the same sample used in the first empirical analysis on share pledging of controlling shareholders. The time-varying difference-in-difference model is designed as follows.

$$\text{Forecast Properties} = \beta_0 + \beta_1 \Delta \text{PLEDGE\_CTRL}_{i,t} + \beta_m \text{CONTROL}_{i,t} + \mu_i + \tau_t + \varepsilon_{i,t} \quad (7)$$

The results from time-varying DID model (see Appendix Table IV-B2) confirm those obtained from the fixed model, they are consistent with coefficients in terms of direction and significance from the first rows of Table IV-6.1 to 6.4.

Table IV-7: Difference-in-difference model

	FREQUENCY		BIAS		ACCURACY		OPTIMISM	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Traditional DID	PSM-DID	Traditional DID	PSM-DID	Traditional DID	PSM-DID	Traditional DID	PSM-DID
TREAT	0.0076 (0.1719)	0.0061 (0.1397)	-0.0023 (-0.2440)	0.0016 (0.1987)	0.3401 (1.5620)	0.3405* (1.6811)	-0.0313 (-1.6101)	-0.0279 (-1.4716)
POST	-0.0001 (-0.0030)	0.0014 (0.0333)	-0.0043 (-0.4814)	0.0007 (0.0914)	0.5633*** (2.7057)	0.6269*** (3.2269)	0.0555*** (2.9632)	0.0557*** (3.0203)
TREAT*POST	0.0022 (0.0348)	-0.0016 (-0.0257)	0.0033 (0.2510)	-0.0004 (-0.0388)	-0.6507** (-2.1369)	-0.6518** (-2.3011)	0.0524* (1.9239)	0.0447* (1.6794)
SIZE	-0.0117 (-0.4512)	-0.0134 (-0.5114)	-0.0036 (-0.5625)	-0.0042 (-0.7259)	0.0773 (0.5814)	0.0401 (0.3197)	-0.0141 (-1.0897)	-0.0153 (-1.1921)
LEVERAGE	-0.4065*** (-4.1628)	-0.3952*** (-4.0057)	0.0782*** (3.3245)	0.0621*** (3.0344)	-1.0839** (-1.9901)	-0.9295* (-1.8257)	0.1919*** (3.8003)	0.1827*** (3.7025)
ROA	-1.6623*** (-5.1401)	-1.7765*** (-5.1214)	-0.1689** (-2.2202)	-0.0864 (-1.1836)	-11.7737*** (-6.2555)	-10.9651*** (-6.1047)	2.1821*** (12.2524)	2.1738*** (12.0476)
GROWTH	0.0580* (1.7057)	0.0605* (1.6916)	-0.0108 (-1.0424)	-0.0069 (-0.7058)	-1.0310*** (-4.6181)	-1.2220*** (-5.2312)	0.1286*** (5.6904)	0.1413*** (5.8480)
MBRATIO	-0.0190*** (-2.8210)	-0.0179** (-2.3525)	-0.0019 (-0.9534)	-0.0026 (-1.3789)	0.0698 (1.5918)	0.0668 (1.5332)	-0.0143*** (-3.4190)	-0.0135*** (-3.0714)
FLOATRATIO	0.1053 (1.4930)	0.0827 (1.1907)	-0.0029 (-0.1825)	0.0049 (0.3563)	-0.7376** (-2.1176)	-0.7119** (-2.1984)	0.0568* (1.7319)	0.0712** (2.1892)
FOLLOWER	0.0069*** (3.5928)	0.0069*** (3.6557)	-0.0006 (-1.4026)	-0.0007* (-1.8174)	0.0336*** (3.8356)	0.0316*** (3.9256)	-0.0041*** (-5.1983)	-0.0039*** (-4.9942)
THOLDERS	-0.1121*** (-4.1284)	-0.1077*** (-4.0342)	-0.0073 (-1.1966)	-0.0078 (-1.4694)	0.0926 (0.7105)	0.0816 (0.6798)	0.0038 (0.3145)	0.0042 (0.3597)
INSTHOLDER	-0.2800*** (-3.5307)	-0.2537*** (-3.3114)	-0.0089 (-0.5418)	-0.0010 (-0.0673)	0.0009 (0.2280)	0.0010 (0.2801)	0.0084 (0.2476)	0.0083 (0.2541)
OWNRATIO	0.3616*** (3.6810)	0.3748*** (3.8971)	-0.0014 (-0.0620)	0.0012 (0.0643)	0.0078* (1.6625)	0.0071 (1.6305)	-0.0802* (-1.7711)	-0.0712 (-1.5915)
DUAL	0.2522*** (6.1997)	0.2574*** (6.4376)	0.0135 (1.1738)	0.0082 (0.8088)	-0.0198 (-0.0939)	0.0836 (0.4256)	0.0191 (0.8193)	0.0163 (0.6931)
_cons	5.0380*** (11.5842)	5.0355*** (11.4668)	0.1978* (1.7601)	0.2093** (2.0772)	-0.2555 (-0.1116)	0.4648 (0.2143)	-0.0811 (-0.3531)	-0.0690 (-0.3001)
Num. of Obs.	2264	2252	1448	1428	1364	1358	936	918
Adj. R-square	0.1097	0.1101	0.0285	0.0196	0.0622	0.0689	0.2195	0.2225

#### IV. How does share pledging influence management and analyst forecast?

Note: Table IV-7 presents the results of the difference-in-difference model on the proxies of forecast properties, with an unmatched sample and a matched sample using propensity score matching method, respectively. Model (2) is applied to all the columns.  $Forecast\ Properties = \beta_0 + \beta_1 TREAT_{i,t} + \beta_2 POST_{i,t} + \beta_3 TREAT \times POST_{i,t} + \beta_m CONTROL_{i,t} + \varepsilon_{i,t}$  (2). Where  $TREAT_{i,t}$  is defined as 1 if the firm pledges its share against a securities company in year 2013, and 0 otherwise.  $POST_{i,t}$  is defined as 1 if the firm pledges its share against a securities company for the first time in year 2013. Results in columns (1) (3) (5) (7) are gained from regressing on unmatched sample, while columns (2) (4) (6) (8) are based on a matched sample using propensity score matching method. The coefficient of interactive term TREAT\*POST is the key parameters of interest. It represents the difference-in-difference effect of the “2013 regulation”, that is how much the average outcome of the treatment group has changed after the treatment, compared to the average outcome of the same group without regulation. The coefficient of TREAT represents the difference between the treatment and the control group before the regulation. The coefficient of POST represents how much the average outcome of the control group has changed in the post-regulation period. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

### ***IV.5.3 Multiple time period difference-in-difference model***

The alternative model to replace the baseline difference-in-difference model testing hypothesis 2 expands the time period. However, subjecting to the risk of losing too many observations when constructing the balanced panel data, the time period is set between 2012 and 2015. To better control the firm- and year-fixed effect, this model includes multiple time periods with fixed effect. The multiple time periods standard DID model is as followed:

$$\begin{aligned} \text{Forecast Properties} = & \beta_0 + \beta_1 TREAT_{i,t} + \beta_2 POST_{i,t} + \beta_3 TREAT_{i,t} \times POST_{i,t} + \\ & \beta_m CONTROL_{i,t} + \text{firm fixed effect} + \text{year fixed effect} + \varepsilon_{i,t} \end{aligned} \quad (8)$$

Same as baseline model, where  $TREAT_{i,t}$  is defined as 1 for all  $i$  if there are shares pledged against a securities company in year  $t$ , and 0 if there is never such activity during the sample period.  $POST_{i,t}$  is defined as 1 if there are shares pledged against securities companies for the first time in year 2013 and assign the same  $i$  with 1 in  $t+1$  and  $t+2$ , and  $POST_{i,t}$  equals 0 if the firm never pledged any shares during the sample period. The coefficient of interactive term  $TREAT_{i,t} \times POST_{i,t}$  is the key parameters of interest. It represents the difference-in-difference effect of the “2013 regulation”, that is how much the average outcome of the treatment group has changed after the treatment, compared to the average outcome of the same group without regulation. The results (see Appendix Table-IV B3) show similar significant effect of the 2013 regulation on analysts’ accuracy and relative optimism.

## **IV.6 Conclusion**

The alternative funding resource of NSOEs, share pledging, is the focus of this paper. Based on a sample of China’s NSOEs from 2011 to 2018, I investigate the relationship between share pledging and management/analyst forecast. The research is inspired by the fact that China’s NSOEs are confronted with restricted funding resources, and therefore resorting to share pledging. Although share pledging provides loans at no expense of holding rights, holding rights are exposed to risks during a downward stock price movement. Thus, controlling shareholders, as the most influencing figure in China’s NSOEs, are motivated to stabilise the stock price to avoid margin call. In 2013, a new regulation was incepted, giving securities

companies permission to act as pledgee to accept share-based loan substantially enlarged the share pledging market, and imposed influence on managers' and analysts' forecast properties.

This paper examines respectively the association between the existence of the abovementioned two types of share pledging and four management/analyst forecast properties: management forecast frequency and bias, analyst forecast accuracy, and relative optimism. To address the potential miss-specification of model and endogeneity problem inherited in the sample, this paper employs fixed effect model and difference-in-difference model in the baseline analysis, and propensity score matching method in additional analysis.

Empirical results show that share pledging affect management and analyst forecast properties in several ways. First, this paper provides evidence that the event of share pledging by controlling shareholder is associated with an increasing number of management forecast issuances (preannouncement), and a reduction in management forecasts bias, suggesting that the firm tries to alleviate information asymmetry through frequently disclosing private information and issuing more credible forecast. Their ultimate purpose is to avoid stock price crash risk and further to dodge margin call pressure. Although the event of share pledging shows no significant effect on analyst forecast accuracy and relative optimism, the net value of pledged shares and ratio of pledged to total tradable shares are significantly positively associated with analyst forecast bias and relative optimism of managers to analysts.

