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The Impact of State Ownership and Regulatory Changes on ESG Performance

Evidence from China

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Abstract

In this study, we explore the dynamic relationship between state ownership and ESG performance in Chinese firms, focusing on the impact of the 2018 Corporate Governance Code and the different ESG Category scores. Our longitudinal analysis spans eight years (2015-2022) and includes 193 firms, 63 of which are state-owned. Our findings indicate that, despite generally lower ESG performance by SOEs compared to non-SOEs, the implementation of the 2018 Code ushered in a significant shift. Notably, non-SOEs demonstrated a more pronounced uplift in ESG performance post-regulation. While we identified prevailing positive ESG trends across all firms, the regulation's specific impact requires further exploration. This study sheds light on the role of regulatory changes in steering ESG performance, offering meaningful insights from the unique Chinese context where state ownership and regulatory shifts are significant determinants.

Keywords – State Ownership, China, ESG, CSR, Code of Corporate Governance

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1 Introduction

In recent years, there has been a growing recognition of the importance of Environmental, Social, and Governance (ESG) practices in the corporate world. ESG considerations are now considered critical factors in assessing a company's sustainability, responsible business conduct, and long-term value creation. As a result, regulators and stakeholders have increasingly focused on enhancing corporate governance frameworks to promote better ESG performance. In this study, we investigate the impact of the Chinese 2018 Corporate Governance Code on the ESG scores of state-owned enterprises (SOEs) and non-SOEs. The Corporate Governance Code aimed to enhance transparency, accountability, and sustainability practices among companies in various industries. By analyzing the ESG scores of both SOEs and non-SOEs before and after the implementation of the regulation, we aim to shed light on the effectiveness of the Corporate Governance Code in improving ESG performance and whether the impact differs between state-owned and non-state-owned enterprises. To achieve our research objectives, we employ a combination of econometric techniques, including propensity score matching, difference-in-differences regressions, and panel data regressions. These methodologies enable us to assess the causal relationship between the implementation of the Corporate Governance Code and changes in ESG scores, while accounting for potential confounding factors and controlling for time-invariant unobserved heterogeneity. Our analysis yields valuable insights into the dynamics between corporate governance, state ownership, and ESG performance. By examining the differential effects of the regulation on SOEs and non-SOEs, we provide a nuanced understanding of how different types of enterprises respond to regulatory changes and improve their sustainability practices. We explore the role of specific factors, such as the presence of a dedicated CSR committee, company size, age, and capital structure in influencing ESG scores.

China presents a unique and compelling case to study due to its distinctive blend of state capitalism and rapid economic growth. As the world's second-largest economy, China is a major player on the global stage, and its approach to ESG practices can have far-reaching implications. The significant presence of state-owned enterprises in China's corporate landscape offers a fascinating opportunity to explore the

interplay between state ownership, corporate governance, and ESG performance. This makes China an exciting and rich context for our investigation. Overall, this study contributes to the ongoing dialogue on corporate governance, state ownership, and ESG performance by providing empirical evidence on the effectiveness of the 2018 Corporate Governance Code and its differential impact on SOEs and non-SOEs. Our analysis revealed that SOEs generally perform worse in ESG than their private counterparts. However, larger firms, regardless of ownership, tend to have better ESG performance, likely due to greater resources and stakeholder expectations. The implementation of the 2018 Corporate Governance Code led to improved ESG scores for both SOEs and private firms, but the increase was more significant for private firms. When examining the prioritization of ESG initiatives, we found that SOEs scored lower in most ESG categories. The presence of a dedicated CSR Committee was found to significantly improve ESG scores across multiple categories.

This thesis is structured as follows:

In **Section 2**, we define ESG and CSR, laying the groundwork for the discussions that follow.

Section 3 delves into the theory and literature review, covering a range of topics from stakeholder theory, the role of governments in ESG, the cost of sustainability, to the specific context of China and its state-owned enterprises.

In **Section 4**, we develop our hypotheses based on the theoretical framework and literature review.

Section 5 presents the data and descriptive statistics, including a detailed overview of the sample, dependent and control variables, and an analysis of ESG and CSR scores across different industries.

Section 6 outlines the methodology, addressing issues such as missing data, propensity score matching, difference-in-difference analysis, and panel regression.

In **Section 7**, we present our results, discussing the relationship between state ownership and ESG scores and the regulatory impact.

Finally, **Section 8** concludes the thesis, summarizing our findings and their implications for the field of corporate sustainability in China.

2 Defining ESG and CSR

Corporate social responsibility (CSR) is becoming increasingly important in the corporate world, and requires companies to conduct business beyond compliance with the law and beyond shareholder wealth maximization, (L. Lin, 2009). ESG is a term that is connected to CSR, and refers to a set of criteria that evaluate a company's performance and practices across environmental, social, and governance dimensions. The framework considers factors beyond financial metrics to assess a firm's impact on society, the environment, and its ability to effectively govern itself. Firstly, the "E" stands for environmental, which focuses on a company's impact on the natural environment. This includes its efforts to reduce carbon emissions, manage waste and pollution, conserve natural resources, and promote sustainable practices throughout its operations, (Galbreath, 2013; Morrison, 2021).

The "S" in ESG represents social factors, which evaluate a company's relationships with its employees, customers, suppliers, and the communities in which it operates. Social considerations include fair labor practices, workplace diversity and inclusion, product safety, human rights, community engagement, and philanthropic initiatives. Lastly, the "G" stands for governance, referring to the structures and practices that govern a company's operations and decision-making processes. Governance factors assess the effectiveness of a company's board of directors, executive compensation practices, shareholder rights, transparency, and risk management. The integration of ESG factors into corporate decision-making has gained traction due to growing recognition that environmental and social issues can have significant impacts on a company's long-term financial performance, (Morrison, 2021).

In 2015, all members of the United Nations (UN) agreed on the ambitious Sustainable Development Goals (SDGs) which address 17 global challenges, including those related to poverty, inequality, climate, and peace and justice, (Sustainable Development Goals, 2019). Through this research, we aim to provide valuable insights for executives, investors, policymakers, and other stakeholders interested in the integration of ESG considerations into decision-making processes.

Investors care about ESG investing for multiple reasons. By focusing on ESG investing, ethical investment practices are actively promoted. Companies that perform better regarding ESG issues can increase shareholder value by properly managing risks, anticipating regulatory action, or accessing new markets, while contributing to the sustainable development of the societies in which they operate. Moreover, these issues can have a strong impact on reputation and brands which is an integral part of company value, (Broadstock et al., 2021).

3 Theory and Literature Review

3.1 Stakeholder Theory

Stakeholder theory is a perspective that emphasizes the importance of considering the interests and concerns of various stakeholders in an organization's decision-making process. It suggests that businesses should take into account the needs of individuals or groups who can affect or are affected by their actions. Rather than solely focusing on maximizing profits for shareholders, (Freeman, 1994). By actively engaging with stakeholders and considering their concerns, organizations can make more informed decisions and create value for both the company and its stakeholders, (Freeman, 1994). Stakeholder theory has had a significant impact on business practices, corporate governance, and sustainability initiatives. It has influenced the development of concepts such as corporate social responsibility (CSR), sustainability reporting, and stakeholder engagement strategies, (Jamali et al., 2008).

Stakeholder management means considering the interests of all relevant parties involved in an organization's activities. This includes considering the legitimate concerns and needs of different stakeholders when making decisions about the organization's structure, overall policies, and specific cases. It applies to various individuals or groups who have a stake in the organization, such as managers, shareholders, government entities, and others, (Donaldson & Preston, 1995). The relationship between stakeholder theory and Environmental, Social, and Governance factors is significant. ESG factors are considered important by many stakeholders, including investors, customers, employees, and communities. Stakeholder theory and ESG are closely related as both focus on taking a broader perspective of organizational impact and considering the interests of various stakeholders beyond just financial shareholders. Stakeholder theory asserts that firms that actively engage in social responsibility not only build trust with stakeholders but also enhance their capacity to translate social investments into profitability, (Clarkson, 1995). Maintaining positive relationships with stakeholders has a long-term beneficial effect on financial performance, (Lin, Chang, & Dang, 2015).

As the CSR requirements increase, the direct effect of CSR on financial performance will be significantly positive for all industry types, (C.-S. Lin et al., 2015). Based on stakeholder theory, firms must engage in a variety of CSR activities to satisfy stakeholder expectations because of the requirements regarding the CSR issues of stakeholders. Signori, San-Jose, Retolaza & Rusconi's study however, found implications for the relationship between stakeholders and ESG practices. According to their research, when evaluating ESG ratings, it is important to go beyond just looking at the societal impact. They argue that ESG frameworks should also consider how a company creates and distributes value for its stakeholders. Instead of solely relying on ESG scores to represent stakeholder interests, they recommend including measures that capture value creation and distribution for stakeholders, (Signori et al., 2021).

3.2 General Literature

Our paper will add to existing papers on stakeholder theory and the impact of ESG and regulations on state- owned enterprises and on public companies. ESG is still a relatively new concept in the existing economic world and our thesis will make a significant contribution to existing ESG-related literature. There are several studies that have focused on different factors affecting CSR performance, but historically most literature has focused on whether CSR activities affect a business' financial performance, (Chen et al., 2018; Bing & Li, 2019; Elmaghrabi, 2021; Baraibar-Diez & Odriozola, 2019; Khan, 2022). ESG papers have extensively explored various topics and issues concerning state-owned enterprises (SOEs). The primary objective of these papers is to gain insights and analyze the incorporation of ESG factors specific to SOEs. Many studies examine the ESG performance of SOEs and their impact on various stakeholders, such as employees, local communities, and the environment.

