

**Corporate Governance and Earnings Quality**  
**in China**

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Die vorliegende kumulative Dissertation besteht aus drei Beiträgen.

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

Dieser Beitrag wurde gemeinsam mit Frau Siqi Zhao (Freie Universität Berlin) erstellt. Der Anteil der beiden Autoren beträgt jeweils 50%.

**Zweite Studie:**

**Internal Control Weakness and Earnings Quality in China**

Dieser Beitrag wurde ohne Koautoren erstellt.

**Dritte Studie:**

**Board Gender Diversity, Gender Bias and Earnings Management:  
Evidence from China**

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**List of Abbreviations**

2SLS	Two-Stage Least Squares
ABSDA	Absolute Value of Discretionary Accruals
CEO	Chief Executive Officer
CFO	Chief Finance Officer
COSO	Committee of Sponsoring Organizations of the Treadway Commission
CSMAR	China Stock Market and Accounting Research
CSRC	Chinese Securities Regulatory Commission
DA	Discretionary Accruals
e.g.	exempli gratia
GAAP	Generally Accepted Accounting Principals
GB	Gender Bias
GD	Gender Diversity
GDP	Gross Domestic Product
i.e.	id est
ICAR	Internal Control Auditing Report
ICR	Internal Control Report
ICW	Internal Control Weakness
ID	Identification
IPO	Initial Public Offerings
MBE	Meeting or Beating Analysts' Earnings Forecasts
MOF	Ministry of Finance
MSDA	Moving Sum of Absolute Discretionary Accruals
PSM	Propensity Score Matching
SEC	Securities and Exchange Commission
SMTH	Income Smoothing
SOX	Sarbanes-Oxley Act

## List of Abbreviations

TA	Total Accruals
UK	United Kingdom
US	United States of America

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## 1. Introduction

In the last three decades, the astonishing economic development in China has been a miracle in the world. China's economics has been the second largest entity after the US economics from 2010. However, how is the quality of this economic development?

This doctoral thesis does not attempt to answer this question from the aspect of macroeconomics, instead it focuses on the earnings quality of listed firms in China, which are the representatives of the emerging China's economics. Insofar, the Chinese regulators have been continuing to take measures to strengthen corporate governance in the listed firms in China in order to improve their earnings quality. Following the SOX in the US, similar steps have been taken by the CSRC and MOF, two major regulators in the Chinese stock markets. In the year 2012, a regulation sets the mandatory disclosure on the main market<sup>1</sup> of the Chinese stock markets from the year 2014 on. Meanwhile, the central, especially the local governments in China have provided favorable incentives to attract returnees to work in their regions in the hope of brain gain brought by these returnees. Last but not the least, gender diversity on the board of directors has been improving and female directors compose more than 15% on the boards of listed firms. This is particularly hard to have been achieved, since China is a country with long tradition of son-preference (Tian et al., 2018).

However, one major question arises: What is earnings quality? How is earnings quality measured? Based on the Statement of Financial Accounting Concepts No. 1<sup>2</sup>, Dechow et al. (2010) provides a definition of earnings quality, which is stated as "Higher quality earnings provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision-maker." Earnings quality is commonly measured by earnings management, but the correlation

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<sup>1</sup> Main market refers to all the stocks in the Shanghai Stock Market and the stocks with an IDs beginning of 002 in the Shenzhen Stock Market.

<sup>2</sup> Statement of Financial Accounting Concepts No. 1 states "Financial reporting should provide information about an enterprise's financial performance during a period."

between earnings quality and earnings management is still an open question. Since earnings quality depends on two parts: the financial performance and the accounting system to measure it, earnings management takes a role in the second part and manages disclosure in the sense of a purposeful intervention in the external financial reporting process in order to pursue some private benefits (Schipper, 1989). As a result, earnings management is commonly assumed to erode earnings quality (Dechow et al., 2010). However, the truthiness of this assumption depends on the different measures of earnings management. Discretionary accruals and target beating have a rather negative correlation with earnings quality while income smoothing and conditional conservatism are rather considered to improve the earnings informativeness, an important aspect of earnings quality.

One of the most widely applied measure of earnings management is discretionary accruals, which are invented by Jones (1991) and further modified by Dechow et al. (1995) and Kothari et al. (2005). In order to calculate discretionary accruals, accruals to capture fundamental performance are treated as normal accruals and thereafter the residual part is considered to capture the distortions from earnings management. That is why discretionary accruals are also called abnormal accruals. From this procedure, a positive relation between discretionary accruals and earnings management is reflected, i.e., more discretionary accruals signify more earnings management in the financial reporting process. However, recent research points out that it would generate biased results when using discretionary accruals from estimating models as an independent variable in the research (Chen, Hribar & Melessa, 2018).

Besides discretionary accruals, income smoothing is well studied and defined. As defined by Fudenberg & Tirole (1995), income smoothing is the process of manipulating the time profile of earnings or earnings reports to make the reported income stream less variable. Insofar, studies conclude that firms with higher income smoothing provide more earnings informativeness, which is a reflection of higher earnings quality (Tucker & Zarowin, 2006; Bao & Bao, 2004). However, opposing discussions remain, since the integrity of financial reports is harmed through income smoothing, which might distort

the decision of related parties.

Target beating, also known as meeting or beating analysts' earnings forecast, is another method to measure earnings management. In order to achieve a good market reaction (Bhojraj et al., 2009; Bartov et al., 2002) or due to the stock based compensation of managers (Cheng & Warfield, 2005), firms have the incentives to meet or beat analysts' earnings forecast through discretionary accruals or by cutting expenses (Bhojraj et al., 2009; Ayers et al., 2006). Hence, more often to meet or beat analysts' earnings forecast is considered to be correlated with more distortion to the actual financial performance.

Conditional conservatism refers to the timelier recognition of losses than gains (Basu, 1997), and more conditional conservatism indicates higher quality of earnings (Ball & Shivakumar, 2005). A timelier recognition of losses signals to the market that the financial report contains necessary information on the possible losses in the future.

Since earnings are calculated and reported through a specific corporate governance, it is not surprising to find a bunch of literature on the correlation between corporate governance and earnings quality (García Lara et al., 2009; Klein, 2002; Ball & Shivakumar, 2005). Following this direction, this thesis attempts to examine the effect of some important changes and characteristics on corporate governance in the listed firms in China on their earnings quality. Theoretically, it would help further clarify the correlation between different means of earnings management and earnings quality.

The first study "CEO's international experience and earnings management: Evidence from Chinese listed firms" examines the possible effect of brain gain of returnees in the position of CEO on earnings management in the listed firms in China:

- How does the international experience of CEOs affect earnings management in listed firms?
- Specifically, how does the international study or work experience affect earnings management in listed firms?

The second study "Internal Control Weakness and Earnings Quality in China" examines a sample of listed firms on the main market, which is required to disclose the



internal control report and the internal control auditing report from 2014. Specifically, it addresses the following questions:

- How does the disclosure of internal control weaknesses affect earnings quality?
- How do financial ICWs and non-financial ICWs affect earnings quality?
- Has the strictness of the quantitative standards to identify material ICWs a correlation with earnings quality?

The third study “Board gender diversity, gender bias and earnings management: Evidence from China” deals with the link between board gender diversity and earnings management in the listed firms in China, addressing the following research questions:

- How does board gender diversity affect earnings management?
- Which role does gender bias play on the link between board gender diversity and earnings management?

The first study “CEO’s international experience and earnings management: Evidence from Chinese listed firms” does not find evidence to support a correlation between CEO’s international experience and earnings management in general. However, CEOs with both international study and work experience do have a restraining effect on earnings management through discretionary accruals, although these CEOs have no intention to meet or beat analysts’ earnings forecast in an immature market, in which the analysts’ forecasts receive no significant response from the institutional investors in China (Ding et al., 2014) due to their biased opinions. When earnings management is measured by conditional conservatism, CEOs with international study experience only are less likely to recognize loss timely, an indication of less conditional conservatism.

The second study “Internal Control Weakness and Earnings Quality in China” overcomes the shortcoming of the self-selection bias in the prior research on the correlation between internal control weakness and earnings quality in the voluntary disclosing period, since it is carried out with a sample in the mandatory disclosing period on ICWs. This study does not find the hypothesized negative correlation between the disclosure of ICWs and earnings quality, which does not fulfill the original intention of

mandatory implementation of Chinese SOX to strengthen the internal control and hence to improve the earnings quality. Meanwhile, it is costly for the listed firms to follow the Chinese SOX. As a result, regulators should reevaluate the cost and the benefit to implement the Chinese SOX. When ICWs are divided into financial and non-financial ICWs, only the non-financial ICWs have a significant and negative effect on income smoothing. Specifically, the strictness of quantitative standards to identify material ICWs is concluded to be positively correlated with income smoothing.

The third study “Board gender diversity, gender bias and earnings management: Evidence from China” finds that board gender diversity is not associated with earnings management, which is in line with some recent studies suggesting that females in top positions do not behave differently than their male counterparts. However, gender bias, measured by the provincial sex ratio at birth, is negatively associated with earnings management. Further analysis indicates that this negative association is indirect, and provinces with lower gender bias exhibit higher economic development, which is related to higher level of earnings management, since listed firms in these well-developed provinces may have more pronounced performance-based compensation and better trained accounting experts.

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

Dongfeng Xie\* & Siqi Zhao\*\*

**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 from CEOs' international experience<sup>3</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 analysts' earnings forecast or conditional conservatism, a significant and negative relation between CEOs with both international study and work experience<sup>4</sup> and earnings management through discretionary accruals is concluded. Besides, CEOs with international study experience only are less likely to recognize loss timely, an indication of less conditional conservatism.

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

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<sup>3</sup> CEOs with international experience are those who once studied in a foreign college/university or worked in a foreign company abroad.

<sup>4</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.

### 2.1 Introduction

This paper attempts to investigate the possible effect from 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 relation between different aspects of CEO and earnings management (Bergstresser & Philippon, 2006; Chen, Lee & Chow, 2015; Hsieh et al., 2014; Laux & Laux, 2009; Hazarika et al., 2012; Kuang et al., 2014; Ali & Zhang, 2015; Krishnan et al., 2011; Mande & Son, 2012; Ho et al., 2015; Ahmed & Duellman, 2013), the possible relation between CEOs' international experience and earnings management remains untouched.

Meanwhile, with more and more returnees back to China, it is becoming interesting to examine if their international experience is a real brain gain to the Chinese listed firms and to 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 restraining earnings management, a usual indication of better earnings quality.

With a hand-collected data of CEOs in the Chinese stock markets from 2010 to 2014, we define a dummy variable as 1 if CEOs have international experience, and 0 otherwise. In this paper, earnings management is measured by *discretionary accruals* (DA), *meeting or beating analysts' 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 both international study and work experience. Although the results from the further regressions are mostly 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, but not the 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 found to be related to less conditional conservatism.

This paper contributes in the following three aspects. First, as 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 literature on 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, since only CEOs with both international study and work experience are related to less earnings management through discretionary accruals, while 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 analysts' earnings forecast in China, a country with immature stock market and unsound legal system. Unlike in the mature stock market of the US where CEOs have strong incentive to meet or beat analysts' earnings forecast (Bergstresser & Philippon, 2006; Chen, Lee & Chow, 2015; Hsieh et al, 2014), no evidence shows that CEOs with international experience have the will to meet or beat analysts' 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.

### **2.2 Literature Review and Hypotheses Development**

Agency theory has stated clearly that managers have their own pursuit of self-interest since the separation of ownership and control (Jensen & Meckling, 1976) in the firm. As CEOs play the leading role in the management team, they have both incentives and ability to pursue their own benefits. One of the common ways of obtaining this goal is through earnings management (Bergstresser & Philippon, 2006; Chen, Lee & Chow, 2015; Hsieh et al, 2014).

We focus on one of the most important experience of top managers which is international experience (Gregersen et al., 1998), since it helps forming the cognitive orientation and enhancing a global mindset, which affects the way top managers manage the firms (Hermann & Datta, 2005, Carpenter et al., 2000). CEOs' international experience affects their personal values, which influence their behaviors (Slater & Dixon-Fowler, 2008; Suutari & Mäkelä, 2007). Therefore, their behavior of engaging 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 favor solid corporate governance and disclosure of reliable financial results to the public, i.e., less 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 & Jin, 2011); meeting or beating analysts' earnings forecast (Ahmed & Duellman, 2013; Filzen & Peterson, 2015; Brown, 2015) and conditional conservatism (Basu, 1997; Ball & Shivakumar, 2005).

#### **2.2.1 CEO and Discretionary Accruals**

Research has studied different aspects of CEO and earnings management, most commonly measured by discretionary accruals. With regard to 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 & Philippon, 2006; Chen, Lee & Chow, 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 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 an 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 earnings management through discretionary accruals. But this incentive of engaging in income-increasing earnings management does not last after the outside CEO survives the short run (Kuang et al., 2014). A special type of CEO, the interim CEO, is also studied by Chen, Luo, Tang & Tong (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 Korea setting.

Besides, Ali & 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, which are 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. A 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 the 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.*

### **2.2.2 CEO and Meeting or Beating Analysts' Earnings Forecast**

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

Mande & 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 analysts' 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 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 to 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 between them, since

CEOs' international experience would restrict their behavior of managing earnings to meet or beat earnings forecast.

*H2: CEOs with international experience are associated with less likelihood of meeting or beating analysts' earnings forecast.*

### **2.2.3 CEO and Conditional Conservatism**

Research on CEO and conditional conservatism is based on the US setting. Female CEOs are found to be related to more conditional conservatism (Ho et al., 2015; Palvia et al., 2015). Ahmed & Duellman (2013) study the behavior 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 on 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 acquisition. As research has not shed light on the relation between CEO's international experience and conditional conservatism, no direction is expected for this relation.

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

## **2.3 Data and Sample**

### **2.3.1 Data**

We hand-collect the characteristic information of the CEOs in the Chinese stock markets, such as age, international study experience, international work experience etc. Financial data are mainly from the *China Stock Market and Accounting Research* (CSMAR) database, and some of company data like age of CEOs, ownership structure are hand-collected. As the internationalization of Chinese GAAP was carried out in 2007 in China

and due to the data availability when we started this research in 2015, a data period from 2007 to 2014 was preliminary selected. Then 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 showed in table 2-1, 11,487 firm-year observations are firstly collected. 3,598 observations are lost due to their subsidiary status. As more than 50% of the shares in these firms are held by single entities, 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 public utility industry and observations with a CEO turnover during a year, which could result in a significant influence on earnings management.

We then apply the industry-classification standards implemented by CSRC in 2012<sup>5</sup> (Jiang et al., 2013). The remaining 6,472 observations are then classified into industry-year groups according to their years and industries. In this paper, CEOs with international experience are those who once studied in a foreign college/university or worked in a foreign company abroad. In the classified industry-year groups, some 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 in order 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>5</sup> CSRC (2012), seen in reference.

## 2 CEOs' International Experience and Earnings Management

Table 2-1: Sample selection (discretionary accruals, meeting or beating analysts' earnings forecasts, conditional conservatism)

Data selection	Firm-year observations discretionary accruals	Firm-year observations meeting or beating analysts' 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

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

### **2.3.2 Propensity Score Matching**

In this paper, three measures are adopted to measure earnings management: Discretionary accruals, meeting or beating analysts' 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 & Wahba, 2002; Li, 2013; Chen, Luo, Tang & Tong, 2015; Rosenbaum & Rubin, 1983). The dependent variable of the logit regression is the likelihood of a firm with 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 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 neighbor matching to select out the ten nearest observations with replacement (Smith, 1997; Beuselinck & 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 neighbor 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 2-2.

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

Variables	Discretionary	MBE	Conditional
	Accruals		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 analysts' 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 2-2 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 does balance the data between treatment group and 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 showed in Table 2-3, 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 0.1% level. After the matching, Govshare loses its significance, which indicates the sample after the propensity score matching is more balanced.

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Table 2-3: Mean values and mean difference (DA sample)

Variables	Before PSM(N=4205)			After PSM(N=1566)		
	Mean of	Mean of	T-test of	Mean of	Mean of	T-test of
	treatment (N=167)	control (N=4038)	mean difference	treatment (N=167)	control (N=1399)	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)

### 2.3.3 Control Variables

The control variables in Table 2-4 are mainly extracted from the recent papers on earnings management and/or CEO characteristics (Ali & Zhang, 2015; Dutilleux et al., 2016; Chen, Luo, Tang & Tong, 2015; Jiang et al., 2013; Beuselinck & Deloof, 2014; Kuang et al., 2014; Francis et al., 2008; Badolato et al., 2014; Chen & Zhang, 2014). A variable GOVSHARE is added in consideration of the important 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.



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Table 2-4: 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 analysts' earnings forecast, the control variables in Table 2-4 are used. As to the analysis of conditional conservatism, time-series test of timeliness in loss recognition (Basu,1997; Ball & Schivakumar,2005; Banker et al.,2016) is applied, in which specified control variables are included.

