

# 企业国有产权、社会责任和财务表现之间的相互关系

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**摘要:** 国有企业与私企或外企进行比较时, 总因其代理问题显得经济效率较低和利润不够亮眼。然而, 越来越多的学者开始研究国有企业在整个社会公共利益当中起到的作用, 有相当一部分的学者认为国有企业在其中有积极影响, 特别是在环境领域。鉴于国有企业财务表现的不足和其较高的社会责任履行水平, 本文尝试探究企业国有产权、社会责任水平和企业财务表现三者之间的关系。

本文应用了双向固定效应模型来研究国有产权和社会责任之间的关系, 发现国有企业的社会责任水平更高, 且非制造业国有企业的社会责任水平比制造业国有企业的社会责任水平更高; 通过应用双重差分模型确定了 2012 年以来社会责任报告强制披露政策对社会责任水平的影响。此外, 通过采用 Lewbel (2012) 提出的研究因果关系的新方法——构建基于异方差的联立方程, 本文发现如果企业社会责任水平提高, 所有企业都会在利润上遭受一定损失, 但是会有更佳的市场表现和更少的资本约束。然而企业财务表现对企业社会责任履行的显著影响则只在非国有企业中发现, 非国有企业若有更高的盈利能力或面临较差的市场表现和更多的资本约束, 将会有提高社会责任水平的动力。而国有企业社会责任水平提高的激励因素和企业财务表现的关系不大。

**关键词:** 国有产权; 企业社会责任; 资产收益率; 经济附加值; 托宾 Q 值; 资本约束

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## 1 Introduction

### 1.1 Research Background

Several years ago, the conflict between the economic development and environmental protection has aroused discussion all over the world, particularly in China. Since the reform and opening-up in 1978, China has created the miracle of economic development's speed. However, the environment has paid for the explosive boom. The deteriorative environment alarmed the government to tackle it. As the corporations is the major participant of the economic society, the Chinese central government has been emphasizing the importance of CSR to enterprises and actively promoting the development of CSR, beginning from those state-owned enterprises (SOEs), and urging them to implement CSR practices.

As said by the State Assets Administration and Committee in China, "Shouldering

social responsibility is the inherent ability of the SOEs.” The SOEs has engaged more in social and environmental activities. For example, Huarun Group which is a big state-owned enterprise has claimed in their CSR report that it manages to make marble waste to treasure. The recent studies has also shown that the state-owned enterprises (SOEs) often care more about social warfare, as well as engage more in environmental protection and sustainable development than private enterprise (Hsu, Liang, and Matos, 2018).

However, companies that with state ownership are often criticized for their poor governance and efficiency due to its agency problem. As pointed out by Chen, Sun, Tang and Wu(2011), government intervention in the SOEs through majority state ownership or the appointment of connected managers distorts investment behavior and harms investment efficiency. Given the serious agency problems in the SOEs as well as the SOEs’ roles in serving public interest, what would the CSR-CFP (corporate financial performance) relation be like when we consider the state ownership of the corporations? Because of the large proportion of SOEs in Chinese listed companies, which is more than 60%, as well as the much more attention to sustainable development in China, the paper explores the interrelationships between Chinese SOEs, corporate social responsibility and corporate financial performance.

## 1.2 Research Significance

Due to the conflict between economics development and dramatic climate change, corporate social responsibility have attracted a great deal of attention. The CSR related previous studies focus on the environmental sustainability and regulation, corporate governance, business ethics and so on , but there are few studies about the relationship between CSR and corporate financial performance considering ownership structure.

In the paper, we first identify the positive relationship between state ownership and CSR level in China, and differentiate the manufacturing SOEs from the non-manufacturing SOEs to identify the impact of industry on CSR level. Besides, the impact of the policy in 2012 that all SOEs have to disclose the CSR report has been investigated. The results can benefit the government to enact the more specific CSR related policies such as ensuring the role of state ownership playing in the social welfare related problems of the company and establish the policy according to industry.

What's more, we investigate the causal relationship between CSR level and corporate financial performance in the SOEs and the non-SOEs respectively. We use four different proxies to evaluate corporate financial performance from different perspective, including ROA (return on asset), EVA (economic value added), Tobin Q and the KZ index (advocated by Kaplan and Zingales(1997) to measure firms' capital constraint). Although there are few studies exploring the relationship between CSR level and EVA, EVA has been a core measurement of the accomplishment of the SOEs in China, that's why we use it to be one of the proxies of corporate financial performance. We evaluate the corporate financial performance from different angels so that the comprehensive relationships between CSR level and corporate financial performance considering state ownership can be derived. Beside, we not only identify that improving CSR level would impair firms' profitability while enhance firms' Tobin Q and access to finance, but also find that the causal effect of corporate financial performance on CSR level is difference between the SOEs and the non-SOEs - the non-SOEs would invest more in social goods if they have higher profitability, face worse market performance and more capital constraint, while the SOEs' CSR engagement more likely depends on political intervention. The difference result of the SOEs and the non-SOEs emphasize that it is necessary to consider state ownership when we explore the relationship between CSR level and corporate financial performance.

The findings of causal relationships between CSR level and financial performance demonstrate that the target of the CSR engagement is improving relationships between the company and the surrounding stakeholders, thus the CSR related investment may impair the firm's interior interest such as profitability, however, the firm can get rewards in a form of better market performance and less capital constraint for its better reputation. The studies can motivate more companies to improve their CSR level and disclose their CSR reports in details, and thus partially tackle the environmental pollution and accomplish the sustainable development in China.

### **1.3 Research Framework**

The paper is divided into six parts. The first part is the introduction part, which mainly introduces the research background, research significance and research framework. The second part is the literature review. In this part, we will review the previous research on the SOEs, CSR and financial performance. Then, in the third

part, we go over the whole process of the practice on CSR in China, propose research question and establish hypotheses based on our research questions. In the fourth part, we select variables, build models for different hypotheses, discuss and analyze the data. The fifth part is the discussion and analysis of the empirical results. The last part of this paper is the conclusion part. We give the corresponding suggestions according to the empirical results.

## **2 Literature Review**

As raised by World Bank's International Finance Corporation, "Corporate social responsibility is the commitment of businesses to contribute to sustainable economic development by working with employees, their families, the local community and society at large to improve their lives in ways that are good for business and for development." Generally, CSR refers to serving people, communities, and the environment in ways that go above and beyond what is legally required (Hoje Jo and Maretno A. Harjoto, 2012). Corporate social responsibility (CSR) has received increased attention decades ago because of the cumulated risk of environment—which can result in heavy losses no matter for investors, companies and nations.

In this Chapter, we review the studies about the relationships between CSR, CFP (corporate financial performance) and state ownership. They are divided into the following parts: the previous research on CSR level and corporate financial performance, the studies about the relationship between CSR Level and Corporate Ownership Structure, as well as the recent research on interrelations among CSR level, corporate financial performance and state ownership.

### **2.1 CSR Level and Corporate Financial Performance**

In this part, we first review the general perspective about the relationship between CSR level and corporate financial performance, which includes two major theories and other viewpoints about the relationship. Then we point out the potential basic paths of CSR's impact on CFP according to the previous studies and review the literature on the relationships between CSR level and different dimensions of CFP.

#### **2.1.1 General Perspective about the Relationships**

CSR is contentious all the time. There are two major theories relevant to the relationship between CSR level and CFP (corporate financial performance). The first

one is the agency cost theory, in which CSR is viewed as agency problem by Friedman (1970). He claims that CSR has a negative effect on corporate financial performance due to the cost of firm's CSR relevant engagement. Brown et al. (2006) also points out that agency costs play a prominent role in explaining corporate giving, managers may benefit themselves using firm resources through corporate philanthropy regardless of shareholders' interest. Based on the agency cost theory, the overinvestment hypothesis is advocated. As argued by Barnea and Rubin (2010), the firms' insiders such as managers and large blockholders may overinvest in CSR just for better personal reputation.

The other theory named the stakeholder theory is claimed by Freeman (1994). He propose that CSR engagement can alleviate the conflict between managers and other stakeholders such as customers, competitors, environmental advocates and government, thus can in turn enjoy less social cost and more market opportunities result in better financial performance. Jo and Harjoto (2011, 2012) also derive the robust positive relationship between CSR and corporate financial performance and support the stakeholder theory.

Besides the two main viewpoints mentioned above, neutral relationship between CSR and corporate financial performance is proposed by Statman and Glushkov (2009). By comparing the return of socially responsible stocks, conventional stocks and controversial stocks (e.g. tobacco, alcohol and gambling), he derived that socially responsible firms have better market performance than conventional companies while worse than controversial stocks. Therefore, the advantage of some social criteria is somewhat offset by the disadvantage of other social criteria which support the hypothesis that CSR has no effect on corporate financial performance.

Some scholars even explore the relationship between CSR level and corporate financial performance according to different industry. As suggested by Baron et al. (2011), the relationship between CSR level and corporate financial performance is positive in consumer industries while negative in industrial industries.

### **2.1.2 The Relationship Between CSR and Varies of CFP dimensions**

In order to explore the relationship between CSR level and corporate financial performance, the scholars have considered from varies of dimensions and used different CFP proxies.

The stock price of the company is one of the most popular research focus a decade ago. Filbeck, Gorman and Zhao(2009) find the significant positive abnormal return

for the new companies added to the list of 100 Best Corporate Citizens and suggest the higher CSR level is associated with higher return. While some scholars find no significant relationship between CSR level and stock return (Mănescu, 2011). Similarly, Statman and Glushkov (2009) also find the higher return of social responsible stocks compared with conventional stocks, but the surplus is offset by shunning controversial stocks and thus the net effect is almost zero.

In terms of corporate social responsibility's effect on the firm's risk, Hoje Jo and Haejung Na (2012) find that the firms in controversial industry (which produce products harmful to human being, society, or environment, e.g. alcohol, tobacco, gambling) can reduce their risk by improving their CSR engagement. The negative relationship between CSR and firm total risk as well as systematic risk is more significant in controversial industry than non-controversial industry. Pornsit Jiraporn, Napatsorn Jiraporn, Adisak Boeprasert and Kiyoun Chang (2014) also derive that the firms engaging more CSR activities would have more favorable credit ratings, specifically, an increase in CSR by one standard deviation improves the firm's credit rating by about 4.5%.

As for capital constraints, Beiting Cheng, Ioannis Ioannou and George Serafeim (2014) derive that the more firms' CSR involvement, the significant lower capital constraints enterprises face, which attributed to (a) reduced agency costs owe to enhanced stakeholder engagement and (b) reduced informational asymmetry because of increased transparency. They also find that firms with poor environmental rating would improve more their CSR engagement and decrease more the capital constraints than their better-rated peers. The conclusion of their research is that higher level of CSR engagement, higher quality relationships with stakeholders, more transparent and accountable are the corporate activities, and thus lower capital constraints the firm face. Their research identify tangible firm characteristics which are associated with capital constraints the firm face.