Researchers assess the extent to which SOEs incorporate sustainable practices, address social concerns, and demonstrate effective governance, (DeWenter & Malatesta, 2001; Boardman & Vining, 1989; Aguilera et al., 2021; Wu et al., 2022). Ownership Structure and ESG is interesting because of how the presence of a government shareholder affects decision-making processes, accountability mechanisms, and the ability to align ESG objectives with financial performance,

(Borisova et al., 2012; Dimson et al., 2015). These papers focus on how SOEs engage with stakeholders, including employees, customers, suppliers, and local communities, to address ESG issues. They also research the effect of stakeholder engagement strategies and the impact on long-term sustainability and reputation. As well as the effect of existing frameworks and recommended policy measures to enhance ESG integration, transparency, and accountability in state-owned enterprises. Case studies of specific SOEs are also carried out to provide insights into ESG practices, challenges, Mohd, 2007). We will specifically analyze the extent of ESG engagement among government-owned firms and compare it to that of other firms. This aspect adds depth to the understanding of ESG practices within different ownership structures.

3.3 ESG and Firm Performance

Previous studies have consistently shown a positive association between CSR, ESG and corporate performance, aligning with stakeholder theory. M. Khan analyzed 199 articles retrieved from the Scopus database that used environmental, social, and governance rating scores as a proxy for sustainability. As far as firm characteristics, financial performance, size, and leverage had a positive relationship with ESG performance, (M. A. Khan, 2022). Brown and Caylor studied the governance quality of 1,868 firms and related it to their valuation statistics. They found measuring for corporate governance quality is positively and significantly related to firm value, (Brown & Caylor, 2005). Bissoondoyal-Bheenick, Brooks, & Do established both a positive and negative relationship between ESG total score and firm performance. They analyzed Tobin's Q which led to a positive relationship on the social pillar, (Bissoondoyal-Bheenick et al., 2023).

Aydoğmuş, Gülay & Ergun found the combined ESG score has a positive and highly significant relationship with the firm value. The social and governance variables have highly significant positive relationships with firm value as well. The environment variable however has no relationship with firm value according to their study, (Aydoğmuş et al., 2022). Lo and Sheu found a significantly positive relationship between corporate sustainability and market value, suggesting that being sustainable increases a firm's value, (Lo & Sheu, 2007).

Dimson, Karakas and Li found positive cumulative abnormal return for successful engagements and a zero return for unsuccessful ones, concluding that ESG improvements increase the market value of engaged companies, (Dimson et al., 2015). An Oxford university study by Clark, Feiner and Viehs reviewed a total of 51 studies, out of which 88% show a positive correlation between sustainability and operational performance, (Clark et al., 2015). Friede, Busch and Bassen conducted a study combining 2200 individual studies on the relationship between ESG criteria and corporate financial performance (CFP). The results showed that the business case for ESG investing is empirically well founded, with about a 90% non-negative ESG- CFP relation in the study. A large majority of the studies showed positive findings (Friede et al., 2015). The empirical results indicate that CSR can indeed enhance intellectual capital, which can increase financial performance. However, the direct effect of CSR on financial performance varies within different industries, (C.-S. Lin et al., 2015). Malik noted that while CSR activities may increase firm costs, they also bring potential benefits that outweigh these costs, (Malik, 2015). Margolis, Elfenbein and Walsh conducted a meta-analysis and redirection of research on the relationship between corporate social and financial performance. They found an overall small, but positive effect in their research, further substantiating the positive effect of CSR on firm performance, (Margolis et al., 2007).

Regarding the general understanding and correlation between ESG and firm performance, the consensus from research is that there is a positive association between strong ESG performance and better firm performance. Neo-classical economists however, find that over-investing in CSR activities could reduce the opportunities for exploiting the resources to maximize profit, (C.-S. Lin et al., 2015). Scholars also suggest that CSR activities have negative effects on firm performance, (Wright & Ferris, 1997). Bebchuk, Cohen & Ferrell found using a governance index, that an increase in the index level is negatively correlated with firm valuation, as measured by Tobin's Q, as well as with stock returns during the 1990-2003 period, (Bebchuk et al., 2004).

3.4 Role of Governments

Governments worldwide have significant influence over their economies through their rules and regulations, as well as their state-owned enterprises. These enterprises, owned and managed by the government, operate across various sectors, and serve many types of goals for their respective governments. State ownership of enterprises introduces distinct objectives that may diverge from those of private shareholders. Unlike maximizing wealth for shareholders, the state often prioritizes maximizing social welfare, (Borisova, Brockman, Salas, & Zagorchev, 2012). State-owned enterprises pursue goals beyond mere profitability, such as promoting greater employment opportunities and achieving broader social aims. Thus, the objectives of SOEs encompass both financial gain and societal benefits, (Li & Wang 1996). DeWenter and Malatesta argue that government-owned firms are thought to forgo maximum profit in the pursuit of social and political objectives, such as wealth redistribution. They expect government-owned firms to be technically less efficient and, therefore, less profitable than private firms, (DeWenter & Malatesta, 2001). Boardman and Vining (1989) provide evidence that large industrial Mixed Enterprises and SOEs perform substantially worse than similar public companies. The results indicate that there are performance differences between public and private companies, (Boardman & Vining, 1989).

Meggison, Nash and Randenborgh examined the effects of privatization, reporting a significant increase in profitability, capital spending, and total employment. They also found a strong performance improvements following both full and partial government divestment, (Meggison et al., 1994). Using various net-income-based measures, government-owned firms are significantly less profitable than privately owned firms, (DeWenter & Malatesta, 2001). State-owned enterprises in China follow government directives and are expected to contribute to initiatives such as employment promotion, employee benefits, education and training, and environmental protection. The government is inclined to provide financial support to large SOEs facing financial difficulties, (K. J. Lin et al., 2020). New reporting policies on ESG disclosures are being developed, which are backed by government initiatives. One such example is presenting evidence that higher the level of CSR disclosure of a corporation, the lower is the level of corporate tax aggressiveness, (Lanis & Richardson, 2012).

Managers of SOEs are frequently reviewed by government agencies, and their political advancement might depend on their performance. The potential loss of political reputation and forced demotion due to poor performance on non-financial measures may force the management to give some priority to socially responsible activities. SOEs have incentives to perform and report on socially responsible activities that benefit the community and the society at large. The specific impact of ESG on state-owned enterprises may depend on various factors, such as the governance structure, regulatory environment, and specific ESG practices implemented by these firms, (Kornai, 1993; H. Li & Zhou, 2005). Governments play a crucial role in establishing laws and policies to ensure the smooth operation of financial markets. Through their regulations, governments have the power to shape a company's impact on the environment and society.

3.5 Cost of Being Sustainable

According to Chen, Hung, and Wang, CSR spending is primarily influenced by political and social factors rather than economic considerations. Their research suggests that mandatory CSR disclosure increases political pressure on firms' CSR activities, leading to higher CSR spending. Specifically, they found that total CSR spending, particularly in environmental protection, is associated with lower firm profitability and pollution levels, (Chen et al., 2018). This supports the notion that mandatory CSR disclosure drives increased CSR spending. In a study by Lins, Servaes, and Tamayo, they provide evidence that firm-specific social capital, developed through CSR activities, pays off during unexpected periods of increased importance in trust, such as during the 2008-2009 financial crisis, (Lins et al., 2017). State ownership of firms has an impact on the relationship between firm performance and CSR disclosure. State-owned enterprises have different goals than private shareholders, often prioritizing social welfare over wealth maximization. As a result, SOEs have objectives that go beyond profit, including promoting greater employment. The difference in prioritization weakens the link between firm performance and CSR disclosure for SOEs, (Q. Li et al., 2013).

On the other hand, Lin, Chang, and Dang-Van argue that investment in CSR activities can lead to higher costs and competitive disadvantages for companies in a competitive market. They suggest that companies with CSR initiatives may face increased costs and reduced competitive advantages compared to those without CSR, (C.-S. Lin et al., 2015). However, Lins, Servaes, and Tamayo found that firms with higher CSR ratings outperformed those with lower ratings by at least four percentage points during the financial crisis, (Lins et al., 2017). These studies shed light on the various influences and outcomes of CSR spending, highlighting the interplay between political, social, and economic factors, as well as the impact of state ownership and competitive market dynamics.

3.6 CSR Committee

Board committees play a vital role in corporate governance, with CSR committees specifically focusing on positioning the company as a responsible corporate citizen. Empirical studies suggest that CSR committees may not have a clear understanding of the underlying economic causes of market failure problems. Their activities often lack targeted approaches to address these issues systematically, (Mackenzie, 2007). Nevertheless, the existence of CSR committees has been shown to enhance various parts of CSR performance, denying the claim that they exist only as a superficial exercise without proof of effect on corporate performance, (Elmaghrabi, 2021). The impact of CSR committees varies across performance dimensions, with a significant direct effect on environmental performance but no direct effect on social performance, (Radu & Smaili, 2022). Additionally, CSR committees indirectly influence CSR performance through CSR-linked compensation, (Radu & Smaili, 2022). Baraibar-Diez & Odriozola found that companies with CSR committees achieve higher ESG and economic scores compared to those without. These committees play a significant role in addressing social and sustainability issues within corporate boards, (Baraibar-Diez & Odriozola, 2019). Establishing efficient participatory bodies within companies is recommended to enhance stakeholder engagement and transparency. The presence of CSR committees signifies a stronger commitment to social principles and global standards, particularly in countries with less stringent CSR governance codes. It is worth noting that other factors, such as the presence of a dedicated CSR director or specialist, can

also influence non-financial performance. The importance of creating effective structures that promote stakeholder engagement and adherence to social principles. Klein found no significant relationship between audit committee independence and firm profitability, highlighting the complexity of committee dynamics and their impact on corporate outcomes, (Klein, 1998).