### 2.4 CEOs' International Experience and Discretionary Accruals

#### 2.4.1 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 showed 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 & Jin, 2011).  $\Delta REV$ ,  $\Delta AR$  and  $PPE$  are calculated in the same way as DeFond & 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, which are categorized into 76 industry-year groups according to the industry-classification standards (CSRC, 2012<sup>6</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.

#### 2.4.2 Descriptive Analysis

As stated before, we use propensity score matching to reduce the sample with 4,205 observations into a sample with 1,566 observations, of which 167 observations are with CEOs who have international experience. We also winsorize all the continuous variables at 1% level at both sides to avoid the effect from outliers. From Table 2-5, 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,

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<sup>6</sup> CSRC (2012), seen in reference.

## 2 CEOs' International Experience and Earnings Management

which are understandable from their distributions of numerical values after the 75% quartile.

Table 2-5: 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 2-4.

### 2.4.3 Multiple Regression Analysis

Table 2-6 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.

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Table 2-6: 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

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Prob(F-Stat.)	0.0000	0.0000	0.0000
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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 working experience, 0 if CEOs are without any international experience.

For definition of other variables see in Table 2-4.

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 an analysis, analysis on INTLWORK is not carried out.

From columns 4 and 5 of Table 2-6, CEOs with international study experience still have no significantly different tendency towards earnings management, compared to CEOs without any international experience. This result is in consistence 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 reducing 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 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 that of 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 is in conformity with prior research by Kuang et al. (2014) and Ali & Zhang (2015). Consistent with Ali & Zhang (2015), CFO has a significant mitigating effect on earnings management.

### **2.4.4 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 setting and in the US setting. We follow this route to recalculate the total accruals and the corresponding discretionary accruals to test the robustness of the results in Table 2-6. With the newly calculated discretionary accruals, function (2) is rerun and the results in Table 2-7 is in conformity with those in Table 2-6.

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Table 2-7: Sensitivity test

Dependent variable	INTLEXP		INTLSTUDY		INTLSTUDYWORK	
	coef.	t-value (p-value)	coef.	t-value (p-value)	coef.	t-value (p-value)
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
	0.1275	2.36 (0.018)**	0.1070	1.57 (0.117)	0.1437	1.68 (0.093)*
Intercept						
N=		1566		997		531
Adj. R		12.99%		12.77%		16.28%
F-Stat.		4.06		3.30		3.53

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Prob(F-Stat.)	0.0000	0.0000	0.0000
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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 working experience, 0 if CEOs are without any international experience.

For definition of other variables see in Table 2-4.

### 2.5 CEOs' International Experience and Meeting or Beating Analysts' Earnings Forecast

#### 2.5.1 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 analysts' 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.

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

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

#### 2.5.2 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 0. The distribution of MBRATIO, INTLSHARE and GOVSHARE are quite similar to that in the descriptive statistics of the sample for discretionary accruals.



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Table 2-8: Descriptive statistics (MBE, N=2000)

Variable	Mean	Median	25% quartile	75% quartile	Standard deviation	Min	Max
DUM_DIFF_EPS	0.2120	0.0000	0.0000	0.0000	0.4088	0.0000	1.0000
INTLEXP	0.0540	0.0000	0.0000	0.0000	0.2261	0.0000	1.0000
SIZE	21.8764	21.6527	20.9597	22.5935	1.2222	19.8655	25.3847
LEVERAGE	0.3921	0.3850	0.2185	0.5603	0.2126	0.0301	0.8434
ROA	0.0794	0.0642	0.0339	0.1072	0.0696	-0.0659	0.3568
GROWTH	0.2101	0.1848	0.0488	0.3438	0.2705	-0.3937	1.1831
MBRATIO	3.4979	2.8710	1.9120	4.3160	2.3164	0.7692	12.8913
BIG4	0.0655	0.0000	0.0000	0.0000	0.2475	0.0000	1.0000
MAJORITY	0.3265	0.3332	0.2470	0.4101	0.1024	0.0860	0.4966
INTLSHARE	0.0393	0.0000	0.0000	0.0000	0.0977	0.0000	0.4943
GOVSHARE	0.1415	0.0196	0.0000	0.2981	0.1812	0.0000	0.5842
LNAGE	3.8704	3.8712	3.7842	3.9512	0.1295	3.5114	4.1972
DUALITY	0.3225	0.0000	0.0000	1.0000	0.4676	0.0000	1.0000
CFO	0.0453	0.0448	-0.0041	0.0990	0.0988	-0.2561	0.3307
ISSUE	0.1525	0.0000	0.0000	0.0000	0.3596	0.0000	1.0000

Note: MBE: Meeting or beating analysts' 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 2-4.

### 2.5.3 Multiple Regression Analysis

Table 2-8 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 analysts' earnings forecasts, even after we follow the method in the analysis of 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 only 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 restraining earnings management through discretionary accruals, but they have no intention to meet or beat analysts' 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

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analysts' 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 on their forecast due to the limited information in the less-developed financial market and their biased opinions again influence other analysts (Zhou & Wu, 2016).

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

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Table 2- 9: Probit regression of MBE

Dependent variable	INTLEXP	INTLSTUDY	INTLSTUDYWORK
DUM_DIFF_EPS	Coefficient (standard deviation)		
INTLEXP	0.1003(0.1564)		
INTLSTUDY		0.0607(0.2115)	
INTLSTUDYWORK			-0.0581(0.2660)
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)	-0.1695(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 working experience, 0 if CEOs are without any international experience.

For definition of other variables see in Table 2-4.

### 2.5.4 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 1 if the difference between the actual EPS and the mean value of analysts' forecasted EPS is larger or equal to 0, and 0 otherwise. The probit regression is rerun and the result on INTLEXP (Z-value=-0.47) is also not significant, which is in conformity with the result in column 2 of Table 2-9.

## 2.6 CEOs' International Experience and Conditional Conservatism

### 2.6.1 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 showed in the function (5).

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

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 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.

### 2.6.2 Multiple Regression Analysis

As table 2-10 depicts,  $\beta_3$  is significantly negative at 1% level in all the three regressions, which is consistent with our prediction that losses are being timelier recognized than gains.  $\beta_6$  is insignificant, revealing that firms which have CEOs with international experience have no inclination to recognize 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 are with international study experience only, indicating that CEOs with international study experience only are less likely to recognize loss timely, which is considered as less conditional conservatism.

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Table 2-10: 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.

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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 working experience, 0 if CEOs are without any international experience.

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

Ball and Shivakumar (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.

### 2.7 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 both international study and work experience do have a significant restraining effect on earnings management. However, CEOs may not care about analysts' forecasts due to the imprecise forecasts from analysts in the Chinese immature stock markets (Zhou & 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 analysts' earnings forecast. As to the conditional conservatism, only CEOs with international study experience alone are related to less conditional conservatism.

Our evidences suggest that CEOs with both international study and work experience do restrain earnings management through discretionary accruals significantly. However, due to limited observations of CEOs with international work experience only, we are not able to test if this type of CEOs is significantly and negatively related to earnings management. As more returnees keep joining the CEOs' team in Chinese listed firms, research can further test if CEOs' international work experience is indeed more valuable in curbing earnings management than their international study experience.

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### 3. Internal Control Weakness and Earnings Quality in China

Dongfeng Xie\*

**Abstract:** I examine the effect of mandatory disclosure on internal control weaknesses in the listed firms of the main market<sup>7</sup> in China since 2014. By collecting and analyzing a dataset from 2014 to 2016, the expected negative effect of *internal control weakness* (ICW) on earnings quality is not detected, no matter when earnings quality is measured by discretionary accruals or income smoothing. Different types of weaknesses are also taken into consideration whether they are related to financial report or not<sup>8</sup>, and only the non-financial ICWs has a significant and negative effect on income smoothing. Specifically, the relation between the strictness of the standards to identify internal control weaknesses and earnings quality is also tested and a significantly positive effect is only found between the strictness and income smoothing.

**Keywords:** Internal control weakness, Earnings quality, Strictness

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<sup>7</sup> Main market refers to all the firms listed in Shanghai Market, whose stock IDs are with a beginning of 6, and the firms with a beginning of 000 in the Shenzhen Market; Listed firms in the Shenzhen Market with a beginning of 002 belong to the small and medium market; Others listed in the Shenzhen Market with a beginning of 300 belong to the start-up market.

<sup>8</sup> Financial ICWs refer to ICWs related to the financial report, while non-financial ICWs refer to ICWs not related to the financial report. Further definition seen in Part 3.2.2.

#### 3.1 Introduction

Since the release of *Sarbanes-Oxley* (SOX) Act in 2002 in the US, an *internal control report* (ICR) with disclosure on internal control weaknesses and any significant changes in internal controls has been required by Section 302 of the Act, and Section 404 further regulates that the ICR should be attested by the auditor. Since then, research on *internal control weakness* (ICW) in the US environment has been emerging, because the disclosure of the ICR after the SOX provides the necessary quantitative data on internal control. Research concerning the US environment focuses mainly on the relation between ICW and corporate operations (Ashbaugh-Skaife et al. 2009; Kim et al. 2011; Tang et al. 2015; Costello 2011; Gao & Jia 2016; Huang et al. 2015; Feng et al. 2014; D’Mello et al. 2017; Sun 2016; Hoitash et al. 2012, Ogneva et al. 2007) like cost of equity, cost of debt and inventory management. Meanwhile, Doyle et al. (2007), Ashbaugh-Skaife et al. (2008), Hossain et al. (2011) and Chan et al. (2008) conclude a negative relation between ICW and earnings quality in the US environment.

Since the release of SOX in the US, many countries have followed suit to implement their own SOX in order to strengthen the construction of and disclosure on internal control. Among them, China has taken some major steps. However, research on ICW in China like Ji et al. (2017) draws mainly on the data from the voluntary disclosing period. Although Ji et al. (2017) find a negative relation between ICW and earnings quality that is consistent with the research findings in the US, a major concern in this study arises from the self-selection bias in the voluntary disclosing period, during which firms could disclose at their own will. To eliminate this self-selection bias and hence to achieve a more convincing result, a research in the mandatory disclosing period is highly demanded in the Chinese environment.

Using a hand-collected data from the ICR and the *internal control auditing report* (ICAR) of the listed firms in the main market between 2014 and 2016, this article examines the relation between ICW and earnings quality in the mandatory disclosing period in China. A dummy variable of my main interest is defined as 1 if a firm discloses with material ICWs or/and important ICWs<sup>9</sup>, and 0 otherwise. I follow the prior research

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<sup>9</sup> MOF & CSRC (2010) categorize ICWs into three types: material weakness, important weakness and common weakness, whose definitions are also provided. As to the definitions of these three types of weaknesses, only material and important weakness could cause serious deviation from internal control

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(Bigus & Hillebrand 2017; Hutton et al. 2009) to measure earnings quality by the *moving sum of absolute discretionary accruals* (MSDA) over the past three years, and a higher MSDA represents lower earnings quality.

Propensity score matching method is adopted to match each firm-year observation with material or/and important ICWs in the treatment group with comparable firm-year observations without material and important ICWs in the control group. Results from both the descriptive and multivariate analyses indicate no significant relation between ICW and earnings quality. In order to test the robustness of this result, I also measure earnings quality by the *absolute discretionary accruals* (ABSDA) in the past year or in the same year, and the insignificant result between ICW and earnings quality remains unchanged. In addition, I follow the prior research to measure earnings quality by income smoothing (Bigus et al. 2016; Perotti & Wagenhofer 2014; Burgstahler et al. 2006), only to find that there is still no significant relation between ICW and earnings quality.

Then, I further divide the ICW firms into firms with financial ICWs and firms with non-financial ICWs and rerun the regression again. Results confirm the finding of the insignificant relation between ICW and earnings quality, which is measured by discretionary accruals. However, when earnings quality is measured by income smoothing, there is a significant and negative relation between non-financial ICWs and income smoothing.

Further, through the exploration of the relation between the strictness of the standards<sup>10</sup> to identify ICWs and earnings quality, which is an innovative research area, no significant relation is identified.

This research makes significant contributions to the literature on ICW, especially in the extension of the research on the relation between ICW and earnings quality into the Chinese market, which is the most important emerging market in the world to have attracted a major proportion of foreign direct investments. Relying on the data in the mandatory disclosing period on internal control in China since 2014, it overcomes the shortcoming of the self-selection bias in the prior research in the voluntary disclosing period in China. To the best of my knowledge, this is the first research examining the

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objectives.

<sup>10</sup> According to CSRC (2011.04), firms themselves have to set up the standards to identify ICWs, so there is a difference on strictness of the standards being set up. Strictness is defined in Part 3.3.2.

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relation between ICW and earnings quality in the mandatory disclosing period on internal control in China. Besides, it is the first attempt to explore an innovative area, i.e., the relation between the strictness of the standards to identify ICWs and earnings quality.

This research also brings inspirations for regulators in China. Although the main intention of implementing the Chinese SOX is to strengthen the internal control and hence to improve the earnings quality, which is a major component of financial reporting quality, my research concludes no significant relation between ICW and earnings quality, regulators should reevaluate the cost and the benefit to implement the Chinese SOX. Meanwhile, as the standards to identify ICWs are set up by the firms, thus leaving enough room for the firms to manipulate their standards in order to avoid being detected with ICWs, regulators are recommended to set the referential standards to identify ICWs according to each industry.

Besides, this research also suggests that investors should pay more attention to the relation between non-financial ICWs and income smoothing, because this is the only significant relation between ICWs and earnings quality in the paper.

The paper is organized as follows: Part 3.2 illustrates the regulations and the disclosure on internal controls in China; Part 3.3 develops the hypotheses; Part 3.4 describes the sample selection and variable definitions; Part 3.5 presents the empirical results; Part 3.6 concludes the research findings.

## **3.2 Institutional Background in China**

### **3.2.1 China's Major Steps on Internal Controls**

In 2006, with the respective release of internal control guidelines for listed firms by the Shanghai<sup>11</sup> and Shenzhen<sup>12</sup> stock exchanges, listed firms are encouraged to disclose the ICR together with the annual report. As a result, it began a period of voluntary disclosure on ICR from January 2007 in China.

The next major step is taken by the *Ministry of Finance* (MOF). Together with another four regulators in 2008, the MOF released "*the Basic Norms of Enterprise*

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<sup>11</sup> SSE (2006), seen in reference.

<sup>12</sup> SZSE (2006), seen in reference.



*Internal Control*”<sup>13</sup>, which encompasses five ingredients<sup>14</sup> following the COSO framework to build up and implement the internal control system in a firm.

In order to implement the norms of internal control in the listed firms, the *Chinese Securities Regulatory Commission* (CSRC) released an announcement<sup>15</sup> in 2011 to choose 68 firms listed both domestically and abroad as an experimental unit mandated to implement “*the Basic Norms of Enterprise Internal Control*” and to disclose their ICRs from that year on, while the other 216 selected firms are required to disclose the ICR from 2012. Since then, more firms have been added into the mandatory list of disclosing the ICR each year. Meanwhile, in order to implement the norms of internal control in a better and more transparent way, CSRC also released an interpretation<sup>16</sup> in 2011 that both qualitative and quantitative standards to identify material weakness, important weakness and common weakness<sup>17</sup> should be set up by the firm. Thus, from the year 2011 on, the disclosure of ICR in China has gone through from a voluntary and mainly qualitative stage to a more mandatory and quantitative stage.

In 2012, MOF released an announcement<sup>18</sup> to regulate the firms in the main market into mandatory disclosure through three steps. As regulated, all the state-owned firms in the main market are mandatory to disclose the ICR from 2012; non-state-owned firms with a market value of more than 5 billion Yuan at December 31, 2011 and meanwhile with an average net income of more than 30 million Yuan between 2009 and 2011 are to be added to the mandatory list from 2013; All the listed firms in the main market are mandatorily required to disclose the ICR from 2014. Once a firm has been added to the list, its ICR should also be attested by an auditor.

#### **3.2.2 ICWs in the Main Market**

In the Chinese Market, ICWs are disclosed in two categories, i.e., *ICWs related to the financial report* (financial ICWs) and *ICWs not related to the financial report* (non-

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<sup>13</sup> MOF (2008), seen in reference.

<sup>14</sup> The five ingredients are control environment, risk assessment, control activities, information and communication, monitoring.

<sup>15</sup> CSRC (2011.02), seen in reference.

<sup>16</sup> CSRC (2011.04), seen in reference.

<sup>17</sup> The definitions of these three kinds of weaknesses were released in MOF & CSRC (2010), seen in reference.

<sup>18</sup> MOF (2012), seen in reference.