In the analysis of the 2013 regulation shock, results demonstrate that analyst forecasts experience an improvement in accuracy, and managers appear more optimistic in forecasting EPS. It could be interpreted that analysts might acquire additional informative messages from the share pledging business of securities companies. However, the firm still attempts to influence securities companies and other outside shareholders via their relatively optimistically biased forecasts. The comparison of the latter with the former examination shows different effect of share pledging when pinned down the pledgee to a specific category—securities companies, indicating that the introduction of the new regulation changes the behaviour of both managers and analysts.

However, this paper suffers from limitations on data availability and thus leaving some questions open to investigate. The incomplete disclosure and accessibility of information

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about share pledging, in terms of exact name of pledger and pledge period, thwart in-depth analysis based on one-to-one matching of share pledging firm and brokerage company. If this kind of data can be employed, further research could draw more specific and robust conclusion on analysts' forecast properties.

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## IV.8 Appendix

Table IV-A: Variable definition

Variable	Definition
FREQUENCY	Management forecast frequency, computed as the total number of preannouncements containing forecasts of EPS issued by the firm in the same fiscal year;
BIAS	Management forecast bias, computed as the absolute difference between mean of management forecast EPS and actual EPS deflated by the beginning-of-fiscal-year stock price and multiplied by 100;
ACCURACY	Analyst forecast accuracy, computed as the absolute difference between mean of analyst forecast EPS and actual EPS deflated by the beginning-of-fiscal-year stock price and multiplied by 100;
OPTIMISM	Management forecast optimism, computed as the absolute difference between mean of management forecast EPS and mean of analyst forecast EPS, deflated by the beginning-of-fiscal-year stock price and multiplied by 100.
PLEDGE_CTRL	=1 if the controlling shareholder of the firm holds a positive value of share-pledging at the end of the fiscal year, and 0 otherwise;
PLGVAL_CTRL	total net value of the share pledging at the end of the fiscal year;
PLGRAT_CTRL	the ratio of the shares pledged by the controlling shareholder to the total tradable shares of the firm;
PLEDGE_BRK	=1 if the firm has all its share pledging at securities companies; =0 if the firm has no share pledging.
SIZE	the logarithm of total assets at the end of fiscal year;
LEVERAGE	the ratio of a firm's total debt to total assets at the end of fiscal year;
ROA	net income before extraordinary items divided by total assets;
GROWTH	the annual growth rate in sales revenues;
MBRATIO	the ratio of the market value to the book value of equity;
FLOATRATIO	the ratio of tradable shares to the total number of shares;
FOLLOWER	the number of analysts that follow the firm;
THOLDERS	the logarithm of total number of shareholders at the end of fiscal year;
INSTHOLDER	the ratio of tradable shares held by institutional investors;
OWNRATIO	the ratio of shares held by the actual controller to the total shares of the firm;
DUAL	=1 if the controlling shareholder undertakes the role of director or CEO in the firm, and 0 otherwise.
SEASONAL	=1 if the firm offers seasonal stock issuance during the year, and 0 otherwise.

Table IV-B1: Fixed-effect model (Top ten shareholders)

	FREQUENCY			BIAS			ACCURACY			OPTIMISM		
PLEDGE_ALL	0.2140*** (10.7907)			-0.0154*** (-3.5812)			-0.0207 (-0.2065)			0.0037 (0.4135)		
PLGVAL_ALL		0.0258*** (2.8071)			-0.0080** (-2.1865)			0.0200 (0.2913)			-0.0069 (-1.2013)	
PLGRAT_ALL			0.1318** (2.0750)			-0.0632** (-2.3240)			0.5065 (0.9574)			-0.0759* (-1.6627)
SIZE	0.0538*** (2.6957)	-0.0035 (-0.1606)	0.0106 (0.5056)	0.0149* (1.9496)	0.0249** (2.3233)	0.0206** (1.9859)	0.2312 (1.4527)	0.0807 (0.3759)	0.0889 (0.4168)	-0.0055 (-0.4096)	0.0176 (0.9248)	0.0134 (0.7212)
LEVERAGE	0.0056 (0.0822)	0.1978*** (2.6946)	0.1811** (2.4797)	0.0678** (2.2956)	0.0247 (0.6452)	0.0300 (0.7856)	0.0710 (0.1333)	-0.5106 (-0.7922)	-0.5310 (-0.8233)	0.0240 (0.5118)	0.0189 (0.3069)	0.0233 (0.3776)
ROA	-1.7002*** (-11.8233)	-0.9430*** (-6.4854)	-0.9137*** (-6.3220)	-0.5920*** (-7.1099)	-0.8170*** (-7.8755)	-0.8272*** (-7.9648)	-20.0308*** (-10.6760)	-24.1233*** (-10.8187)	-24.0399*** (-10.7421)	2.8655*** (18.4331)	3.0864*** (16.4738)	3.0713*** (16.3953)
GROWTH	0.1270*** (10.6628)	0.0489*** (3.8799)	0.0494*** (3.9162)	-0.0069 (-1.1349)	-0.0022 (-0.3014)	-0.0022 (-0.3094)	-0.2708** (-2.5049)	-0.0838 (-0.6901)	-0.0876 (-0.7183)	0.0437*** (4.1027)	0.0222* (1.7791)	0.0225* (1.8054)
MBRATIO	-0.0121*** (-3.9853)	-0.0135*** (-4.1534)	-0.0122*** (-3.8505)	0.0010 (0.7984)	0.0018 (1.1515)	0.0013 (0.8447)	0.0251 (1.0802)	0.0193 (0.7002)	0.0217 (0.8038)	-0.0034 (-1.6052)	-0.0006 (-0.2526)	-0.0012 (-0.4956)
FLOATRATIO	0.4712*** (11.5915)	0.1204*** (2.7277)	0.1186*** (2.6874)	-0.0537*** (-4.2632)	-0.0367* (-1.9490)	-0.0354* (-1.8812)	-0.8109*** (-3.2815)	-0.7615** (-2.1207)	-0.7773*** (-2.1654)	0.0799*** (3.2902)	0.0789*** (2.1641)	0.0800*** (2.1932)
FOLLOWER	0.0030*** (2.7405)	0.0031*** (2.5899)	0.0034*** (2.8748)	0.0001 (0.1660)	0.0004 (0.7640)	0.0003 (0.5425)	0.0382*** (5.5924)	0.0374*** (4.0397)	0.0377*** (4.0822)	-0.0058*** (-9.8721)	-0.0061*** (-8.1853)	-0.0062*** (-8.2842)
THOLDERS	-0.1108*** (-6.3121)	-0.0053 (-0.3173)	-0.0054 (-0.3197)	0.0044 (1.0109)	0.0024 (0.3753)	0.0025 (0.3810)	0.5083*** (5.1362)	0.8217*** (6.2234)	0.8180*** (6.1842)	-0.0607*** (-6.8546)	-0.0930*** (-7.5628)	-0.0927*** (-7.5241)
INSTHOLDER	0.0671 (1.0911)	0.0383 (0.5371)	0.0521 (0.7308)	0.0070 (0.5695)	0.0138 (0.5905)	0.0096 (0.4120)	-0.0059* (-1.9400)	-0.0107** (-2.0468)	-0.0108** (-2.0691)	0.0424 (1.4168)	0.0651 (1.3002)	0.0623 (1.2425)
OWNRATIO	0.1198 (1.2753)	-0.0022 (-0.0217)	-0.0037 (-0.0365)	-0.0131 (-0.3932)	0.0087 (0.1941)	0.0102 (0.2276)	-0.0057 (-0.8567)	-0.0052 (-0.5271)	-0.0060 (-0.6007)	0.0422 (0.6136)	0.0232 (0.2566)	0.0300 (0.3315)
DUAL	0.0533** (2.1156)	0.0293 (1.0821)	0.0299 (1.1058)	0.0022 (0.1850)	-0.0056 (-0.3815)	-0.0056 (-0.3820)	0.0649 (0.3261)	0.2939 (1.0953)	0.2936 (1.0948)	-0.0145 (-0.7952)	-0.0115 (-0.4809)	-0.0116 (-0.4854)
_cons	3.1114*** (7.4687)	3.2427*** (7.2927)	3.4197*** (7.6907)	-0.2576 (-1.6321)	-0.2982 (-1.3843)	-0.3526* (-1.6464)	-6.1188* (-1.8408)	-5.6482 (-1.2513)	-5.4439 (-1.2155)	0.2334 (0.8402)	0.1523 (0.4011)	0.1133 (0.2980)
Firm-Fixed_Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of Obs.	11588	7419	7419	7981	5207	5207	7803	5228	5228	5599	3792	3792
Within R-square	0.1179	0.0372	0.0362	0.0734	0.1161	0.1161	0.0972	0.1278	0.1280	0.2883	0.3354	0.3358

Note: Table IV-B1 presents the results of the fixed-effect model on the proxies of forecast properties. The regressions are based on the following model.