3.7 China and State-Owned Enterprises

China's position as the world's second-largest economy and its recent growth can be attributed to factors such as high exports, a thriving manufacturing sector, and a large pool of low-wage workers, (Jiang & Kim, 2015). Over the years, China has been characterized as a "state capitalist" system, where the state retains a significant role alongside market forces and private enterprises. State ownership and government interventions are common features of these systems, aimed at achieving economic development goals and competitiveness, (Pearson et al., 2021). In the late 1990s, China initiated significant privatization and downsizing of state-owned enterprises, with a shift towards managing the remaining large SOEs to drive economic growth and serve the party-state's interests. The foundation for employee involvement in decision-making processes and CSR, aligned with the stakeholder model of corporate governance, was laid by the 1994 Company Law. The Chinese Company Law serves as a legal framework governing the establishment, organization, operation, and management of companies in China. It encompasses various types of companies, including limited liability companies, joint-stock companies, and foreign-invested enterprises. The law has undergone revisions to adapt to the changing economic landscape. While the concept of modern corporate social responsibility was not initially conceived during the drafting of the law, employee participation and rights protection were influenced by traditional Chinese socialist ideology, (Jiang & Kim, 2015).

The Chinese government plays a significant role in shaping the CSR discourse. Article 5 of the 2006 Chinese Company Law mandates companies to undertake social responsibility as a core aspect of their business. In 2008, the State-Owned Assets Supervision and Administration Commission of the State Council (SASAC) released the Guide Opinion on Social Responsibility Implementation by Central-Government-Controlled State-Owned Enterprises, further emphasizing

CSR implementation for SOEs under the oversight of SASAC, (Q. Li et al., 2013; Jiang & Kim, 2015). However, China's unique cultural and institutional characteristics influence managerial incentives regarding CSR and the prioritization of stakeholders. Despite some progress, shareholder primacy still predominates in Chinese companies, with limited influence from stakeholders. This highlights the ongoing challenges in fully integrating CSR practices and stakeholder management in the Chinese business context, (Q. Li et al., 2013). The China Securities Regulatory Commission (CSRC) is a ministry level institution and is therefore directly under the authority of China state council, which is the main administrative authority in China, (Jiang & Kim, 2015). The commission performs as "regulatory function, according to the relevant laws and regulations, and with the authority by the State Council, over the securities and futures market of China, maintains an orderly securities and futures market order, and ensure a legal operation of the capital market", (CSRC, 2023).

Although the government has launched some CSR initiatives, there are no regulatory costs for irresponsible behavior that are not addressed clearly. This could lead Chinese companies to remain uncommitted to CSR prioritizing. Chinese consumers are not as actively pressuring companies to develop and produce goods and services responsibly compared to their counterparts in western countries. The Chinese government and the political environment hinder the formation and agenda of critical players in Corporate Social Responsibility, such as non-governmental organizations. As a result, the community most affected by environmentally irresponsible behavior from companies lacks proper channels to voice their concerns and lacks legal support for protection.

With approximately 60% of listed companies being state-owned enterprises, China's unique ownership structure impacts stakeholder-company relationships and the level and quality of CSR disclosure, (Smith et al., 2005). Lin suggest that differences in ownership structures across countries may affect stakeholder-company relationships and influence the level and quality of CSR disclosure. The CSR principles for the Chinese SOEs should be consistent with the international trend, but also be compatible with the national and organizational reality in China, (L. Lin, 2009).

SOEs are some of the largest and most important Chinese firms, and they have their own unique and significant agency problem. The state can possibly extract resources from SOEs to satisfy state objectives. This could hinder SOEs from maximizing their profits. The main ways that SOEs provide social stability are by maintaining excess labor and providing welfare to retired employees, (Bai et al., 2006). Bearing the responsibility and costs of maintaining social stability diminishes SOEs' ability to generate profit, which harms minority shareholders, (J. Y. Lin et al., 1998; Bai et al., 2006). State-owned enterprises are controlled by the state and have dual objectives of generating profit and implementing state policies, which can sometimes create conflicting interests (Jiang & Kim, 2020). Controlling shareholder entrenchment significantly contributes to the agency problem in China. Due to their large equity stakes or state ownership, outside investors and boards lack the authority to dismiss insiders for poor performance, (Jiang & Kim, 2020). In China, many controlling shareholders also have political connections. While controlling shareholders of SOEs, that is, the government, are naturally politically connected, it is also common for controlling shareholders of non-SOEs to build connections with the government through connected CEOs, top managers, or directors, (Jiang & Kim, 2020). A database of CEOs and directors of 790 companies that went public in China between 1993 and 2001 (nearly 73% of all IPOs) shows that almost 27% of CEOs were politically connected, (Fan et al., 2007).

3.8 Code of Corporate Governance for Listed Companies

The Code of Conduct for Listed Companies in China was published in 2018 by China Securities Regulatory Commission, (CSRC, 2018). Outlined in Chapter 1, the code serves as a framework to enhance corporate governance, protect investors' rights, and foster the steady and sound development of China's capital markets. Chapter 1 ties the code to the Company Law of the People's Republic of China, establishing the principles and guidelines for listed companies. The code is voluntary to follow as the code states that listed companies should act in the spirit of the code in their efforts to improve corporate governance. This is an important aspect as the public listed firms are only encouraged to follow the Code, but faces no punishment if they choose to ignore it.

The code aims to enhance transparency, protect the rights and interests of shareholders, and improve the overall governance framework in the Chinese capital market. A list of the chapters from the framework is included below.

Chapter 1: *General Principles*

Chapter 2: *Shareholder Meeting*

Chapter 3: *Directors and Board of Directors*

Chapter 4: *Supervisors and the Board of Supervisors*

Chapter 5: *Senior Executives and Incentive and Disciplinary Systems*

Chapter 6: *Controlling Shareholders, Related Parties, and Listed Companies*

Chapter 7: *Institutional Investors and Other Related Institutions*

Chapter 8: *Stakeholders, Environmental Protection, and Social Responsibility*

Chapter 9: *Information Disclosure and Transparency*

Chapter 10: *Supplementary Provision*

Each chapter addresses specific aspects of corporate governance and provides guidelines for listed companies to adhere to. These chapters encompass areas such as shareholder meetings, board structures, internal supervision, senior executive management, controlling shareholders, institutional investors, stakeholder engagement, environmental protection, social responsibility, and information disclosure. Chapter 8 emphasizes the importance of stakeholder management, environmental protection, and social responsibility. The framework encourages listed companies to integrate ecological and environmental protection requirements into their development strategies, actively participate in the construction of ecological civilization, and play a role in pollution prevention, resource conservation, and ecological protection. Chapter 9 underscores the significance of information disclosure and transparency. It mandates listed companies to disclose environmental information, social responsibility efforts such as poverty alleviation, and corporate governance-related matters in accordance with laws, regulations, and the requirements of competent authorities. Regular analysis of corporate governance status and formulation of improvement plans.

4 Hypotheses Development

H1: State-owned enterprises exhibit superior ESG performance compared to their non-state-owned counterparts.

In our investigation of the ESG performance of state-owned enterprises compared to non-state-owned counterparts, we found compelling evidence supporting our hypothesis. Drawing on the research conducted by (Jia et al., 2022), we learned that firms with higher institutional ownership, which is often the case with state-owned enterprises in China, tend to exhibit superior ESG performance. This is particularly evident in the environmental aspect of ESG. Furthermore, institutional shareholders, which in the Chinese context often equate to state entities, can incentivize firms to engage in ESG by influencing management change and board voting. Additionally, the study by (Zhang & Jin, 2022) found that state-owned enterprises play a stronger role in promoting green technology innovation compared to non-state-owned enterprises when considering ESG performance. These findings provide a strong foundation for our hypothesis and underscore the potential role of state ownership in driving superior ESG performance.

However, it is worth noting that there are studies presenting a different perspective. For instance, research conducted by (Fuadah et al., 2022) found that, in Indonesia, state and family ownership do not affect ESG disclosure. This suggests that state-owned enterprises do not necessarily exhibit superior ESG performance or disclosure compared to their non-state-owned counterparts. Furthermore, research by (Yang & Li, 2023) suggests that corporate financialization, a common practice among state-owned enterprises, can negatively impact ESG performance. This implies that while state ownership might drive superior ESG performance, other factors such as corporate financialization can influence this relationship. Therefore, in our analysis, we aim to provide a more nuanced understanding of the ESG performance of state-owned versus non-state-owned enterprises.

H2: The implementation of the 2018 Corporate Governance Code for listed companies have exerted a more pronounced influence on the ESG scores of non-state-owned enterprises, relative to their state-owned enterprise counterparts.

Building on our second hypothesis, we draw attention to the potential influence of the 2018 Corporate Governance Code on the ESG scores of non-state-owned enterprises. This is informed by the findings of a study conducted by (Yan et al., 2023), they investigated the impact of environmental regulation, specifically the officials' accountability audit of natural resources (AANR), on the ESG performance of companies in China. Interestingly, the study found that the AANR pilot had a more significant impact on the ESG performance of non-state enterprises. This suggests that non-state-owned enterprises may be more responsive to regulatory changes. Further underscoring the potential influence of the 2018 Corporate Governance Code on these enterprises, the study by, (Fuadah et al., 2022), which examined the impact of ownership structure on ESG disclosure within the context of Indonesian firms, revealed that foreign and public ownership had a positive and significant effect on ESG disclosure, while state and family ownership did not exhibit the same influence.

H3: State-owned enterprises will prioritize ESG initiatives differently than their state-owned counterparts, which will be reflected in the ESG category scores.