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financial ICWs). However, there is no clear definition for these two categories, because the boundary between internal control over financial reporting and internal control not over financial reporting is not clearly set. In China, Internal control activities are divided into 18 areas by MOF & CSRC (2010)<sup>19</sup>. But unlike in the statement from Ji et al. (2017), this regulation does not provide a clear standard for classifying the 18 areas into internal control over financial reporting or not. Only a definition of internal control over financial reporting was interpreted by CSRC (2011.04)<sup>20</sup>: Internal control over financial reporting are the related controls implemented by the board of directors, board of supervisors, managers and all the employees in order to reasonably assure the authenticity and integrity of the financial report and internal controls to secure assets that are related to the reliability of the financial report. All the controls other than internal control over financial reporting are internal control not over financial reporting. According to this interpretation, listed firms are required to set up their standards for classifying these two types of internal control, thus dividing ICWs into financial ICWs and non-financial ICWs.

Both the financial and non-financial ICWs are further categorized into three different types of ICWs according to their severities, which are material ICWs, important ICWs and Common ICWs, as regulated by MOF & CSRC (2010)<sup>21</sup>. Material ICWs are defined as one or more weaknesses which could lead to serious deviation from internal control objectives; Important ICWs are one or more weaknesses, whose severity and economic consequences are lower than those of material ones but still could lead to deviation from internal control objectives; Common ICWs are weakness other than material and important ones. As a result, there are six types of ICWs due to the categorization. And both quantitative and qualitative standards are set up to identify the six types of ICWs.

In order to achieve a detailed data of these six types of ICWs, I download both ICRs and ICARs from the websites of the Shanghai Stock exchange and Shenzhen Stock exchange<sup>22</sup>. Below is an example from the ICWs' disclosure of the firm with the stock ID

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<sup>19</sup> MOF & CSRC (2010), seen in reference.

<sup>20</sup> CSRC (2011.04), seen in reference.

<sup>21</sup> MOF & CSRC (2010), seen in reference.

<sup>22</sup> The website of Shanghai Stock Exchange: [www.sse.com.cn](http://www.sse.com.cn), the website of Shenzhen Stock Exchange:

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601118 in the year 2015, which provides an illustration about the ICWs' disclosure in Chinese listed firms.

Table 3- 1: Standards to identify ICWs in the firm 601118 in the year 2015

	Material ICWs	Important ICWs	Common ICWs
	$x \geq 5\% \text{ Profit}$	$3\% \text{ Profit} \leq x < 5\% \text{ Profit}$	$x < 3\% \text{ Profit}$
Quantitative standards to identify financial ICWs	$x \geq 1\% \text{ Assets}$	$0.5\% \text{ Assets} \leq x < 1\% \text{ Assets}$	$x < 0.5\% \text{ Assets}$
	$x \geq 1\% \text{ Revenue}$	$0.5\% \text{ Revenue} \leq x < 1\% \text{ Revenue}$	$x < 0.5\% \text{ Revenue}$
	$x \geq 3\% \text{ Equity}$	$0.5\% \text{ Equity} \leq x < 3\% \text{ Equity}$	$x < 0.5\% \text{ Equity}$
Qualitative standards to identify financial ICWs		Qualitatively defined standards	
Quantitative standards to identify non-financial ICWs	$y \geq 20 \text{ Million}$	$5 \text{ Million} \leq y < 20 \text{ Million}$	$y < 5 \text{ Million}$
Qualitative standards to identify non-financial ICWs		Qualitatively defined standards	
Definitions:			
x: Potential misstatement amount;			
y: Loss;			
Profit: Profit before tax;			
Asset: Total assets.			
Note: The monetary unit is Chinese Yuan.			

Table 3-1 presents the quantitative and qualitative standards to identify financial and non-financial ICWs in different severities, i.e., material ICWs, important ICWs and Common ICWs, from the firm 601118 in the year 2015. In the year 2015, the firm does not disclose any non-financial ICWs; instead, it discloses all the three types of financial ICWs, which offers a good example to understand the definitions of these three types according to their severities. It discloses one material weakness and one important weakness in details in the ICR and the auditor also discloses these two weaknesses in the ICAR.

- **One material weakness:** Although the firm prepaid 161 Million Yuan to a related party to purchase inventories, the related party did not supply on time

and therefore the related party did de facto possess the money.

- **One important weakness:** Weaknesses in the provisions for hedging, for example the hedging amount in 2015 was more than the amount of spot goods.

Besides, the firm mentions in the ICR that there may be common ICWs during the operation, but these common ICWs do not impede the realization of internal control objectives.

Through the definition of the three types of weaknesses according to their severities and the description as shown in the example, both the material and important weaknesses could lead to a deviation from internal control objectives, but the common ones could not due to their much less severity. That is why I treat a firm as an ICW firm, when it has material or/and important weaknesses. Besides, common weaknesses are only vaguely disclosed in the ICR and are not presented in the auditors' ICAR.

### 3.3 Hypotheses

#### 3.3.1 ICW and Earnings Quality

As stated by 2013 COSO Framework on internal control, internal control is defined as a process which is designed to provide reasonable assurance regarding the achievement of objectives relating to operations, reporting and compliance<sup>23</sup>. From the definition, internal control plays an important role in the process of financial reporting, since earnings are calculated and financial reports are processed in a specified environment of internal control. A disclosure of ICW in the firm reflects the deficiencies in the internal control system in the firm, which might allow managers to engage in more earnings management in the process of financial reporting, resulting a relative lower earnings quality.

The empirical research on ICW comes forth mainly after the release of SOX in the US, which requires the disclosure of ICWs, and researchers focus on the influence of ICW on different kinds of corporate operations.

In the US setting, ICW could result in a higher cost of equity (Ashbaugh-Skaife et al. 2009), a higher debt/loan rate (Kim et al. 2011; Tang et al. 2015), tighter non-price

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<sup>23</sup> COSO refers to the Committee of Sponsoring Organizations of the Treadway Commission. For the definition of internal control by COSO, seen in <https://www.coso.org/Documents/990025P-Executive-Summary-final-may20.pdf>.

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terms (Kim et al. 2011) and lenders' move away from financial covenants to security and price protection (Costello 2011) in a debt contracting. An existence of ICWs could also lead to a holding of more liquid assets like cash in hand, since the value of the assets in these ICW firms are substantially undervalued (Gao & Jia 2016) and therefore, the holding of cash is more valuable for ICW firms (Huang et al. 2015). ICW is also related to inventory management and ICW firms have systematically lower inventory turnover ratios and more inventory impairments (Feng et al. 2014). The internal capital allocation and investment are also affected by internal control, with higher quality of internal control helping improving the management decisions in directing corporate resource to various projects (D'Mello et al. 2017); however, a negative audit opinion on internal control leads to a significantly lower investment than a clean one (Sun 2016). Besides, a research by Lin et al. (2015) reveals a severe effect of ICW on performance in the banking industry in China. Some research even shows that ICWs' disclosure could affect the compensation of managers, as demonstrated by Hoitash et al. (2012) that CFOs experience a decrease in bonus compensation after the disclosure of material ICWs.

However, a research carried out by Ogneva et al. (2007) concludes that ICWs are not directly associated with higher cost of equity. To sum up, most of the prior research confirms the value of internal control on corporate operations, some of which even test the effect of a remediation of ICWs. In other words, a remediation could lead to lower cost of equity (Ashbaugh-Skaife et al. 2009) and lower cost of debt/loan (Kim et al. 2011; Tang et al. 2015), a better inventory management (Feng et al. 2014), more efficiency in internal capital allocation (D'Mello et al. 2017) and investment efficiency (Sun 2016). Sun (2016) also finds a decline in investment when ICWs are revealed.

Furthermore, the influence of ICW on earnings quality has been researched. Based on the pre- and post-SOX period in the US, Doyle et al. (2007); Ashbaugh-Skaife et al. (2008) and Hossain et al. (2011) demonstrate a negative relation between ICW and earnings quality, and that SOX does help in the improvement of corporate governance and the curbing of earnings management, which results in a better earnings quality. Although Chan et al. (2008) find only a mild evidence on the negative relation between ICW and earnings quality, such a relation is confirmed in the US.

Beyond the US-Setting, Lu et al. (2011) examine the lower compliance cost setting of ICW disclosures in Canada and conclude that the existence of ICWs is related to a

higher level of accruals, which is usually considered as lower accrual quality. In the Chinese setting, Ji et al. (2017) analyze the ICW data between 2010 and 2011 that is within a voluntary disclosing period in China, and find that ICW firms are related to more discretionary accruals, leading to a lower earnings quality, and also that the more serious an ICW is, the lower earnings quality a firm has. A major concern over this research arises out of the self-selection bias in the sample, since firms themselves could choose whether to disclose the ICR or not in the voluntary disclosing period. To eliminate the self-selection bias in the voluntary disclosing period, a research with a sample in the mandatory disclosing period on ICR is necessary. As listed firms in the main market in China have all been mandatorily required to disclose the ICR since 2014, it provides an available dataset from 2014 to 2016 to test the first hypothesis.

*H 1: The existing of ICWs is negatively associated with earnings quality in China.*

In the US setting, material ICWs are further categorized into two types as suggested by Moody, which are account-specific weaknesses and company-level weaknesses (Doyle et al. 2007, Bedard et al. 2012). Only ICWs related to overall company-level controls (Doyle et al. 2007) affect earnings quality significantly and negatively, since a remediation or the audit effort is more likely to be adopted to tackle the account-specific ICWs (Bedard et al. 2012). As stated before, the categorization of ICWs in China is different, which are financial and non-financial ICWs.

Since Ji et al. (2017) conclude that both types of ICWs affect the earnings quality negatively in the voluntary ICRs' disclosing period, I attempt to check if such a negative relation still exists under the mandatory environment.

*H 2.1: The existing of financial ICWs is negatively associated with earnings quality in China.*

*H 2.2: The existing of non-financial ICWs is negatively associated with earnings quality in China.*

#### **3.3.2 Strictness and Earnings Quality**

As mentioned before, it is the firm, more precisely, the board of directors in the firm that is required to set up their own qualitative and quantitative standards to identify ICWs. As a result, the level of strictness of the standards is different among the firms. Research in this area on strictness is lacking. Through researching on the influence of the percentage of outside directors in the board of directors on the strictness of the standards to identify

ICWs in the listed firms in China, Tan et al. (2016) find a significant and positive relation. According to them, 62.7% of the listed firms in their sample from 2011 to 2014 set up their quantitative standards based on profit, 62.6% based on asset, 57.6% based on revenue, and 27.6% based on equity. They measure the strictness of the standards by two means: One is by the number of standards from the four categories (profit, asset, revenue and equity); The other is that they compare the bottom limit of each standard to identify material ICWs to the average value<sup>24</sup> of the category of the standard in their sample, which concludes that if the result is lower, a dummy variable 1 is defined for the standard as a strict one. Then the total of the defined dummy variables from maximal four categories represents the strictness of the standards, which ranges from 0 to 4 and is defined as the variable STRICTNESS in this paper.

So far, there has not been any research on the relation between STRICTNESS and earnings quality and therefore no direction can be expected.

*H 3: The quantitative standard to identify ICWs is related to earnings quality.*

#### **3.4 Data, Sample Selection and Definitions of Variables**

##### **3.4.1 Data and Sample Selection**

The detailed data of ICWs are hand-collected from the ICRs and ICARs disclosed on the websites of both stock exchanges in China. Meanwhile, I also extract from the ICR whether a material or important weakness is a financial one or a non-financial one. Then, following the method of Tan et al. (2016), I also define the strictness of the standards to identify ICW from the ICR. Besides, the financial data are both from the China Stock Market & Accounting Research (CSMAR) Database and my hand-collecting from financial reports. Table 3-2 summarizes the process of the sample selection.

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<sup>24</sup> The average values are 5% of the profit, 1.5% of the revenue, 1.5% of total asset, 2% of the equity. Although my sample is from 2014 to 2016, the standards are quite stable once they were set, which was noticed when I was collecting the data manually.

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Table 3- 2: Sample selection

Data selection	Firm-year observations
ICW data (2014-2016)	4526
Less: unavailability of ICRs and/or ICARs	(191)
Less: financial service and utility industries	(416)
Less: listed less than 3 years	(258)
Less: industry_year groups without any observation with material or important ICWs	(1065)
Less: industry_year groups with no more than 10 observations	(77)
Less: a firm with 0 total assets in the year 2010	(3)
Sample before propensity score matching	2516
Definitions:	
ICW= Internal control weakness	
ICR= Internal control report	
ICAR= Internal control auditing report	

From 2014 to 2016, 4,526 observations are collected from 1,570 firms in the main market and 191 observations are dropped due to the unavailability of their ICRs and/or ICARs<sup>25</sup>. As to calculate discretionary accruals to measure earnings quality, 416 observations in the financial service and utility industries are also dropped. Observations with a listed time less than 3 years are also excluded from my sample, because at least 3 years' financial data are needed to calculate the moving sum of absolute discretionary accruals, which is the main measure of earnings quality in this paper. Further, I also drop industry\_year group without any observations with material or important ICWs, as well as industry\_year group with no more than 10 observations. Then a firm with 0 total assets in the year 2010 is also dropped. As a result, a sample of 2,516 observations is left.

#### 3.4.2 Propensity Score Matching

In order to remove the bias between ICW observations in the treatment group and non-ICW observations in the control group with respect to a vector of covariates, a propensity score matching method (Rosenbaum & Rubin 1983; Guo & Fraser 2015; Chen et al. 2015)

<sup>25</sup> According to CSRC (2011.04), firms can apply to the stock exchanges for an exemption from ICRs' disclosure, when they are in a restructure in that year or the significant change of internal control or the material weakness is related to the core commercial secret.



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is adopted to assign comparable control observations to the treatment one. The dependent variable is the likelihood of ICW, while firm size, shares held by the top 3 shareholders in percentage (TOP3) and strictness are chosen as the covariates in the logit function to predict the propensity score.

In my prediction, the direction of firm size on the likelihood of ICW is unclear. Large firms are more capable to bear the costs for the compliance of SOX (Krishnan et al. 2008), and could therefore build up a more efficient internal control system with lower likelihood of ICW, which results in a reduction of information asymmetry (Gupta et al. 2018) and an alleviation of agency problems (Qi et al. 2017). But a paper by Rice & Weber (2012) indicates that firm size is negatively related to the probability of disclosing ICWs. Besides, the several largest shareholders play the most important monitoring role in corporate operations by appointing board directors, who may express the shareholders' dissatisfaction by withholding the votes for the managers, when ICWs are discovered in the company (Ye et al. 2013), thus managers may attempt to avoid the occurrence of ICWs. As a result, top shareholders may have a negative relation to the occurrence of ICWs. Then, I follow the research by La Porta et al. (1998) by using the top 3 shareholders to represent the concentration of the shares. Strictness should have a positive relation to the occurrence of ICW, as stricter standards to identify ICW could lead to more ICWs being detected. Table 3-3 presents the result from the logit regression.

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Table 3- 3: Predicting the likelihood of occurrence of internal control weaknesses

Variables	Coefficient/Std. Error
SIZE	-0.2577***(0.0694)
TOP3	-1.0100(0.6348)
STRICTNESS	0.1271(0.0756)
Include fixed industry effects	Yes
Include fixed year effects	Yes
Number of observations	2516
Pseudo R <sup>2</sup>	0.0472

Note: Robust standard errors reported in parentheses, data of SIZE are from CSMAR database, data of TOP3 and STRICTNESS are hand-collected

Definitions:

SIZE=Ln (Total assets at the end of the year)

TOP3=Shares held by the largest 3 shareholders in percentage

STRICTNESS is defined as in Part 3.3.2

\* p<0.05

\* \*p<0.01

\*\*\* p<0.001 (two-tailed tests)

From Table 3-3, SIZE has a significant negative effect on the occurrence of ICWs. Although TOP3 and STRICTNESS are only marginally significant at the level of 10%, their signs of coefficients are as expected. Then a nearest matching with replacement (Smith 1997; Beuselinck 2014) is adopted, through the 3:1 (control to treatment) matching, a sample of 547 observation is left, including 149 treatment observations and 398 control observations.

In order to check the balance of the sample after propensity score matching, t-test is applied to test if the mean differences of the independent variables between the treatment group and the control group are still significant. Results from Table 3-4 confirm that the sample is more balanced now, since the variables SIZE and TOP3 before propensity score matching lose their significance thereafter.