$Forecast\ Properties = \beta_0 + \beta_1 PLEDGE\_ALL_{i,t} + \beta_m CONTROL_{i,t} + \mu_i + \tau_t + \varepsilon_{i,t}$ . All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

Table IV-B2: Time-varying difference-in-difference model

	FREQUENCY	BIAS	ACCURACY	OPTIMISM
PLEDGE_CTRL	0.1603*** (9.0724)	-0.0173*** (-3.9476)	0.0005 (0.0044)	0.0077 (0.8255)
SIZE	0.0588*** (2.9047)	0.0154** (2.0030)	0.2298 (1.4438)	-0.0061 (-0.4504)
LEVERAGE	-0.0266 (-0.3889)	0.0708** (2.4133)	0.0702 (0.1316)	0.0234 (0.4983)
ROA	-1.7259*** (-11.9074)	-0.5902*** (-7.1068)	-20.0266*** (-10.6664)	2.8664*** (18.4589)
GROWTH	0.1301*** (10.8506)	-0.0069 (-1.1333)	-0.2718** (-2.5085)	0.0436*** (4.0921)
MBRATIO	-0.0114*** (-3.7239)	0.0008 (0.7042)	0.0251 (1.0805)	-0.0034 (-1.6084)
FLOATRATIO	0.4761*** (11.5794)	-0.0525*** (-4.1574)	-0.8133*** (-3.2929)	0.0791*** (3.2582)
FOLLOWER	0.0030*** (2.7119)	0.0000 (0.1431)	0.0382*** (5.5925)	-0.0058*** (-9.8630)
THOLDERS	-0.1154*** (-6.4784)	0.0048 (1.1086)	0.5080*** (5.1246)	-0.0609*** (-6.8714)
INSTHOLDER	0.0776 (1.2555)	0.0075 (0.6128)	-0.5973* (-1.9571)	0.0416 (1.3934)
OWNRATIO	0.0954 (1.0152)	-0.0100 (-0.2991)	-0.5723 (-0.8609)	0.0403 (0.5864)
DUAL	0.0552** (2.1826)	0.0027 (0.2259)	0.0638 (0.3221)	-0.0149 (-0.8211)
_cons	3.0948*** (7.3210)	-0.2749* (-1.7336)	-6.0887* (-1.8299)	0.2492 (0.8908)
Firm-Fixed_Effect	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes
Num. of Obs.	11588	7981	7803	5599
Adj. R-square	0.1115	0.0740	0.0972	0.2884

Note: Table IV-B2 presents the results of the time-varying difference-in-difference model on the proxies of forecast properties, with an unmatched sample. The regressions are based on model (7).

$Forecast\ Properties = \beta_0 + \beta_1 \Delta PLEDGE\_CTRL_{i,t} + \beta_m CONTROL_{i,t} + \varepsilon_{i,t}$ . All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

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Table IV-B3: Multiple time periods difference-in-difference model

	FREQUENCY	BIAS	OPTIMISM	ACCURACY
TREAT*POST	0.0501 (0.9523)	0.0126 (0.9114)	0.0712** (2.0689)	-0.7208** (-2.2262)
SIZE	0.0315 (0.6767)	0.0292* (1.9063)	-0.1076** (-2.2808)	1.3527*** (3.0511)
LEVERAGE	0.0534 (0.3023)	0.0695 (0.9494)	0.0238 (0.1661)	0.7029 (0.4860)
ROA	-1.0081*** (-2.7873)	0.0152 (0.0666)	2.5894*** (6.6316)	-20.8839*** (-4.1177)
GROWTH	0.0512* (1.9434)	-0.0175* (-1.6996)	0.1159** (5.1790)	-1.1276*** (-4.8085)
MBRATIO	0.0011 (0.2412)	-0.0043** (-2.4623)	0.0028 (0.5797)	-0.0029 (-0.0592)
FLOATRATIO	0.0886 (1.2219)	-0.0374* (-1.6738)	-0.0334 (-0.5527)	0.3295 (0.5002)
FOLLOWER	0.0005 (0.2000)	0.0001 (0.0665)	-0.0027* (-1.6956)	0.0286 (1.3423)
THOLDERS	0.0216 (0.8284)	-0.0077 (-0.9750)	-0.0753*** (-2.9825)	0.8608*** (3.3153)
INSTHOLDER	-0.1279 (-1.4466)	0.0139 (0.5445)	-0.0512 (-0.7169)	-0.2378 (-0.3624)
OWNRATIO	0.2702 (1.4216)	0.1436* (1.7949)	-0.0595 (-0.2773)	-1.8629 (-0.9680)
DUAL	-0.0064 (-0.0888)	-0.0034 (-0.1121)	0.0399 (0.7900)	-0.3074 (-0.8182)
_cons	2.8181*** (2.8506)	-0.5387 (-1.6165)	2.6664*** (2.9430)	-34.4008*** (-3.4964)
Num. of Obs.	2380	1316	812	1324
Adj. R-square	0.0098	0.0192	0.2341	0.1283

Note: Table IV-B3 presents the results of the multiple time periods difference-in-difference model on the proxies of forecast properties. The regressions are based on model (8).  $Forecast\ Properties = \beta_0 + \beta_1 TREAT_{i,t} + \beta_2 POST_{i,t} + \beta_3 TREAT_{i,t} \times POST_{i,t} + \beta_m CONTROL_{i,t} + firm\ fixed\ effect + year\ fixed\ effect + \varepsilon_{i,t}$ , where  $TREAT_{i,t}$  is defined as 1 for all  $i$  if there are shares pledged against a securities company in year  $t$ , and 0 if there is never such activity during the sample period.  $POST_{i,t}$  is defined as 1 if there are shares pledged against securities companies for the first time in year 2013 and assign the same  $i$  with 1 in  $t+1$  and  $t+2$ , and  $POST_{i,t}$  equals 0 if the firm never pledged any shares during the sample period. The coefficient of interactive term  $TREAT_{i,t} \times POST_{i,t}$  is the key parameters of interest. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

Table IV-C1: Covariate Balance Check Before and After Matching. (Dependent variable: FREQUENCY)

Covariate		2011 Before: N=1041 After: N=388		2012 Before: N=1153 After: N=491		2013 Before: N=1148 After: N=723		2014 Before: N=1234 After: N=894		2015 Before: N=1437 After: N=909		2016 Before: N=1589 After: N=964		2017 Before: N=1951 After: N=1154		2018 Before: N=2035 After: N=1208	
		%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test
SIZE	Unmatched	41.5	5.96***	45.3	7.00***	20.4	3.42***	14.5	2.54**	21.0	3.96***	30.5	5.93***	27.7	5.98***	21.3	4.69***
	Matched	-8.3	-0.77	-22.4	-2.33 **	-8.4	-1.13	-10.0	-1.54	-6.6	-1.06	-11.1	-1.88*	-4.6	-0.83	-6.5	-1.22
LEVERAGE	Unmatched	25.7	3.42***	19.5	2.61***	39.4	6.49***	24.6	4.29***	24.9	4.67***	28.3	5.43***	28.8	6.15***	12.4	2.91***
	Matched	1.6	0.15	-13.6	-1.69*	-18.1	-2.60***	-2.8	-0.48	-8.9	-1.45	-8.3	-1.39	-1.7	-0.31	3.7	0.94
ROA	Unmatched	-8.5	-0.98	-21.2	-3.12***	-15.6	-2.51**	-10.5	-1.83*	-20.3	-3.83***	-22.7	-4.47***	-20.4	-4.35***	-7.2	-1.66*
	Matched	0.6	0.22	12.6	1.22	-0.7	-0.10	6.5	1.07	6.1	1.00	3.8	0.67	3.8	0.74	-3.1	-0.63
GROWTH	Unmatched	-5.1	-0.58	-5.1	-0.65	-1.9	-0.30	10.5	1.85*	9.5	1.65*	13.1	2.30**	9.9	1.94*	6.4	1.30
	Matched	0.2	0.91	-0.6	-0.60	-9.3	-0.93	2.0	0.32	-0.2	-0.43	0.9	0.54	-0.6	-0.31	1.4	0.47
MBRATIO	Unmatched	-5.1	-0.59	-10.3	-1.38	-5.9	-0.90	-7.5	-1.31	-9.5	-1.94**	-7.4	-1.63	-10.7	-2.20**	-17.9	-4.17***
	Matched	-1.3	-1.30	8.7	1.75*	-1.0	-0.74	3.2	0.63	0.9	1.60	1.3	1.08	5.1	0.75	4.2	1.08
FLOATRATIO	Unmatched	57.4	7.99***	41.5	6.38***	13.4	2.22**	8.5	1.48	11.8	2.24**	11.5	2.27**	31.0	6.81***	23.5	5.26***
	Matched	-21.8	-2.10**	-33.5	-3.64***	-12.5	-1.66*	-4.6	-0.73	-7.2	-1.13	-6.4	-1.04	-9.1	-1.61	-10.7	-1.95*
FOLLOWER	Unmatched	-17.6	-2.42**	-10.7	-1.60	-15.1	-2.47**	-2.2	-0.38	8.1	1.51	24.2	4.63***	15.4	3.28***	5.5	1.21
	Matched	1.2	0.12	9.2	1.02	7.6	1.10	5.5	0.82	1.9	0.30	-11.6	-2.03**	0.5	0.09	-1.1	-0.20
THOLDERS	Unmatched	42.1	5.96***	36.2	3.00***	11.3	1.88*	0.1	0.03	6.3	1.17	7.7	1.48	17.6	3.79***	12.5	2.75***
	Matched	-6.9	-0.65	-33.3	-3.52***	-6.0	-0.79	-4.0	-0.59	-1.2	-0.18	-2.3	-0.37	-6.3	-1.15	-7.0	-1.31
INSTHOLDER	Unmatched	31.9	4.39***	20.5	3.12***	5.3	0.88	22.9	4.02***	31.7	5.88***	27.2	5.26***	26.1	5.54***	17.7	3.85***
	Matched	-9.6	-0.95	-4.5	-0.49	-3.0	-0.40	-4.4	-0.68	-3.6	-0.59	-11.9	-2.08**	-4.1	-0.80	-3.3	-0.64
OWNRATIO	Unmatched	-9.5	-1.33	-6.6	-1.00	3.3	0.55	-4.5	-0.79	-2.8	-0.54	-9.3	-1.84*	-9.6	-2.11**	-0.6	-0.13
	Matched	10.1	0.97	21.0	2.28**	2.3	0.31	0.2	0.04	-1.5	-0.23	3.2	0.51	3.7	0.66	2.9	0.53
DUAL	Unmatched	-24.0	-3.51***	-15.2	-2.39**	1.5	0.24	7.7	1.35	14.0	2.65**	7.0	1.37	17.1	3.740***	25.2	5.65***
	Matched	8.3	0.72	14.6	1.45	0.7	0.09	-2.4	-0.36	-4.7	-0.73	-6.6	-1.02	-4.8	-0.80	-8.8	-1.56