Chinese scholars Qinghua Zhu, Junjun Liu, Kee-hung Lai (2016) also explore whether CSR engagement can improve the firm's financial and environmental performance. They find that CSR practices are related to organizational governance, human rights, and that the environment can benefit from their social performance. Their research shows the positive effect of CSR specific dimensions on corporate social performance and financial performance which include EVA.

Because of the complicated relationship, Timo Busch and Gunnar Friede (2018)

explore CSR-CFP relationship by using the data all relevant in previous studies. They explore the relationship between the specific CSR dimensions and CFP dimensions. The specific CSR dimensions include corporate environment performance, CSR reputation and CSR disclosure. The specific CFP dimensions contain perceptual CFP(perceptual evaluations of business performance by senior executives), operational CFP(e.g. staff turnover yield, reduced material and waste streams), traditional CFP Categories (e.g. ROA, profit, debt to asset) and return of mutual funds. As a result, the significant, positive, robust, and bilateral CSR-CFP relationship is derived.

## 2.2 Corporate Ownership Structure and CSR Level

Among the kinds of corporate ownership structure, the state-owned enterprises are often associated with inefficiency compared with private ventures and foreign companies, especially in China. However, because the goal of the SOEs is to ensure the long-term interest of the whole country, given that the worse global environment in recent years, the function of the SOEs in terms of social welfare have attracted more and more scholars. As Wei et al. (2005) point out, the SOEs are sometimes used by the state as vehicles to pursue political objectives, instead of only pursuing wealth maximization. Unlike private enterprises, the SOEs have the responsibilities to engage in political, social and environmental related activities, especially during difficult times such as economic crises or natural accidents due to their political role, the SOEs must take social responsibilities such as no worker layoff and salary reduction in China to minimize unemployment even when economic recession happens.

Many scholars have explored link between corporate ownership structure and CSR level or ESG engagement. The positive relationship between state ownership and firm's CSR level has been found in many research. For instance, Dietrich Earnhart and Lubomir Lizal (2006) derive that the state ownership has significant negative relationship with a firm's absolute air pollutants emission, and conclude that increased state ownership can improve the company's environmental performance. Nazli A. Mohd Ghazali (2007) constructs a CSR check-list and finds that the increased director ownership has significant negative relationship with the CSR disclosure, while if the government hold a substantial amount of the corporation's shares, the extent of the CSR disclosure would increase. Wenjing Li and Ran Zhang (2010) the controlling right of the largest shareholder in the SOEs is significantly positively

related to the firm's CSR level, while in the non-state-owned enterprises the relationship is significant negative. Francesco Calza, Giorgia Profumo and Ilaria Tutore (2016) explore the relationship between corporate ownership and environmental proactivity, which is the extent of corporate management commitment to climate change and environmental disclosure to important stakeholders. They argue that a higher percentage of state ownership is accompanied with a higher environmental proactivity. It implies that the state has the explicit aim of enhancing the quality of the environment and, as a shareholder, it may exercise the necessary power to pressure managers to engage more in environmental issues.

The most recent research about the relationship between corporate ownership structure and corporate social responsibility is done by Po-Hsuan Hsu, Hao Liang and Pedro Matos (2018). They point out that state-owned enterprises paid more attention to the environment and reduce their CO2 emissions than non-state owned companies after the events on social welfare such as Copenhagen Accord and the Fukushima nuclear disaster.

Since the significant and positive relationship between the state ownership and CSR level has been identified gradually, recent studies have explored the reason behind the relationship. Therefore, CSR studies have been extended to examine the political role of CSR practices (Fooks et al., 2013).

Because political connections in China are very important (Fan et al., 2007; Cull et al., 2015), and the firms actively look for ways to build their political networks, it is useful and insightful to study CSR in China (Lin et al., 2015). By examining the impact of replacement of city mayors on Chinese listed companies' CSR choices, Lin (2015) find that firms (especially private firms and small firms who need political connections) engage in CSR to build relationships with the new mayors. Taken in this sense, one of the reasons of firms' being voluntary to improve CSR level is to get along well with the local government and get the prospect interests.

### **2.3 State Ownership, CSR Level and CFP**

As for the special situation in China where the SOEs dominate the capital market, Erin, Chih-Chuan, Li-Hsun, Hung-Gay (2018) explore the interrelations among state ownership, CSR level and corporate financial performance by explore the CSR-CFP relationship in SOEs and non-SOEs separately. They conclude that CSR-CFP relationship is positive in non-SOEs while negative in the SOEs. They use the stakeholder theory to explain the former result and the agency cost theory to explain



the later one. In the SOEs, because of severe agency - government problems, managers at firms with lackluster performance would engage more in CSR to serve the state's interest or to ensure the firm's survival regardless of shareholders' interest and thus the cost of CSR engagement is larger the benefit of it. While the non-SOEs have fewer agency problems, and tend to improve CSR level to ensure long-run survival of the firms, and the CSR investments can bring economic benefits by resolving conflicts among stakeholders. The major proxy of CFP in their paper is Tobin Q.

#### **2.4 Main contributions**

Based on the above research, we find that there are kinds of theories and research methods towards the relationship between state ownership and CSR level, and the link between corporate financial performance and CSR level. However, the relationship between CSR level and corporate financial performance seems can be influenced by many factors such as the choice of the corporate financial performance's proxy, and few scholars have studied the interrelationship among state ownership, corporate financial performance and CSR level, i. e. what the CSR-CFP relationship would be like in the case of SOEs. From a practical point of view, with the increasingly importance of the CSR, the research of the causal relationship between CSR level and corporate financial performance considering the ownership structure needs more attention both for listed companies and capital market regulators, especially in China.

Secondly, we distinguish manufacturing SOEs and non-manufacturing SOEs, so that we can further identify their difference in their CSR level. What's more, we have identified the influence of the government policy to CSR and introduce it as an extra instrumental variable to identify the causal effect of CSR level on corporate financial performance. In addition, we use four different proxies to measure corporate financial performance - accounting-based performance ROA, economic-based performance EVA, market-based performance Tobin Q and financing-based performance KZ index. EVA has not been used in prior researches to represent corporate financial performance, however we use it because it has been a core measurement for SOEs in China. Besides, we explore the causal relationship in the SOEs and the non-SOEs separately so that we can derive the difference between the SOEs and the non-SOEs in terms of CSR-CFP relation.

### 3 Background and Hypothesis Development

Our paper aims at investigating how the SOEs perform in social responsibility compared with other corporations, whether the CSR level positively correlated with corporate financial performance (higher ROA and less capital constraint) , and whether the relationship is consistent when we consider the SOEs. The regulation of disclosure of CSR report in China has been declared at the end of 2011. We review the content of the regulation in section 3.1, propose research question in section 3.2, and discuss the hypotheses in section 3.3.

#### 3.1 Main Contents of the Regulation

As the environment has got worse, the government has applied kinds of measures to tackle the conflict between the economic development and environmental protection. In order to accomplish the goal of carbon dioxide emission reduction, it is necessary to promote the CSR disclosure around the all Chinese companies. State-owned Assets Supervision and Administration Commission of the State Council (SASAC) publicized a CSR guideline in 2008, and further required all Chinese national SOEs in 2009 to publicize CSR or sustainability reports within three years. In order to make enterprises pay more attention to the environment and avoid unsystematic risk on environment. Shanghai Stock Exchange has declared in September 2011 that it would gradually enforce the listed companies especially in traditional industries such as coal, metal and oil industry to release social responsibility report and environmental effect annual report. Just in 3 months. At the end of 2011, State Assets Administration Committee has claimed that the SOEs have to issue social responsibility reports from 2012. Meanwhile, in order to push the SOEs to shoulder the social responsibility, the SASAC developed CSR indicators with CSR practices included in the annual evaluation system for SOEs. More specific requirements of CSR report has been raised by both Shanghai Stock Exchange and Shenzhen Stock Exchange since then.

From the practice we can notice the leading role of the SOEs in publicizing CSR reports. As said by the State Assets Administration and Committee in China, “Shouldering social responsibility is the inherent ability of the SOEs.” The SOEs has engaged more in social and environmental activities. For example, Huarun Group which is a big state-owned enterprise has claimed in their CSR report that it manages to make marble waste to treasure.

### 3.2 Research Question

Based on the regulation we reviewed above, we can see that the regulator department take stricter measures towards information disclosure on social responsibility and environmental effect. Combined the regulation with the situation where Chinese SOEs make up about two-thirds of the local stock market capitalization, the relationship between state ownership and CSR level is need to be discussed, especially when we consider the industry. What' s more, as the traditional viewpoint of the negative relationship between state ownership and corporate financial performance, the interrelationship among state ownership, CSR level and corporate financial performance is worth studying. We study the interrelationship by examining the CSR-CFP relationship for the SOEs and the non-SOEs separately. Therefore, our research question is whether the state ownership is a determinant of CSR level, what the relationship between CSR and corporate financial performance will be like if we consider the state ownership.

### 3.3 Hypothesis Development

#### 3.3.1 State Ownership and CSR Level

According to the prior research, there are many scholars have found that the increased state ownership can improve the company' s CSR level based on different samples and periods. As the owner of SOEs, the state naturally pay more attention to the benefit of the whole society. It implies that the state has the explicit aim of enhancing the quality of the environment and, as a shareholder, it may exercise the necessary power to pressure managers to engage more in environmental issues.

What' s more, because the previous studies on state ownership and CSR have referred to the specific industry and have claimed to pay attention to the industry' s effect (e.g. Lai et al. (2013) explore the relationship in shipping; Qinghua Zhu, Junjun Liu and Kee-hung La (2015) investigate the relationship in manufacturing industry). We also want to investigate the effect of industry on the relationship between state ownership and CSR level. Thus we divide the whole sample into two part-manufacturing firms and non-manufacturing companies. Because the manufacturing is more likely to pollute the environment (such as steel industry), we suppose that the polluted firms would be reluctant to disclose specific information on social responsibility. When it comes to the SOEs, the manufacturing SOEs may have lower CSR score than non-manufacturing SOEs. Based on the above

analysis, we make us hypothesis 1a and 1b:

H1a The relationship between state ownership and CSR level is positive.

H1b The CSR level of non-manufacturing SOEs is higher than that of manufacturing SOEs.

Moreover, because the policy that enforce all the SOEs disclose CSR report annually from 2012 is a limestone in the practice of promoting CSR level, we want to identify the influence of the policy on CSR level. As the policy is a signal to all market-participators that the government highlight the social and environmental engagement, the CSR level must have risen up later. Thus we make us hypothesis 1c:

H1c The impact of the policy on CSR level is significant and positive.

### **3.3.2 State ownership, CSR Level and Corporate Financial Performance**

The state-owned enterprises are found inefficiency in the previous studies due to its agency problem, and thus they are usually associated with poor corporate financial performance. But if the improved CSR level is linked with better corporate financial performance, what the relationship will be like when we consider the state ownership in the firms? Can the SOEs make the balance between its own perhaps poor corporate financial performance and its natural social responsibilities? What the difference of the outcome between SOEs and non-SOEs improve the same magnitude of the CSR level? Does the causal relationship exist among the state ownership, corporate financial performance and CSR level?