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Table 3- 4: Mean values and mean differences

Variables	Before PSM(N=2516)			After PSM(N=547)		
	Mean of treatment (N=149)	Mean of control (N=2367)	T-test of mean difference(T-value)	Mean of Treatment (N=149)	Mean of control (N=398)	T-test of mean difference (T-value)
SIZE	22.1473	22.7097	4.6767***	22.1473	22.3986	1.6791
TOP3	0.4307	0.4694	2.8039**	0.4307	0.4551	1.4897
STRICTNESS	1.6779	1.5467	-1.3104	1.6779	1.5653	-0.9609

Definitions:

SIZE=Ln (Total assets at the end of the year)

TOP3=Shares held by the largest 3 shareholders in percentage

STRICTNESS is defined as in Part 3.3.2

\* p<0.05

\*\*p<0.01

\*\*\* p<0.001 (two-tailed tests)

#### 3.4.3 Measure of Earnings Quality

I use discretionary accruals to measure earnings quality, and a higher level of discretionary accruals usually indicates a lower earnings quality. For the timing of accruals, Doyle et al. (2007) state that it would be meaningful to use the discretionary accruals in the years before the disclosure of the ICWs, since the ICWs may have existed in a firm for several years and the firm together with the auditor will take countermeasure in the year of disclosure. The timing of accruals is more precisely tested by Dechow et al. (1996), who prove that firms generally manage earnings in 1 to 3 years and then the earnings reverse quickly. Based on these considerations, I follow the method of (Bigus and Hillebrand 2017; Hutton et al. 2009) to take the moving sum of absolute discretionary accruals over the past three years before the disclosure of ICW as the measure of earnings quality.

For the estimation of discretionary accruals, the modified Jones (1991) model (Dechow et al. 1995) is adopted, and the function is as following.

$$\frac{TA_{i,t}}{A_{i,t-1}} = r_0 \frac{1}{A_{i,t-1}} + r_1 \frac{(\Delta REV_{i,t} - \Delta AR_{i,t})}{A_{i,t-1}} + r_2 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (1)$$

with TA=total accruals, A=assets, REV=revenues, AR=accounts receivables,

PPE=property, plant and equipment.

Meanwhile, the sample is categorized into industry-year groups, in which the standards of industry classification announced by CSRC in 2012<sup>26</sup> are applied (Jiang et al. 2013).

#### **3.4.4 Definition of Variables**

Table 3-5 provides the definition of all variables in this paper. Control variables are mainly from the prior research (Doyle et al. 2007; Ashbaugh-Skaife et al. 2008; Chan et al. 2008; Lu et al. 2011; Bedard et al. 2012) on earnings management and internal control weaknesses. Table 3-5 also provides the predicted sign of the influence of each control variable on the main dependent variable which is earnings management.

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<sup>26</sup> CSRC (2012), seen in reference.

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Table 3- 5: Definition of variables

Variable	Predicted Sign	Measurement	Source
<b>Dependent Variables:</b>			
MSDA		Moving sum of absolute discretionary accruals in the past three years	CSMAR Database
ABSDA		Absolute discretionary accruals in the past year	
SMTH		Income smoothing	
<b>Independent Variables:</b>			
ICW		1 if a material or important ICW is disclosed, 0 otherwise	Hand-collected
FIN		1 if a financial material or a financial important ICW is disclosed, 0 otherwise	
NFIN		1 if a non-financial material or a non-financial important ICW is disclosed, 0 otherwise	
STRICTNESS		Ranges from 0 to 4, defined in 3.3.2	
<b>Control Variables:</b>			
SIZE	-	The log of total assets	CSMAR Database
LEVERAGE	+	Total liabilities divided by total assets	
LOSS	+	1 if the net profit is negative in the past year, 0 otherwise	
ROA	?	Return on assets	
CFO	+	Standard deviation of cash flow from operations, scaled by average assets	
VOLATILITY	+		
FIRM AGE	?	The log of the firm's listed years	
BIG4	?	1 if the internal control is audited by a Big4, 0 otherwise	Hand-collected
GOV	-	1 if a firm is held by the state for more than 50%, 0 otherwise	
TOP3	-	Shares held by the top 3 largest shareholders, measured in percentage	
Note: Predict signs are from the results of prior research; + represents positive relation; - represents negative relation; ? represents contradicted relation			

Prior research agrees mostly on the influential direction of firm size, leverage, loss and CFO volatility on earnings management. In this research, TOP3 is added as a control variable, since large shareholders have the voting right to replace top managers, which constrains top managers' scale of earnings management (Huang et al. 2013). Meanwhile, as quite a bunch of listed firms in China are controlled by the state or state-owned entities

and they are less likely to manage earnings (Guo & Ma 2015; Cheng et al. 2015), a dummy variable of GOV is also added.

## **3.5 Results**

### **3.5.1 Descriptive Analysis**

Table 3-6, Panel A provides details of ICW firms each year according to different categories of ICWs. As illustrated above, I only treat firms with material or/and important ICWs as ICW firms, and the sample from 2014 to 2016 includes 149 ICW firms, of which 78 have financial ICWs and 94 non-financial ICWs.

Table 3-6, Panel B presents descriptive statistics for the sample after propensity score matching. In the sample, 27.24% of the firms report ICWs, while 23.40% of them experienced a loss of net income in the past year. The firms are listed for 15.48 years ( $e^{2.7393}$ ) on average. Besides, the top three shareholders hold almost half of the stocks in the firms, which may indicate a strong control from the major shareholders. The concentration of shareholding is also indicated by GOV, in which one fifth of the listed firms are state-owned. Meanwhile, these firms' average ROA (0.84%) presents a low profitability, although there are still firms which achieve a ROA more than 20%. This is not surprising, since the 149 ICW firms achieve an average ROA of -2.83%. As to the dependent variable, the mean value of MSDA is more than the median one, which states that firms in the last two quartiles enter in earnings management through discretionary accrual at a higher level than those in the first two quartiles.

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Table 3- 6: Descriptive statistics

<b>Panel A: Details of ICW firms in the sample(N=547)</b>					
Year	ICW=1	Material	Important	Financial	Non-financial ICWs
		ICWs	ICWs	ICWs	
2016	54	30	26	29	32
2015	47	17	32	26	28
2014	48	26	24	23	34
Total	149	73	82	78	94

<b>Panel B: Descriptive statistics of the sample after propensity score matching (N=547)</b>							
Variable	Mean	Q1	Median	Q3	Std Dev	Min	Max
MSDA	0.1984	0.1018	0.1566	0.2393	0.1636	0.0231	1.0231
ICW	0.2724	0.0000	0.0000	1.0000	0.4456	0.0000	1.0000
FIN	0.1426	0.0000	0.0000	0.0000	0.3500	0.0000	1.0000
NFIN	0.1718	0.0000	0.0000	0.0000	0.3776	0.0000	1.0000
STRICTNESS	1.5960	1.0000	1.0000	2.0000	1.2193	0.0000	4.0000
SIZE	22.3344	21.2380	22.3420	23.4066	1.5387	19.0161	25.6995
LEVERAGE	0.5352	0.3511	0.5412	0.7016	0.2271	0.0947	1.0809
LOSS	0.2340	0.0000	0.0000	0.0000	0.4238	0.0000	1.0000
ROA	0.0084	-0.0008	0.0154	0.0426	0.0786	-0.3476	0.2180
CFO VOLATILITY	0.0564	0.0210	0.0397	0.0685	0.0563	0.0035	0.3252
FIRM AGE	2.7393	2.6391	2.8332	2.9957	0.3947	1.0986	3.1781
BIG4	0.0676	0.0000	0.0000	0.0000	0.2514	0.0000	1.0000
GOV	0.2011	0.0000	0.0000	0.0000	0.4012	0.0000	1.0000
TOP3	0.4485	0.3217	0.4367	0.5606	0.1691	0.1312	0.8388

<b>Panel C: Descriptive statistics of ICW-firms versus Non ICW-firms (N=547)</b>					
Variable	ICW firms (N=149)		Non-ICW firms (N=398)		T-test of mean differences
	Mean	Median	Mean	Median	Two-tailed p-value
MSDA	0.2157	0.1716	0.1920	0.1531	0.1315
SIZE	22.1662	22.2519	22.3974	22.3858	0.1179
LEVERAGE	0.6230	0.6282	0.5024	0.4913	0.0000***
LOSS	0.3289	0.0000	0.1985	0.0000	0.0013***
ROA	-0.0283	0.0048	0.0222	0.0199	0.0000***
CFO VOLATILITY	0.0696	0.0429	0.0514	0.0382	0.0007***
FIRM AGE	2.7557	2.8904	2.7332	2.8332	0.5535
BIG4	0.0604	0.0000	0.0704	0.0000	0.6806
GOV	0.1678	0.0000	0.2136	0.0000	0.2351
TOP3	0.4309	0.4152	0.4550	0.4417	0.1370

\* p<0.1

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\* \*p<0.05

\*\*\* p<0.01 (two-tailed tests)

Note: All the continuous variables are winsorized at 1% and 99%. For definition of variables see Table 3-5.

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From Table 3-6, Panel C, there is no significant difference on earnings management between ICW firms and non-ICW firms, which does not support hypothesis 1. The ICW firms possess higher leverage, more volatile cash flow from operations, higher probability of experiencing a loss in the past year, and worse performance, compared to non-ICW firms. Table 3-7 provides the result of the correlation test. It is not surprising that the correlation between GOV and TOP3 is quite high, since state-owned firms have a high concentration of shareholding.



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Table 3- 7: Pearson correlation matrix

	MSDA	ICW	FIN	NFIN	STRICTNESS	SIZE	LEVERAGE	LOSS	ROA	CFO VOLATILITY	FIRM AGE	BIG4	GOV
ICW	0.0646												
FIN	0.0290												
NFIN	0.0837		0.1330										
STRICTNESS	0.0043												
SIZE	-0.2799	-0.0669	-0.0456	-0.0754	0.0338								
LEVERAGE	-0.0509	0.2366	0.1231	0.2121	-0.0126	0.1977							
LOSS	0.0615	0.1371	0.1080	0.0802	-0.0471	-0.1446	0.2398						
ROA	-0.0344	-0.2861	-0.1615	-0.2901	0.0290	0.1687	-0.4393	-0.3537					
CFO VOLATILITY	0.4920	0.1437	0.0661	0.1772	-0.0024	-0.3245	0.0138	0.0673	-0.0832				
FIRM AGE	0.1205	0.0254	0.0561	-0.0051	0.0217	-0.3042	0.0000	0.0361	0.0008	0.0531			
BIG4	-0.0469	-0.0176	-0.0266	-0.0069	-0.0601	0.2980	0.0165	-0.1145	0.0800	-0.0868	-0.0962		
GOV	-0.1273	-0.0509	-0.0742	-0.0109	0.0279	0.4037	0.0626	-0.0295	-0.0102	-0.0814	-0.1519	0.0828	
TOP3	-0.1489	-0.0637	-0.0715	-0.0346	0.0365	0.5040	0.0312	-0.1093	0.1328	-0.1332	-0.2528	0.1800	<u>0.6143</u>

Note: For definition of variables see Table 3-5

### 3.5.2 Multivariate Analysis

#### 3.5.2.1 ICW and Earning Quality

The following equation is employed to form an OLS regression to test Hypothesis 1.

$$MSDA_{i,t} = \beta_0 + \beta_1 * ICW_{i,t} + \beta_2 * SIZE_{i,t} + \beta_3 * LEVERAGE_{i,t} + \beta_4 * LOSS_{i,t} + \beta_5 * ROA_{i,t} + \beta_6 * CFO\ VOLATILITY_{i,t} + \beta_7 * FIRM\ AGE_{i,t} + \beta_8 * BIG4_{i,t} + \beta_9 * GOV_{i,t} + \beta_{10} * TOP3_{i,t} + \partial_{i,t} \quad (2)$$

As presented in columns 2 and 3 in Table 3-8, the variable of interest ICW has a t-value of 0.05, which is not significant even at a 10% level. As a result, the expected negative relation between ICW and earnings quality in Hypothesis 1 is not found. Among the control variables, CFO VOLATILITY is significantly and positively related to MSDA, which signifies that firms with unstable cash flow have lower earnings quality; TOP3 is also positively related to MSDA at a significant level of 10%, implying that firms with more concentrated ownership tend to have lower earnings quality.

Table 3- 8: Earnings quality and ICWs

	Dependent Variable		Dependent Variable		Dependent Variable	
	MSDA		ABSDA		SMTH	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
INTERCEPT	0.1876	1.34	0.0138	0.19	-5.2154	-2.76***
ICW	0.0006	0.05	0.0040	0.61	-0.0885	-0.64
SIZE	-0.0059	-1.09	-0.0017	-0.58	0.1884	2.54**
LEVERAGE	-0.0225	-0.62	0.0157	0.97	0.7387	1.74*
LOSS	0.0199	1.33	0.0013	0.21	-0.8077	-3.78***
ROA	0.0061	0.06	0.0077	0.13	-0.1509	-0.12
CFO VOLATILITY	1.0652	5.37***	0.4121	4.08***	10.0155	6.44***
FIRM AGE	0.0004	0.03	-0.0005	-0.08	-0.3440	-2.47***
BIG4	0.0268	1.04	0.0096	0.85	0.2789	1.26
GOV	-0.0148	-0.91	-0.0065	-0.81	-0.3431	-1.26
TOP3	0.0802	1.78*	0.0381	1.61	-0.6918	-1.55
Number of						
Observations	547		547		547	
Adjusted R <sup>2</sup>	42.87%		21.70%		14.78%	

\* p<0.1

\*\* p<0.05

\*\*\* p<0.01 (two-tailed tests)

Note: For definition of variables see Table 3-5

In order to check the reliability of the result, I also measure earnings quality by *absolute discretionary accruals* (ABSDA) in the past year and the results in columns 4 and 5 of Table 3-8 are consistent. Besides measuring earnings quality by discretionary accruals, income smoothing (Bigus et al. 2016; Perotti & Wagenhofer 2014 ; Burgstahler et al. 2006), as defined in equation (3), is also adopted. In equation (3), the data of operating income and cash flow from operation over the past three years are gathered to calculate their standard deviations. As showed in columns 6 and 7 of Table 3-8, there is still no significant influence of ICW on earnings quality.

$$SMTH_{i,t} = \frac{SD(\text{operating income}_{i,t}/(\text{total assets}_{i,t-1}))}{SD(\text{cash flow from opration}_{i,t}/\text{total assets}_{i,t-1})} \times (-1) \quad (3)$$

Another consideration is also undertaken: there could be a problem by defining ICW as 1 for both material and important ICWs. Thus, I redefined ICW as 1 only when material ICWs are disclosed and rerun the main regression by using all the three dependent variables again, the results remain insignificant between ICW and earnings quality.

As Ji et al. (2017) measure earnings quality by the absolute discretionary accruals in the year of the ICWs' disclosure and find a significant and negative relation between earnings quality and disclosure of ICWs in the voluntary ICWs' disclosing period from 2010 to 2011 in China. I also follow their way to examine the relation in the mandatory disclosing period, and the insignificance of the variable ICW (t-value: 0.61; p-value:0.541) demonstrates that the negative relation does not exist.

As a result, managers' behavior of earnings management through discretionary accruals and income smoothing is of no significant difference between ICW firms and non-ICW firms in the mandatory disclosing period on ICWs in China.

#### **3.5.2.2 Financial ICWs versus non-financial ICWs**

To test if there is a different effect on earnings quality between the financial and non-financial ICWs, the dummy variable ICW in equation (2) is replaced by FIN and NFIN. The other variables in this regression are the same as in equation (2).

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The same three dependent variables to test Hypothesis 1 are applied again. The results from Table 3-9 are mostly consistent with those in Table 3-8, and both financial and non-financial ICWs are not significantly related to earnings management. One exception is that non-financial ICWs have a negative effect on income smoothing at a significant level of 10%, and a swift from NFIN=0 to NFIN=1 results in a 31.62% (-0.3449/-1.0908)<sup>27</sup> decrease in income smoothing.

Table 3- 9: Earnings quality and ICWs (fin & nfin)

	Dependent Variable MSDA		Dependent Variable ABSDA		Dependent Variable SMTH	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
INTERCEPT	0.1871	1.35	0.0132	0.18	-5.1842	-2.78***
FIN	-0.0035	-0.23	0.0003	0.04	0.1516	0.90
NFIN	0.0065	0.36	0.0060	0.72	-0.3449	-1.75*
SIZE	-0.0059	-1.09	-0.0017	-0.58	0.1879	2.56**
LEVERAGE	-0.0233	-0.64	0.0156	0.96	0.7654	1.81*
LOSS	0.0202	1.35	0.0015	0.25	-0.8247	-3.84***
ROA	0.0127	0.13	0.0107	0.19	-0.4394	-0.33
CFO						
VOLATILITY	1.0596	5.26***	0.4093	4.02***	10.2673	6.46***
FIRM AGE	0.0006	0.05	-0.0004	-0.07	-0.3555	-2.54**
BIG4	0.0265	1.02	0.0095	0.83	0.2916	1.31
GOV	-0.0148	-0.91	-0.0066	-0.82	-0.3411	-1.25
TOP3	0.0795	1.76*	0.0378	1.60	-0.6569	-1.48
Number of Observations	547		547		547	
Adjusted R <sup>2</sup>	42.78%		21.58%		15.14%	

\* p<0.1

\*\* p<0.05

\*\*\* p<0.01 (two-tailed tests)

Note: For definition of variables see Table 3-5

By following Ji et al. (2017)'s method, I also test Hypothesis 2 again by measuring earnings quality with absolute discretionary accruals in the year of the ICWs' disclosure. Neither the financial ICWs (t-value: 0.04; p-value: 0.968) nor the non-financial ICWs (t-value: 0.72; p-value:0.470) exert any significant influence on earnings quality.