Note: Table IV-C1 presents the results of the covariate balance check before and after propensity score matching on treatment variable PLEDGE\_CTRL, with dependent variable FREQUENCY. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

IV. How does share pledging influence management and analyst forecast?

Table IV-C2: Covariate Balance Check Before and After Matching (Dependent variable: BIAS)

Covariate		2011 Before: N=679 After: N=200		2012 Before: N=812 After: N=281		2013 Before: N=793 After: N=485		2014 Before: N=864 After: N=577		2015 Before: N=993 After: N=572		2016 Before: N=1106 After: N=585		2017 Before: N=1371 After: N=730		2018 Before: N=1363 After: N=746	
		%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test								
SIZE	Unmatched	44.7	4.98***	39.6	5.09***	14.2	1.97**	17.6	2.59***	23.3	3.64***	38.5	6.23***	33.4	6.01***	27.6	4.87***
	Matched	-19.3	-1.15	-21.1	-1.76*	-7.4	-0.81	-4.6	-0.54	-10.5	-1.37	-15.4	-2.10**	-12.2	-1.81*	-12.4	-1.84*
LEVERAGE	Unmatched	83.0	9.12***	39.0	4.41***	45.0	6.10***	44.2	6.50***	34.8	5.36***	37.9	6.03***	35.5	6.21***	26.1	4.62***
	Matched	-33.2	-2.19**	-8.0	-0.93	-19.4	-2.45**	-12.6	-1.59	-14.1	-1.85*	-13.8	-1.87*	-14.1	-2.27**	-2.0	-0.32
ROA	Unmatched	-35.0	-3.60***	-32.4	-3.76***	-21.1	-2.77***	-17.5	-2.57***	-18.3	-2.87***	-25.2	-4.10***	-24.4	-4.18***	-4.7	-0.87
	Matched	8.1	0.53	-4.2	-0.47	6.1	0.78	7.2	0.93	4.1	0.53	14.1	1.94*	10.4	1.92*	-4.1	-0.62
GROWTH	Unmatched	25.9	2.89***	-7.6	-0.80	9.4	1.29	22.3	3.29***	8.8	1.27	13.7	1.96**	14.9	2.38**	8.2	1.27
	Matched	-27.4	-1.59	11.4	2.47**	9.4	1.68*	-3.4	-1.02	0.0	-0.01	-0.2	-0.11	1.4	0.46	0.8	0.30
MBRATIO	Unmatched	5.5	0.59	-5.0	-0.62	-8.6	-1.17	-1.0	-0.14	-8.4	-1.31	-26.4	-4.41***	-13.2	-2.26**	-21.2	-4.09***
	Matched	-8.6	-0.55	0.6	0.05	2.8	0.32	-3.6	-0.43	2.7	0.34	10.8	1.44	3.6	0.60	4.0	0.75
FLOATRATIO	Unmatched	58.6	6.40***	41.6	5.26***	20.2	2.78***	19.9	2.92***	20.7	3.25***	18.7	3.08***	32.1	5.85***	25.7	4.60***
	Matched	-25.8	-1.59	-9.4	-0.71	-7.8	-0.83	-1.9	-0.24	-8.5	-1.07	-4.8	-0.63	-13.9	-2.01**	-4.1	-0.57
FOLLOWER	Unmatched	-14.7	-1.57	-7.4	-0.92	-20.0	-2.70***	-0.9	-0.13	13.7	2.09**	32.0	5.06***	20.3	3.55***	11.0	1.92*
	Matched	9.3	0.63	-15.7	-1.19	12.2	1.47	-0.9	-0.10	-10.4	-1.35	-3.4	-0.45	-1.1	-0.17	-8.0	-1.22
THOLDERS	Unmatched	40.4	4.43***	29.9	3.72***	10.6	1.47	5.9	0.87	9.4	1.44	8.4	1.34	18.8	3.33***	14.7	2.56**
	Matched	-24.2	-1.54	-10.2	-0.81	-3.6	-0.39	0.8	0.10	-9.7	-1.21	-7.0	-0.92	-14.4	-2.14**	-9.8	-1.46
INSTHOLDER	Unmatched	27.4	2.89***	11.6	1.44	3.9	0.54	24.7	3.63***	33.6	5.13***	35.6	5.69***	29.7	5.22***	21.9	3.78***
	Matched	-16.1	-1.12	-8.5	-0.67	-0.1	-0.02	-10.3	-1.33	-6.6	-0.88	-6.1	-0.84	-3.1	-0.48	-9.3	-1.52
OWNRATIO	Unmatched	-14.8	-1.57	-8.7	-1.06	-3.4	-0.47	-16.1	-2.37**	-9.6	-1.49	-19.1	-3.14***	-10.0	-1.82**	-1.4	-0.25
	Matched	14.5	0.96	20.5	1.64	-2.9	-0.31	6.4	0.79	0.6	0.08	2.5	0.32	3.8	0.55	3.4	0.49
DUAL	Unmatched	-37.0	-4.56***	-10.6	-1.38	-5.3	-0.74	-4.5	-0.67	10.0	1.57	-1.0	-0.16	14.5	2.63***	21.0	3.79***
	Matched	26.4	1.48	10.4	0.74	8.4	0.88	1.6	0.19	-4.6	-0.56	-6.1	-0.77	-2.2	-0.30	-10.4	-1.45

Note: Table IV-C2 presents the results of the covariate balance check before and after propensity score matching on treatment variable PLEDGE\_CTRL, with dependent variable BIAS. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

IV. How does share pledging influence management and analyst forecast?

Table IV-C3: Covariate Balance Check Before and After Matching (Dependent variable: ACCURACY)

Covariate		2011		2012		2013		2014		2015		2016		2017		2018	
		%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test
SIZE	Unmatched	31.2	4.00***	41.0	5.57***	23.7	3.38***	7.9	1.17	2.4	0.37	16.6	2.75***	-1.9	-0.31	10.5	1.70*
	Matched	-0.6	-0.05	-13.3	-1.28	-10.6	-1.15	-2.0	-0.25	1.1	0.14	-7.7	-1.11	-2.3	-0.30	-1.1	-0.14
LEVERAGE	Unmatched	49.7	7.09***	70.0	9.54***	56.9	8.06***	29.4	4.35***	20.9	3.20***	27.0	4.40***	25.8	4.01***	34.8	5.53***
	Matched	-7.1	-1.15	-28.2	-2.75***	-26.2	-3.05***	1.0	0.13	-3.2	-0.41	-10.2	-1.52	-11.3	-1.57	-10.0	-1.31
ROA	Unmatched	-24.1	-3.14***	-27.6	-3.92***	-28.0	-3.89***	-11.5	-1.70*	-18.2	-2.84***	-15.4	-2.58***	-21.5	-3.15***	-39.1	-6.00***
	Matched	-1.6	-0.20	8.2	0.73	9.8	1.03	6.5	0.90	8.9	1.19	5.0	0.73	10.1	1.70*	8.4	1.40
GROWTH	Unmatched	-6.2	-0.64	-0.6	-0.07	1.5	0.20	23.2	3.42***	7.7	1.04	11.9	1.72	7.9	1.07	13.0	1.87*
	Matched	0.0	0.83	4.9	0.69	-0.1	-0.01	-3.9	-0.56	-0.3	-0.50	-0.8	-0.48	-0.6	-0.29	-4.2	-0.94
MBRATIO	Unmatched	3.3	0.39	2.0	0.28	-8.2	-1.09	-1.0	-0.15	0.3	0.05	-5.4	-0.88	2.3	0.33	-16.5	-2.65***
	Matched	-10.4	-0.75	-2.1	-0.17	-4.6	-0.40	4.4	0.65	-4.5	-0.54	2.5	0.34	-1.2	-0.20	10.7	1.36
FLOATRATIO	Unmatched	45.1	5.55***	40.5	5.49***	22.9	3.23***	-5.2	-0.77	-14.0	-2.17**	-10.1	-1.69*	5.2	0.85	14.5	2.38
	Matched	-20.0	-1.78*	-26.3	-2.44**	-12.5	-1.36	2.9	0.38	1.0	0.13	3.6	0.49	-7.7	-0.99	-1.4	-0.18
FOLLOWER	Unmatched	-17.6	-2.09**	-15.2	-1.99**	-18.4	-2.56**	-0.8	-0.11	4.1	0.63	15.6	2.56**	-2.7	-0.43	-8.4	-1.35
	Matched	-0.2	-0.02	-2.0	-0.19	-1.1	-0.13	-5.0	-0.61	1.9	0.24	-7.6	-1.13	4.9	0.64	3.9	0.49
THOLDERS	Unmatched	33.7	4.17***	39.3	5.26***	19.8	2.80***	-1.8	-0.27	1.1	0.17	0.4	0.06	0.6	0.09	8.8	1.44
	Matched	1.5	0.14	-18.6	-1.80*	-10.2	-1.14	3.1	0.38	-7.0	-0.90	0.8	0.11	-6.0	-0.80	-6.2	-0.79
INSTHOLDER	Unmatched	32.8	3.96***	26.3	3.49***	7.0	0.99	20.5	3.04***	23.9	3.62***	20.8	3.41***	11.9	1.88*	10.8	1.71*
	Matched	-23.6	-2.22**	-13.3	-1.30	-2.4	-0.26	-12.6	-1.61	-0.5	-0.07	-4.7	-0.69	-3.6	-0.51	-1.0	-0.13
OWNRATIO	Unmatched	-1.5	-0.19	-9.7	-1.29	-5.5	-0.77	0.7	0.10	6.0	0.94	-5.7	-0.98	6.2	1.02	-2.9	-0.47
	Matched	-0.4	-0.03	10.1	0.97	7.0	0.76	2.8	0.35	1.8	0.22	-0.6	-0.09	1.3	0.17	1.1	0.14
DUAL	Unmatched	-24.7	-3.16***	-23.4	-3.27***	-4.4	-0.62	6.5	0.96	19.6	3.06***	10.2	1.70*	21.6	3.55***	34.2	5.74***
	Matched	2.8	0.23	18.2	1.57	6.2	0.69	0.9	0.11	-4.8	-0.58	-4.8	-0.64	-5.1	-0.61	-5.2	-0.63