Our third hypothesis posits that state-owned enterprises and non-state-owned enterprises prioritize ESG initiatives differently, leading to variations in ESG category scores. This hypothesis is rooted in the understanding that the unique operational contexts, stakeholder expectations, and regulatory pressures faced by SOEs and non-SOEs may shape their ESG priorities. A study by (Deng & Cheng, 2019) on China's A-share listed companies, examine the relationship between enterprise's ESG indices and stock market performance. The study found a positive correlation between a company's ESG indices and its stock market performance. Interestingly, the impact of ESG indices on non-state-owned enterprises was found to be greater than that on state-owned enterprises. This suggests that non-state-owned enterprises might prioritize ESG initiatives differently than their state-owned counterparts.

5 Data and Descriptive Statistics

5.1 The Sample

Our sample consists of 193 public Chinese companies, spanning across 22 different industries as classified by the Global Industry Classification Standard (GICS). It is important to note that companies were included in the sample only if they had representation in both the SOE and non-SOE categories within their respective industries. This was done to ensure a balanced and fair comparison across the two categories. Companies that fell within the SIC-code (Standard Industrial Classification) between 4000 - 4999 and 6000 - 6999 were excluded from the sample. These sectors typically include companies in the Energy & Transportation and Financials, which have unique characteristics and regulatory environments that could potentially skew the results of the study (Hong et al., 2022). By excluding these sectors, we aim to maintain a more homogeneous and representative sample for our analysis. The sample is further divided into SOEs and non-SOEs. Out of the 193 companies, 63 are SOEs and 130 are non-SOEs. According to Eikon Refinitiv's definition, which is where we collected all the data, a company is considered an SOE if it is owned or controlled by the government or any governmental body. This ownership or control is manifested if the government holds more than 50% of the voting rights in the company or possesses a 'golden share', which grants it veto power, (Eikon Refinitiv, 2023). Utilizing this definition, we were able to accurately classify companies in our sample as SOEs or non-SOEs. It is important to note that for our study, we only included companies that maintained their SOE or non-SOE status consistently throughout the entire sample period. Below, we present an overview of the sample used in our study.

Table 5.1: Overview of the Sample

GICS Industry Name	SOE	non-SOE	Total
Aerospace & Defense	5	1	6
Air Freight & Logistics	1	2	3
Automobile Components	1	4	5
Automobiles	3	4	7
Beverages	4	4	8
Broadline Retail	1	4	5
Chemicals	1	12	13
Commercial Services & Supplies	1	1	2
Construction & Engineering	11	5	16
Electrical Equipment	4	5	9
Electronic Instruments & Components	3	12	15
Entertainment	1	6	7
Health Care Providers & Services	1	6	7
Hotels, Restaurants & Leisure	1	4	5
Industrial Conglomerates	1	1	2
Machinery	4	15	19
Metals & Mining	6	13	19
Oil, Gas & Consumable Fuels	8	5	13
Passenger Airlines	1	3	4
Pharmaceuticals	3	16	19
Specialty Retail	1	6	7
Wireless Telecommunication Services	1	1	2
Total	63	130	193

5.2 Geography

The economic landscape of China presents a unique and compelling context for our study due to the significant presence of State-owned enterprises, being the country with the largest number of SOEs in the world. These firms are estimated to contribute 23-28% of national GDP of China, (Aguilera et al., 2021), and provide a rich ground for examining the interplay between government ownership and corporate behavior. In recent years, China has been increasingly focusing on ESG factors and CSR policies, reflecting a growing recognition of the importance of sustainable and responsible business practices.

Regulatory policies have played a crucial role in this development. In 2018, the China Securities Regulatory Commission (CSRC) established a basic framework for CSR disclosure through the Corporate Governance Guidelines for listed Companies. By the end of 2018, approximately a quarter of all listed companies in China had voluntarily disclosed their CSR reports, (Bing & Li, 2019).

5.3 Time Horizon

Our study spans a time horizon of eight years, from 2015 to 2022. This period is particularly significant as it allows us to examine the impact of the 2018 Code of Corporate Governance, providing us with four years of data both before and after the implementation of this regulation. The data used is relatively recent, with the latest data collected from the fiscal year of 2022. This ensures that our findings are relevant and reflective of the current state of CSR and ESG trends in Chinese SOEs and non-SOEs. In our data collection process, we made a decision to only include firms that had at least five years of ESG data. This was done to ensure the robustness and reliability of our analysis. It is important to note that we encountered a significant amount of missing data for the years prior to 2018. This limitation was taken into account during our analysis and interpretation of the results.

5.4 Dependent Variables

The dependent variable in our regression model is the ESG score, as well as the ten category scores that make up the total ESG score. We obtain all scores from the Thomson Reuters Refinitiv Eikon database, all scores range between 0 and 100. The category scores provide a more granular view of a company's ESG performance, allowing us to identify specific areas of strength and weakness. By analyzing these category scores, we can gain a deeper understanding of the specific factors that contribute to a company's overall ESG performance.

Table 5.2: ESG Category Scores

Environmental	Social	Governance
Resource use score	Workforce score	Management score
Emissions score	Human rights score	Shareholder score
Innovation score	Community score	CSR strategy score
	Product responsibility score	

5.5 Control Variables

Total Assets (TA) - Firm Size (Natural log)

Total Assets (TA) serves as a control variable to account for firm size, measured in USD. Firm size is a significant factor in ESG performance, as larger firms typically have more resources to invest in ESG initiatives and may face different regulatory requirements compared to smaller firms. Larger firms may face increased public scrutiny, incentivizing them to improve their ESG performance. Prior research, such as (Drempetic et al., 2020), has consistently observed a positive correlation between firm size and sustainability reporting, indicating that firm size can significantly influence ESG scores. According to (Mohd, 2007) there is a notable correlation between CSR disclosure and elements like director ownership, company size, and government ownership. Larger firms and those with significant government stakes tend to provide more CSR information, while firms with higher director ownership disclose less. By controlling for Total Assets, we ensure that any observed differences in ESG ratings between SOEs and non-SOEs are not merely due to differences in firm size.

Return on Assets (ROA) - Financial Performance

Return on Assets (ROA) is a key control variable in our study. It measures a company's profitability in relation to its total assets, providing insights into the efficiency of a company's asset utilization to generate earnings. Recent studies, such as those by (Aydoğmuş et al., 2022b) and (Kim & Lee, 2020), suggest a positive and significant relationship between ESG scores and firm profitability. They propose that firms with higher profitability are more likely to invest in sustainability initiatives, supporting the inclusion of ROA as a control variable in our analysis.

Price-to-Book (P/B) - Financial Performance

The Price-to-Book (P/B) ratio is another financial metric that compares a company's market value to its book value. A higher P/B ratio may reflect a favorable market perception of a company, potentially influenced by its ESG efforts. It could also signify market expectations about a company's future earnings growth, which could be impacted by its ESG performance. Research suggests that a firm's engagement in ESG activities and its net profit margin can influence its P/B multiple, (Joshi & Chauha, 2020). Therefore, controlling for the P/B ratio can help us understand how market values and profitability intersect with a company's ESG scores.

Leverage – Capital Structure

Leverage, the ratio of a company's debt to its equity, is another control variable in our study. This metric is a key component of a company's capital structure, which refers to the mix of debt and equity used to finance its assets, (Baker & Martin, 2011). High leverage may indicate financial risk and could potentially limit a company's capacity to invest in ESG initiatives due to higher debt obligations. Therefore, controlling for leverage allows us to examine its potential influence on a company's ESG performance. This is particularly relevant given the lack of consensus in existing research about the ideal capital structure for a firm and the impact of debt on performance, (Cumming, 2012)

Age – Foundation Year

The age of a firm can reflect its maturity and business stage, which may influence its approach to ESG practices. Younger firms, often in development or growth stages, may prioritize market share and competitiveness, potentially limiting their focus on ESG. Conversely, older, more established firms may have more resources and experience to devote to ESG initiatives.

CSR Committee – Binary Variable

The presence of a CSR Committee within a company is the final control variable in our study. A CSR Committee is typically responsible for overseeing and guiding a company’s CSR strategies and initiatives. The existence of such a committee can be indicative of a company’s commitment to CSR and ESG practices. It suggests that the company has dedicated resources and personnel to manage these issues, which could lead to more effective and comprehensive CSR and ESG strategies.

Industry – Dummy Variables

The industry in which a company operates can significantly influence its ESG risks, opportunities, and governance standards. For instance, a company in the oil and gas sector may face greater environmental risks and different governance standards compared to a company in the entertainment industry. By including industry dummies, we can account for these industry-wide effects when comparing ESG ratings between SOEs and non-SOEs.

5.6 ESG Comparison

This initial comparison is based on the raw data before any adjustments are made to account for missing values. Our dataset spans from 2015 to 2022, and as mentioned earlier, we strictly included companies that had at least five years of ESG data. However, it is worth noting that we encountered a significant amount of missing ESG data, particularly for the years prior to 2018.