<sup>27</sup> -1.0908 is the median value of SMTH (income smoothing).

### 3.5.2.3 Strictness and Earnings Quality

The variable ICW in function (2) is replaced by STRICTNESS to test Hypothesis 3. As stated before, the likelihood of the occurrence of ICW is the dependent variable in the procedure of propensity score matching. But ICW is not the variable of interest in this regression, thus the sample before propensity score matching including 2,516 observations is undertaken.

Table 3-10 provides the insignificant relation between strictness and discretionary accruals. However, strictness of the standards to identify ICWs has a significant and positive effect on income smoothing at 10% level.

Table 3- 10: Earnings quality and strictness

	Dependent Variable MSDA		Dependent Variable ABSDA		Dependent Variable SMTH	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
INTERCEPT	0.0874	0.99	0.0336	1.02	-4.2217	-6.63***
STRICTNESS	0.0000	0.00	-0.0011	-1.05	0.0397	1.74*
SIZE	-0.0002	-0.07	-0.0010	-0.76	0.1323	4.91***
LEVERAGE	-0.0124	-0.57	0.0005	0.06	0.3159	1.64
LOSS	0.0234	2.45**	0.0142	3.61***	-0.5957	-6.92***
ROA	0.0578	0.8	0.0653	1.94*	-0.5846	-0.84
CFO VOLATILITY	1.4166	12.26***	0.5333	10.57***	8.5695	14.65***
FIRM AGE	0.0105	1.73*	0.0018	0.68	-0.1809	-2.66***
BIG4	-0.0097	-0.86	0.0023	0.5	-0.1025	-1.1
GOV	-0.0337	-3.68***	-0.0089	-2.55**	0.0783	0.93
TOP3	0.0393	1.47	0.0063	0.62	-0.3964	-1.87*
Number of Observations	2516		2516		2516	
Adjusted R <sup>2</sup>	35.58%		23.79%		13.01%	

\* p<0.1

\*\* p<0.05

\*\*\* p<0.01 (two-tailed tests)

Note: For definition of variables see Table 3-5

I also rerun the above regressions using the sample after propensity score matching and find the insignificant results between strictness and earnings quality, which is measured by both discretionary accrual and income smoothing.

#### 3.6 Conclusion

I conduct the research on the relation between ICW and earnings quality in the mandatory disclosing period on internal control in China. By collecting and analyzing the recent data from the listed firms in the main market of the Chinese stock market between 2014 and 2016, I do not find any significant influence from ICW on earnings quality, which is measured by different kinds of discretionary accruals such as MSDA and ABSDA and by income smoothing. It states that firms, no matter with ICW or not, have no significant difference towards earnings management, which often represents the inverse of earnings quality. Then, by separate consideration on financial and non-financial ICWs, the results confirm mostly the insignificant relation between ICW and discretionary accruals, but there is a significant and negative relation between non-financial ICWs and income smoothing.

By the further test on the relation between strictness of standards to identify ICWs and earnings quality, no significant result is found between strictness and earnings quality which is measured by discretionary accruals, but a significant and positive relation between strictness and income smoothing is indicated.

This is the first research on the relation between ICW and earnings quality in the mandatory disclosing period in China, as to my best knowledge. By eliminating the self-selection bias, it provides a more convincing result. Moreover, it is also the first research to explore the effect of the strictness of the standards to identify ICWs on earnings quality.

This research has implications for regulators from two aspects. On the one side, the insignificant relation between ICW and earnings quality states clear that even ICWs are mandatorily required to be disclosed, it does not indicate that firms with serious types of ICWs have lower earnings quality. As a result, regulators should reevaluate the benefits and the costs stemming from the mandatory disclosure on internal control. On the other side, it would be necessary and meaningful for regulators to set the referential standards to identify ICWs according to each industry. Till now, the standards to identify ICWs are

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set up by the firms themselves and firms still have room to set up loose standards to avoid being identified as ICW firms.

Besides, investors should focus more on the relation between non-financial ICWs and income smoothing, because only non-financial ICWs has a significant and negative effect on income smoothing, but not on discretionary accruals.

There are still limitations in this paper. First, disclosure of ICWs represents only part of the internal control quality, thus ICW firms may not always be related to lower quality of internal control, compared to non-ICW firms. Second, there is still maneuvering room for the firms to disclose ICWs, as the standards to identify ICWs are set up by the firms themselves. Third, the sample in this research is limited to the main market of the Chinese stock market due to the scope of mandatory disclosure, which may not represent the whole picture of the Chinese market. Further research is potentially encouraged to test the relation between ICW and earnings quality after the complete implementation of mandatory disclosure on internal control in all the listed firms in China.

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## 4. Board Gender Diversity, Gender Bias and Earnings Management:

### Evidence from China

Jochen Bigus \* . Dongfeng Xie \*\*

**Abstract** We analyze the link between board gender diversity and earnings management for Chinese listed firms. The Chinese setting allows us to control for variations in gender *bias* which we measure by sex ratio at birth in each province (male births per female births). We find that gender bias is negatively associated with earnings management, while board gender diversity has no significant sign. Further testing shows that the gender bias effect is indirect: Gender bias is negatively associated with provincial economic development, while lower economic development goes along with lower levels of earnings management. Our study suggests the need to more carefully analyze the indirect ways in which gender bias may be related to corporate decisions.

**Keywords:** Gender diversity, Earnings management, Gender bias. Economic development, Board of directors.

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### 4.1 Introduction

This paper examines the effect of board gender diversity and gender bias on earnings management in the unique setting in China, which has a long tradition of preference for sons and a decades-long one-child policy (Tian et al., 2018). Although a spate of research (Srinidhi et al., 2011; Arun et al., 2015; Gaviious et al., 2012; Gull et al., 2018; Strydom et al., 2017) has documented the positive effect of female directors in restraining earnings management, García Lara et al. (2017) challenge those findings by stressing that it is not board gender diversity, but gender bias that actually restrains earnings management. Besides García Lara et al. (2017), research on the relationship between gender bias and earnings management is virtually non-existent. Moreover, prior research has mainly been conducted in US and European settings.

This paper addresses the link between board gender diversity, gender bias and earnings management in China, asking the following questions: (1) Do we observe a link between board gender diversity and earnings management in a country that is known for relatively strong gender bias? (2) Does variety in provincial gender bias contribute to explain the level of earnings management?

The Chinese setting seems to be especially suitable for measuring gender bias, because the one-child policy implemented in the 1980s may have influenced some parents to “choose” whether their only child should be female or male. China has 31 provinces, and we use the provincial sex ratio at birth as a proxy measure for gender bias.<sup>28</sup> The sex ratio at birth is the ratio of male births per female births. We find both unusually high sex ratios in many Chinese provinces, but also significant variation in the sex ratio across provinces. García Lara et al. (2017) mainly measures gender bias by the fact whether female board members are appointed or not. Since gender bias is usually deeply rooted in societal and cultural values, the provincial sex ratio might be a suitable alternative

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<sup>28</sup> Sex ratio at birth is defined by the United Nations Population Division as male births per female births, seen in <http://data.un.org/Data.aspx?d=PopDiv&f=variableID%3A52>. The World Health Organization uses a similar definition, see [http://www.searo.who.int/entity/health\\_situation\\_trends/data/chi/sex-ratio/en/#](http://www.searo.who.int/entity/health_situation_trends/data/chi/sex-ratio/en/#).

measure.

We use a partly hand-collected dataset of all Chinese publicly listed firms from 2015 to 2017, and test how gender diversity and gender bias are associated with earnings management. Board gender diversity is measured by the proportion of female directors on the board (García Lara et al., 2017; Gaviouis et al., 2012). We measure earnings management by the absolute value of discretionary accruals (Jones, 1991; Dechow et al., 1995).

We cannot confirm a significant relationship between board gender diversity and earnings management. However, we find that more serious gender bias is significantly associated with lower levels of earnings management, but in an indirect way: A 2SLS design shows that gender bias is significantly negatively associated with provincial GDP per capita while (the fitted value of) provincial GDP per capita remains positively related to earnings management.

This paper contributes to the literature in several aspects. First, to the best of our knowledge, this is the first paper that examines whether there is a link between board gender diversity and earnings management in China. Qi et al. (2017) and Liu et al. (2016) investigated how gender diversity in the top management team and the existence of a female CFO, respectively, affected earnings management. However, we were unable to find evidence on how the presence of female board directors is associated with earnings management in Chinese firms. Similar to García Lara et al. (2017), this paper cannot confirm that board gender diversity is clearly associated with earnings management.

Second, and possibly more importantly, we suggest a new measure of gender bias based on provincial sex ratio at birth. We find that gender bias affects earnings management indirectly through the province's economic well-being. Provinces with more gender bias exhibit lower GDP per capita and, by that, lower levels of earnings management. In the given legal and institutional framework<sup>29</sup> provided by the central

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<sup>29</sup> There is literature showing that the development of the legal and institutional framework is linked to the development of capital markets and to earnings quality, see La Porta, Lopez de Silanes, Shleifer & Vishny

Chinese authorities, we may expect both more pronounced performance-based compensation and better trained accounting experts in richer provinces. Overall, while García Lara et al. (2017) document that *firm*-level gender bias affects earnings management in the UK, this paper finds a significant, but indirect link between *provincial* gender bias and earnings management in China.

This paper is organized as follows: Section 4.2 outlines corporate governance in Chinese listed firms. Section 4.3 summarizes the literature on gender diversity, gender bias, and earnings management in order to develop the hypotheses. Section 4.4 illustrates how gender bias in China manifests itself. Section 4.5 describes the sample selection and defines the variables. Section 4.6 presents the empirical results, and Section 4.7 concludes.

### **4.2 Corporate Governance in Chinese Listed Firms**

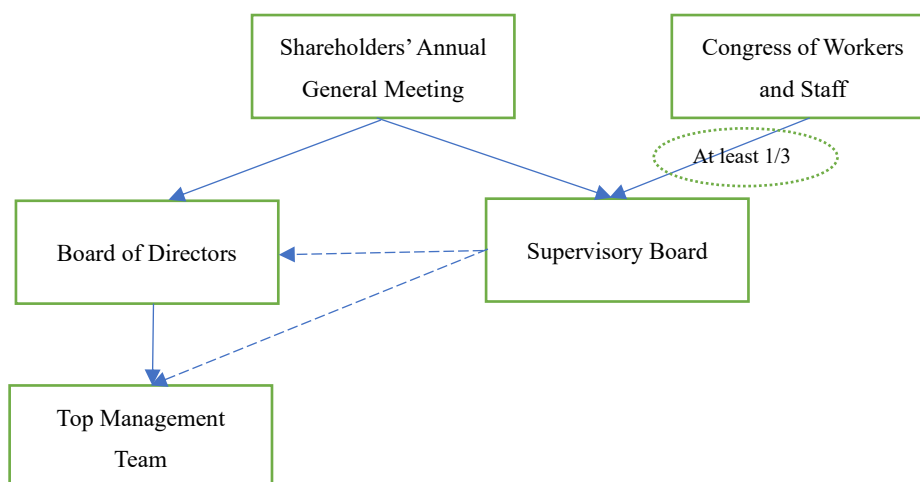
The Company Law (Gongsi Fa) in China requires all listed firms to set up both a board of directors and a supervisory board. As depicted in Figure 4-1, the board of directors is elected at the shareholders' annual general meeting, while the members of the supervisory board in China are partly elected at the shareholders' annual general meeting, but at least one-third of them must be elected at the Congress of Workers and Staff in the firm.

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(1998) and Leuz, Nanda & Wysocki (2003).



Figure 4-1: Corporate governance in Chinese listed firms



This looks like a two-tier system, but it fundamentally differs from the German pattern: It is the board of directors, not the supervisory board, that appoints and monitors the top management team and decides on corporate strategy and other important topics. The main task of the supervisory board in China is to monitor directors or managers for illegal behavior. Ultimately, the Chinese corporate governance system is a special two-tier system (Frag & Mallin, 2016; Ding et al., 2010) or essentially, very similar to the Anglo-Saxon single-tier system (Tian, 2001). As a result, the board of directors plays an important role for the firm's earnings management.

### 4.3 Literature Review and Hypotheses Development

#### 4.3.1 Board Gender Diversity and Earnings Management

The proportion of female board directors around the world has been increasing year by year,<sup>30</sup> especially after some countries in the European Economic Area, such as Norway, France and Spain, have mandated gender quotas or have set guidelines to encourage more female directors on the board (Marinova et al., 2016; Srinidhi et al., 2011). As a result, a wealth of research on the effect of board gender diversity has been carried out (Terjesen,

<sup>30</sup> The proportion of female directors has increased from 14.5% in 2014 to 16.9% in 2016 around the world, according to a study published by Harvard Law School:

<https://corpgov.law.harvard.edu/2017/01/05/gender-parity-on-boards-around-the-world/>.

Sealy and Singh, 2009). Research on the relationship between board gender diversity and earnings management started about ten years ago.

According to agency theory, the presence of female directors should restrain the earnings management of managers, as they seem to monitor the executive board better than male directors. Female directors have better attendance records (Terjesen, Sealy and Singh, 2009), which in turn improves the attendance records of their male counterparts (Adams and Ferreira, 2009). Female directors are said to also bring more independent thinking to the boardroom, which they have gathered from different experiences and different socialization processes (Gavious et al., 2012; Hillman et al., 2007; Pelled et al., 1999). In this way, female directors act very similarly to independent directors (Srinidhi et al., 2011; Adams et al., 2010; Adams and Ferreira, 2009). Board independence is usually found to go along with lower levels of earnings management (Klein, 2002; Alves, 2014; Dechow et al., 1996; Vafeas, 2005; Chen, Cheng and Wang, 2015; Marra, Mazzola and Prencipe, 2011). The different perspectives brought by gender diversity can facilitate more informed board decisions (Srinidhi et al., 2011).

The empirical research on the relationship between gender diversity and earnings management has mainly been conducted in US and European settings, often finding that board gender diversity is associated with lower levels of earnings management (Srinidhi et al., 2011; García Lara et al., 2017; Arun et al., 2015; Gavious et al., 2012; Gull et al., 2018; Strydom et al., 2017). Srinidhi et al. (2017) and Arun et al. (2015) analyzed the US and the UK settings, respectively, and pointed out that female (independent) directors may have been responsible for restraining earnings management. García Lara et al. (2017) identified such an effect only from female independent directors, using a dataset of publicly listed firms in the UK. With French firms, Gull et al. (2018) not only detected a deterring effect of female directors on earnings management, but also revealed two key attributes of female directors in the effective monitoring of managers' behavior on earnings management, i.e. business expertise and audit committee membership. By applying critical mass theory (Kanter, 1977) into the Australian environment, Strydom et al. (2017) concluded that balanced boards, with a female proportion of 20%-60%, were

associated with lower levels of earnings management than those boards which were all-male or had a female proportion below 20%. Gavius et al. (2012) analyzed a sample of Israeli high-technology firms listed in the US and not only suggested a negative relationship between the presence of female directors and earnings management, but also detected a restraining effect on earnings management when firms were led by female CEOs or CFOs. Abbot et al. (2012) reported that the presence of female directors in the US market reduced the likelihood of financial restatement, which reaffirmed the more effective monitoring role of female directors.

In the Chinese setting, the proportion of female directors on the board of listed firms in the sample period has increased from 14.2% in 2015 to 15.4% in 2017 according to our data.<sup>31</sup> However, the link between board gender diversity and earnings management has not yet been tested for the Chinese market. Qi et al. (2017) and Liu et al. (2016) reported that more gender diversity in a company's top management and the existence of a female CFO, respectively, were associated with lower levels of earnings management in China, but did not analyze board gender diversity. Consistent with the outcomes of prior research, the first hypothesis is:

*H1: More gender diversity on the board is associated with lower levels of earnings management.*

#### **4.3.2 Gender Bias on the Board**

De Cabo et al. (2011) suggested considering gender bias on the board by interpreting the effect of board gender diversity. The appointment of directors on the board is not gender-neutral (Sila et al., 2016; Farrel and Hersch, 2005) and women have to break through the "glass ceiling" to reach board positions (Adams and Funk, 2012). Both Sila et al. (2016) and Farrel & Hersch (2005) found that the chance of appointing a new female director was lower if there was already a high proportion of female directors on the board, and that a woman was more likely to take over a director position after the departure of a

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<sup>31</sup> Fan et al. (2019) reported a figure of less than 10% in 2006.

female director. Farrel & Hersch (2005) even calculated the probability of adding a female director when there is no departure from the board (10.9%), which was significantly lower than that of their male counterparts (42.9%).