Note: Table IV-C3 presents the results of the covariate balance check before and after propensity score matching on treatment variable PLEDGE\_CTRL, with dependent variable ACCURACY. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

IV. How does share pledging influence management and analyst forecast?

Table IV-C4: Covariate Balance Check Before and After Matching (Dependent variable: OPTIMISM)

Covariate		2011		2012		2013		2014		2015		2016		2017		2018	
		Before: N=480 After: N=185	t-test	Before: N=611 After: N=255	t-test	Before: N=614 After: N=349	t-test	Before: N=646 After: N=417	t-test	Before: N=732 After: N=362	t-test	Before: N=859 After: N=440	t-test	Before: N=888 After: N=377	t-test	Before: N=769 After: N=339	t-test
SIZE	Unmatched	34.0	3.48***	34.2	3.88***	20.5	2.48**	12.2	1.56	5.9	0.76	23.9	3.31***	4.8	0.66	18.6	2.40**
	Matched	-2.6	-0.16	-17.0	-1.31	-8.6	-0.83	4.4	0.48	-3.1	-0.33	-7.6	-0.90	-4.3	-0.48	0.6	0.06
LEVERAGE	Unmatched	74.9	7.28***	63.2	7.25***	57.9	7.00***	40.7	5.17***	32.0	4.11***	35.9	4.89***	28.9	3.75***	39.6	4.95***
	Matched	-29.9	-2.07**	-29.6	-2.29**	-24.2	-2.40**	-10.5	-1.12	-8.6	-0.91	-12.4	-1.45	-15.8	-1.94*	-12.0	-1.29
ROA	Unmatched	-19.1	-1.81*	-39.5	-4.45***	-37.9	-4.50***	-11.4	-1.45	-17.1	-2.26**	-10.3	-1.43	-22.9	-2.71***	-36.1	-4.32***
	Matched	11.2	0.78	8.3	0.71	12.9	1.27	5.4	0.61	1.1	0.11	7.0	0.85	8.7	1.36	8.6	1.20
GROWTH	Unmatched	7.7	0.77	-6.1	-0.58	8.5	1.01	27.9	3.52***	8.6	0.99	12.7	1.52	11.6	1.31	11.3	1.26
	Matched	1.6	0.09	-7.0	-0.83	-3.7	-0.32	-8.7	-1.27	-2.7	-0.66	-0.1	-0.06	-0.2	-0.06	-5.2	-0.91
MBRATIO	Unmatched	8.8	0.82	-1.4	-0.15	-11.9	-1.40	10.9	1.39	10.1	1.28	-3.8	-0.52	2.8	0.34	-14.8	-1.84*
	Matched	-18.2	-1.16	-9.2	-0.67	7.6	0.75	-2.6	-0.29	-1.8	-0.19	-4.2	-0.48	1.0	0.14	-1.6	-0.17
FLOATRATIO	Unmatched	41.3	4.02***	33.7	3.80***	26.2	3.17***	7.2	0.91	-3.7	-0.48	-9.7	-1.35	3.8	0.53	18.7	2.45**
	Matched	-21.0	-1.29	-21.7	-1.64	-14.3	-1.32	4.4	0.47	4.1	0.41	5.7	0.64	-1.1	-0.11	6.8	0.68
FOLLOWER	Unmatched	-12.1	-1.14	-7.2	-0.79	-19.6	-2.31**	1.3	0.16	9.3	1.19	22.8	3.12***	0.2	0.03	-1.3	-0.16
	Matched	7.2	0.49	-4.2	-0.32	9.3	0.96	10.9	1.12	-8.7	-0.92	-6.4	-0.77	-4.2	-0.47	0.1	0.01
THOLDERS	Unmatched	29.4	2.91***	30.4	3.36***	15.4	1.87*	3.6	0.46	4.0	0.51	1.7	0.23	5.1	0.68	12.4	1.57
	Matched	-5.2	-0.35	-15.5	-1.26	-3.8	-0.37	14.7	1.61	-10.4	-1.08	2.4	0.27	-4.0	-0.44	2.9	0.29
INSTHOLDER	Unmatched	28.8	2.73***	18.5	2.06**	9.0	1.10	26.9	3.41***	24.4	3.11***	26.7	3.66***	17.8	2.37**	19.2	2.40**
	Matched	-14.2	-0.96	-5.4	-0.42	-2.6	-0.24	-12.2	-1.32	-0.9	-0.09	-9.5	-1.15	-2.3	-0.28	-2.2	-0.24
OWNRATIO	Unmatched	-5.7	-0.54	-9.2	-1.01	-10.7	-1.27	-13.6	-1.73*	-2.9	-0.37	-17.1	-2.45**	3.7	0.52	-6.9	-0.90
	Matched	-1.6	-0.11	16.5	1.26	7.0	0.66	8.3	0.89	-10.7	-1.11	3.6	0.40	-2.4	-0.26	-1.3	-0.13
DUAL	Unmatched	-36.1	-3.89***	-8.9	-1.02	-7.3	-0.89	-9.3	-1.18	12.1	1.60	0.2	0.03	12.6	1.73*	23.0	3.07***
	Matched	3.9	0.23	2.9	0.21	9.5	0.84	1.1	0.12	-5.6	-0.59	-7.1	-0.78	-12.2	-1.20	-5.8	-0.55

Note: Table IV-C4 presents the results of the covariate balance check before and after propensity score matching on treatment variable PLEDGE\_CTRL, with dependent variable OPTIMISM. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

IV. How does share pledging influence management and analyst forecast?

Table IV-C5: Covariate Balance Check Before and After Matching, for baseline difference-in-difference model

Covariate		Dependent variable: FREQUENCY Before: N=2136 After: N=1465		Dependent variable: BIAS Before: N=1287 After: N=972		Dependent variable: ACCURACY Before: N=1196 After: N=848		Dependent variable: OPTIMISM Before: N=771 After: N=569	
		%bias	t-test	%bias	t-test	%bias	t-test	%bias	t-test
SIZE	Unmatched	-12.8	-2.52**	-17.3	-2.73***	-22.8	-3.44***	-20.5	-2.49**
	Matched	2.3	0.40	8.0	1.17	-0.8	-0.11	1.5	0.17
LEVERAGE	Unmatched	-7.3	-1.30	11.9	1.95*	10.9	1.70*	18.8	2.39**
	Matched	6.0	1.32	11.8	1.69*	-1.6	-0.21	12.2	1.31
ROA	Unmatched	-8.7	-1.70*	-31.5	-5.03***	-25.0	-3.97***	-41.0	-5.07***
	Matched	-6.9	-1.27	-9.1	-1.39	-0.6	-0.08	-4.8	-0.58
GROWTH	Unmatched	-3.3	-0.56	-5.5	-0.79	-4.8	-0.61	-6.3	-0.75
	Matched	0.3	1.13	-1.1	-0.18	-0.1	-0.46	8.8	1.19
MBRATIO	Unmatched	1.8	0.36	-4.6	-0.76	1.4	0.21	-7.9	-0.96
	Matched	4.6	0.94	4.0	0.58	9.1	1.25	10.9	1.35
FLOATRATIO	Unmatched	-25.7	-5.13***	-6.5	-1.04	-16.0	-2.39**	3.9	0.48
	Matched	2.4	0.43	3.1	0.46	1.4	0.19	16.5	1.88*
FOLLOWER	Unmatched	-9.1	-1.81*	-23.7	-3.73***	-25.3	-3.84***	-35.2	-4.24***
	Matched	-6.7	-1.15	-0.1	-0.02	3.5	0.49	0.1	0.01
THOLDERS	Unmatched	-21.6	-4.29***	-4.3	-0.70	-13.9	-2.06**	6.1	0.75
	Matched	6.1	1.06	2.8	0.40	1.6	0.21	6.8	0.73
INSTHOLDER	Unmatched	-18.2	-3.71***	-23.9	-3.83***	-15.1	-2.33**	-20.9	-2.59***
	Matched	2.1	0.35	-1.9	-0.27	6.4	0.82	-0.3	-0.03
OWNRATIO	Unmatched	15.6	3.08***	2.4	0.38	4.8	0.71	-5.8	-0.70
	Matched	-7.3	-1.24	-8.7	-1.22	-2.1	-0.27	3.5	0.39
DUAL	Unmatched	21.7	4.25***	12.8	2.00**	15.6	2.31**	10.2	1.23
	Matched	-3.8	-0.74	-6.6	-1.15	2.8	0.39	-6.1	-0.78

Note: Table IV-C5 presents the results of the covariate balance check before and after propensity score matching on treatment variable PLEDGE\_BRK. All variables are defined in the Appendix Table IV-A. Robust t-statistics are presented in parentheses. \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% level, using two-tailed tests.

## V.1 Summary

In this dissertation, I provide evidence about the relationship between the characteristics of different corporate managers or insiders and financial reporting quality. The financial reporting quality is measured using a variety of direct and indirect proxies: earnings management, management forecast quality, disclosure quality index and analyst forecast accuracy. Models are used to match the attributes of the sample and the research question in the baseline regression. The instrumental variable approach and propensity score matching method are used to address the endogeneity problems arising with the firm's selection of the particular manager or the decision of a specific activity.