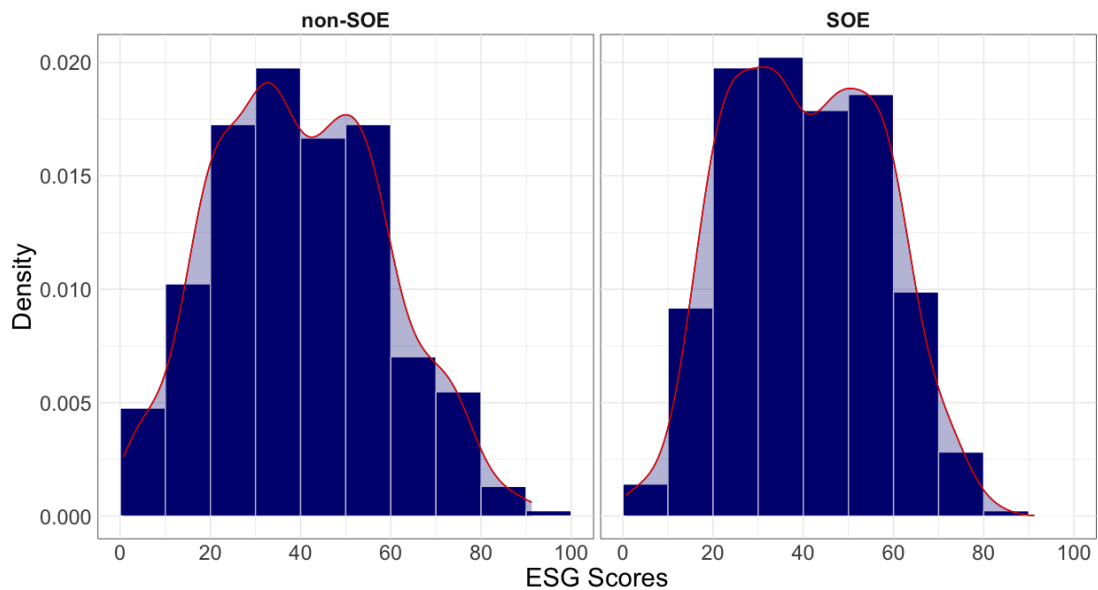
Table 5.3: Companies missing ESG Data

Year	non-SOE	SOE
2015	84	35
2016	79	35
2017	37	9
2018	0	0

Below, we can see a visual representation of the distribution of ESG scores for all years. The height of each bar corresponds to the density of companies with ESG scores within that range (bandwidth of 10). The red line represents a density plot,

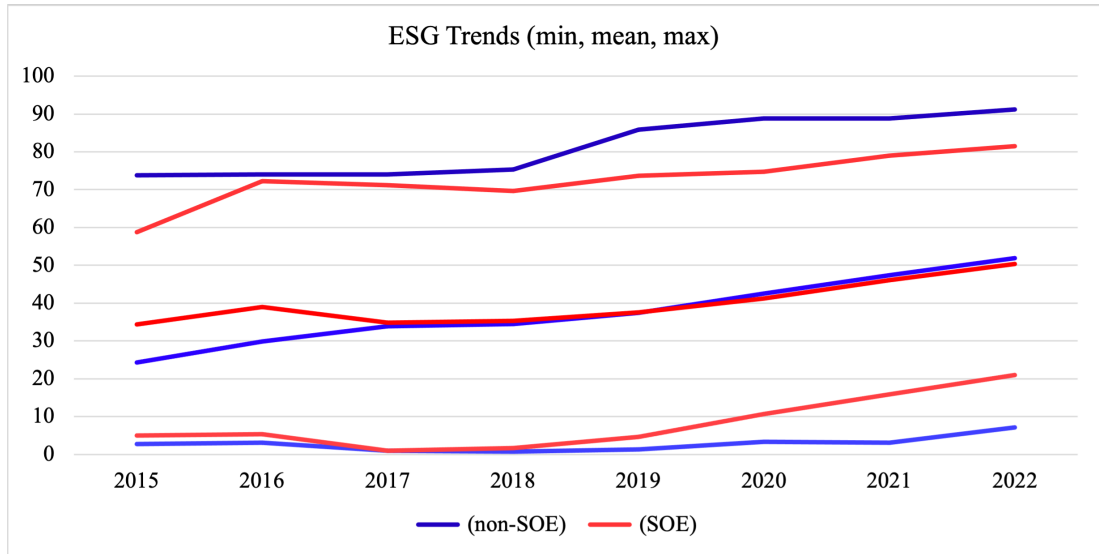
which is a smoothed version of the histogram and gives an idea of the shape of the distribution. We observe that both types of companies have similar distribution of ESG scores. Suggesting that, despite the differences in ownership structure and potential differences in regulatory requirements, both SOEs and non-SOEs have been performing quite similarly in terms of their ESG initiatives, making it an interesting case for further analysis.

Figure 5.1: ESG Density Distribution



Furthermore, the summary statistics provide interesting insights into the ESG performance of SOEs and non-SOEs over the years. For both SOEs and non-SOEs, there has been a consistent upward trend in ESG scores from 2015 to 2022. The minimum, first quartile, median, mean, third quartile, and maximum ESG scores all increased over this period for both types of enterprises. Non-SOEs have seen a steady rise in median ESG scores from 21.41 to 53.06, while SOEs have also improved, with median scores increasing from 33.77 to 51.65. The minimum and maximum scores for both groups also generally increase over time, indicating broad improvements in ESG practices. However, the rate of improvement and range of scores vary reflecting differences in their operational contexts and ESG strategies. The visualization below illustrates the trends in ESG scores, including the minimum, mean, and maximum values, over the period from 2015 to 2022. Providing a clear picture of the evolution and progression of ESG practices among the firms in our study.

Figure 5.2: ESG Trends



5.7 Descriptive Statistics

Below we present an overview of the descriptive statistics for SOEs and non-SOEs over the period of 2015-2022, as well as the four-year period before and after the Code of Corporate Governance for Listed Companies (2018). This division allows us to observe any shifts in the characteristics and behaviors of both SOEs and non-SOEs in response to this regulatory change. Both groups have seen an increase in mean ESG scores, indicating improved ESG engagement. The presence of CSR committees has also risen significantly, more so in SOEs, suggesting a response to the Code. We observe that both groups have experienced a slight decrease in Return on Assets (ROA) and an increase in leverage, indicating potential financial challenges which might be due to Covid-19. Overall, the Code appears to have positively influenced ESG engagement and the establishment of CSR committees. The percentage of companies with a CSR Committee is higher for SOEs, suggesting a greater emphasis on corporate social responsibility in these organizations.

Table 5.4: Descriptive statistics of SOEs

SOE - (2015 - 2022)							
	Min	q1	Median	Mean	q3	Max	SD
ESG	0.94	26.91	39.73	40.44	53.73	81.43	16.32
Total Assets	19.79	22.40	23.39	23.56	24.61	28.04	1.57
ROA	-0.20	0.02	0.03	0.05	0.07	1.82	0.10
P/B	0.23	0.95	1.49	3.11	3.04	35.53	4.49
Leverage	0.00	0.16	0.46	0.88	1.18	17.01	1.38
Age	5	13	18	19	23	42	7
CSR Committee (%)	0.17	0.22	0.47	0.46	0.66	0.76	0.22
SOE - (2019 - 2022)							
	Min	q1	Median	Mean	q3	Max	SD
ESG	4.61	31.36	44.02	43.79	57.20	81.43	16.26
Total Assets	20.48	22.73	23.58	23.76	24.71	28.04	1.55
ROA	-0.11	0.02	0.03	0.06	0.07	1.82	0.13
P/B	0.23	0.74	1.19	3.13	2.47	35.53	5.08
Leverage	0.00	0.17	0.41	0.80	1.09	5.40	0.95
Age	9	15	21	21	24	42	7
CSR Committee (%)	0.52	0.54	0.64	0.64	0.74	0.76	0.10
SOE - (2015 - 2018)							
	Min	q1	Median	Mean	q3	Max	SD
ESG	0.94	22.74	33.33	35.57	47.24	72.27	15.17
Total Assets	19.79	22.14	23.20	23.35	24.24	27.61	1.57
ROA	-0.20	0.02	0.03	0.05	0.08	0.29	0.06
P/B	0.44	1.17	1.87	3.09	3.46	30.08	3.77
Leverage	0.00	0.16	0.54	0.97	1.28	17.01	1.71
Age	5	11	17	16	20	38	7
CSR Committee (%)	0.17	0.17	0.27	0.28	0.40	0.41	0.13

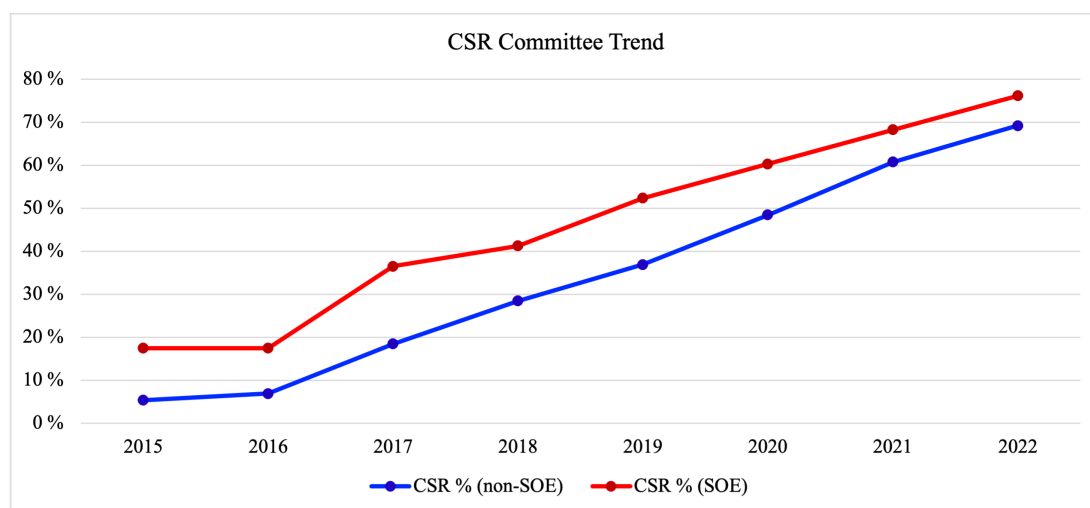
Table 5.5: Descriptive statistics of non-SOEs