In order to answer these questions, we divide the sample into two groups—the SOEs and the non-SOEs, and explore the CSR-CFP relations in the two groups separately. In terms of the corporate financial performance, we mainly consider four aspects—ROA (return on asset), EVA (economic value added), Tobin Q, and capital constraint (KZ index advocated by Kaplan and Zingales(1997)).

#### **3.3.2.1 State ownership, CSR Level and ROA**

We use return on asset (ROA) as one of our proxies of corporate financial performance. ROA has been regarded as the best proxy for measuring corporate financial performance (CFP)—given that the accounting practices of firms are comparable (Cochran and Wood, 1984). Rim, Claude and Francois (2009) have found the robust significant negative causal effect of CSR on ROA, which is consistent at least in short term. They identified the trade-off hypothesis that the costs of CSR would reduce profits since the economic benefit of CSR engagement is difficult to measure

while the costs are numerous.

As for the impact of ROA on CSR level, Tan and Peng (2003) point out that availability of slack resources (i.e., previous profits) strongly influenced the level of CSR engagement and verify the slack resource hypothesis. The firms would win the long run (survive longer) if they invest in social goods (such as environment programs and community relations), thus the firms would have incentive to spend money on CSR engagement once they have enhanced profitability. According to the analysis above, our hypothesis 2a and 2b are as follows:

H2a Improving CSR level would lower ROA both in the SOEs and non-SOEs.

H2b Enhancing ROA would enable the SOEs and the non-SOEs to raise their CSR level.

### 3.3.2.2 State ownership, CSR Level and EVA

Economic value added (EVA) is used by SASAC to measure the outcome of the manager who is responsible for the SOEs. Compared with ROA, EVA is an economic concept. Different from accounting concept of profit, EVA measures the economic profit on investors' view. EVA considers the opportunity cost of the investment. It is positive only when the profit is larger than the average net profit of the society. Using EVA to measure the profit corresponds to the goal of value control. Nowadays, EVA is used by SASAC to measure the outcome of the man who is responsible for the SOEs in China. Though there are no literature discussing the relationship between EVA and CSR level before, we use EVA as one of the proxies of corporate financial performance due to its economic meaning and function in China. We suppose that the relationship between EVA and CSR level is similar with the relationship between ROA and CSR level because both of EVA and ROA are measurements of the firm's profitability, which means the trade-off hypothesis and slack resource hypothesis are presumed. We make us hypothesis 3a and 3b that:

H3a Improvement in CSR level would result in EVA reduction both in the SOEs and non-SOEs.

H3b Increasing EVA would make the SOEs and the non-SOEs enhance their CSR level.

### 3.3.2.3 State ownership, CSR Level and Tobin Q

Tobin Q, as a market-based performance, is widely used in measuring the corporate financial performance. Erin, Chih-Chuan, Li-Hsun and Hung-Gay (2018) use Tobin Q to represent corporate financial performance when they explore the relationship of

CSR-CFP in China from 2008 to 2012. They found that the causal effect of Tobin Q on CSR is negative in the SOEs, and use the managerial opportunism hypothesis to explain the result. They claim that poor financial performance (i.e., low Tobin Q) would make managers in SOEs tend to use CSR engagement to decorate their accomplishment while the engagement may not be consistent with shareholders' interest. The causal effect of Tobin Q on CSR is insignificant in the non-SOEs due to their fewer agency problems. They also find the causal effect of CSR on Tobin Q is positive in the non-SOEs while insignificant in the SOEs. The reason they give is that the non-SOEs can improve the relationship with stakeholders and thus result in progress in corporate financial performance.

In our paper, we also use Tobin Q to represent the corporate financial performance but we have different hypothesis. Because Tobin Q is market-based performance which reflect the valuation of the enterprises in people's mind. From stakeholder perspective, higher CSR level would improve the relationship between the firm and stakeholders (such as suppliers, customers, employees and government), which can bring the firm better reputation, market competitiveness and market performance as a result. When the Tobin Q raises or is high enough, managers in the firm may have less incentive to invest in social goods such as environment programs. Thus, we make us hypothesis 4a and 4b that:

H4a Improvement in CSR level can lead to advancement in Tobin Q both in the SOEs and non-SOEs.

H4b If a firm's Tobin Q decreases, no matter the firm is state-owned or not, it would enhance its CSR level.

#### **3.3.2.4 State ownership, CSR Level and Capital Constraint**

Capital constraint is represented by KZ index, which is first advocated by Kaplan and Zingales(1997), and extensively used in the corporate finance literature (Beiting, Ioannis, and George, 2014). KZ index is calculated according to Baker, Stein, and Wurgler (2003) and the specific construction of the KZ index is presented in appendix a. As for the relationship between capital constraint and CSR level, Beiting, Ioannis, and George (2014) have found that firms with higher CSR level face less capital constraint and therefore higher ability to access finance in capital market. The reasons they analyze include lower agency costs through stakeholder engagement (i.e., better stakeholder engagement would limit the short-term

opportunistic behavior and reduce contracting costs), as well as increased transparency through CSR reporting (presumed firms with higher CSR level would disclose more information about CSR engagement).

According to the literature, we also assume that there is a positive causal effect of firm's CSR level on capital constraint. In addition, we suppose that if the firm face more capital constraint (i.e., larger KZ index), the corporation would engage more CSR related activities and disclose more information about CSR engagement in order to have better reputation and improve ability to access finance in capital market. We make us hypothesis 5a and 5b that:

H5a Improvement in CSR level can result in less capital constraint both in the SOEs and non-SOEs.

H5b More capital constraint would push the SOEs and the non-SOEs enhance their CSR level.

## 4 Model and Data

### 4.1 Model

In our paper, we construct the intersection terms, Two-way Fixed Effect Model and Simultaneous-Equation Model based on heteroskedasticity (Lewbel, 2012) to test the interrelationships between state ownership, corporate financial performance and CSR level. Moreover, as the policy that enforce all the SOEs disclose CSR reports annually from 2012 was published at the end of 2011, we use Difference-in-Difference Model to identify the influence of the policy on CSR level.

#### 4.1.1 Dependent Variable

As we explore the interrelationships between state ownership, corporate financial performance and CSR level, the dependent variables are different in each relationship. In the relationship between state ownership and CSR level, we use CSR index collected from Rankins CSR Ratings (RKS) as dependent variables (*RLCSR* in the paper). When we explore the causal effect of CSR level on corporate financial performance in the SOEs and the non-SOEs separately, we use *ROA*, *EVA\_s* (standardized EVA), *TBQ* (Tobin Q) and *KZ\_s* (standardized KZ index) as dependent variables. When we explore the causal effect of corporate financial performance on CSR level, the dependent variable is *RLCSR*.

#### 4.1.2 Independent Variable

In our paper, the independent variables are also different for different relationship and models. In the first model where we explore the relationship between state ownership and CSR level, we use variable *state* as an independent variable. The variable *state* is a dummy variable which values 1 if the company is state-owned. When we explore the causal relationship between CSR level and corporate financial performance, we construct simultaneous-equation model where the independent variable is *RLCSR* in the first equation and corporate financial performance proxies (i.e., *ROA*, *EVA\_s*, *TBQ*, and *KZ\_s*) in the second equation respectively.

##### 4.1.2.1 Index for CSR Level

In our paper, we use CSR index collected from Rankins CSR Ratings (RKS) as the proxy of a company's CSR level. RKS has developed the domestic first CSR ratings system and has been an authoritative communication platform on CSR for listed companies. The CSR total score in Rankins CSR Ratings is a comprehensive index which considers four major dimensions—macrocosm, content, technique and industry. Each dimension includes the evaluation of the specific situation. For example, in regard with macrocosm, RKS evaluate how much the firm's long-term plan reveal its goal of social responsibility and whether the firm's major business match the goal. Donations, environmental investment and carbon emission reduction have also been contained in the evaluation. Thus, the CSR score provided by RKS is completed enough to measure the firm's CSR level.

##### 4.1.2.2 Variables Refers to Hypotheses

For hypothesis 1a, because we want to investigate whether the industry would affect the firm's CSR level, we add the interaction variable *manu\_state* to explore whether the manufacturing industry would affect firm's CSR level. For hypothesis 1b where we expect the positive and significant impact of the policy on CSR level, variable *policy* (valuing 1 if the observation is in term of 2012 to 2017) has been a treatment indicator, since all SOEs are required to disclose CSR report annually from 2012.

For hypotheses relevant to CSR-CFP relations, the simultaneous-equation model based on heteroskedasticity is constructed, in which the CSR index (*RLCSR*) and



corporate financial performance proxies (*ROA*, *EVA\_s*, *TBQ* and *KZ\_s*) are independent variables in turn.

In addition, to double check the causal effect of CSR level on corporate financial performance, besides the generated instrumental variable, we also use the variable *policy* as an extra instrumental variable.

#### 4.1.2.3 Company Characteristics

Since the previous studies have identified that corporate governance has an impact on firm' s CSR level, we take corporate governance related variables into consideration, including *Top 10* (sum of shareholding percentage of top-ten negotiable shareholders), *control* (percentage of shares of listed companies held by direct controlling shareholder), *INDS* ( the number of independent directors divided by supervisor director) and *duality* (dummy variable equals 1 if a CEO is also chair of the board and 0 otherwise). What' s more, corporate financial covariates have also been included-*Size* (log of total asset), *MBR* (MB ratio-not as covariate when Tobin Q is dependent variable), *DBR* (debt ratio) and *ROA* (return on asset-when ROA is not dependent variable). These variables can reflect the firm' s corporate governance, size, capital structure and profitability.

Table 4.1 Meaning of Variables

Variables	Meaning
CSR Index from RKS database	
<i>RLCSR</i>	total score of CSR level
Variables related with state ownership	
<i>state</i>	=1 if the company is state-owned
<i>forei</i>	=1 if the company is foreigner-owned
<i>priva</i>	=1 if the company is a private company
Firm characteristics	
<i>MBR</i>	firm' s MB ratio
<i>Size</i>	log of firm' s total asset in billion
<i>Log_MV</i>	log of Market value of equity

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<i>DBR</i>	firm' s debt ratio
<i>ROA</i>	firm' s ROA
<i>EVA</i>	firm' s economic value added
<i>TBQ</i>	firm' s Tobin Q
<i>KZ_s</i>	a standardized index which measure capital constraint
<i>Top 10</i>	Sum of shareholding percentage of top-ten negotiable shareholders
<i>control</i>	Percentage of shares of listed companies held by direct controlling shareholder
<i>duality</i>	Dummy variable equals 1 if a CEO is also chair of the board and 0 otherwise
<i>INDS</i>	INDS is calculated as the number of independent directors divided by supervisor directors
Other variables	
<i>manu</i>	=1 if the company is in manufacturing industry
<i>manu_state</i>	a intersection of <i>Manu</i> and <i>state</i> , =1 if the company is a manufacturing SOE
<i>policy</i>	=1 if the firm is in the period of 2012-2017.