### *CEOs' international experience and earnings management*

This paper evaluates the influence of CEOs' international experience on earnings management. To have a comprehensive understanding of international experience, we measure international experience using three categories: international experience of either study or work, only study, and both study and work. However, subject to the scarcity of observations of CEOs with only international work experience, the tests leave this type of CEO. Earnings management is proxied using commonly used methods: discretionary accruals, meet or beat earnings forecast, unconditional conservatism.

The empirical results show no significant relationship between CEOs' international experience and earnings management, suggesting the weak influence of the general measurement: the gain in human capital does not inhibit earnings management in China's listed firms. When looking at subcategories, CEOs with international study and work experience do have a significant restraining effect on absolute discretionary accruals. Furthermore, only CEOs with international study experience are related to less conditional conservatism. Among three dependent variables, meet or beat analyst earnings forecasts demonstrate no relationship with any experience. These results could be explained by assuming that analysts' forecasts are not crucial to the CEOs' financial strategies.

Previous research has documented the positive effect of brain gain on corporate governance and a firm's performance. This paper is the first to explore how returnees, when serving a listed firm as CEO, translate their abroad experience into changes in earnings management. However, in all, this research establishes that the brain gain in China's listed firms contributes to a limited extent to the inhibition of earnings management.

*Characteristics and incentives of the board secretary and disclosure quality*

This research investigates the role of the board secretary in China's listed firms. In line with agency theory and upper echelons theory, this paper employs measurements of stock-based incentives, tenure and financial expertise to study their effect on disclosure quality. Disclosure quality is proxied by four most frequently used measurements: accrual-based earnings management, management forecast accuracy, likelihood and frequency, disclosure transparency score assessed by SZSE.

Evidence obtained from this research supports the idea that characteristics of board secretary are associated with disclosure quality. Tenure displays significant influence on all proxies of disclosure quality. The longer a board secretary serves the firm, the better quality possessed by financial figures, both financial reporting (less upward discretionary accruals) and forward-looking (more accurate management forecast) ones. At the same time, longer tenure inhibits the likelihood and frequency of the firm to issue earnings forecast preannouncements. The Shenzhen Stock Exchange transparency score indicates that the disclosure quality is improved with the board secretary who experiences longer employment. Within the tenure analysis, the signs of coefficients drawn from separate regressions on disclosure quality seem contradictory, a possible explanation for this might be that those different proxies of disclosure quality are linked with the respective duties of the board secretary. The motivation and ability to fulfil the duties change with the tenure length, thus implying different influences they exert on disclosure quality. The results are consistent with former studies, arguing that tenure represents expertise power and that both the reduction in earnings management and disclosure inclination result from the familiarity with firm capabilities, operations and disclosure environment.

In contrast to tenure, stock-based incentives display opposite coefficients in almost all regressions. Upward accrual-based earnings management is associated with larger stock-based incentives, while the results demonstrate an increase in the likelihood and number of earnings preannouncement issuance. Motivated by personal wealth interest brought by stock price performance, the board secretary tends to involve in upward earnings management as a top management team member and frequent preannouncement issuances to intervene in information asymmetry and stock performance.

The influences of financial work experience on disclosure quality are limited to earnings forecast preannouncements. The results indicate that a board secretary who used to work in the finance industry has less tendency in issuing preannouncements and that the number of issuances decreases with such experience. The effect of financial working experience resembles that of tenure; the reluctance of issuing earnings forecast preannouncement could come from a better understanding of the firm's financial status and familiarity with the financial market.

The results hold after controlling for the ratio of stock-based compensation ratio and tenure of CEO, and other financial factors. The results gained from regressions on a matched sample using the propensity score matching method are similar to those in the baseline regressions, showing that the unmatched sample is free from self-selection bias related to financial expertise.

*How does share pledging influence management and analyst forecast? Evidence from non-state-owned enterprises in China's A-share security market*

The focus of this paper is share pledging of non-state-owned enterprises. The empirical analysis consists of two parts: one about the shares pledged by controlling shareholders, another about a regulation shock.

Based on a sample of China's NSOEs from 2011 to 2018, the baseline results from a fixed-effect model provide evidence that the occurrence of share pledging by controlling shareholders is associated with better management forecast quality, represented by an increasing number of management forecast issuances, and a reduction in management forecasts bias. The results suggest that firms attempt to alleviate information asymmetry through frequently disclosing private information and issuing more credible forecasts. Behind the effort, the purpose is reasonably assumed to stabilise stock price to dodge margin call risk. The occurrence of share pledging shows no significant effect on analyst forecast accuracy and relative optimism. In contrast, the net value of pledged shares and the ratio of pledged to total tradable shares are significantly positively associated with analyst forecast bias and relative optimism of managers to analysts. It indicates that when focusing on firms with share pledging activities, analyst forecast accuracy is hampered by the intricacy inherent in share pledging. The controlling shareholders could pledge shares based on their auspicious private information,

or they could repurchase shares using the collateralised loan; in the worse scenario, the loan is used to rescue the firm from financial distress.

The analysis of the 2013 regulation shock is the first one to investigate the effect of this regulation. Based on a difference-in-difference model, empirical evidence demonstrates an improvement in analyst forecasts accuracy and managers' relative optimism. Since the regulation came into effect in the middle of 2013, securities companies rapidly expanded their share pledging business with listed firms, thus boosting the whole market. Analysts, therefore, might acquire cross-department information, within securities companies, about the financial or operational status of the listed firms with share pledging. While on the contrary, the firm attempts to influence securities companies—institutional investors and analysts—using optimistic management forecasts. The two analyses show different effects of share pledging types, indicating that the new regulation changed the forecasting behaviour of both managers and analysts.

To sum up, the three papers provide evidence to answer the research questions, and the dissertation adds to the literature in agency problems and upper echelon theory.

## V.2 Deutsche Zusammenfassung

In dieser Dissertation zeige ich den Zusammenhang zwischen den Merkmalen verschiedener Manager oder Insider und der Qualität der Finanzberichterstattung. Die Qualität der Finanzberichterstattung wird anhand einer Vielzahl direkter und indirekter Indikatoren gemessen: Ertragsmanagement, Qualität der Managementprognosen, ein Index für die Offenlegungsqualität und Prognosegenauigkeit der Analysten. Es werden verschiedene Modelle verwendet, um die Merkmale der Stichprobe an die Forschungsfrage in der Hauptregression anzugleichen. Der Instrumentalvariablenansatz und die Propensity-Score-Matching-Methode werden verwendet, um die Endogenitätsprobleme anzugehen, die sich aus der Auswahl des jeweiligen Managers durch das Unternehmen oder der Entscheidung für eine bestimmte Aktivität ergeben.

### *CEOs' international experience and earnings management*

Diese Arbeit bewertet den Einfluss der internationalen Erfahrung von CEOs auf das Ertragsmanagement. Um ein umfassendes Verständnis von Auslandserfahrung zu erhalten, messen wir Auslandserfahrung anhand von drei Kategorien: Auslandserfahrung durch Studium oder Arbeit, nur durch Studium und durch sowohl Studium als auch Arbeit. Aufgrund des Mangels an Beobachtungen von CEOs mit ausschließlich internationaler Arbeitserfahrung lassen die Tests jedoch diese Art von CEO außen vor. Das Ertragsmanagement wird anhand allgemein verwendeter Methoden ermittelt: diskretionäre Periodenabgrenzungen, die Erfüllung oder das Übertreffen der Gewinnprognose der Analysten und unbedingt vorsichtige Bilanzierung.

Die empirischen Ergebnisse zeigen keinen signifikanten Zusammenhang zwischen der internationalen Erfahrung von CEOs und dem Ertragsmanagement, was auf den schwachen Einfluss der allgemeinen Messung hindeutet: Der Gewinn an Humankapital behindert nicht das Ertragsmanagement in Chinas börsennotierten Unternehmen. Betrachtet man die Unterkategorien, so haben CEOs mit internationaler Studien- und Arbeitserfahrung einen deutlich dämpfenden Effekt auf die absoluten diskretionären Periodenabgrenzungen. Darüber hinaus senken nur CEOs mit internationaler Studienerfahrung die vorsichtige Bilanzierung. Unter den drei abhängigen Variablen zeigt die Erfüllung oder Übertreffen der

Gewinnprognosen von Analysten keinen Zusammenhang mit irgendeiner Erfahrung. Diese Ergebnisse könnten durch die Annahme erklärt werden, dass die Prognosen der Analysten für die Finanzstrategien der CEOs nicht entscheidend sind.

Frühere Forschungen haben die positive Wirkung von Brain Gain auf die Unternehmensführung und die Leistung eines Unternehmens dokumentiert. Diese Arbeit ist die erste, die untersucht, wie Rückkehrer, wenn sie als CEO einer börsennotierten Firma arbeiten, ihre Auslandserfahrung in eine Veränderung des Ertragsmanagement umsetzen. Insgesamt zeigt diese Studie jedoch, dass der Brain Gain in Chinas börsennotierten Unternehmen in begrenztem Umfang zur Hemmung des Ertragsmanagements beiträgt.

#### *Characteristics and incentives of the board secretary and disclosure quality*

Diese Studie untersucht die Rolle des Vorstandssekretärs in Chinas börsennotierten Unternehmen. In Übereinstimmung mit der Agency-Theorie und der Upper-Echelons-Theorie misst diese Untersuchung aktienbasierte Anreize, Betriebszugehörigkeit und Finanzexpertise, um deren Auswirkungen auf die Offenlegungsqualität zu untersuchen. Die Offenlegungsqualität wird anhand der vier am häufigsten verwendeten Messgrößen näherungsweise bestimmt: periodengerechtes Ertragsmanagement, Qualität, Wahrscheinlichkeit sowie Häufigkeit der Managementprognosen und ein durch die Shenzhen Stock Exchange (SZSE) bewerteter Maßstab zur Offenlegungstransparenz.