non-SOE - (2015 - 2022)							
	Min	q1	Median	Mean	q3	Max	SD
ESG	0.66	25.35	38.63	39.95	53.52	91.22	18.68
Total Assets	17.00	21.71	22.46	22.52	23.27	26.31	1.13
ROA	-0.96	0.03	0.06	0.06	0.10	0.58	0.08
P/B	-1.41	1.30	2.35	3.46	4.40	32.49	3.43
Leverage	0.00	0.18	0.52	0.99	1.05	103.51	3.69
Age	0	14	19	19	23	38	6
CSR Committee (%)	0.05	0.10	0.33	0.34	0.58	0.69	0.24
non-SOE - (2019 - 2022)							
	Min	q1	Median	Mean	q3	Max	SD
ESG	1.27	31.57	45.07	44.77	57.22	91.22	18.35
Total Assets	20.46	21.97	22.66	22.79	23.54	26.31	1.07
ROA	-0.96	0.02	0.05	0.05	0.09	0.58	0.09
P/B	-1.41	1.20	2.08	3.21	3.89	32.49	3.50
Leverage	0.00	0.19	0.54	1.18	1.06	103.51	5.08
Age	3	16	21	21	25	38	6
CSR Committee (%)	0.37	0.40	0.55	0.54	0.67	0.69	0.14
non-SOE - (2015 - 2018)							
	Min	q1	Median	Mean	q3	Max	SD
ESG	0.66	19.67	30.57	32.11	45.10	75.28	16.44
Total Assets	17.00	21.48	22.18	22.26	23.05	25.70	1.13
ROA	-0.49	0.03	0.06	0.07	0.12	0.40	0.07
P/B	-0.07	1.43	2.65	3.73	4.90	20.81	3.34
Leverage	0.00	0.18	0.52	0.80	1.05	12.41	1.15
Age	0	12	17	16	21	34	6
CSR Committee (%)	0.05	0.06	0.13	0.15	0.26	0.28	0.11

5.8 CSR Comparison

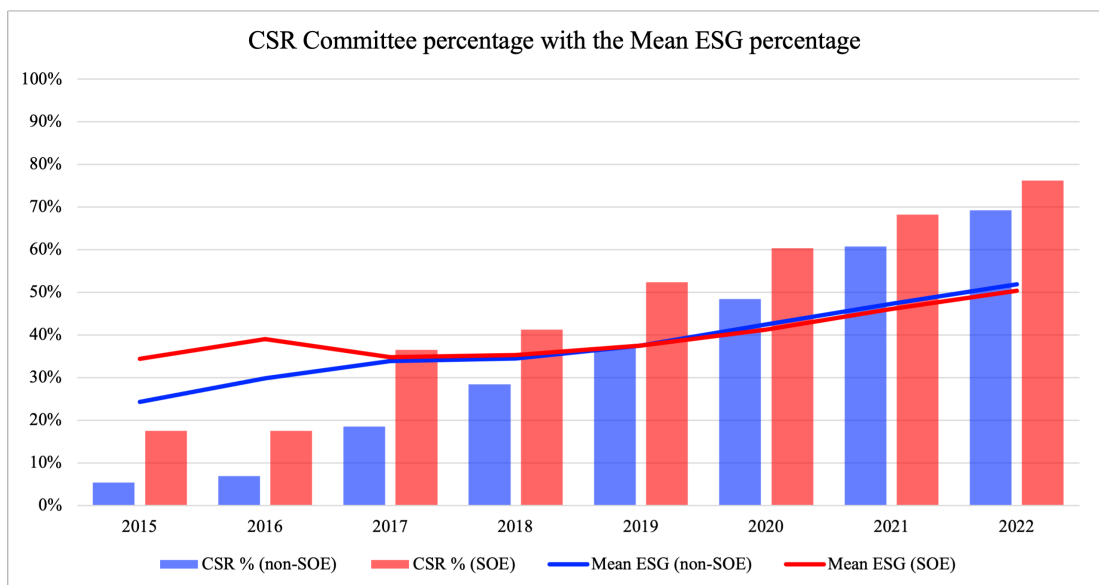
The trend in the establishment of CSR Committees in both SOEs and non-SOEs over the years 2015 to 2022 provides a compelling narrative about the impact of the Code of Corporate Governance for Listed Companies (2018). In 2015, well before the introduction of the Code, only 17% of SOEs and a mere 5% of non-SOEs had established CSR Committees. However, the subsequent years saw a moderate increase in these percentages for both types of companies. By 2018, the year before the Code was implemented, 41% of SOEs and 28% of non-SOEs had CSR Committees. This suggests that companies were already recognizing the importance of CSR, even before the Code's enforcement. The years following the implementation of the Code witnessed a more pronounced increase in the establishment of CSR Committees. By 2019, the first year after the Code's enforcement, 52% of SOEs and 37% of non-SOEs had such committees in place. This upward trend continued, and by 2022, a substantial 76% of SOEs and 69% of non-SOEs had CSR Committees. In figure below we can see the CSR Committee trend from 2015 to 2022.

Figure 5.3: CSR Committee Trends



This trend does not only underscore the influence of regulatory changes on corporate behavior but also highlight the increasing recognition of the importance of CSR in the corporate world. It suggests that companies, whether state-owned or not, are increasingly committed to integrating social, environmental, and governance considerations into their operations and strategic planning. The implementation of the Code appears to have acted as a catalyst, accelerating this shift towards greater CSR engagement. Research by (Baraibar-Diez & D. Odriozola, 2019) demonstrated that the presence of a CSR committee within a company can significantly influence its ESG performance. The study, which analyzed data from 197 listed firms across Spain, France, Germany, and the UK from 2005 to 2015, found that companies with a CSR committee tend to have higher ESG scores. This suggests that the establishment of a CSR committee is indicative of a company’s commitment to sustainability and social responsibility, which in turn positively impacts its ESG performance. The study also found that the presence of a CSR committee led to better non-financial performance across the four countries. This underscores the role of CSR committees in not only meeting the expectations and demands of diverse stakeholders but also in enhancing a company’s overall ESG performance. Below we see the mean ESG scores, converted to percentage, combined with the CSR Committee trend for both SOEs and non-SOEs.

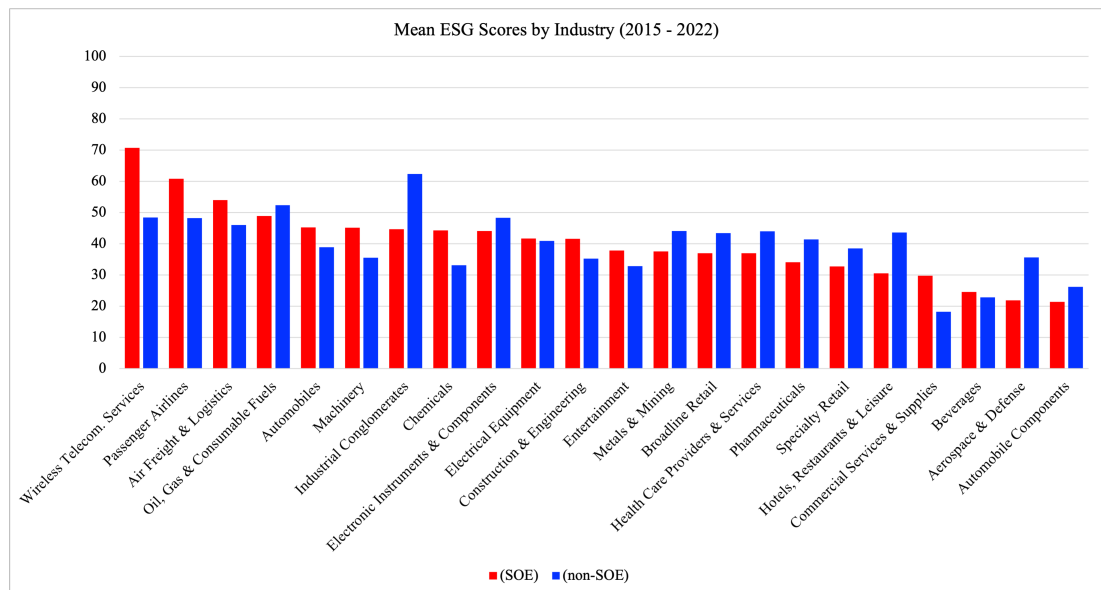
Figure 5.4: CSR Committee Percentage with the Mean ESG Percentage



5.9 Industry Analysis

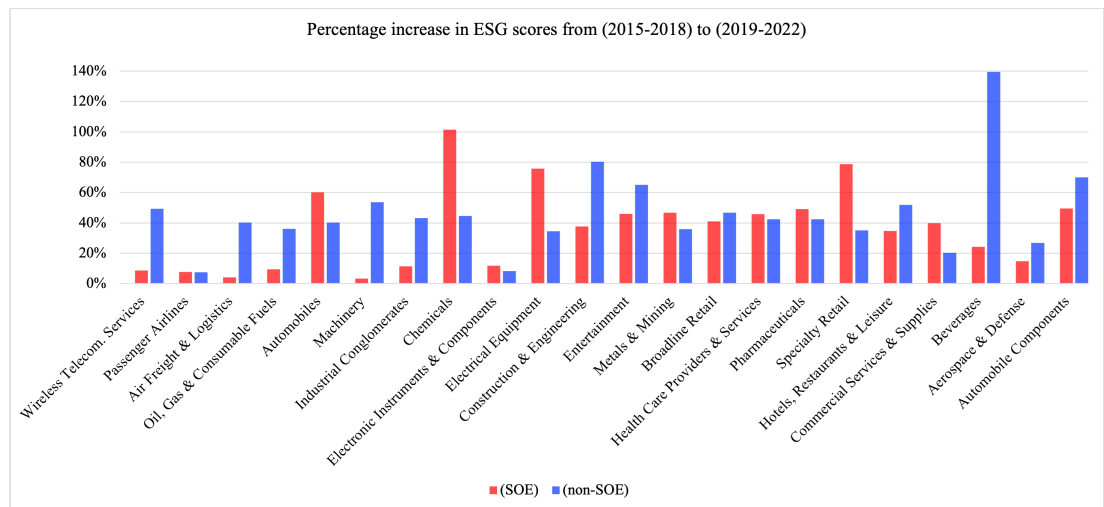
An analysis of the average ESG scores across all industries from 2015 to 2022 reveal interesting insight. The overall average ESG score for SOEs across all industries is (40.44), slightly higher than the average score of (39.95) for non-SOEs. However, this overall trend masks significant variations across different industries. For instance, in the Wireless Telecom. Services industry, SOEs have a substantially higher mean ESG score (70.69) compared to non-SOEs (48.44). While in the Industrial Conglomerates industry, non-SOEs outperform SOEs with an average ESG score of (62.36) compared to (44.66) for SOEs. Research by (Garcia et al., 2017) find significant variation in the practice of ESG performance among companies operating in BRICS countries (Brazil, Russia, India, China, and South Africa). The study found that companies in sensitive industries, which are subject to higher levels of public scrutiny and regulatory oversight, tend to have better ESG performance. This is because these companies are more likely to invest in ESG practices to mitigate the risks associated with their operations and to meet the expectations of their stakeholders. This supports our findings and suggests that the higher average ESG score in SOEs could be due to the fact that these companies are often part of sensitive industries, such as utilities and energy, which are subject to greater regulatory oversight and public scrutiny. These companies may invest more in ESG practices to reduce risks and meet stakeholder expectations, leading to higher ESG scores.