The gender bias in the selection of directors may explain the scarce presence of women on the board (De Cabo et al., 2011). Females who have been able to break through the “glass ceiling” might be more talented and better prepared, and therefore likely to exert more effective monitoring than their male counterparts (García Lara et al., 2017), resulting in a greater restraining effect on the earnings management of managers. In this way, the restraining effect on earnings management from board gender diversity may essentially result from gender bias. After uncovering the negative relationship between gender diversity and earnings management in their research, García Lara et al. (2017) adopted three criteria to split the whole sample into two subsamples: a subsample with discriminatory observations and a subsample with non-discriminatory observations. Among non-discriminating firms, they no longer found a negative relationship between gender diversity and earnings management. They concluded that it was not gender diversity, but gender bias, that restrained earnings management.

The gender bias measure of García Lara et al. (2017) was based on the *firm*'s decisions about whether female directors were appointed or not. However, gender bias is usually more deeply rooted in *societal* and *cultural* values. The one-child policy in China provides a unique setting to identify different levels of gender bias in different provinces as measured by the provincial sex ratio at birth. Qi et al. (2017) and Liu et al. (2016) investigated the Chinese setting as well; however, they did not account for gender bias.

The association between gender bias and earnings management is not straightforward from a theoretical point of view. On the one hand, one may expect that more serious gender bias will result in fewer female directors and thus, in less monitoring on managers' earnings management activities. On the other hand, more serious gender bias makes it harder for females to climb up the ladder such that only the most talented females may make it. Due to this selection effect, female directors might be more qualified to discover and to restrain earnings management. At the end, it is an empirical question,

whether it is the “quantity” of female directors or the “quality” that prevails.

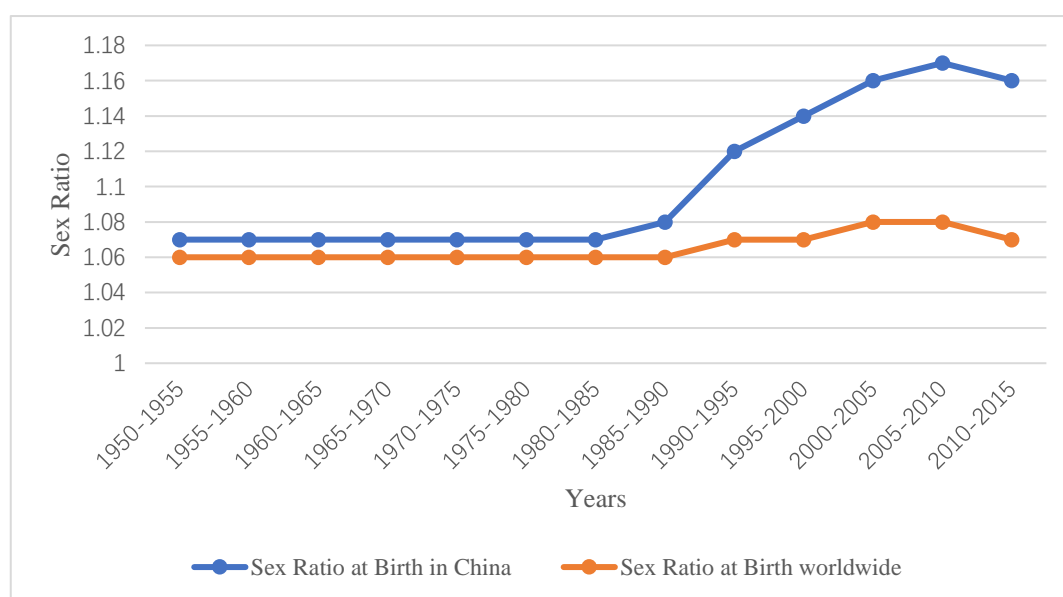
Consistent with the finding of García Lara et al. (2017), we hypothesize:

*H2: Gender bias is associated with a higher level of earnings management.*

#### 4.4 Gender Bias in China

Before the 1980s, China had a stable sex ratio at birth slightly above 1.05, which reveals its long tradition of son preference, see Figure 4-2.

Figure 4-2: Sex ratio at birth in China and worldwide



Data source: Database of United Nations: Sex ratio at birth, retrieved from <http://data.un.org/Data.aspx?d=PopDiv&f=variableID%3A52>.

After the implementation of the one-child policy in the 1980s, the sex ratio at birth in China rose significantly compared to the index worldwide. The one-child policy clearly enhanced the effect of son preference (Tian et al., 2018). We take the sex ratio at birth as a measure for gender bias, which is supported by the following quote from the World Health Organization:

“[I]f a country’s population does not equalize or rather exceeds the 105-threshold (males per 100 females), it means societies with a dominating preference for male child [sic] tend to intervene in nature and reduce the number of born girl child [sic]

by sex-selective abortion and infanticide.”<sup>32</sup>

The latest census from 2010 discloses the birth population between November 1, 2009 and October 31, 2010. In 2010, the sex ratio at birth reached 1.1794, which is far above the natural sex ratio of about 1.05 suggested by the World Health Organization.<sup>33</sup> The level of this gender bias varies widely across provinces (Attané, 2009), see Table 4-1.

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<sup>32</sup> See [http://www.searo.who.int/entity/health\\_situation\\_trends/data/chi/sex-ratio/en/](http://www.searo.who.int/entity/health_situation_trends/data/chi/sex-ratio/en/).

<sup>33</sup> See [http://www.searo.who.int/entity/health\\_situation\\_trends/data/chi/sex-ratio/en/](http://www.searo.who.int/entity/health_situation_trends/data/chi/sex-ratio/en/).

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Table 4-1: Sex ratios at birth according to 2000 and 2010 censuses from different provinces in China

Province	Sex ratio at birth (boys/girls)		Change from 2000 to 2010
	2000	2010	
Beijing	1.1056	1.0948	-0.98%
Tianjin	1.1251	1.1369	1.04%
Hebei	1.1343	1.1488	1.28%
Shanxi (山西)	1.1252	1.1022	-2.04%
Neimenggu	1.0845	1.1210	3.36%
Liaoning	1.1283	1.1018	-2.34%
Jilin	1.1123	1.1118	-0.05%
Heilongjiang	1.0971	1.1241	2.46%
Shanghai	1.1064	1.1115	0.46%
Jiangsu	1.1651	1.1624	-0.23%
Zhejiang	1.1386	1.1813	3.75%
Anhui	1.2785	1.2864	0.62%
Fujian	1.1793	1.2559	6.50%
Jiangxi	1.1474	1.2284	7.06%
Shandong	1.1217	1.1941	6.46%
Henan	1.1846	1.1777	-0.58%
Hubei	1.2818	1.2409	-3.19%
Hunan	1.2616	1.2323	-2.32%
Guangdong	1.3030	1.2034	-7.64%
Guangxi	1.2555	1.2268	-2.28%
Hainan	1.3564	1.2529	-7.63%
Chongqing	1.1513	1.1251	-2.28%
Sichuan	1.1601	1.1164	-3.77%
Guizhou	1.0703	1.2212	14.10%
Yunnan	1.0871	1.1177	2.81%
Xizang	1.0273	1.0661	3.78%
Shanxi (陕西)	1.2210	1.1533	-5.54%
Gansu	1.1482	1.1737	2.22%
Qinghai	1.1035	1.1240	1.85%
Ningxia	1.0879	1.1386	4.66%
Xinjiang	1.0612	1.0614	0.02%
China	1.1686	1.1794	0.92%

Data is from the National Bureau of Statistics of China: Data to calculate sex ratio at birth in the year 2010 is from <http://www.stats.gov.cn/tjsj/pcsj/rkpc/6rp/indexch.htm> while data to calculate sex ratio at birth in the year 2000 is from <http://www.stats.gov.cn/tjsj/ndsj/renkoupuocha/2000puocha/pucha.htm>. The latest census in 2010 provides the birth data between November 1, 2009 and October 31, 2010; the census in 2000 provides birth data between November 1, 1999 and October 31, 2000.

As Table 4-1 shows, the sex ratio at birth between the last two censuses in China in 2000 and 2010 slightly increased from 1.1686 to 1.1794. This indicates the long-lasting effect of gender bias in China, despite the rapid economic development during this time. We have financial accounting and corporate governance data from 2015 to 2017, and therefore consider the gender bias information from the latest census in the year 2010.

Although a two-child policy came into effect in 2015, it will still need time to change the ideology of gender bias against female births.<sup>34</sup> Therefore, this new policy is unlikely to have considerably affected the results on gender bias during our sample period.

## 4.5 Data, Sample and Variables

### 4.5.1 Data Selection

The sample consists of all firms listed on Chinese stock markets from 2015 to 2017. That data of board characteristics has been hand-collected from annual reports; financial data has come mainly from the *China Market & Accounting Research* (CSMAR) database.

Table 4-2: Sample selection

Data selection	Firm-year observations
Board data (2015-2017)	9,435
Less: financial service and utility industries	(524)
Less: data unavailability in control variables	(827)
Less: industry-year groups with no more than 10 observations	(380)
<b>Selected sample</b>	<b>7,704</b>

As Table 4-2 depicts, we started with 9,435 firm-year observations from the listed Chinese firms. We deleted 524 observations in the financial service and utility industries, because accruals were not comparable with other industries; this could have introduced noise into our measure of earnings management. We dropped another 827 observations due to data unavailability in control variables. In order to calculate discretionary accruals, we dropped industry-year groups with no more than ten observations. Finally, a sample

<sup>34</sup> Even though the one-child policy was officially abolished in 2015, it still continues to have an effect; moreover, many parents felt they could not afford more than one child anyway, due to the sharply increased cost of living (e.g. housing prices, school fees).



of 7,704 observations was left for analysis.

#### 4.5.2 Measurement of Gender Bias

As noted above, we measured gender bias by the sex ratio at birth in the province in which the firm's headquarters were located. We used the data from the latest census in the year 2010. Regarding the headquarters, listed firms are required to disclose both their registered address and their primary business address in their annual report. Both addresses are usually the same or at least in the same province, but exceptions exist. In this paper, the business address was used to identify the location of the headquarters, because the main operations of the firm take place at the location of the business address and thus is influenced by the local environment.

#### 4.5.3 Measure of Earnings Management

Following prior literature (Gavious et al., 2012; Arun et al., 2014; Strydom et al., 2017; García Lara et al., 2017; Gull et al., 2018), we have adopted the modified Jones (1991) model (Dechow et al., 1995) to estimate *absolute discretionary accruals* (ABSDA) to proxy earnings management. The absolute value considers efforts of both increasing and decreasing earnings, both of which impair accounting quality. Absolute discretionary accruals equal the absolute value of the residual  $\varepsilon_{i,t}$  in Equation (1):

$$\frac{TA_{i,t}}{A_{i,t-1}} = r_0 \frac{1}{A_{i,t-1}} + r_1 \frac{(\Delta REV_{i,t} - \Delta AR_{i,t})}{A_{i,t-1}} + r_2 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (1)$$

where  $TA$  = total accruals = operating income minus cash flow from operations (Fang & Jin, 2011; Hribar & Collins, 2012; Asthana et al., 2015),  $A$  = total assets,  $REV$  = revenues,  $AR$  = accounts receivable,  $PPE$  = property, plant and equipment,  $\Delta$  = change of.

Larger values of ABSDA ( $= |\varepsilon_{i,t}|$ ) indicate more pronounced earnings management and lower accounting quality. We measure ABSDA with respect to industry-year groups, applying the industry classification of the China Securities Regulatory Commission (CSRC) in 2012<sup>35</sup> (Jiang et al., 2013).

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<sup>35</sup> See "Guidelines for the Industry Classification of Listed Firms", CSRC, October 26, 2012.

### **4.5.4 Independent Variables**

One important independent variable is board gender diversity. We follow the literature and proxy board gender diversity by the proportion of female directors on the board (Gavious et al., 2012; García Lara et al., 2017). We also consider the squared value of gender diversity, because critical mass theory suggests that the effect from gender diversity on earnings management reverses when the female proportion of the board reaches a certain threshold (Kanter, 1977; Strydom et al., 2017).

As control variables, we use board and other firm characteristics that prior literature has suggested have an effect on earnings management, such as board size, the proportion of independent board directors, CEO duality, size, leverage, profitability, sales growth, and market-to-book ratio (Srinidhi et al., 2011; García Lara et al., 2017; Arun et al., 2015; Gavious et al., 2012; Gull et al., 2018).

## 4 Board Gender Diversity, Gender Bias and Earnings Management

Table 4-3: Definitions of variables

Variable	Measurement	Note
<b>Dependent Variable:</b>		
ABSDA	Absolute value of discretionary accruals	
<b>Independent Variables:</b>		
GD	Proportion of female directors on the board	
GB	Provincial sex ratio at birth according to the location of the headquarter of each listed firm	
<b>Control Variables:</b>		
SIZE	Natural logarithm of total assets	
LEV	Total liabilities divided by total assets	
LOSS	1 if the net profit is negative in the past year, 0 otherwise	Company level
ROA	Return on assets	
SALEGR	Sales growth rate from year t-1 to t	
M/B	Market-to-book ratio	
<hr/>		
Bsize	Natural logarithm of the number of total board members	
BI	Proportion of independent directors on the board	Board level
DUAL	1 if CEO is also the board chairman, 0 otherwise	

Data on GD, Bsize, BI and DUAL is hand-collected; data to calculate provincial sex ratio at birth is from the National Bureau of Statistics of China, see <http://www.stats.gov.cn/tjsj/pcsj/rkpc/6rp/indexch.htm>; all other data is from the CSMAR database.

### 4.6 Empirical Analyses

#### 4.6.1 Descriptive Statistics

Panel A in Table 4-4 shows that absolute discretionary accruals, ABSDA, are in a skewed distribution. The mean value was 0.0506, lower than the mean value 0.080 reported by García Lara et al. (2017) for UK-listed firms. Female directors constituted 14.7% of board members on average. 10.3% of listed firms experienced a loss in the previous year, and the average return on assets of the listed firms was almost 4.0%. The average sales' growth was 24.3% and the average market-to-book ratio was about 5.1, indicating favorable prospects of Chinese listed firms. There were 8.3 ( $e^{2.1168}$ ) directors on the board on average; independent directors represented more than one-third (0.3756), as

## 4 Board Gender Diversity, Gender Bias and Earnings Management

mandatorily required by the regulations in China.

Table 4-4: Descriptive statistics

<b>Panel A: Descriptive statistics of the sample (N = 7,704)</b>							
Variable	Mean	Q1	Median	Q3	Std.		
					Dev.	Min	Max
ABSDA	0.0506	0.0157	0.0347	0.0655	0.0532	0.0005	0.3087
GD	0.1470	0.0000	0.1111	0.2222	0.1307	0.0000	0.5455
GB	1.1664	1.1118	1.1777	1.2034	0.0532	1.0614	1.2864
SIZE	22.2439	21.3706	22.1165	22.9663	1.2582	19.6838	25.9707
LEV	0.4256	0.2577	0.4128	0.5790	0.2079	0.0595	0.9248
LOSS	0.1027	0.0000	0.0000	0.0000	0.3036	0.0000	1.0000
ROA	0.0399	0.0135	0.0368	0.0680	0.0571	-0.1748	0.2087
SALEGR	0.2428	-0.0234	0.1205	0.3196	0.6202	-0.6151	4.3304
M/B	5.0840	2.2906	3.6288	5.8311	5.5871	0.7390	43.1770
Bsize	2.1168	1.9459	2.1972	2.1972	0.1989	1.6094	2.7081
BI	0.3756	0.3333	0.3636	0.4286	0.0536	0.3000	0.5714
DUAL	0.2636	0.0000	0.0000	1.0000	0.4406	0.0000	1.0000

**Panel B: Descriptive statistics of the sample (N = 7,704) according to gender bias**

Variable	Gender bias (GB) firms (N = 3,863)		Non-GB firms (N = 3,841)		T-test of mean differences
	Mean	Median	Mean	Median	Two-tailed p-value
ABSDA	0.0494	0.0343	0.0518	0.0352	0.0419**
GD	0.1507	0.1250	0.1432	0.1111	0.0126**
SIZE	22.1581	22.0798	22.3302	22.1453	0.0000***
LEV	0.4176	0.4052	0.4336	0.4213	0.0007***
LOSS	0.0901	0.0000	0.1153	0.0000	0.0003***
ROA	0.0423	0.0395	0.0374	0.0344	0.0001***
SALEGR	0.2343	0.1348	0.2515	0.1042	0.2231
M/B	5.2017	3.6684	4.9655	3.5769	0.0635*
Bsize	2.1166	2.1972	2.1171	2.1972	0.9180
BI	0.3746	0.3333	0.3765	0.3636	0.1064
DUAL	0.2804	0.0000	0.2468	0.0000	0.0008***

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$  (two-tailed tests). All continuous variables are winsorized at 1% and 99%. For a definition of variables, see Table 4-3. Definitions: GB firms: Firms in provinces with a sex ratio at birth above or equal to the median value 1.1777; otherwise, Non-GB firms.