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## 4.2 Model for Hypotheses

Based on all the analysis and variables we choose, we establish the following regression framework to test our hypothesis.

### 4.2.1 Two-way FE Model with Intersection

When we investigate the relationship between state ownership and CSR level, we use Two-way Fixed Effect model to estimate. Since we consider industry in the relationship, we construct intersection *manu\_state* (valuing 1 if the firm is a manufacturing SOE) and add it into the Two-way FE model. Two-way FE Model considers not only the unobserved variables that varies with different individuals but also the unobserved variables that varies with time. Because there are kinds of ownership structure in our sample, and the regulations on CSR is gradually enhance there years, the time fixed effect and individual fixed effect should be contained in the model. Here, we show the model that we use:

Model 1:

$$RLCSR_{it} = \beta_0 + \beta_1 state_{it} + \beta_2 manu_{it} + \beta_3 manu\_state_{it} + \sum_{j=1}^k \lambda_j Z_{jit} + \sum_{t=2}^9 \gamma_t DT_t + u_i + \varepsilon_{it} \quad (t=1, 2, 3 \dots 10) \quad (4.1)$$

In this model,  $\sum_{j=1}^k \lambda_j Z_{jit}$  is a set of control variables (such as *Top 10*, *control*, *duality*, *INDS*, *Size*, *DER*, *MBR*, *ROA* in this paper) and their coefficient.  $DT_t$  is a set of year-dummy variables so the  $\sum_{t=2}^9 \gamma_t DT_t$  illustrate time-fixed effect. Since our samples are collected from 10 years, there are total 9 time dummy variables in the model.  $u_i$  is the unobserved individual fixed effect.  $\varepsilon_{it}$  is the error term.

$\beta_1$ ,  $\beta_2$  and  $\beta_3$  are what we are interested in. By testing the sign and magnitude of  $\beta_1$ ,  $\beta_2$  and  $\beta_3$ , we can derive the relationship between the state ownership and CSR level, as well as the difference of CSR level between manufacturing SOEs and non-manufacturing SOEs.

#### 4.2.2 DID Model

We use Difference-in-Difference Model to identify the impact of compulsory CSR report disclosure for the SOEs on the CSR level. The SOEs is our treatment group and the non-SOEs is our control group. The variable *policy* also divide our sample into two different period- pre-policy change period (2010-2011) and post-policy change period (2012-2017). We show the model that we use is:

Model 2:

$$RLCSR_{it} = \beta_0 + \delta_0 policy_{it} + \beta_1 state_{it} + \delta_1 policy_{it} * state_{it} + \sum_{j=1}^k \lambda_j Z_{jit} + \varepsilon_{it} \quad (t=1, 2, 3 \dots 10) \quad (4.2)$$

In the model,  $RLCSR_{it}$  is CSR score of firm  $i$  in year  $t$ .  $policy_{it}$  is a dummy variable valuing 1 if the firm  $i$  in year  $t$  is in the period of 2012 to 2017 (post-policy change period).  $state_{it}$  is a dummy variable valuing 1 if the firm  $i$  in year  $t$  is state-owned enterprise.  $\sum_{j=1}^k \lambda_j Z_{jit}$  is a set of control variables and their coefficient. The parameter  $\delta_1$ , which we are interested in, measures the effect of the policy on the average CSR level.

#### 4.2.3 Simultaneous-Equation Model Based on Heteroskedasticity

In order to explore the causal relationship between CSR level and corporate financial performance, we use a novel heteroskedasticity-based approach using simultaneous-equation model advocated by Lewbel (2012). The method dose not need specific instrumental variable while generate an instrumental variable constructed by existed independent variables. The model can avoid the bias and problems of

choosing different instrumental variables when exploring the causal relationship, and the estimator usually take standard form of the generalized method of moments (GMM). Therefore it is widely used in recent studies (Emran and Hou, 2013; Schlueter et al., 2015; Dungey et al., 2015; Erin, Chih-Chuan, Li-Hsun, and Hung-Gay, 2018). We show the fully simultaneous model that we use as follows:

Model 3:

$$CFP_{it} = \beta_1 RLCSR_{it} + \sum_{j=1}^k \lambda_{1j} Z_{jit} + \varepsilon_{1it} \quad (t=1, 2, 3 \dots 10) \quad (4.3)$$

$$RLCSR_{it} = \beta_2 CFP_{it} + \sum_{j=1}^k \lambda_{2j} Z_{jit} + \varepsilon_{2it} \quad (t=1, 2, 3 \dots 10) \quad (4.4)$$

where the errors  $\varepsilon_{1it}$  and  $\varepsilon_{2it}$  may be correlated and no equality constraints are imposed on the structural parameters  $\beta_1$ ,  $\beta_2$ ,  $\lambda_1$  and  $\lambda_2$ .

It is well known that without specifying further information or restrictions, if both  $\beta_1$  and  $\beta_2$  are different from zero, the simultaneous equation cannot be consistently estimated using standard econometric methodology or it would result in simultaneity bias problem. The classical solution is to introduce an instrumental variable. However, the selection of instrumental variables depends on the scholars' analyzation which means different scholars may use varies of instrumental variables to explore the same relationship and thus the results can be controversial sometimes. Moreover, in lots of estimation, the instrumental variables cannot be identified since the condition of IV is some kind of strict. To solve the problem, Lewbel (2012) propose a novel heteroskedasticity-based approach – as long as a vector of exogenous variables that are uncorrelated with the covariance of heteroskedastic errors are observed, the identification of the simultaneous equations can be obtained.

$CFP_{it}$  is a set of four proxies of corporate financial performance in the paper— $ROA$ ,  $EVA\_s$ ,  $TBQ$  and  $KZ\_s$ . When we explore the relationship between CSR level and  $ROA$ , the  $CFP$  in the formula (4.3) and (4.4) is  $ROA$ , and similarly for  $EVA\_s$ ,  $TBQ$  and  $KZ\_s$ .  $\sum_{j=1}^k \lambda_j Z_{jit}$  is a set of control variables (such as  $Top\ 10$ ,  $control$ ,  $duality$ ,  $INDS$ ,  $Size$ ,  $DER$ ,  $MBR$ ,  $ROA$  in this paper) and their coefficient. We shall notice that when we explore the causal relationship between  $ROA$  and CSR level, the control variables set would no longer contain  $ROA$ . Moreover, since the correlation between MB ratio and Tobin Q is almost 1, when we explore the causal relationship between Tobin Q and CSR level, MBR is no longer used as control variables neither.

Because we expect the policy has an impact on CSR level, combined with that the policy cannot affect corporate financial performance directly, we can add *policy*

as an extra instrumental variables for *RLCSR* into the first equation to double check if the CSR level has causal effect on corporate financial performance.

We need to clarify that before we use the heteroskedasticity-based simultaneous-equation model, we have identified the heteroskedasticity in the model and use Durbin-Wu-Hausman (DWH) test to identify the existence of endogeneity problem as well.

### 4.3 Data

#### 4.3.1 Data Processing

We collect CSR index from RKS database which are in the period of 2008 to 2017 in China. Because of the declaration of the CSR report regulation is at the end of 2011 in China, the sample are divided into the two periods- the pre-policy period from 2008 to 2011 and the post-policy period from 2012 to 2017. Other data we need including the corporate governance related variables and corporate finance related variables are collected from CSMAR.

What we should mention is that there is an implied assumption-the firm would not disclose the relevant information if the firm neglect the specific environmental or social engagement. So the CSR index which measure the CSR level according to firm' s CSR report can reflect corporate social responsibility in reality.

After eliminating the sample with missing information, we get 3667 firm years, 1074 for the pre-policy period and 2593 for the post-policy period.

#### 4.3.2 Data Descriptive Statistics

Table 4.2 shows the distribution of the samples over years. As we can see from the table, over the entire 10-year sample period, there are 3667 firm years. Before the regulation of the CSR report, there are 1074 firm years, and there are 2593 firm years after the regulation.

Table 4.2 Distribution of the Sample over Years

Year	Number of Sample
2008	173
2009	278
2010	296

2011	327
2012	392
2013	404
2014	419
2015	446
2016	446
2017	486
2008-2011	1074
2012-2017	2593
2010-2017	3667

Table 4.3 provides descriptive statistics for all the variables. From the Table 4.3, we can know that there are about 70.8% of the sample are state-owned enterprise, 44.7% of the sample are manufacturing companies, 27.1% of the sample are manufacturing SOEs.

Table 4.3 Descriptive Statistics for All the Variables

Variable	Obs	Mean	Std.Dev.	Min	Max
manu	3,667	0.447	0.497	0	1
state	3,667	0.708	0.455	0	1
manu state	3,667	0.271	0.445	0	1
priva	3,667	0.242	0.428	0	1
forei	3,667	0.0256	0.158	0	1
st pr f	3,667	0.000273	0.0165	0	1
sta f	3,667	0.00109	0.0330	0	1
pr f	3,667	0.00764	0.0871	0	1
RLCSR	3,667	39.20	13.56	11.69	89.30
duality	3,667	0.135	0.342	0	1
INDS	3,667	0.911	0.281	0.143	3
control	3,667	41.63	16.13	2.090	89.44
Top 10	3,667	60.52	16.96	13.28	101.2
MBR	3,667	1.503	1.458	0.0456	15.17
Size	3,667	23.23	1.680	19.54	30.73

DBR	3,667	0.517	0.202	0.0140	1.513
ROA	3,667	0.0441	0.0538	-0.448	0.477
EVA	3,667	9.550e+08	7.830e+09	-6.090e+10	1.370e+11
EVA s	3,667	7.92e-10	1	-7.895	17.37
TBQ	3,667	2.020	1.363	0.699	15.70
KZ	3,086	4.290e+10	2.970e+11	3.110e+08	6.230e+12
KZ s	3,086	-2.43e-10	1	-0.143	20.78
Log MV	3,667	23.78	1.454	20.54	30.72
policy	3,667	0.707	0.455	0	1

Table 4.4 provide the descriptive statistics about the SOEs and the non-SOEs. From Table 4.4, we can derive that compared with the non-SOEs, the SOEs generally have larger size, higher debt ratio, lower MB ratio/ROA /Tobin Q, more EVA, as well as less capital constraint. As for governance characteristics of the SOEs, the leadership measured by *duality* (valuing 1 if the CEO is also the chairman of the board and zero otherwise) is weaker, the independent director ratio (*INDS*) is lower, the extent of corporate ownership concentration measured by *top 10* (sum of shareholding percentage of top-ten negotiable shareholders) and *control* (percentage of shares of listed companies held by direct controlling shareholder) is higher..