Figure 5.5: Mean ESG Scores by Industry (2015-2022)



We delve deeper into the data to explore the changes in ESG performance over time. Specifically, we examine the percentage increase in mean ESG scores from (2015-2018) to (2019-2022). We observe that SOEs had an increase of 36% in ESG scores, while non-SOEs experienced a 46% increase, yielding a 10% increase more than SOEs. The observed trends in ESG performance have important implications, particularly in the context of China. The substantial growth in ESG scores post-2018 indicates the positive impact of the regulation on ESG performance across industries. However, the variation in ESG performance underscores the need for a nuanced understanding of the specific challenges and opportunities within each industry. While it may look like the Code of Corporate Governance has generally improved ESG performance, its impact may vary depending on the specific characteristics of each industry. Below we have visualized the percentage increase in ESG scores for the four year period before and after the 2018 Code.

Figure 5.6: Percentage Increase in ESG Scores from (2015-2018) to (2019-2022)



The data reveals substantial variations across different industries. For instance, the Automobiles industry saw a remarkable increase in ESG scores for SOEs (60%) and non-SOEs (40%). Similarly, the Chemicals industry experienced a significant increase for SOEs (101%) and a substantial increase for non-SOEs (44%). These findings align with the research by (Garcia et al., 2017) which suggests that companies in sensitive industries tend to have better ESG performance due to increased regulatory oversight and public scrutiny. Yet, it is important to note that while the overall trend is positive, there are industries that lag behind. For instance, the Aerospace & Defense industry saw a relatively modest increase in

ESG scores for SOEs (15%) and non-SOEs (27%). The results suggests that the Code has been effective in promoting better ESG practices among listed companies in China. However, the degree of improvement varies significantly across different industries and between SOEs and non-SOEs. While regulatory measures are effective in promoting better ESG practices, a more nuanced approach may be necessary to address the specific challenges and opportunities within each industry. As China continues to evolve its regulatory framework, it will be crucial to monitor these trends and adjust strategies accordingly to ensure continued progress in ESG performance.

6 Methodology

6.1 Missing Data

In the process of collecting data, we encountered a significant amount of missing data, particularly in the period before 2018. A reason for this can be due to the regulatory environment in China differs substantially from that of Western countries. Research by (Noronha et al., 2013) suggests that CSR reporting in China is still in a preliminary stage and lags behind the rest of the Western world. The lack of a standardized reporting framework and the voluntary nature of CSR reporting in China might lead to inconsistencies and gaps in the data. The study further notes that Chinese companies operate under different disclosure requirements, which may not necessitate the reporting of certain data points that are commonly disclosed by companies in other countries. Chinese companies, particularly state-owned enterprises, may not disclose certain data due to different regulatory standards and privacy concerns, leading to gaps in the dataset. Language barriers and translation inaccuracies can further contribute to missing or incomplete data. The emphasis on ESG factors in reporting may not be as pronounced in Chinese corporate culture, resulting in less available data in these areas.

In our analysis, we preferred to discard observations with missing values rather than impute them. Imputation, although useful for preserving sample size, can inadvertently inject bias. For instance, Mean Imputation can dilute variance, as it substitutes missing data with mean values, diminishing overall data variability. Regression Imputation, despite its sophistication, relies on an assumed inter-variable relationship that may not truly exist, thus potentially introducing model-based bias. Though discarding missing data can risk information loss, we believe it is a more prudent and robust approach considering the risk of data misrepresentation through imputation. Importantly, we are also implementing Propensity Score Matching to refine our sample, further justifying the decision to remove NA's.

The following sections will detail the specific analytical techniques we employed, including Propensity Score Matching (PSM) and paired t-tests, Difference – in – Difference (DiD) analysis, and linear and pooled ordinary least squares (OLS) regression to further investigate the differences in ESG performance between SOEs and non-SOEs.

6.2 Propensity Score Matching

Propensity Score Matching (PSM) is a widely applied approach to estimate causal treatment effects, such as the impact of state ownership on ESG performance in our study. As indicated by our pre-matching descriptive statistics, there is a substantial divergence in observed characteristics, particularly Total Assets, between SOEs and non-SOEs. Therefore, we utilized the PSM method to balance these characteristics and ensure a solid foundation for comparability. PSM simulates a randomized experiment, mitigating selection bias, and simplifies matching by condensing multiple covariates into a single propensity score. The process begins with the estimation of the propensity score—probability of a firm being an SOE—followed by choosing a matching algorithm and determining the region of common support to ensure similar firms are compared, (Caliendo & Kopeinig, 2008).

Implementing PSM on our data set resulted in a decrease in observations from 1544 to 632, indicating a stringent pairing of SOEs and non-SOEs based on their propensity scores. This data set includes 316 SOEs and an equal number of non-SOEs, offering a balanced sample that facilitates precise estimation of the treatment effect of state ownership on ESG performance, taking into account observed firm characteristics. While this reduction in observations may seem substantial, it is a necessary trade-off for the enhanced validity and reliability of our results. This refined sample, as a result, offers a more accurate insight into the influence of state ownership on ESG performance. All matching results are presented in (Appendices D, PSM Matching).

Note that all control variables are winsorized at 1 % level.

6.3 Difference - in - Difference

Building on the matched data set, we conduct a Difference-in-Difference (DiD) analysis to identify the effects of a regulatory change on the ESG performance of SOE firms. This is done by comparing the change in ESG scores for SOEs and non-SOEs before and after the Code of Corporate Governance in 2018. The interaction term between SOE status and the post-regulation period is included in the regression model to capture this effect. This methodology is suitable for our study as it allows us to estimate the causal effect of being an SOE on ESG performance while controlling for observed characteristics and time-invariant unobserved characteristics. This approach also enables us to investigate if the Code of Corporate Governance has yielded any discernible influence over time, particularly with respect to any marked shifts in ESG performance trends between SOEs and non-SOEs.

$$\begin{aligned} \text{Diff-in-Diff estimate} &= (\text{Treatment_post} - \text{Treatment_pre}) - (\text{Control_post} - \text{Control_pre}) \\ & \hspace{20em} (6.1) \\ & = \end{aligned}$$

$$\text{Diff - in - Diff} = (\text{ESG}_{(T,t+r)} - \text{ESG}_{(T,t)}) - (\text{ESG}_{(C,t+r)} - \text{ESG}_{(C,t)}) \quad (6.2)$$

T = Treatment, C = Control, t = time before regulation, (t+r) = time after regulation

6.4 Panel Regression

Despite our initial approach favoring the fixed effects model to counteract time-invariant unobserved characteristics affecting ESG scores, it was not feasible to estimate for SOEs with this model. Using the 'plm' package in R, which typically assists in deciding between fixed and random effects models, (Croissant & Millo, 2008), the results yielded towards a fixed effects model. However, practical limitations led us to select pooled regression for our analysis. This method still enables us to concentrate on the key variables isolate their influence on ESG scores, yielding reliable estimates of their impacts.

Furthermore, we checked all five condition underlying the OLS to ensure the robustness of our results. First we used the Variance Inflation Factor (VIF) to control for multicollinearity in our regression model, ensuring that our predictors are not highly correlated, which would otherwise compromise the reliability of our results. We performed a Breusch-Pagan test for all models fitted, which revealed some level of heteroskedasticity. For corrective measures, we used heteroskedasticity-robust standard error and test statistics. Controlling for autocorrelation we performed Breusch-Godfrey tests, which suggested the presence of autocorrelation in our models, (Wooldridge, 2012). We used Cook's Distance test to identify and handle influential data points that could significantly alter our regression results, thereby improving the reliability of our model, (Cook, 1977). Upon visual inspection we find no signs of patterns in the estimated residuals. Hence, the linearity assumption is satisfied. Finally, the normality assumption is also satisfied by inspecting the plots.

(Model Diagnostics and Correlation matrices are reported in Appendices, B & C)

Model 1:

$$ESG_i = \beta_0 + \beta_1 SOE_i + \beta_2 TA_i + \beta_3 ROA_i + \beta_4 P/B_i + \beta_5 Leverage_i + \beta_6 Age_i + \beta_7 CSR_i + \epsilon_i \quad (6.3)$$

Model 2:

$$Category\ Score_i = \beta_0 + \beta_1 SOE_i + \beta_2 TA_i + \beta_3 ROA_i + \beta_4 P/B_i + \beta_5 Leverage_i + \beta_6 Age_i + \beta_7 CSR_i + \epsilon_i \quad (6.4)$$

Both with: (β_8 *IndustryDummies*)

7 Results and Discussion

H1: State-owned enterprises exhibit superior ESG performance compared to their non-state-owned counterparts.