Panel B in Table 4-4 split the sample into firms in locations with a sex ratio at birth

higher than or equal to the median (gender bias (GB) firms) and firms with lower sex ratios at birth (Non-GB firms). Panel B suggests that Non-GB firms exhibited a higher level of earnings management and less board gender diversity. Moreover, firms located in provinces with less gender bias were larger, exhibited higher leverage and lower profitability, and were more prone to disclose losses. Correlation coefficients in Table 4-5 do not suggest severe problems of multicollinearity.

Table 4-5: Pearson correlation matrix

Pearson Correlation Matrix											
	ABSDACC	GD	GB	SIZE	LEV	LOSS	ROA	SALEGR	M/B	BSIZE	BI
GD	0.0008										
GB	-0.0347	0.0066									
SIZE	-0.0849	-0.1263	-0.0854								
LEV	0.1287	-0.0806	-0.0435	0.4992							
LOSS	0.1323	-0.0330	-0.0372	-0.0630	0.1694						
ROA	-0.1839	0.0527	0.0204	-0.0005	-0.3761	-0.2564					
SALEGR	-0.0009	0.0147	-0.0218	0.0639	0.0299	0.0536	0.1928				
M/B	0.1587	0.0293	0.0070	-0.4562	0.0579	0.1407	-0.0375	0.0289			
BSIZE	-0.0712	-0.0759	0.0048	0.2455	0.1217	-0.0173	0.0084	-0.0113	-0.1242		
BI	0.0415	0.0213	-0.0177	0.0011	0.0015	0.0103	-0.0283	-0.0058	0.0391	-0.5579	
DUAL	-0.0108	0.0983	0.0303	-0.1388	-0.1196	-0.0549	0.0851	0.0163	0.0455	-0.1604	0.1051

For a definition of variables, see Table 4-3.

## 4.6.2 Multivariate Analyses

### 4.6.2.1 Ordinary Least Squares Regressions

Equation (2) shows the regression to test Hypotheses 1 and 2:

$$\begin{aligned}
 ABSDA_{i,t} = & \beta_0 + \beta_1 GD_{i,t} + \beta_2 GD_{i,t}^2 + \beta_3 GB_i + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \\
 & \beta_6 LOSS_{i,t-1} + \beta_7 ROA_{i,t} + \beta_8 SALEGR_{i,t} + \beta_9 M/B_{i,t} + \beta_{10} BSIZE_{i,t} + \beta_{11} BI_{i,t} + \\
 & \beta_{12} DUAL_{i,t} + \text{industry fixed effects} + \text{year fixed effects} + \partial_{i,t}
 \end{aligned}
 \tag{2}$$

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Table 4-6: OLS regression on gender diversity, gender bias and earnings management

	Dependent Variable		Dependent Variable	
	ABSDA		ABSDA	
	Coefficient	T-statistic	Coefficient	T-statistic
INTERCEPT	0.1830	7.31***	0.1663	6.48***
GD	-0.0056	-0.46	-0.0056	-0.46
GD*GD	0.0109	0.38	0.0117	0.41
GB	-0.0221	-2.03**	-0.0091	-0.77
SIZE	-0.0047	-5.74***	-0.0049	-5.87***
LEV	0.0199	3.99***	0.0206	4.12***
LOSS	0.0103	3.99***	0.0106	4.11***
ROA	-0.1140	-5.56***	-0.1159	-5.65***
SALEGR	0.0000	0.04	0.0001	0.09
M/B	0.0009	4.02***	0.0009	4.01***
BSIZE	-0.0069	-1.75*	-0.0065	-1.64*
BI	0.0124	0.92	0.0124	0.92
DUAL	-0.0009	-0.68	-0.0012	-0.85
GDP			0.0052	2.52**
Industry- and year-fixed effects	included	included	included	included
Number of Observations	7,704		7,704	
Adjusted R <sup>2</sup>	11.40%		11.46%	

GDP = Provincial GDP per capita in ten thousand Chinese Yuan. For a definition of other variables, see Table 4-3. \*p < 0.1, \*\*p < 0.05, \*\*\*p < 0.01 (two-tailed tests)

Table 4-6 indicates that gender diversity, as measured by the proportion of female directors on the board, is not significantly related to earnings management; we have to reject Hypothesis 1. When we measure board gender diversity differently, that is, by the proportion of females among *independent* directors (Garcia Lara et al., 2017), we still obtain an insignificant coefficient. This result conforms with some previous findings on gender diversity in the boardroom, which have asserted that female directors do not necessarily behave differently than male directors (Adams & Funk, 2012; Sila et al., 2016), including with regard to earnings management (Garcia Lara et al., 2017).<sup>36</sup> With regard to the control variables, larger firms, firms with higher ROA, with lower leverage and with larger board size all exhibited lower levels of earnings management.

<sup>36</sup> However, other literature has suggested that gender plays a role in corporate decisions, see, e.g. Srinidhi et al., 2011; Arun et al., 2015; Gaviious et al., 2012; Gull et al., 2018; Strydom et al., 2017.

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In the first regression, the association between gender bias and earnings management was negative and significant at a level of 5%, which is in accordance with the finding in the descriptive analysis. The effect is also significant in economic terms. Firms located in provinces with strong gender bias exhibited absolute discretionary accruals that were lower by 0.0221, that is, more than 40% of the mean value of ABSDA.

The result can be interpreted in different ways. First, in provinces with more serious gender bias, only most qualified females will make it to become a board director and those most qualified females will more likely to detect (excessive) earnings management. The level of earnings management should thus be lower.

A second way of interpreting this result might be that gender bias is linked to province's economic well-being which in turn relates to earnings management. Kabeer & Natali (2013) summarized previous studies on the relationship between gender equality and economic development and found that gender equality had a robust and positive impact on economic development, while the reverse relationship was inconsistent. Maceira (2017) reported that improved gender equality considerably increased GDP per capita, a common measurement for the level of economic development (Kabeer & Natali, 2013).

Therefore, we included an additional independent variable to Equation 2, named GDP and measured according to provincial GDP per capita in 2018, the most recent year with available data. If the argument about qualified selection of female directors were right, gender bias would still be significant after adding provincial GDP per capita. Similar to the assignment of provincial sex ratio at birth, each listed firm gets its GDP value based on the location of its headquarters.

Results from Columns 4 and 5 of Table 4-6 show a significant and positive association between provincial economic development and earnings management, while gender bias loses its significance. The result suggests that listed firms in provinces with better economic development tend to engage more in earnings management. Meanwhile, the correlation between provincial sex ratio at birth and provincial GDP per capita is -

0.4183, which is consistent with the findings by Maceira (2017).

#### 4.6.2.2 Robustness Test

##### 4.6.2.2.1 Alternative measurement of discretionary accruals

In order to test the robustness of the results in Table 4-6, we used an alternative way to calculate total accruals based on items of the balance sheet (Kothari et al., 2015; Jones, 1991):

$$\begin{aligned} \text{Total accruals}_t = & [(\Delta \text{current assets}_t - \Delta \text{cash}_t) - (\Delta \text{current liabilities}_t - \\ & \Delta \text{current maturities of long term debt}_t) - \text{depreciation \& amortization}_t] \\ & / \text{total assets}_{t-1} \quad (3) \end{aligned}$$

Based on this different definition of total accruals, we recalculated discretionary accruals (ABSDA). After that, we rerun the analyses in Table 4-6. The results, depicted in Table 4-7, are qualitatively consistent with the main analyses in Table 4-6, suggesting that gender bias loses its significance after adding the variable of GDP as a measure of provincial economic development.



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Table 4-7: Robustness test: different measurements of discretionary accruals (Kothari et al., 2015)

	Dependent Variable		Dependent Variable	
	ABSDA		ABSDA	
	Coefficient	T-statistic	Coefficient	T-statistic
INTERCEPT	0.3417	6.77***	0.3147	5.97***
GD	0.0123	0.48	0.0123	0.48
GD*GD	-0.0487	-0.79	-0.0474	-0.78
GB	-0.0404	-1.70*	-0.0195	-0.73
SIZE	-0.0070	-4.25***	-0.0072	-4.36***
LEV	-0.0097	-0.98	-0.0086	-0.87
LOSS	0.0155	3.12***	0.0160	3.21***
ROA	0.0903	3.09***	0.0874	2.98***
SALEGR	0.0311	8.52***	0.0311	8.55***
M/B	0.0018	4.62***	0.0018	4.62***
BSIZE	-0.0216	-2.73**	-0.0210	-2.64**
BI	-0.0355	-1.29	-0.0354	-1.28
DUAL	0.0106	3.50**	0.0103	3.35**
GDP			0.0084	1.83*
Industry- and year-fixed effects	included	included	included	included
Number of Observations	7704		7704	
Adjusted R <sup>2</sup>	10.11%		10.14%	

GDP = Provincial GDP per capita in ten thousand Chinese Yuan. For a definition of other variables, see Table 4-3. All continuous variables are winsorized at 1% and 99%. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$  (two-tailed tests).

### 4.6.2.2.2 Heckman (1979) two stage approach

Since we test the effect of board gender diversity on earnings management, endogeneity arises if firms with less earnings management may attract and hire more females on the board (Srinidhi et al., 2011; García Lara et al., 2017). A Heckman (1979) two stage approach is applied to control for this possible endogeneity.

In the first stage, the dependent variable FEMALE is a dummy variable which is defined as 1 if there is at least one female director on the board, and 0 otherwise. Besides controlling for provincial sex ratio at birth as a measurement of gender bias, the other explainable variables are from prior research (Hillman et al., 2007; Srinidhi et al., 2011; García Lara et al., 2017). The definitions of all variables in the first stage are listed in Table 4-8. Table 4-9 presents the results of the first stage regression with Equation (4).

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$$\begin{aligned}
 FEMALE_{i,t} = & \alpha_0 + \alpha_1 GB_i + \alpha_2 SIZE_{i,t} + \alpha_3 ROA_{i,t} + \alpha_4 M/B_{i,t} + \alpha_5 SALEGR_{i,t} \\
 & + \alpha_6 FIRMAGE_{i,t} + \alpha_7 TOTRISK_{i,t} + \alpha_8 BSIZE_{i,t} \\
 & + \alpha_9 RET_{i,t} + \alpha_{10} MARKET\_SHARE_{i,t} + \text{year fixed effects} + \partial_{i,t}
 \end{aligned}$$

(4)

Table 4-8: Variables in the first stage of Heckman two stage approach

Variable	Measurement
<b>Dependent Variable:</b>	
FEMALE	1 if there is at least one female director on the board, and 0 otherwise
<b>Independent Variable:</b>	
FIRMAGE	Age of the firm measured from the IPO year
TOTRISK	Standard deviation of weekly stock returns over the fiscal year
RET	Stock return over the fiscal year
MARKET_SHARE	Market share of the firm, measured by firm sales divided by the total sales of the industry

For definitions of other independent variables, see in Table 4-3.

Table 4-9: The first stage regression of Heckman two stage approach

	Dependent variable FEMALE	
	Coeff.	Z-statistic
Intercept	1.3670	2.53**
GB	-0.1594	-0.56
SIZE	-0.0905	-5.31***
ROA	0.8651	3.10***
M/B	-0.0026	-0.80
SALEGR	0.0218	0.85
FIRMAGE	-0.0037	-1.53
TOTRISK	-0.6328	-0.90
BSIZE	0.6847	8.70***
RET	0.0223	0.68
INDUSCON	-1.5221	-3.12***
Year-fixed effect	included	
Number of observations	7,703	
Pseudo R2	0.0170	
LR Statistic	157.72	
p-value	0.0000	

\*p < 0.1, \*\* p < 0.05, \*\*\* p<0.01 (two-tailed tests). Definitions of variables see in Table 4-8 and Table 4-3. All the continuous variables are winsorized at 1% and 99%. One observation is lost due to the data unavailability in calculating TOTRISK.

Table 4-9 shows that smaller and more profitable firms and firms with less market power are more likely to have a female director. The provincial sex ratio at birth is not significant, though.

In the second stage, the inverse Mills ratio calculated from the first stage is plugged into Equation (2). Table 4-10 shows that the inversed Mills ratio is highly significant, suggesting that the coefficients of the OLS regressions were biased due to endogeneity. Still, qualitative results remain the same. Similar to the OLS regressions in Table 4-6, firms with female directors do not exhibit significantly different earnings management to firms with male directors only. Instead, the provincial sex ratio at birth is significantly

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negatively associated with absolute discretionary accruals but loses its significance after adding the provincial GDP per capita.

Table 4-10: The second stage regression of Heckman two stage approach

	Dependent Variable ABSDA		Dependent Variable ABSDA	
	Coefficient	T-statistic	Coefficient	T-statistic
INTERCEPT	0.1932	7.53***	0.1769	6.71***
GD	-0.0049	-0.41	-0.0050	-0.41
GD*GD	0.0103	0.36	0.0111	0.39
GB	-0.0262	-2.40**	-0.0137	-1.14
SIZE	-0.0088	-5.15***	-0.0088	-5.14***
LEV	0.0196	3.94***	0.0202	4.06***
LOSS	0.0102	3.96***	0.0105	4.08***
ROA	-0.0854	-3.78***	-0.0881	-3.89***
SALEGR	0.0009	0.76	0.0010	0.79
M/B	0.0007	3.27***	0.0007	3.28***
BSIZE	0.0159	1.87*	0.0155	1.83*
BI	0.0117	0.87	0.0118	0.87
DUAL	-0.0008	-0.56	-0.0010	-0.73
GDP			0.0049	2.41**
Inverse Mills Ratio	0.0653	3.03***	0.0631	2.93***
Industry- and year-fixed effects		included		included
Number of Observations		7703		7703
Adjusted R <sup>2</sup>		11.53%		11.58%

GDP = Provincial GDP per capita in ten thousand Chinese Yuan. For a definition of other variables, see Table 4-3. All continuous variables are winsorized at 1% and 99%. \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01 (two-tailed tests).

### 4.6.2.3 Two-Stage Least Squares Regression

The results from the OLS regressions indicate a possible indirect effect from gender bias on earnings management through economic development. For a given legal and institutional framework<sup>37</sup> provided by the central Chinese authorities, we might expect a

<sup>37</sup> There is literature showing that the development of the legal and institutional framework is linked to the development of capital markets and to earnings quality, see La Porta, Lopez de Silanes, Shleifer & Vishny (1998) and Leuz, Nanda & Wysocki (2003).

positive relationship between provincial economic development and earnings management for two reasons. First, in provinces with higher economic development, we may assume we would find a better trained labor force, and thus more knowledge about how to actually manage earnings. Second, in wealthier provinces, we may also expect higher salaries, and thus more pronounced performance-based management compensation. Since bonuses are often based on accounting information, we would expect a stronger incentive to manage earnings in well-developed provinces.

Since gender bias is not significantly associated with earnings management once we consider GDP, and since the correlation between gender bias and economic development is high ( $-0.4183$ ), we run a 2SLS regression. In the first stage, factors including gender bias are treated as independent variables, while economic development is the dependent variable. From the first-stage regression, the fitted values of GDP per capita ( $GDP\_fv$ ) are extracted and plugged into Equation (5) of the second stage regression.

$$\begin{aligned}
 ABSDA_{i,t} = & \beta_0 + \beta_1 GDP\_fv_i + \beta_2 GD_{i,t} + \beta_3 GD_{i,t}^2 + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \\
 & \beta_6 LOSS_{i,t-1} + \beta_7 ROA_{i,t} + \beta_8 SALEGR_{i,t} + \beta_9 M/B_{i,t} + \beta_{10} BSIZE_{i,t} + \beta_{11} BI_{i,t} + \\
 & \beta_{12} DUAL_{i,t} + \partial_{i,t} \qquad (5)
 \end{aligned}$$

In the first stage, we defined provincial GDP per capita as the dependent variable. China's central government dictates the same legal and educational system for all provinces, such that we cannot use those factors as determinants for provincial GDP. Following the literature, we choose gender bias, population and GDP growth as independent variables. Maceira (2017) has argued that continuous improvement on gender equality induces a large positive effect on economic development in the European Union, as measured by GDP per capita. The role of population in economic development is controversial (Peterson, 2017), because population is the denominator in calculating GDP per capita, but it is also one of the most important resources in economic development. Despite these twofold effects of population on economic development, Ilter (2017) has contended that

there is a negative relationship between population and GDP per capita. Ilter (2017) also has made an argument for GDP growth as a factor affecting GDP per capita because provinces with lower GDP per capita might grow faster. The variables used in the first stage-regression are summarized in Table 4-11.