Table 4.4 Descriptive Statistics for the SOEs and the non-SOEs

->	state	=	0		
Variable	Obs	Mean	Std.Dev.	Min	Max
Size	1,071	22.55	1.383	19.54	29.50
Log MV	1,071	23.33	1.190	20.57	29.61
DBR	1,071	0.458	0.198	0.0140	1.513
MBR	1,071	2.114	1.808	0.0494	15.17
ROA	1,071	0.0611	0.0574	-0.166	0.466
EVA s	1,071	-0.0732	0.203	-0.517	2.546
TBQ	1,071	2.573	1.719	0.699	15.70
KZ s	855	-0.0800	0.415	-0.143	6.705
Top 10	1,071	54.61	17.01	13.28	95.42
control	1,071	37.12	17.06	2.090	89.44
duality	1,071	0.269	0.444	0	1

INDS	1,071	0.974	0.223	0.400	1.667
->	state	=	1		
Variable	Obs	Mean	Std. Dev.	Min	Max
Size	2,596	23.50	1.713	19.54	30.73
Log MV	2,596	23.97	1.512	20.54	30.72
DBR	2,596	0.541	0.198	0.0415	1.345
MBR	2,596	1.251	1.200	0.0456	14.72
ROA	2,596	0.0370	0.0506	-0.448	0.477
EVA s	2,596	0.0302	1.180	-7.895	17.37
TBQ	2,596	1.792	1.109	0.711	15.11
KZ s	2,231	0.0307	1.146	-0.143	20.78
Top 10	2,596	62.96	16.34	13.35	101.2
control	2,596	43.49	15.36	2.100	86.42
duality	2,596	0.0801	0.272	0	1
INDS	2,596	0.886	0.299	0.143	3

Table 4.5 presents the two-sample t test for RLCSR in the SOEs and non-SOEs with unequal variances (due to the existence of heteroskedasticity). descriptive statistics about the SOEs and the non-SOEs. From Table 4.5, we can know that the average CSR score of the SOEs is higher than that of the non-SOEs for about 4.758 points, which is significant at 1% level. It means that the SOEs shoulder more social responsibility than the non-SOEs.

Table 4.5 Two-sample T Test for RLCSR with Unequal Variances

Group	Obs	Mean	Std. Err.	Std. Dev.	95% Conf.	Interval
state=0	1,071	35.84	0.363	11.89	35.12	36.55
state=1	2,596	40.59	0.274	13.97	40.06	41.13
combined	3,667	39.20	0.224	13.56	38.77	39.64
diff	-4.758	0.455	-5.650	-3.866		
diff =	mean(0)	-	mean(1)	t	=	-10.46
Ho	diff=0		Satterthwaite	=	2325	
			's degrees			
			of freedom			



Ha	diff<0	Ha	diff!=0	Ha	diff>0
	Pr(T<t)=0		Pr(T<t)=0		Pr(T<t)=1

Table 4.6 exhibits the descriptive statistics about the manufacturing firms and the non-manufacturing firms. From Table 4.6, we can derive that compared with the non-manufacturing companies, the manufacturing corporations generally have smaller size, lower debt ratio, higher MB ratio/ROA /Tobin Q, less EVA, as well as less capital constraint. As for governance characteristics of the manufacturing corporations, the leadership measured by *duality* (valuing 1 if the CEO is also the chairman of the board and zero otherwise) is stronger, the independent director ratio (*INDS*) is lower, the extent of corporate ownership concentration measured by *top 10* (sum of shareholding percentage of top-ten negotiable shareholders) and *control* (percentage of shares of listed companies held by direct controlling shareholder) is lower.

Table 4.6 Descriptive Statistics for Manufacturing Firms and Non-manufacturing Firms

->	manu	=	0		
Variable	Obs	Mean	Std. Dev.	Min	Max
Size	2,027	23.60	1.818	19.54	30.73
Log MV	2,027	24.10	1.587	20.54	30.72
DBR	2,027	0.539	0.205	0.0252	1.141
MBR	2,027	1.362	1.412	0.0456	15.17
ROA	2,027	0.0434	0.0465	-0.271	0.449
EVA s	2,027	0.0749	1.317	-7.895	17.37
TBQ	2,027	1.901	1.318	0.711	15.70
KZ s	1,696	0.0922	1.341	-0.143	20.78
Top 10	2,027	62.14	17.63	13.35	98.58
control	2,027	42.27	16.71	3.990	86.42
duality	2,027	0.119	0.324	0	1
INDS	2,027	0.914	0.280	0.143	2.500
->	manu	=	1		
Variable	Obs	Mean	Std. Dev.	Min	Max
Size	1,640	22.76	1.357	19.54	27.31

Log MV	1,640	23.39	1.159	20.54	27.44
DBR	1,640	0.490	0.194	0.0140	1.513
MBR	1,640	1.678	1.496	0.130	14.72
ROA	1,640	0.0449	0.0616	-0.448	0.477
EVA s	1,640	-0.0926	0.278	-2.676	3.210
TBQ	1,640	2.167	1.404	0.699	15.11
KZ s	1,390	-0.113	0.0582	-0.143	0.645
Top 10	1,640	58.53	15.88	13.28	101.2
control	1,640	40.84	15.36	2.090	89.44
duality	1,640	0.155	0.362	0	1
INDS	1,640	0.908	0.283	0.143	3

Table 4.7 shows the two-sample t test for RLCSR in the manufacturing firms and non-manufacturing companies with unequal variances (because of the existence of heteroskedasticity). As the difference of CSR score of the non-manufacturing firms and manufacturing firms is 4.277, which is positive and significant, it means that the non-manufacturing firms have higher CSR level compared with manufacturing companies.

Table 4.7 Two-sample T Test for RLCSR with Unequal Variances

Group	Obs	Mean	Std. Err.	Std. Dev.	95% Conf.	Interva l
manu=0	2,027	41.12	0.331	14.91	40.47	41.77
manu=1	1,640	36.84	0.278	11.24	36.30	37.38
combined	3,667	39.20	0.224	13.56	38.77	39.64
diff	4.277	0.432	3.430	5.125		
diff =	mean(0)	-	mean(1)	t	=	9.896
Ho	diff=0		Satterthwaite	=	3647	
			's degrees			
			of freedom			
Ha	diff<0	Ha	diff!=0	Ha	diff>0	
	Pr(T<t)=1		Pr(T<t)=0		Pr(T<t)=0	

## 5 Empirical results

### 5.1 State Ownership and CSR Level

#### 5.1.1 State Ownership and CSR Level When Considering Industry

As some of the previous studies has explored the relationship between state ownership and CSR level in different industry (e. g. Lai et al. (2013) explore the relationship in shipping; Qinghua Zhu, Junjun Liu and Kee-hung La (2015) investigate the relationship in manufacturing industry), combined with the descriptive data which tell us the average CSR score of the non-manufacturing firms is higher than manufacturing corporations, we decide to consider the effect of industry on CSR level by simply divide the firms into two groups—manufacturing industry and non-manufacturing industry. In order to capture the difference between manufacturing SOEs and non-manufacturing SOEs, we construct an intersection (*manu\_state*) of manufacturing (*Manu*) and state ownership (*state*). Due to the existence of heteroskedasticity, we also use the robust estimation to identify the relationship.

The results in Table 5.1 show that the coefficient estimates for *state* is 4.4806, which is significantly positive at 5% degree even we make a robust estimation. The coefficient estimates for *manu\_state* is -3.4334, which is significantly negative at 10% degree when we make a robust estimation. It means that the CSR score of the SOEs is higher than the non-SOEs at least 1 point. When we consider the industry, the CSR score of non-manufacturing SOEs is higher than that of manufacturing SOEs about 3.43 point, and 4.48 points higher than the non-SOEs' CSR score. From Table 5.1, we can conclude that the SOEs indeed have higher CSR level compared to the non-SOEs, and that while manufacturing SOEs have lower CSR than other SOEs, the combined effect is still positive showing manufacturing SOEs still have positive effects on CSR score.

Table 0.1 Results for Model 1

	Two-way FE	Two-way FE Robust
	RLCSR	RLCSR
state	4.4806*** (1.3438)	4.4806** (2.1058)
manu	-0.2790	-0.2790

	(1. 1446)	(1. 5084)
manu_state	-3. 4334***	-3. 4334*
	(1. 3055)	(2. 0584)
Top_10	0. 0351**	0. 0351
	(0. 0176)	(0. 0241)
control	-0. 0536***	-0. 0536**
	(0. 0198)	(0. 0257)
duality	0. 2775	0. 2775
	(0. 4270)	(0. 5766)
INDS	-0. 5302	-0. 5302
	(0. 6610)	(0. 9983)
ROA	1. 1689	1. 1689
	(2. 7635)	(3. 6526)
MBR	-0. 1014	-0. 1014
	(0. 1343)	(0. 1535)
Size	1. 4859***	1. 4859**
	(0. 3799)	(0. 5863)
DBR	0. 4527	0. 4527
	(1. 2834)	(1. 7275)
constant	-5. 4862	-5. 4862
	(8. 4038)	(13. 0888)
N	3667	3667
R2	0. 368	0. 368

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 5.1.2 The Effect of Policy on CSR Level

The regulations and guidelines about CSR reports gradually become completed in recent years due to the valuation of the government. But the statement of State-owned Assets Supervision and Administration Commission of the State Council (SASAC) in December 2011, which force the SOEs have to issue social responsibility reports from 2012, is still the first step to exercise. The policy is a signal from which we can predict that the disclosing CSR reports would become compulsory for all listed companies in the future. Thus, the policy must influence the development of CSR in China. To identify the impact of the policy, we use Difference-in-Difference (DID)

model to capture the effect. Because the precondition of the DID is that the treated group and control group should be divided randomly, i. e., the two groups are similar before the treatment, we compute the average CSR score of the SOEs and non-SOEs each year as shown in Figure 5.1. As displayed in the figure, in 2008 when the SASAC just publish the guideline of CSR report, the difference between the average CSR score for the SOEs (29.39 point) and that for the non-SOEs (27 point) is 2.39 point. The gap between the SOEs and the non-SOEs is not big, which means that there are little difference between the SOEs' CSR level and the non-SOEs' CSR level in 2008. The gap becomes widen from 2009 (the average CSR score of the SOEs is higher than the non-SOEs about 5.26 point) when the SASAC further claimed that all Chinese national SOEs to disclose CSR or sustainability reports within three years. And In 2012 after State Assets Administration Committee requiring that the SOEs have to issue social responsibility reports from 2012, the difference between the SOEs' average CSR score and the non-SOEs' average CSR score is 5.25 point. Since the policy is claimed in 2009 and enacted in 2012, the effect is similar and there is no big gap between the two group' s CSR score in 2008, and thus using DID model is reasonable.

2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

Figure 0.1 Average CSR score of the SOEs and the non-SOEs

The DID equation being estimated is as follows (same as Model 2):

$$RLCSR_{it} = \beta_0 + \delta_0 policy_{it} + \beta_1 state_{it} + \delta_1 policy_{it} * state_{it} + \sum_{j=1}^k \lambda_j Z_{jit} + \varepsilon_{it} \quad (t=1, 2, 3 \dots 10) \quad (4.2)$$

Estimation results are illustrated in Table 5.2, and the two-sample t-test is shown in Table 5.3. As the coefficient estimates for  $\delta_1$  - the difference between the control group (the non-SOEs) and the treated group (the SOEs) after the policy - is 1.618, which is significant at 1% degree, it means that the policy which requires all the SOEs disclose CSR reports has improved the CSR level of the SOEs.