Die aus dieser Untersuchung gewonnenen Erkenntnisse stützen die Hypothese, dass die Merkmale des Vorstandssekretärs mit der Offenlegungsqualität zusammenhängen. Die Beschäftigungsdauer zeigt einen erheblichen Einfluss auf alle Messungen der Offenlegungsqualität. Je länger ein Vorstandssekretär im Unternehmen tätig ist, desto besser sind die Finanzzahlen sowohl bei der Finanzberichterstattung (weniger positive diskretionäre Periodenabgrenzungen) als auch bei in die Zukunft gerichteten Zahlen (genauere Managementprognosen). Gleichzeitig hemmt eine längere Amtszeit die Wahrscheinlichkeit und Häufigkeit der Veröffentlichung von Gewinnprognosen durch das Unternehmen. Der Transparenz-Maßstab der SZSE zeigt, dass die Offenlegungsqualität mit einem Vorstandssekretär verbessert wird, der länger beschäftigt ist. Innerhalb der Analyse zur Beschäftigungsdauer scheinen die Vorzeichen der Koeffizienten, die aus separaten

Regressionen zur Offenlegungsqualität hervorgehen, widersprüchlich zu sein. Eine mögliche Erklärung dafür könnte sein, dass diese unterschiedlichen Messungen der Offenlegungsqualität mit den jeweiligen Aufgaben des Vorstandssekretärs verbunden sind. Motivation und Fähigkeit zur Aufgabenerfüllung verändern sich mit der Beschäftigungsdauer und implizieren damit unterschiedliche Einflüsse auf die Offenlegungsqualität. Die Ergebnisse stimmen mit früheren Studien überein und argumentieren, dass die Betriebszugehörigkeit eine Kompetenzmacht darstellt und dass sowohl die Verringerung des Ertragsmanagements als auch die Neigung zur Offenlegung aus der Vertrautheit mit den Möglichkeiten im Unternehmen, den Prozessen und dem Offenlegungsumfeld resultieren.

Im Gegensatz zur Betriebszugehörigkeit weisen aktienbasierte Anreize in fast allen Regressionen entgegengesetzte Koeffizienten auf. Aufwärts gerichtetes Ertragsmanagement ist mit größeren aktienbasierten Anreizen verbunden, während die Ergebnisse eine Zunahme der Wahrscheinlichkeit und Anzahl der Veröffentlichung von Gewinnprognosen zeigen. Motiviert durch das persönliche Vermögensinteresse, das durch die Aktienkursentwicklung hervorgerufen wird, neigt der Vorstandssekretär dazu, sich als Mitglied des Top-Managementteams an der Ertragssteuerung nach oben zu beteiligen und häufig Vorankündigungen herauszugeben, um in die Informationsasymmetrie und die Aktienentwicklung einzugreifen.

Der Einfluss der Berufserfahrung im Finanzbereich auf die Offenlegungsqualität beschränkt sich auf die Vorankündigung von Gewinnprognosen. Die Ergebnisse zeigen, dass ein Vorstandssekretär, der früher in der Finanzbranche gearbeitet hat, weniger dazu neigt, Vorankündigungen herauszugeben und dass die Anzahl der Veröffentlichungen mit dieser Erfahrung abnimmt. Die Wirkung der finanziellen Arbeitserfahrung ähnelt der der Betriebszugehörigkeit. Die Zurückhaltung bei der Veröffentlichung einer Vorankündigung für Gewinnprognosen könnte auf ein besseres Verständnis der Finanzlage des Unternehmens und seine Vertrautheit mit dem Finanzmarkt zurückzuführen sein.

Die Ergebnisse bleiben robust wenn für das Verhältnis der aktienbasierten Vergütungsquote, der Amtszeit des CEO sowie für andere finanzielle Faktoren kontrolliert wird. Die aus Regressionen einer gematchten Stichprobe unter Verwendung der Propensity-Score-Matching-Methode gewonnenen Ergebnisse ähneln denen in den Hauptregressionen, was

zeigt, dass die nicht gematchte Stichprobe frei von Selbstselektionsverzerrungen im Zusammenhang mit Finanzexpertise ist.

*How does share pledging influence management and analyst forecast? Evidence from non-state-owned enterprises in China's A-share security market*

Der Schwerpunkt dieser Arbeit liegt auf der Verpfändung von Aktien von nicht staatseigenen Unternehmen. Die empirische Analyse besteht aus zwei Teilen: zum einen aus den verpfändeten Aktien von kontrollierenden Aktionären und zum anderen aus einem Regulierungsschock.

Basierend auf einer Stichprobe von Chinas nichtstaatliche Unternehmen von 2011 bis 2018 liefern die Hauptergebnisse eines Modells mit fixen Effekten den Nachweis, dass das Auftreten von Anteilsverpfändungen durch kontrollierende Aktionäre mit einer besseren Qualität der Managementprognosen verbunden ist, was durch eine zunehmende Anzahl von Managementprognosen dargestellt wird und eine Verringerung der Verzerrung der Managementprognosen. Die Ergebnisse deuten darauf hin, dass Unternehmen versuchen, die Informationsasymmetrie zu verringern, indem sie häufig private Informationen offenlegen und glaubwürdigere Prognosen abgeben. Es wird vermutet, dass der Zweck hinter dieser Anstrengung darin besteht, den Aktienkurs zu stabilisieren, um das Margin-Call-Risiko zu vermeiden. Die Verpfändung von Aktien zeigt keine signifikanten Auswirkungen auf die Genauigkeit der Analystenprognosen und den relativen Optimismus. Im Gegensatz dazu sind der Nettowert der verpfändeten Aktien und das Verhältnis der verpfändeten Aktien zu den gesamten handelbaren Aktien signifikant positiv mit der Verzerrung der Analystenprognosen und dem relativen Optimismus der Manager gegenüber den Analysten verbunden. Dies weist darauf hin, dass die Genauigkeit der Analystenprognosen bei der Konzentration auf Unternehmen mit Aktivitäten zur Verpfändung von Aktien durch die mit der Verpfändung von Aktien verbundene Komplexität beeinträchtigt wird. Die kontrollierenden Aktionäre könnten Aktien auf der Grundlage ihrer vielversprechenden privaten Informationen verpfänden oder sie könnten Aktien unter Verwendung eines besicherten Darlehens zurückkaufen. Im schlimmsten Fall wird der Kredit dazu verwendet, das Unternehmen aus einer finanziellen Notlage zu retten.

Die Analyse des Regulierungsschocks im Jahr 2013 ist die erste, die die Wirkung dieser Regulierung untersucht. Basierend auf einem Differenz-von-Differenzen-Modell zeigen empirische Belege eine Verbesserung der Genauigkeit der Analystenprognosen und des relativen Optimismus‘ der Manager. Seit Inkrafttreten der Verordnung Mitte 2013 haben Wertpapierhäuser ihr Aktienverpfändungsgeschäft mit börsennotierten Unternehmen zügig ausgebaut und damit den gesamten Markt beflügelt. Analysten könnten daher abteilungsübergreifende Informationen innerhalb von Wertpapierunternehmen über den finanziellen oder operativen Status der börsennotierten Unternehmen mit Aktienverpfändung erhalten, während das Unternehmen versucht, Wertpapierfirmen – institutionelle Investoren und Analysten – mithilfe von optimistischen Managementprognosen zu beeinflussen. Die beiden Analysen zeigen unterschiedliche Auswirkungen von Aktienverpfändungsarten, was darauf hindeutet, dass die neue Regulierung das Prognoseverhalten sowohl von Managern als auch von Analysten verändert hat.

Zusammenfassend liefern die drei Studien Belege zur Beantwortung der Forschungsfragen, sodass die Dissertation die Literatur zu Agency-Problemen und Upper-Echelon-Theorie ergänzt.

## **VI. Abstract in English (Kurzzusammenfassung auf Deutsch)**

This dissertation provides evidence about the relationship between the characteristics of different corporate managers or insiders and financial reporting quality, based on agency theory and upper echelon theory. The first paper examines the influence of CEOs' international experience on earnings management. To have a comprehensive understanding of international experience, we measure international experience using three categories: international experience of either study or work, only study, and both study and work. Three commonly used proxies capture earnings management: discretionary accruals, meet or beat earnings forecast, unconditional conservatism. OLS models test a sample of China's listed firms from 2010 to 2014. A propensity score matching method is used to generate a matched sample with balanced covariate means to address endogeneity problems. The empirical results show no significant relationship between CEOs' international experience and earnings management, suggesting that the gain in human capital has a weak effect on inhibition of earnings management in China's listed firms. When looking at subcategories, CEOs with international study and work experience do have a significant restraining effect on absolute discretionary accruals. Furthermore, only CEOs with international study experience are related to less conditional conservatism. Meet or beat analyst earnings forecasts demonstrate no relationship with experience among three dependent variables. The second research explores how the board secretary in China's listed firms affects management and analyst earnings forecast properties. I measure the characteristics of the board secretary using the stock-based incentives, tenure and financial expertise; forecast properties using accrual-based earnings management, accuracy, likelihood and frequency of management forecast, and disclosure transparency score. The empirical analysis is based on a sample of the listed firms from 2012 to 2016 in Shenzhen Stock Exchange. Evidence supports the general idea that the characteristics of board secretary are associated with disclosure quality. Tenure is positively related to forecasts related to financial figures, that is, to less upward discretionary accruals and more management forecast accuracy. Longer tenure inhibits the likelihood and frequency of earnings forecast preannouncements. The Shenzhen Stock Exchange transparency score indicates that the disclosure quality is improved with the board secretary who experiences longer employment. In contrast to tenure, stock-based incentives display opposite coefficients in almost all