Table 4-11: Variables in the first-stage regression of the 2SLS model

Variable	Measurement
<b>Dependent Variable:</b>	
GDP	Provincial GDP per capita in hundred thousand Chinese Yuan in 2018
<b>Independent Variable:</b>	
GB	Provincial sex ratio at birth according to the location of the listed firm's headquarters
Population	Population in hundred millions in 2018
Growth	Provincial GDP growth rate from 2017 to 2018

Data source: National Bureau of Statistics of China

Column 1 in Table 4-12 indicates that gender bias is negatively and highly significantly associated with GDP per capita. The effect is also strong in economic terms: A switch from the third quartile to the first quartile of the sex ratio at birth (1.2034 – 1.1118), that is, a decline in gender bias of about 9%, implies an average increase of 17.8% ( $9\% * 1.9782$ ) in GDP per capita. With a mean GDP per capita of 89,561 yuan, this translates to 15,945 yuan. This result is consistent with the findings by Maceira (2017). As expected, population is negatively related to GDP per capita. Provincial GDP growth is also negatively related to GDP per capita, which indicates that provinces with lower GDP per capita achieve higher GDP growth.

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Table 4-12: 2SLS regression

Dependent variable	GDP	ABSDA
	Coeff. (t-stat.)	Coeff. (t-stat.)
Intercept	3.4202 (40.96)***	0.1482 (7.04)***
GB	-1.9782 (-25.32)***	
Population	-0.1162 (-9.75)***	
Growth	-1.7853 (-9.94)***	
GDP_fv		0.0110 (2.63)***
GD		-0.0053 (-0.44)
GD*GD		0.0103 (-0.36)
SIZE		-0.0048 (-5.79)***
LEV		0.0201 (4.02)***
LOSS		0.0103 (3.97)***
ROA		-0.1136 (-5.54)***
SALEGR		0.0000 (0.04)
M/B		0.0009 (4.02)***
BSIZE		-0.0069 (-1.76)*
BI		0.0121 (0.90)
DUAL		-0.0009 (-0.67)
Industry- and year-fixed effects	included	included
Number of observations	7,704	7,704
Adj. R <sup>2</sup>	19.21%	11.44%

\*p < 0.1, \*\* p < 0.05, \*\*\* p<0.01 (two-tailed tests). GDP\_fv = fitted values of the provincial GDP per capita from the first-stage regression. For a definition of other variables, see Tables 4-3 and 4-11. All the continuous variables are winsorized at 1% and 99%.

The right column in Table 4-12 shows the endogeneity-adjusted estimate of provincial GDP per capita on the earnings management measure. The fitted values of provincial GDP per capita are positively and significantly associated with earnings management at a p-level of 1%. The coefficient with respect to GDP\_fv is about 2.1 times the size of the respective OLS estimate (0.0110 vs. 0.0052). Since the t-value is about the same (2.63 vs. 2.52 with the OLS estimate), the standard error roughly doubles, indicating that the instrument variables in the first regression are suitable.

Overall, the findings of the 2SLS regression confirm the results in Table 4-6 that regional economic development is a main determinant of earnings management in listed firms and that gender bias indirectly affects earnings management.

### 4.7 Conclusion

We analyzed a sample of Chinese listed firms and found that board gender diversity was not associated with earnings management, which is in line with some recent studies suggesting that females in top positions do not decide on corporate issues differently than their male counterparts. Second, and possibly more importantly, we did find that gender bias, as measured by the provincial sex ratio at birth, was negatively associated with earnings management. Our analyses indicated that provinces with lower gender bias exhibit higher economic development and, by that, a *higher* level of earnings management.

We have highlighted the issue of gender bias and presented a new way to measure it. More research is necessary on how to measure gender bias and how gender bias affects corporate governance choices and firm decisions, both directly and *indirectly*. Even though the Chinese framework provides an almost unique setting to measure gender bias based on cultural and societal norms, one must be careful about transferring our results to countries with more developed securities market regulation and financial reporting regulation. This would be an avenue for future research.



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#### 4 Board Gender Diversity, Gender Bias and Earnings Management

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### Summary in English

The present thesis “Corporate Governance and Earnings Quality in China” investigates different factors affecting earnings quality of listed firms in the Chinese stock markets. It extends the prior research on the way of attempting to find out which elements do generate a significant effect on earnings quality.

The first paper “CEO’s International Experience and Earnings Management: Evidence from Chinese Listed Firms” attempts to confirm whether CEO’s international study and work experience brings a brain gain into the improvement of earnings quality, commonly measured by less earnings management. By gathering and analyzing a dataset from 2010 to 2014 on all the listed firms in Shanghai and Shenzhen stock markets, no evidence is found to support a correlation between CEO’s international experience and earnings management, no matter if earnings management is measured by discretionary accruals, meeting or beating analysts’ earnings forecasts or conditional conservatism. However, after dividing the whole sample into subsamples according to different kinds of international experience, it is concluded that CEOs with both international study and work experience try to restrain earnings management through discretionary accruals (Coef.= $-0.0164$ , t-value= $-2.39$ ) at a significant level of 5%. Nevertheless, these CEOs with both types of international experience do not intend to meet or beat analysts’ earnings forecasts in an immature stock market, in which imprecise earnings forecasts from analysts lead to no significant response from institutional investors when they are making decisions on investments. Besides, CEOs with international study experience only are less likely to recognize loss timely, an indication of less conditional conservatism.

The second paper “Internal Control Weakness and Earnings Quality in China” examines the relation between *internal control weakness* (ICW) and earnings quality in the main market, which refers to all the stocks in the Shanghai Stock Market and stocks in the Shenzhen Stock Market with an ID’s beginning of 002. The sample is constrained to the main market, because the mandatory disclosure on *internal control report* (ICR) and *internal control auditing report* (ICAR) is required only on the main market from the year 2014. By hand-collecting a dataset from 2014 to 2016, I define the *moving sum of absolute*

*discretionary accruals* (MSDA) as the main measurement for earnings quality, and the more MSDA is, the worse the according earnings quality would be. ICW is defined as a dummy variable which equals to 1 when a firm discloses material and/or important ICWs, and 0 otherwise.

As the multivariate analysis shows, the expected negative effect of ICW on earnings quality in prior research is not detected. Alternative robustness tests based on the new measurement of earnings quality, the *absolute discretionary accruals* (ABSDA) and income smoothing, further confirm the finding. Further, I consider different types of ICWs: Financial ICWs and non-financial ICWs and find no evidence on a relation between both types of ICWs and earnings quality, no matter measured by MSDA or ABSDA. Nevertheless, the non-financial ICWs have a marginally significant and negative effect on income smoothing (T-value=-1.75).

In this paper, I also test the effect of the strictness of the standards to identify material ICW on earnings quality. Following Tan et al. (2016), strictness is defined in the range from 0 to 4, and the larger it is, the stricter the standard is set. Results suggest an insignificant relation between strictness and earnings quality, measured by both MSDA and ABSDA. However, a significantly positive relation at a marginal level (T-value=1.74) is found between strictness and income smoothing.

The third paper “Board Gender Diversity, Gender Bias and Earnings Management: Evidence from China” examines the effect of board gender diversity and gender bias on earnings management in the listed firms in China. Gender Diversity is measured by the proportion of female directors on the board, a common measure from prior research. Gender Bias is only defined in the special Chinese condition with long-term son preference and decades of one-child policy from the 1980s, which makes the sex ratio at birth (male births per female births) at provincial level an exogenous measure for gender bias. Earnings management is measured by the absolute value of discretionary accruals.

A sample of 7704 observations from 2015 to 2017 in the Chinese stock markets is hand-collected and analyzed. Each firm in the sample is allocated with its provincial sex

ratio at birth based on the headquarter of the firm. Although we do not find evidence to support a significant effect from board gender diversity on earnings management, gender bias is negatively associated with earnings management at 5% level. However, it is hard to believe that more gender bias is combined with less earnings management.

Therefore, we suppose that this link could be indirect and add provincial GDP per capita as an additional independent variable. Gender bias loses its significance, while provincial GDP (T-value=2.52) is significantly and positively correlated with earnings management. A further 2SLS regression suggests that gender bias is significantly and negatively associated with provincial GDP per capita in the first stage and the fitted value of provincial GDP per capita remains positively related to earnings management. This result indicates that listed firms in well-developed provinces tend to engage more in earnings management.

### Summary in German

Die vorliegende Arbeit „Corporate Governance and Earnings Quality in China“ untersucht, wie unterschiedliche Faktoren Einfluss auf die Finanzberichterstattungsqualität der börsennotierten Aktiengesellschaften des chinesischen Aktienmarktes ausüben. Sie liefert einen Beitrag zu früheren Studien, welche den Einfluss bestimmter Faktoren auf die Finanzberichterstattungsqualität von Unternehmen untersuchen.

Die erste Studie „CEO’s International Experience and Earnings Management: Evidence from Chinese Listed Firms“ untersucht, ob die internationale Studien- und Arbeitserfahrung der CEOs der Erhöhung der Finanzberichterstattungsqualität ein *brain gain* bringt. Die erhöhte Finanzberichterstattungsqualität wird üblicherweise durch weniger Earnings Management gemessen. Durch das Sammeln und die Analysen eines Datensatzes aller börsennotierten Aktiengesellschaften der Aktienmärkte in Shanghai und Shenzhen von 2010 bis 2014 wird kein Beweis für einen Zusammenhang zwischen der internationalen Erfahrung der CEOs und Earnings Management gefunden, egal ob Earnings Management von diskretionären Periodenabgrenzungen, von der Erfüllung oder das Übertreffen der Gewinnprognose der Analysten sowie von bedingt vorsichtiger Bilanzierung bemessen wird. Jedoch ergibt sich die Folgerung, dass CEOs mit beiden Erfahrungen, nämlich, der Studien- und Arbeitserfahrung, versuchen, Earnings Management durch diskretionäre Periodenabgrenzungen (Coef. $=-0,0164$ , t-value $=-2,39$ ) zu begrenzen und es ist signifikant auf einem Niveau von 5%, nachdem die Stichprobe nach der unterschiedlichen internationalen Erfahrung geteilt wurde. Trotzdem beabsichtigt diese Gruppe von CEOs mit beiden internationalen Erfahrungen nicht, die Gewinnprognose der Analysten zu erfüllen oder zu übertreffen, da der chinesische Aktienmarkt noch in einer unreifen Phase steht, in der die unpräzisen Gewinnprognosen der Analysten keinen signifikanten Einfluss auf die institutionellen Investoren haben, wenn die institutionellen Investoren eine Investitionsentscheidung treffen möchten. Außerdem sind CEOs mit internationaler Studienerfahrung weniger wahrscheinlich, Verluste zeitgerecht zu verbuchen, d. h. es gibt weniger bedingt vorsichtige Bilanzierung.



Die zweite Studie „Internal Control Weakness and Earnings Quality in China“ untersucht den Zusammenhang von *internal control weakness* (ICW) und Finanzberichterstattungsqualität in *main market*. Es werden alle Aktiengesellschaften im Shanghai Stock Market und die Aktiengesellschaften, deren IDs Anfang 002 ist, im Shenzhen Stock Market einbezogen. Die Stichprobe beschränkt sich auf das *main market*, weil nur Aktiengesellschaften vom *main market* ab dem Jahr 2014 verpflichtet sind, die *internal control reports* (ICR) und die *internal control auditing reports* (ICAR) zu veröffentlichen. Deswegen ist die Stichprobe von 2014 bis 2016. Das zentrale Maß für die Finanzberichterstattungsqualität ist die *moving sum of absolute discretionary accruals* (MSDA), und je größer die MSDA ist, umso schlechter wird die entsprechende Finanzberichterstattungsqualität. Der Hauptvariable, ICW, ist als 1 definiert, wenn eine Aktiengesellschaft *material* und/oder *important* ICWs veröffentlicht; und 0 sonst.

Durch die multivariate Analyse wird der geschätzte negative Einfluss von ICW auf die Finanzberichterstattungsqualität der vorherigen Forschung nicht gefunden. Das Ergebnis der Hauptanalyse wird von alternativen Robustheitstests weiter bestätigt, egal ob die Finanzberichterstattungsqualität von den *absoluten diskretionären Periodenabgrenzungen* (ABSDA) oder durch *income smoothing* bemessen wird. Es werden unterschiedliche Typen der ICWs berücksichtigt, namentlich financial ICWs und non-financial ICWs, und es wird kein Hinweis für einen Zusammenhang zwischen beiden Typen der ICWs und der Finanzberichterstattungsqualität gefunden, egal ob die Finanzberichterstattungsqualität von MSDA oder von ABSDA bemessen wird. Dennoch üben die non-financial ICWs einen schwach signifikanten Einfluss auf *income smoothing* (T-value=-1,75) aus.

Diese Studie beschäftigt sich weiter mit dem Einfluss von der Strenge des Standards zur Identifizierung der *material* ICWs auf die Finanzberichterstattungsqualität. Die Strenge des Standards wird nach Tan et al. (2016) von 0 bis 4 definiert. Eine größere Ziffer bedeutet einen strengeren Standard. Es ergibt sich einen insignifikanten Zusammenhang zwischen der Strenge des Standards und der Finanzberichterstattungsqualität, wenn die Finanzberichterstattungsqualität sowohl von

MSDA als auch von ABSDA bemessen wird. Jedoch wird ein signifikant positiver Zusammenhang zwischen der Strenge des Standards und income smoothing auf einem schwachen Niveau gefunden.

Die dritte Studie „Board Gender Diversity, Gender Bias and Earnings Management: Evidence from China“ beschäftigt sich mit dem Einfluss der Geschlechtervielfalt des Vorstandes und des geschlechtsbezogenen Verzerrungseffektes auf das Earnings Management der Aktiengesellschaften in China. Die Geschlechtervielfalt des Vorstandes wird durch den Anteil der weiblichen Direktoren im Vorstand bemessen, ein gängiges Maß der früheren Forschung. Der geschlechtsbezogene Verzerrungseffekt kann nur im einzigartigen chinesischen Umfeld definiert werden, in der die lange Tradition der Sohn-Präferenz und die Ein-Kind-Politik seit den 1980s das Geschlechtsverhältnis bei der Geburt von der Provinz als ein exogenes Maß für den geschlechtsbezogenen Verzerrungseffekt ermöglicht. Earnings Management wird über die absoluten diskretionären Periodenabgrenzungen gemessen.

Es wurde eine Stichprobe mit 7704 Beobachtungen von 2015 bis 2017 gesammelt und analysiert. Jeder Aktiengesellschaft in der Stichprobe wird nach der Provinz des Hauptsitzes des Unternehmens das entsprechende provinZIALE Geschlechtsverhältnis bei der Geburt zugeteilt. Der geschlechtsbezogene Verzerrungseffekt ist negativ mit Earnings Management von dem Niveau 5% verbunden, obwohl kein signifikanter Einfluss der Geschlechtervielfalt des Vorstandes auf das Earnings Management gefunden wird. Trotzdem ist es schwer zu verstehen, dass der geschlechtsbezogene Verzerrungseffekt mit geringem Earnings Management verbunden ist. Es wird vermutet, dass der Effekt indirekt ist. Daher wird das provinZIALE GDP pro Kopf als eine weitere unabhängige Variable hinzugefügt. Dadurch verliert der geschlechtsbezogene Verzerrungseffekt seine Signifikanz und das provinZIALE GDP pro Kopf ist signifikant und positiv mit Earnings Management verbunden (T-value=2,52). Eine 2SLS Regression ergibt, dass der geschlechtsbezogene Verzerrungseffekt signifikant und negativ mit dem provinZIALEN GDP pro Kopf in der ersten Stufe verbunden ist und der fitted value des provinZIALEN GDP pro Kopf weiterhin positiv mit Earnings Management verknüpft ist.

Das Ergebnis weist darauf hin, dass die Aktiengesellschaften aus gut entwickelten Provinzen zu mehr Earnings Management neigen.

## **Declaration of Honor**

### **Ehrenwörtliche Erklärung**

Hiermit erkläre ich, dass ich mich noch keinem Promotionsverfahren unterzogen oder um Zulassung zu einem solchen beworben habe, und die Dissertation in der gleichen oder einer anderen Fassung bzw. Überarbeitung einer anderen Fakultät, einem Prüfungsausschuss oder einem Fachvertreter an einer anderen Hochschule nicht bereits zur Überprüfung vorgelegen hat.

Hiermit erkläre ich, dass ich für die Dissertation folgende Hilfsmittel und Hilfen verwendet habe:

Alle Hilfsmittel sind in den betreffenden Studien angegeben. Dies betrifft insbesondere die CSMAR<sup>®</sup> Datenbank, die die Unternehmensdaten in China anbietet. Darüber hinaus wurden für die Studien Daten von den Börsen in Shanghai und Shenzhen erworben. Statistische Auswertungen erfolgten mit der Software STATA<sup>®</sup>.

Auf dieser Grundlage habe ich die Arbeit selbstständig verfasst.

Berlin, den 30.01.2020

Dongfeng Xie