Table 0.2 Results for Model 1

Outcome var.	RLCSR	S. Err.	t	P> t
Before				
Control	-72.22			
Treated	-72.15			
Diff(T-C)	0.0780	0.736	0.110	0.916
After				

Control	-67.71			
Treated	-66.09			
Diff(T-C)	1.618	0.487	3.320	0.001***
Diff-in-Diff	1.541	0.839	1.840	0.066*

R-square: 0.39

\* Means and Standard Errors are estimated by linear regression

\*\*Robust Std. Errors

\*\*Inference: \*\*\* p<0.01; \*\* p<0.05; \* p<0.1

Table 0.3 Two-Sample T Test (the SOEs and the non-SOEs)

Variable(s)	Mean Control	Mean Treated	Diff.	t	Pr( T > t )
RLCSR	30.30	34.39	4.089	4.570	0.0000***
MBR	2.033	1.387	-0.645	6.630	0.0000***
Size	22.14	23.04	0.895	8.790	0.0000***
DBR	0.470	0.529	0.0600	4.460	0.0000***
ROA	0.0700	0.0490	-0.0210	5.720	0.0000***
Top 10	52.57	62.23	9.668	8.290	0.0000***
control	36.08	44.01	7.936	7.340	0.0000***
duality	0.193	0.0700	-0.123	5.900	0.0000***
INDS	0.946	0.893	-0.0530	2.490	0.0129**

\*\*\* p<0.01; \*\* p<0.05; \* p<0.1

From Table 5.3, we can derive that in the whole period, the average score of the non-SOEs (control group) and that of the SOEs (treated group) is 30.3 and 34.49 separately, and the difference of average CSR score between the two groups is 4.089 which is significant at 1% level. The results again identify that the policy which enforce the SOEs to disclose CSR reports annually can indeed improve the CSR level.

## 5.2 The Causal Effect of CSR on Corporate Financial Performance

In this part, we use four different proxies from different perspective to measure corporate financial performance. The proxies include accounting-based performance ROA, economic-based performance EVA, market-based performance Tobin Q, and financing-based performance KZ index which measures firm's capital constraint.

Because we have identified the existence of heteroskedasticity and endogeneity when we use Two-way Fixed Effect Model to explore the relationship, in order to avoid uncertainty and bias of choosing instrumental variables while exploring the causal relationship, we apply a novel heteroskedasticity-based approach using simultaneous-equation model advocated by Lewbel (2012). Since the policy which forces all the SOEs to publish CSR reports has been identified in section 5.1.2 that it indeed affects CSR level, we use the variable *policy* as an extra instrumental variable when we explore the causal effect of CSR level on corporate financial performance. In this part, we exhibit the results of formula (4.3) in Model 3- the causal effect of CSR on corporate financial performance, and will discuss the result of formula (4.4) in Model 3- the causal effect of corporate financial performance on CSR level in part 5.3.

### 5.2.1 The Causal Effect of CSR on ROA

Table 5.4 shows the estimate results of formula (4.3) in Model 3 when we use ROA as the proxy of corporate financial performance. As we can see, when it is the case of the SOEs, the coefficient estimates for *RLCSR* is insignificant when we just use generated instruments while is negative (-0.0011) and significant at 1% level when we add variable *policy* as an instrument. For the non-SOEs, no matter whether we add extra instrument or not, the coefficient estimates for *RLCSR* is negative and significant- -0.0004 (significant at 10% degree) when we just use generated instruments and -0.001 (significant at 1% degree) when we take *policy* as an extra instrument. Since the results of applying *policy* as an extra instrument is more significant, we can conclude that the improving CSR level would impair firm's profitability (i.e., ROA) no matter for the SOEs and the non-SOEs at least in short term, and the magnitude is similar (each point of increased CSR score would result in about 0.1 percent decrease in ROA). The conclusion is consistent with the trade-off hypothesis (Makni, Francoeur and Bellavanc, 2009) which reflects that the costs of CSR would lead to reduction of the profits because CSR is lack of readily measurable economic benefits while have huge costs that make shareholder wealth grow less (Friedman, 1970).

Apart from CSR score, we can also find that if the sum of shareholding percentage of top-ten negotiable shareholders increases, the firms' ROA would enhance. If a CEO in the SOEs is also the chair of the board, the SOE's ROA would improve too. If independent director ratio (INDS) in the non-SOEs is higher, the non-SOE's ROA

would be raised. As for firm's financial characteristic, higher MB ratio, larger size and lower debt ratio are associated with improved ROA in both kinds of firms.

Table 0.4 Results for Formula (4.3) in Model 3 When ROA is Dependent Variable

Instruments	SOE		non-SOE	
	Generated Instruments	Generated Instruments and policy	Generated Instruments	Generated Instruments and policy
RLCSR	0.0001 (0.0002)	-0.0011*** (0.0002)	-0.0004* (0.0002)	-0.0010*** (0.0002)
Top_10	0.0002*** (0.0001)	0.0004*** (0.0001)	0.0002 (0.0001)	0.0003** (0.0001)
control	0.0000 (0.0001)	-0.0001 (0.0001)	0.0002 (0.0001)	0.0002 (0.0001)
duality	0.0057* (0.0031)	0.0068** (0.0032)	-0.0052 (0.0034)	-0.0056 (0.0035)
INDS	-0.0017 (0.0030)	-0.0009 (0.0031)	0.0075 (0.0061)	0.0121** (0.0060)
MBR	0.0069*** (0.0015)	0.0086*** (0.0016)	0.0130*** (0.0015)	0.0142*** (0.0015)
Size	0.0059*** (0.0012)	0.0108*** (0.0012)	0.0115*** (0.0021)	0.0150*** (0.0020)
DBR	-0.1158*** (0.0083)	-0.1073*** (0.0083)	-0.0934*** (0.0141)	-0.0979*** (0.0141)
constant	-0.0646*** (0.0211)	-0.1478*** (0.0213)	-0.1901*** (0.0403)	-0.2605*** (0.0385)
<i>N</i>	2596	2596	1071	1071
$R^2$	0.248	0.210	0.283	0.260

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 5.2.2 The Causal Effect of CSR on EVA

When we use EVA\_s (standardized Economic value added (EVA)) as the proxy of corporate financial performance, the results are as displayed in table 5.5. As we



can see, for the SOEs, no matter whether we add extra instrument or not, the coefficient estimates for RLCSR is negative and significant— $-0.0084$  (significant at 10% degree) when we just use generated instruments and  $-0.011$  (significant at 1% degree) when we take policy as an extra instrument. When it comes to the non-SOEs, the coefficient estimates for RLCSR is insignificant when we just use generated instruments while is negative ( $-0.0019$ ) and significant at 5% level when we also take variable *policy* into consideration. From the Table 5.5, we can derive that if the company (no matter the SOEs or the non-SOEs) invests more in social goods (i.e., engage in more CSR activities), the investors of the company may get a loss in a form of opportunistic cost compared with social average return at least in short term. The negative causal effect is more prominent in the SOEs. The trade-off hypothesis can explain the potential reason behind it—CSR engagement requires lots of investment or cost in a short time while few rewards of the engagement can be readily measurable. We notice that the conclusions of the causal effect of CSR level on ROA and EVA are similar even if they measure the firm's profitability from different angle. Thus we can conclude that improving CSR level does have a significantly negative effect on firm's profitability at least in short term.

Table 0.5 Results for Formula (4.3) in Model 3 When EVA\_s is Dependent Variable

Instruments	SOE		non-SOE	
	EVA_s		EVA_s	
	Generated Instruments	Generated Instruments and policy	Generated Instruments	Generated Instruments and policy
RLCSR	$-0.0084^*$ (0.0046)	$-0.0110^{***}$ (0.0038)	$-0.0013$ (0.0012)	$-0.0019^{**}$ (0.0009)
Top_10	$-0.0007$ (0.0016)	$-0.0001$ (0.0015)	$0.0011^{**}$ (0.0005)	$0.0012^{**}$ (0.0005)
control	$-0.0015$ (0.0023)	$-0.0024$ (0.0022)	$-0.0011^{**}$ (0.0005)	$-0.0011^{**}$ (0.0005)
duality	$0.0151$ (0.0333)	$0.0098$ (0.0351)	$0.0010$ (0.0074)	$0.0003$ (0.0072)
INDS	$-0.1132^{**}$ (0.0517)	$-0.1066^{**}$ (0.0528)	$0.0240$ (0.0196)	$0.0228$ (0.0190)

ROA	2.0596*** (0.4046)	2.0378*** (0.4102)	0.9371*** (0.1031)	0.9412*** (0.1004)
MBR	0.1388*** (0.0237)	0.1407*** (0.0242)	0.0025 (0.0023)	0.0027 (0.0023)
Size	0.3430*** (0.0539)	0.3521*** (0.0541)	0.0497*** (0.0081)	0.0512*** (0.0076)
DBR	-0.0437 (0.1185)	-0.0246 (0.1187)	0.0164 (0.0224)	0.0119 (0.0215)
constant	-7.7492*** (1.1282)	-7.8675*** (1.1422)	-1.2708*** (0.1721)	-1.2834*** (0.1662)
N	2596	2596	1071	1071
R2	0.171	0.164	0.278	0.258

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 5.2.3 The Causal Effect of CSR on Tobin Q

The causal effect of CSR level on Tobin Q (*TBQ* in the paper) is exhibited in Table 5.6. For the SOEs, the coefficient estimates for RLCSR is insignificant when we just use generated instruments. But when we add variable *policy* into the model as an instrument, the coefficient estimates for RLCSR is 0.0067, which is positive and significant at 5% level. On the other hand, the positive causal effect of CSR level on Tobin Q in the non-SOEs is more obvious. No matter whether we add extra instrument or not, the coefficient estimates for RLCSR is positive and significant—0.0106 (significant at 10% degree) when we just use generated instruments and 0.0189 (significant at 1% degree) when we take *policy* as an extra instrument. By comparing the coefficient estimates, we can derive that if the SOEs and the non-SOEs increase their CSR score by the same magnitude, the non-SOEs would enjoy higher Tobin Q than the SOEs.

The potential reason behind the positive effect of CSR level on Tobin Q can be explained by the stakeholder theory. Higher CSR score means more engagement in social responsibility, and thus better relationship between the corporation and stakeholders such as suppliers, customers, community, government and employees. The improved relationship would result in better reputation, higher valuation in investors' mind and thus higher Tobin Q eventually.