regressions. Larger stock-based incentives are associated with upward accrual-based earnings management while increased likelihood and number of earnings preannouncement issuances. The results suggest that stock performance motivates the board secretary to engage in upward earnings management and frequent preannouncement issuances to intervene in information disclosure. The influences of financial working experience on disclosure quality are limited to earnings forecast preannouncements. The results indicate that a board secretary who used to work in the finance industry has less tendency in issuing preannouncements and that the number of issuances decreases with such experience. The effect of financial work experience resembles that of tenure, suggesting that expertise, representing a better understanding of the firm's financial status and familiarity with the financial market, increase the reluctance of issuing earnings forecast preannouncements. Further instrumental variable approach and propensity score matching methods confirm that the baseline results do not suffer from severe endogeneity problems. The third paper focuses on the pledging of shares by non-state enterprises (NSOEs) using two empirical analyses: first on the shares pledged by controlling shareholders and then on a regulation shock. Based on a sample of China's NSOEs from 2011 to 2018, tests on the first type employs a fixed-effect model. Evidence shows that the occurrence of share pledging by controlling shareholders is associated with more management forecast issuances and fewer management forecasts biases, while no significant effect on analyst forecast accuracy and relative optimism. The effort to improve management forecast quality suggests that the firm stabilises stock price and avoids margin call risk. In addition, the net value of pledged shares and the ratio of pledged to total tradable shares are positively associated with analyst forecast bias and relative optimism of managers to analysts. The results indicate the information asymmetry between the two sides, suggesting that share pledging is so intricate to add noise to analyst forecast. The second part investigates a regulation shock in share pledging. The regulation came into effect in the middle of 2013, allowing securities companies to make share pledging business as pledges. Based on a difference-in-difference model, empirical evidence demonstrates an improvement in analyst forecasts accuracy, indicating that analysts might benefit from extra cross-department private information about the financial or operational status of the listed firms with share pledging. While on the contrary, management forecasts display relatively more optimism than analysts, showing that the firm attempts to use optimistic reports to influence outsiders.

Diese Dissertation liefert Belege über die Beziehung zwischen den Eigenschaften verschiedener Unternehmensmanager oder Insider und der Qualität der Finanzberichterstattung, basierend auf der Agency- und der Upper-Echelons-Theorie. Die erste Studie untersucht den Einfluss der internationalen Erfahrung von CEOs auf das Ertragsmanagement. Um ein umfassendes Verständnis von Auslandserfahrung zu erhalten, messen wir Auslandserfahrung anhand von drei Kategorien: Auslandserfahrung durch Studium oder Arbeit, nur durch Studium und durch sowohl Studium als auch Arbeit. Drei häufig verwendete Messgrößen erfassen das Ertragsmanagement: diskretionäre Periodenabgrenzungen, die Erfüllung oder das Übertreffen der Gewinnprognose der Analysten und unbedingt vorsichtige Bilanzierung. OLS-Regressionen testen eine Stichprobe von börsennotierten Unternehmen in China von 2010 bis 2014. Ein Propensity-Score-Matching wird verwendet, um eine gematchte Stichprobe mit ausgeglichenen Mittelwerten der Kovariaten zu generieren und Endogenitätsprobleme zu lösen. Die empirischen Ergebnisse zeigen keinen signifikanten Zusammenhang zwischen der internationalen Erfahrung von CEOs und dem Ertragsmanagement, was darauf hindeutet, dass der Gewinn an Humankapital einen schwachen Effekt auf die Hemmung des Ertragsmanagements in Chinas börsennotierten Unternehmen hat. Betrachtet man die Unterkategorien, so haben CEOs mit internationaler Studien- und Berufserfahrung einen deutlich dämpfenden Effekt auf die absoluten Ermessensrückstellungen. Darüber hinaus senken nur CEOs mit internationaler Studierfahrung die vorsichtige Bilanzierung. Die Erfüllung oder das Übertreffen der Gewinnprognosen von Analysten zeigen keinen Zusammenhang mit irgendeiner Erfahrung gemessen durch die drei abhängigen Variablen. Die zweite Studie untersucht, wie der Vorstandssekretär in Chinas börsennotierten Unternehmen die Gewinnprognosen des Managements und der Analysten beeinflusst. Die Eigenschaften des Vorstandssekretärs werden anhand von aktienbasierten Anreizen, Betriebszugehörigkeit und Finanzexpertise gemessen; die Eigenschaften der Prognosen mithilfe von periodengerechtes Ertragsmanagement, Qualität, Wahrscheinlichkeit sowie Häufigkeit der Managementprognosen und einem Maßstab zur Offenlegungstransparenz. Die empirische Analyse basiert auf einer Stichprobe der von 2012 bis 2016 an der Shenzhen Stock Exchange notierten Unternehmen. Die empirischen Belege stützen die allgemeine Vorstellung, dass die

Eigenschaften des Vorstandssekretärs mit der Offenlegungsqualität verbunden sind. Die Betriebszugehörigkeit steht in positivem Zusammenhang mit Prognosen in Bezug auf Finanzkennzahlen, d. h. mit weniger positiven diskretionären Periodenabgrenzungen und einer höheren Genauigkeit der Managementprognosen. Eine längere Betriebszugehörigkeit hemmt die Wahrscheinlichkeit und Häufigkeit der Vorankündigungen von Gewinnprognosen. Der Maßstab zur Offenlegungstransparenz der Shenzhen Stock Exchange zeigt, dass die Offenlegungsqualität mit dem Vorstandssekretär verbessert wird, der länger beschäftigt ist. Im Gegensatz zur Betriebszugehörigkeit weisen aktienbasierte Anreize in fast allen Regressionen entgegengesetzte Koeffizienten auf. Größere aktienbasierte Anreize sind mit einem aufwärtsgerichteten Ertragsmanagement verbunden, während die Wahrscheinlichkeit und Anzahl der Veröffentlichung von Gewinnvorankündigungen erhöht wird. Die Ergebnisse deuten darauf hin, dass die Wertentwicklung der Aktie den Vorstandssekretär dazu motiviert, sich an einem Ertragsmanagement nach oben zu beteiligen und häufig Vorankündigungen herauszugeben, um in die Offenlegung von Informationen einzugreifen. Die Einflüsse der Finanzarbeitserfahrung auf die Offenlegungsqualität beschränken sich auf die Vorankündigungen von Gewinnprognosen. Die Ergebnisse zeigen, dass ein Vorstandssekretär, der früher in der Finanzbranche gearbeitet hat, weniger dazu neigt, Vorankündigungen herauszugeben und dass die Anzahl der Veröffentlichungen mit dieser Erfahrung abnimmt. Die Wirkung von Berufserfahrung im Finanzbereich ähnelt der von Betriebszugehörigkeit, was darauf hindeutet, dass Fachwissen, welches ein besseres Verständnis der Finanzlage des Unternehmens und Vertrautheit mit dem Finanzmarkt darstellt, die Zurückhaltung bei der Veröffentlichung von Vorankündigungen für Gewinnprognosen erhöht. Weitere Instrumentalvariablenansätze und Propensity-Score-Matching-Methoden bestätigen, dass die Hauptergebnisse nicht unter schwerwiegenden Endogenitätsproblemen leiden. Die dritte Arbeit konzentriert sich auf die Verpfändung von Aktien durch nichtstaatliche Unternehmen mithilfe von zwei empirischen Analysen: zuerst werden die von kontrollierenden Aktionären verpfändeten Aktien untersucht und anschließend ein Regulierungsschock. Die erste Analyse basiert auf einer Stichprobe von Chinas nichtstaatliche Unternehmen von 2011 bis 2018 und verwendet ein Modell mit fixen Effekten. Die Untersuchungen zeigen, dass das Auftreten von Aktienverpfändungen durch Mehrheitsaktionäre mit mehr Veröffentlichungen und weniger Verzerrungen von Managementprognosen verbunden ist, während es keinen signifikanten

Einfluss auf die Genauigkeit der Analystenprognosen und den relativen Optimismus hat. Die Bemühungen, die Qualität der Managementprognosen zu verbessern, deuten darauf hin, dass das Unternehmen den Aktienkurs stabilisiert und das Margin-Call-Risiko vermeidet. Darüber hinaus sind der Nettowert der verpfändeten Aktien und das Verhältnis der verpfändeten Aktien zu den gesamten handelbaren Aktien positiv mit der Verzerrung der Analystenprognosen und dem relativen Optimismus der Manager gegenüber den Analysten verbunden. Die Ergebnisse zeigen die Informationsasymmetrie zwischen den beiden Seiten, was darauf hindeutet, dass die Verpfändung von Aktien so kompliziert ist, dass sie die Analystenprognosen verfälscht. Der zweite Teil untersucht einen Regulierungsschock bei der Verpfändung von Aktien. Mitte 2013 trat die Verordnung in Kraft, die es Wertpapierfirmen ermöglicht, Aktienverpfändungsgeschäfte als Verpfändung zu tätigen. Basierend auf einem Differenz-von-Differenzen-Modell zeigen empirische Belege eine Verbesserung der Genauigkeit der Analystenprognosen, was darauf hindeutet, dass Analysten von zusätzlichen abteilungsübergreifenden, privaten Informationen über den finanziellen oder operativen Status der börsennotierten Unternehmen mit Aktienverpfändung profitieren könnten. Währenddessen zeigen Managementprognosen relativ mehr Optimismus als Analysten, was zeigt, dass das Unternehmen versucht, optimistische Berichte zu verwenden, um Außenstehende zu beeinflussen.

**Berlin, 14.03.2022**

**Statement in accordance with Sec. 4(2)**

I hereby state that I have not undergone any doctoral procedure or applied for admission to any such procedure, and that the dissertation has not been presented for review, in the same version or another version, revised or not, to another department or school, examining board, or departmental representative at another higher education institution.

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**Berlin, 14.03.2022**

**Statement in accordance with Sec. 10(3)**

I hereby state that I have used the following aids and materials for the dissertation:

CSMAR database

Shanghai and Shenzhen Stock Exchange public data and reports

STATA

I have written the paper myself on this basis.

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