Table 0.6 Results for Formula (4.3) in Model 3 When TBQ is Dependent Variable

Instrument	SOE		non-SOE	
	Generated Instruments	Generated Instruments and policy	Generated Instruments	Generated Instruments and policy
RLCSR	0.0040 (0.0035)	0.0067** (0.0029)	0.0106* (0.0058)	0.0189*** (0.0057)
Top_10	0.0129*** (0.0020)	0.0125*** (0.0020)	0.0080** (0.0037)	0.0060 (0.0037)
control	-0.0059*** (0.0017)	-0.0054*** (0.0017)	-0.0043 (0.0036)	-0.0033 (0.0037)
duality	0.0975 (0.0745)	0.0855 (0.0741)	0.3615*** (0.1086)	0.3695*** (0.1089)
INDS	0.0102 (0.0528)	0.0137 (0.0527)	0.0224 (0.1545)	0.0231 (0.1557)
Size	-0.3210*** (0.0289)	-0.3360*** (0.0267)	-0.5072*** (0.0508)	-0.5311*** (0.0510)
DBR	-0.6142*** (0.1301)	-0.5752*** (0.1264)	0.0142 (0.3485)	0.0889 (0.3480)
ROA	2.8707*** (0.5657)	2.9189*** (0.5666)	11.0799*** (1.2303)	10.5465*** (1.2342)
constant	8.8218*** (0.5117)	9.0423*** (0.4848)	12.5382*** (1.0054)	12.8262*** (1.0087)
N	2596	2596	1071	1071
R2	0.289	0.289	0.361	0.362

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

#### 5.2.4 The Causal Effect of CSR on Capital Constraint

Capital constraint, as measured by KZ index can reflect the firm's access to finance. Table 5.7 shows the causal effect of CSR on the standardized firm's capital constraint (KZ\_s). Since the coefficient estimate for *RLCSR* is more significant when generated instrument is the only one instrument we consider, we take this version

as the standard. For the SOEs, the coefficient estimates for RLCSR is  $-0.0103$ , which is negative and significant at 5% degree. In the case of the non-SOEs, it turns out to be  $-0.0089$ , which is negative and significant at 1% degree. These results tell us that improving CSR level would lower firms' capital constraint, and for the SOEs, the capital constraint would fall further.

The potential reason is that the increased CSR score means the firm engage more in CSR activities and disclose more information on CSR, both two improvements would decrease firm's capital cost by avoiding potential related risk (such as illegal pollutant discharge), enhancing transparency and earning better reputation. As pointed out by Laura T. Starks (2009), CSR engagement could affect the risk of the firm such as regulatory risk, supply chain risk, product and technology risk, litigation risk, reputational risk, and physical risk. The lower risk can make companies enjoy less capital constraint such as gaining the bargain lending rate from bank. Enhancing information transparency can make public fully aware of the firm's social responsibility and thus make the firm enjoy better reputation and lower capital cost.

Table 0.7 Results for Formula (4.3) in Model 3 When KZ\_s is Dependent Variable

Instruments	SOE		non-SOE	
	KZ_s	KZ_s	KZ_s	KZ_s
	Generated Instruments	Generated Instruments and policy	Generated Instruments	Generated Instruments and policy
RLCSR	$-0.0103^{**}$ (0.0045)	0.0006 (0.0028)	$-0.0089^{***}$ (0.0034)	$-0.0017$ (0.0021)
Top_10	0.0019 (0.0018)	0.0006 (0.0008)	0.0017 (0.0017)	0.0007 (0.0008)
control	$-0.0049^*$ (0.0026)	$-0.0011$ (0.0008)	$-0.0047^*$ (0.0026)	$-0.0010$ (0.0008)
duality	$-0.0131$ (0.0322)	$-0.0072$ (0.0169)	$-0.0122$ (0.0317)	$-0.0005$ (0.0154)
INDS	$-0.0743$ (0.0512)	$-0.0258$ (0.0338)	$-0.0724$ (0.0507)	$-0.0297$ (0.0322)
MBR	$0.1561^{***}$	$0.0152^{**}$	$0.1520^{***}$	$0.0159^{***}$

	(0.0295)	(0.0061)	(0.0284)	(0.0059)
Size	0.3490***	0.0522***	0.3365***	0.0565***
	(0.0591)	(0.0140)	(0.0537)	(0.0130)
DBR	-0.1072	0.0304	-0.0992	0.0160
	(0.0811)	(0.0486)	(0.0777)	(0.0457)
ROA	-1.1589***	-0.1396	-1.1314***	-0.1176
	(0.3037)	(0.1689)	(0.2968)	(0.1600)
constant	-7.7208***	-1.3135***	-7.4798***	-1.3360***
	(1.2487)	(0.2827)	(1.1579)	(0.2749)
N	2231	855	2231	855
R2	0.192	0.160	0.194	0.121

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 5.3 The Causal Effect of Corporate Financial Performance on CSR

This part demonstrates the estimate results of formula (4.4) in Model 3 when using the four different proxies of corporate financial performance (*ROA*, *EVA\_s*, *Tobin Q*, and *KZ\_s*), i.e., the causal effect of corporate financial performance on CSR. By dividing the sample into two groups—the SOEs and the non-SOEs, we can know that whether the better corporate financial performance can motivate the firm to enhance their CSR level both for the SOEs and the non-SOEs.

#### 5.3.1 The Causal Effect of ROA on CSR

We report the results in Table 5.8. As shown in the table, for the SOEs, the coefficient estimate of *ROA* is insignificant, while for the non-SOEs, the coefficient estimate of *ROA* is 30.1902, which is positive and significant at 5% degree. The results tell us that for the SOEs, there is little effect of ROA on CSR level (i.e., higher ROA does not necessarily result in higher CSR level), while for the non-SOEs, the causal effect of ROA on CSR level does exist (i.e., the enhancement of profitability can lead to improvement in CSR level).

The potential reason of explaining the difference between the SOEs and the non-SOEs is that the non-SOEs pursue the long-term survival, thus they have incentives to spend the previous profit on social goods such as environmental programs and philanthropy (slack resource hypothesis). Once the non-SOEs have higher profitability, they would invest more in social goods. However for the SOEs, they

do not need to struggle to survive, they can run in a long term as long as they have support from the government. Thus the goal or requirement of the government may have large impact on the SOEs' CSR engagement instead of higher ROA.

Table 0.8 Results for Formula (4.4) in Model 3 When ROA is Independent Variable

Instruments	SOE		non-SOE	
	RLCSR		RLCSR	
	Generated Instruments	Generated Instruments	Generated Instruments	Generated Instruments
ROA	12.5473		30.1902**	
	(8.5359)		(11.7894)	
Top_10	0.1304***		0.1428***	
	(0.0204)		(0.0285)	
control	-0.0701***		-0.0657**	
	(0.0193)		(0.0300)	
duality	-0.1733		1.1675*	
	(0.7681)		(0.6473)	
INDS	-0.8944		0.8040	
	(0.6804)		(1.4714)	
MBR	0.7337***		0.5218**	
	(0.2092)		(0.2436)	
Size	4.8023***		4.7331***	
	(0.1869)		(0.3911)	
DBR	-5.3381***		-5.3598**	
	(1.6745)		(2.3171)	
constant	-75.1067***		-77.8273***	
	(3.7691)		(8.8038)	
<i>N</i>	2596		1071	
<i>R</i> <sup>2</sup>	0.360		0.248	

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 5.3.2 The Causal Effect of EVA on CSR

As the same of the former results, we just substitute the variable *EVA\_s* (standardized EVA) for *ROA*. The results are reported in Table 5.9. When it is the

case of the SOEs, the coefficient estimate of *EVA\_s* is insignificant, while for the non-SOEs, the coefficient estimate of *EVA\_s* is 13.4128, which is positive and significant at 1% degree. A similar conclusion can be derived – for the SOEs, there is little effect of EVA on CSR level (i. e., More EVA cannot ensure higher CSR level), while for the non-SOEs, the causal effect of EVA on CSR level does exist (i. e., If the non-SOEs have more EVA, they would engage more in CSR activities).

The reason behind the results is similar to the reason of different causal effect of ROA on CSR level between the SOEs and the non-SOEs. Due to the existence of survival motivation, more EVA, the non-SOEs can invest more in social goods and engage more in CSR activities. While the motivation of the CSR engagement for the SOEs is the pressure from the government instead of the profitability.

Table 0.9 Results for Formula (4.4) in Model 3 When *EVA\_s* is Independent Variable

Instruments	SOE	non-SOE
	RLCSR	RLCSR
	Generated Instruments	Generated Instruments
<i>EVA_s</i>	0.0463 (0.1072)	13.4128*** (1.7498)
Top_10	0.1275*** (0.0198)	0.1472*** (0.0275)
control	-0.0633*** (0.0180)	-0.0425 (0.0287)
duality	-0.1335 (0.7421)	-1.2256** (0.6181)
INDS	-0.8047 (0.6641)	0.0505 (1.4758)
ROA	-10.3940** (4.2883)	-13.5305** (6.7366)
MBR	1.1201*** (0.1960)	0.7818*** (0.2024)
Size	4.9213*** (0.1864)	3.9976*** (0.3617)
DBR	-8.1295*** (1.3483)	-8.8875*** (1.8669)

constant	-76.1057*** (4.0858)	-54.4562*** (8.9296)
$N$	2596	1071
$R^2$	0.365	0.292

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 5.3.3 The Causal Effect of Tobin Q on CSR

The causal effect of Tobin Q on CSR level is exhibited in Table 5.10. For the SOEs, the coefficient estimate of  $TBQ$  is insignificant, while for the non-SOEs, the coefficient estimate of  $TBQ$  is  $-0.6790$ , which is negative and significant at 10% degree. It means that the market performance or public valuation of the firm has no effect on CSR engagement for the SOEs, while negative effect for the non-SOEs. If the non-SOEs' Tobin Q is lower (i.e., poorer market performance and lower public valuation), the non-SOEs would tend to have more CSR engagement. It may be because the non-SOEs is more care about their market performance, in order to decorate their accomplishment and win better reputation, they engage more in CSR activities to raise their valuation in public mind. Whereas for the SOEs, the market performance have little impact on their behavior due to their role of serving public interest instead of pursuing good market performance and high valuation of the public.

Table 0.10 Results for Formula (4.4) in Model 3 When TBQ is Dependent Variable

Instruments	SOE	non-SOE
	RLCSR	RLCSR
	Generated Instruments	Generated Instruments
TBQ	-0.1397 (0.2110)	-0.6790* (0.3582)
Top_10	0.1468*** (0.0203)	0.1720*** (0.0284)
control	-0.0761*** (0.0192)	-0.0780*** (0.0285)
duality	0.0452 (0.7582)	1.6872*** (0.6395)
INDS	-1.2793* (0.7582)	0.5283 (0.6395)



	(0.6835)	(1.4499)
Size	4.6809***	4.1725***
	(0.1809)	(0.3562)
DBR	-9.7848***	-8.7712***
	(1.3313)	(2.0460)
ROA	-6.1321	17.0009**
	(4.4073)	(7.7237)
constant	-68.4411***	-61.0005***
	(3.9020)	(8.1505)
$N$	2596	1071
$R^2$	0.360	0.231

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 5.3.4 The Causal Effect of Capital Constraint on CSR

The causal effect of capital constraint (standardize KZ index) on CSR level is shown in Table 5.11. For the SOEs, the coefficient estimate of  $KZ\_S$  is insignificant, while in the case of non-SOEs, the coefficient estimate of  $KZ\_S$  is 5.0534, which is positive and significant at 1% degree. We can conclude that the capital constraint has little effect on CSR engagement for the SOEs, but positive effect on CSR level for the non-SOEs. When the more capital constraint the non-SOEs face (i.e., higher  $KZ\_s$ ), the more CSR engagement would the non-SOEs have.

The potential reason may be that when face more capital constraint, the non-SOEs would attend to more CSR activities and disclose more CSR related information to decorate their performance and improve information transparency, so that they can show a good social image and financing more easily. For the SOEs, however, they have less sensitivity about the capital constraint for their social role, and thus little causal effect of capital constraint on CSR engagement.

Table 0.11 Results for Formula (4.4) in Model 3 When  $KZ\_s$  is Dependent Variable

	SOE	non-SOE
	RLCSR	RLCSR
Instruments	Generated Instruments	Generated Instruments
$KZ\_s$	-0.1737	5.0534***

	(0.1167)	(1.1224)
Top_10	0.1546***	0.1343***
	(0.0213)	(0.0324)
control	-0.0796***	-0.0256
	(0.0195)	(0.0342)
duality	0.2088	0.8346
	(0.7091)	(0.6727)
INDS	-0.6873	-0.0657
	(0.7052)	(1.4404)
MBR	0.9942***	1.0826***
	(0.2187)	(0.2638)
Size	4.7664***	4.1763***
	(0.2120)	(0.3863)
DBR	-7.5108***	-7.3013***
	(1.4083)	(2.1136)
ROA	-10.2522**	3.1150
	(4.5971)	(8.1151)
_cons	-73.4124***	-62.8921***
	(4.6371)	(8.7589)
<i>N</i>	2231	855
<i>R</i> <sup>2</sup>	0.361	0.308

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 6 Conclusion and Suggestion

### 6.1 Conclusion

In this study, we investigate the interrelationships between state ownership and corporate financial performance as well as CSR level. We also identify whether the policy that force the SOEs to disclose CSR reports annually can improve the CSR level in China. The proxy of the CSR level is the CSR total score computed by RKS, the authoritative CSR evaluation institute in China.

In the first part, we find that the relationship between state ownership and CSR level is significant and positive, which means the SOEs usually have higher CSR level than other types of companies including foreign enterprises and private

ventures, as well as the mixed ownership companies. By considering the industry's effect on CSR level, we conclude that the manufacturing SOEs would have lower CSR level than non-manufacturing SOEs. Then we examine the effect of the policy which requires all SOEs disclose CSR reports annually in China. By using Difference-in-Difference model, we identify the positive impact of the CSR disclosure policy on the CSR level.

When it comes to the studies of the causal relationship between CSR and corporate financial performance, four major proxies—ROA (return on asset), Economic Value Added (EVA), Tobin Q and KZ index (which measure capital constraint) are used to represent the corporate financial performance.

When we use ROA and EVA to represent the firm's profitability and explore their relationship with CSR level, we find that for all firm, no matter the SOEs and the non-SOEs, higher CSR level would lead to lower profitability, however, enhanced profitability would result in higher CSR level in the non-SOEs. As for market performance which measured by Tobin Q, higher CSR score would lead to higher Tobin Q (i. e., better market performance) for all firms, while poor Tobin Q would motivate the non-SOEs engage more in CSR activities. We also find that both the SOEs and the non-SOEs can enjoy less capital constraint when they improve their CSR level, while only the non-SOEs would have incentive to have more CSR engagement when face more capital constraint. In a word, improving CSR level would result in lower profitability but better market performance and less capital constraint for all firms, but only the non-SOEs would engage more in CSR activities when they have enhanced profitability, poor market performance and more capital constraint.

Higher CSR score means more investment in social goods, however, the benefit of the CSR engagement cannot be measured in short term, therefore the firm's profitability decrease. However, higher CSR score also means less risk faced by companies (such as regulatory risk, product and technology risk and so on) and high transparency of the CSR information, and thus make firms have better market performance and less capital constraint. As for the causal effect of corporate financial performance on CSR level, only the non-SOEs would have incentive to improve CSR engagement when they have higher profitability, face poor market performance and more capital constraint because they struggle to survive longer. Investment in CSR activities can benefit them with better reputation and thus can improve their market performance and financing more easily. The incentive of the CSR engagement

for the SOEs seems are unrelated with corporate financial performance, the political incentive may make up a high percentage when the SOEs make a CSR investment decision.

Although this thesis explores the CSR-CFP relationship considering state ownership from different perspective in China, we only examine the causal effect in short term, and thus the long-run causal relationships between CSR level and corporate financial performance considering the ownership types need to be further studied.

## 6.2 Suggestion

### 6.2.1 Suggestions for Regulator

Because the SOEs indeed have higher CSR level than the non-SOEs, even the Chinese SOEs are in the stage of reform to improve their efficiency nowadays, the government can still ensure the state ownership's function in protecting the social welfare. For example, the government can establish a committee being responsible for the SOEs' social and environmental engagement while leave the company room of making decisions in other fields. The performance of CSR can also be contained in the evaluation system of the SOEs' outcome. Besides, as the basic business model is different between kinds of industry (i.e., different production and merchandise), the externalities are also different. Therefore the government or the Stock Exchange can establish the specific policy on CSR and guidelines of CSR reports for different industries. For instance, the production in manufacturing industry need more attention than the non-manufacturing for its particular bad externalities, and the funds flow of the financial industry need to be stated in details in financial companies' CSR report for their huge power in supporting the development of other companies.

Although there exist regulations about CSR disclosure of listed companies, some corners which cannot be fully supervised indeed exist. Therefore, except for the specific regulation and guidelines of CSR report, the development of independent examination institution should be promoted. The examination institutions are professional in evaluating firm's environmental investment and cost in reality, so that they can prevent the firms from disclosing the false information. Besides, the development of CSR evaluation institution should also be supported. The completed CSR evaluation system can provide more standardized and comparable information about the firms' CSR level, and thus the investors can have a more objective evaluation of the risk and development of the listed companies.

### 6.2.2 Suggestions for Company

Although investing in social goods such as environmental programs may impair firms' profitability in short term for few benefit of the CSR investment can be measured readily, the companies can enjoy better market performance and less capital constraint by improving CSR level. Thus there is unnecessary for firms to concerned too much about balance between CSR level and the profitability. The companies can put the environmental friendly conscious into practice no matter in the factory or the normal office building.

What' s more, since the enhanced transparency about the CSR disclosure is vital for the firm' s market performance and access to finance, the firms shall be responsible for the truth of the CSR disclosure and compose their CSR reports according to the guidelines of the Stock Exchange or *Sustainability Reporting Guidelines* which released by Global Reporting Initiative (GRI) so that their CSR reports can be standardized and comparable. Besides, the companies can also use other channels to disclose their social and environmental engagement more frequently, deeply and actively, such as publicizing their new innovation which saves the resource on their official website, a news conference or even a brochure of their products to customers. By diversifying the CSR disclosure channel, the firms can earn the better reputation which results in better market performance as well as less capital constraint.

### 6.2.3 Suggestions for Investors

As it is said, "when there exists demand, there is a market." The investors, who provide capital for companies to do all activities, is also an indispensable part in promoting the CSR level. If the investor pay attention to the companies' potential risk of social and environment engagement and highlight the CSR level, the firms would have to improve their CSR level and disclose related information in details. Moreover, the abnormal stock return of the social responsible companies are found in the literature (Statman and Glushkov, 2009), thus the investors, no matter institutional investors or individual investors, need consider the companies' CSR level before making decisions of investment. By collecting the companies' CSR information in different ways and comparing the outcome with the firms' counterpart, the investors can make more advisable decisions.

Furthermore, the environmental investment and social engagement is a kind of

investment which should be measured in a long term, instead of boosting profit at once. Therefore, for most of individual investors in China, who have incomplete knowledge about investment whereas seek for high returns in a short time, should convert the speculate conscious into investment conscious and invest the firms with long-term interest.

Additionally, if the investors find there are false information disclosed by the companies or the illegal social and environmental engagements of the firms, the investors can report the companies and make official department and the public aware of them. The formation of the such public-supervise system can urge companies engaging more positive social and environmental activities and promoting their CSR level.

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#### APPENDIX A CONSTRUCTION OF THE KZ INDEX

We calculate the KZ index according to Baker, Stein, and Wurgler (2003) as follows:

KZ index=

$$-1.002 CF_{it}/A_{it-1} - 39.368 DIV_{it}/A_{it-1} - 1.315 C_{it}/A_{it-1} + 3.139 LEV_{it} + 0.283 Q_{it}$$

where  $CF_{it}/A_{it-1}$  is cash flow over lagged assets;  $DIV_{it}/A_{it-1}$  is cash dividends over lagged assets;  $C_{it}/A_{it-1}$  is cash balances over lagged assets;  $LEV_{it}$  is debt ratio; and  $Q_{it}$  is the market value of equity over assets.



## The Interrelationships Between State Ownership, Corporate Financial Performance and CSR

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**Abstract:** State-owned enterprises (SOEs) are often associated with poor corporate financial performance (CFP), economic inefficiency and unsatisfactory profit for its agency problem especially compared with private companies or foreign companies. However, as the environment around the world get worse, the social welfare has aroused the attention of the public. More and more scholars began to explore the role of the SOEs play in the social public welfare and most of them derive the positive influence of the SOEs particularly in terms of environmental protection. Given the poor corporate financial performance and higher CSR level of the SOEs, what the interrelationships between state ownership, CSR level and CFP (corporate financial performance)? Is there any difference of the CSR-CFP relationship between the SOEs and the non-SOEs? We explore the answers in this paper.

This study is focused on corporations in China, where the SOEs account for more than 60% of the local stock market capitalization in China. By constructing Fixed Effect Model and intersection terms, we found that the state-owned enterprises have higher CSR level, and that the non-manufacturing SOEs indeed have higher CSR score than manufacturing SOEs. We also construct Difference-in-Difference model to identify the positive and significant effect of the compulsory CSR reports disclosure policy on CSR level. In order to explore the causal relationship between CSR level and corporate financial performance, we also apply a heteroskedasticity-based approach using simultaneous-equation model (Lewbel, 2012). We find that for the causal effect of CSR level on corporate financial performance, all the firms would suffer loss but enjoy better market performance and less capital constraint if they improve their CSR level. However, the significant causal effect of corporate financial performance on CSR level is only found in the non-SOEs, who have incentive to engage more in CSR activities if they have higher profitability, poor market performance and more capital constraint. The incentive of the SOEs improving CSR level seems have little link with corporate financial performance.

**Keywords:** state ownership, CSR, ROA, EVA, Tobin Q, capital constraint