We aim to examine the impact of state ownership on ESG performance of Chinese firms over the period 2015-2022. Using propensity score matching, we create a balanced sample of 632 observations, half of which are SOEs, and half are non-SOEs. The propensity scores are primarily matched on the size of the firms, as measured by Total Assets, where the biggest deviation is observed. We then calculated the Average Treatment Effect (ATE) for each variable, which represents the average difference in outcomes between SOEs and non-SOEs, combined with paired t-tests to assess the statistical significance of these differences. We expect to prove that state owned enterprises perform better than comparable non-state owned enterprises in terms of ESG scores.

Our results, presented below in Table 7.1, indicate a statistically significant difference in ESG performance between SOEs and non-SOEs, contradicting our Hypothesis 1. Specifically, the average treatment effect for ESG is -6.3252, with a t-value of -4.3754. This suggests that, on average, SOEs have lower ESG scores than comparable non-SOEs. This result is highly statistically significant at the 1% level. For the control variable Total Assets, we observe an ATE of -0.0424, a t-value of -0.4058. This lack of significant difference in size between SOEs and non-SOEs in our sample is a good indication of successful propensity score matching. Likewise, other control variables such as Return on Assets (ROA), Price-to-Book ratio (P/B), Age, and the presence of a CSR Committee demonstrate no significant differences between SOEs and non-SOEs, further supporting the adequacy of our propensity score matching. Leverage, however, displays a significant correlation with state ownership, suggesting that SOEs typically have lower leverage than non-SOEs.

Table 7.1: SPM, ATE and paired t-test for SOEs in the period (2015 – 2022)

	ATE	t-value	p-value	
ESG	-6.3252 (1.4448)	-4.3754	0.0000	***
Total Assets	-0.0424 (0.1044)	-0.4058	0.6852	
ROA	0.0025 (0.0051)	0.4931	0.6223	
P/B	-0.0258 (0.2988)	-0.0864	0.9312	
Leverage	-0.1693 (0.0944)	-1.7929	0.0739	*
Age	0.3576 (0.5361)	0.6668	0.5054	
CSR.Committee	0.0032 (0.0404)	0.0792	0.9369	

Note: This table presents the coefficients for ATE estimation, t-value and p-value. All based on the propensity-score matched data set for the period 2015 – 2022. A default logistic model predicts each firm’s propensity score using the control variables mentioned above. The sample consists of 632 observations, evenly split between state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs), with each group accounting for 316 observations. Degrees of freedom is 315. The statistical significance levels are the following: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard Errors are reported in parentheses.

These results suggest that the lower ESG performance of SOEs cannot be attributed to differences in the observed variables. The divergence from our initial hypothesis, along with the regulatory changes in 2018, warrants further examination, potentially dividing the analysis into pre-regulation (2015-2018) and post-regulation (2019-2022) periods. This approach could reveal the regulatory changes’ impact on the relationship between state ownership and ESG performance, offering a deeper understanding of Chinese firms’ dynamics. The results from the pre-regulation period serve as a baseline, enabling us to evaluate the relationship between state ownership and our variables of interest without the influence of regulatory changes. We first look at the results for the pre-regulation period, presented below in Table 7.2.

Table 7.2: SPM, ATE and paired t-test for SOEs in the period (2015 – 2018)

	ATE	t-value	p-value	
ESG	-3.6540 (1.9390)	-1.8835	0.0611	*
Total Assets	0.1121 (0.1613)	0.6958	0.4873	
ROA	-0.0045 (0.0074)	-0.6050	0.5458	
P/B	0.3869 (0.3988)	0.9707	0.3328	
Leverage	0.0422 (0.1428)	0.2955	0.7680	
Age	0.3057 (0.8378)	0.3648	0.7156	
CSR.Committee	0.0600 (0.0627)	0.9561	0.3401	

Note: This table presents the coefficients for ATE estimation, t-value and p-value. All based on the propensity-score matched data set for the period 2015 – 2018. A default logistic model predicts each firm’s propensity score using the control variables mentioned above. The sample consists of 220 observations, evenly split between state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs), with each group accounting for 110 observations. Degrees of freedom is 219. The statistical significance levels are the following: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard Errors are reported in parentheses.

The results from the pre-regulation period (2015-2018) indicated no significant ESG performance advantage for SOEs. The Average Treatment Effect for ESG was -3.6540, a result statistically significant at the 10% level, indicating a tendency for SOEs to have lower ESG scores than their non-SOE counterparts. Still contradicting our initial hypothesis (H1) that SOEs would exhibit superior ESG performance. In addition, variables such as Total Assets, Return on Assets, Price-to-Book, Leverage, Age, and the presence of a CSR Committee also showed no significant differences between the two groups. These findings suggest that, prior to the 2018 regulatory changes, SOEs and non-SOEs performed similarly across these parameters. We now shift our focus to the post-regulation period (2019-2022) to discern if there have been changes due to regulatory adjustments. The results of this period are displayed in Table 7.3.

Table 7.3: SPM, ATE and paired t-test for SOEs in the period (2019 – 2022)

	ATE	t-value	p-value	
ESG	-6.5720 (1.7318)	-3.7951	0.0002	***
Total Assets	-0.1023 (0.1194)	-0.8572	0.3919	
ROA	0.0059 (0.0063)	0.9328	0.3515	
P/B	-0.1974 (0.3938)	-0.5014	0.6164	
Leverage	-0.2842 (0.1135)	-2.5024	0.0127	*
Age	0.7450 (0.6629)	1.1241	0.2617	
CSR.Committee	0.0540 (0.0419)	1.2869	0.1987	

Note: This table presents the coefficients for ATE estimation, t-value and p-value. All based on the propensity-score matched data set for the period 2019 – 2022. A default logistic model predicts each firm’s propensity score using the control variables mentioned above. The sample consists of 404 observations, evenly split between state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs), with each group accounting for 202 observations. Degrees of freedom is 403. The statistical significance levels are the following: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard Errors are reported in parentheses.

In the post-regulation period (2019-2022), we see substantial changes in the ESG performance and Leverage of SOEs compared to non-SOEs. Notably, there is a significant and even larger decrease in the ESG performance of SOEs, with an Average Treatment Effect of -6.5720. This value is statistically significant at the 1% level, underscoring that SOEs significantly underperform in ESG metrics compared to non-SOEs in this period. We also observe that Leverage for SOEs exhibits a substantial negative shift (ATE = -0.2842), which is statistically significant at the 10% level. This suggests that in the post-regulation period, SOEs operate with less leverage than their non-SOE counterparts. For the other variables the post-regulation period does not show any significant differences between SOEs and non-SOEs.

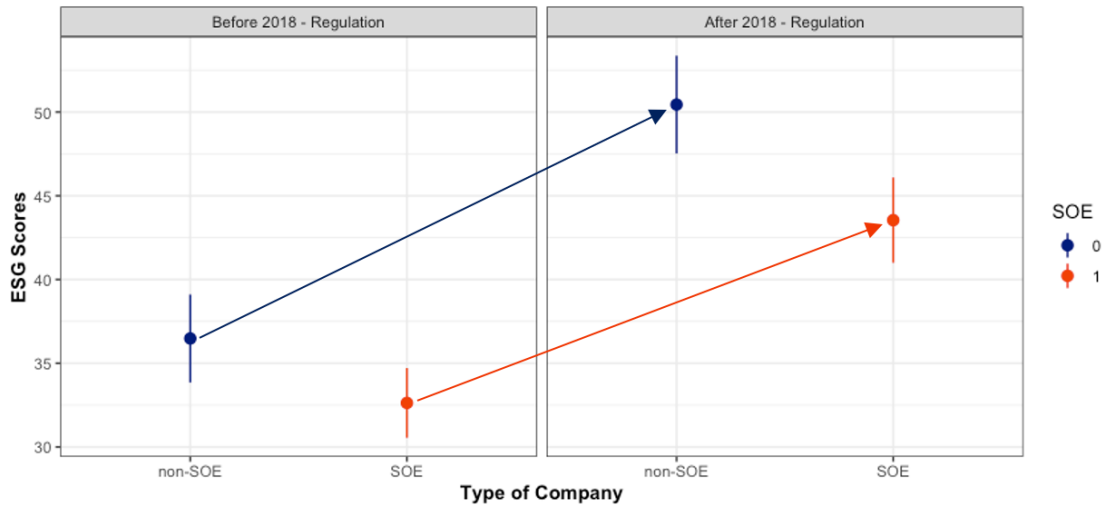
Our hypothesis proposed that SOEs would show superior ESG performance compared to non-SOEs in China from 2015 to 2022. However, our results seem to be aligned with the studies by (Fuadah et al., 2022) and (Yang & Li, 2023), underscoring that SOEs tend to perform worse in ESG metrics to their non-SOE counterparts. Across the entire period, SOEs displayed significantly lower ESG scores, a trend that was amplified post-regulation in 2019-2022. Similarly, Leverage for SOEs was significantly lower, particularly after regulation. Despite these findings, no significant differences were noted for other variables such as Total Assets, ROA, P/B, Age, and presence of a CSR Committee. We plan to delve deeper into the regulatory impacts through a Difference-in-Differences analysis in the following section.

H2: The implementation of the 2018 Corporate Governance Code for listed companies have exerted a more pronounced influence on the ESG scores of non-state-owned enterprises (non-SOEs), relative to their state-owned enterprise (SOE) counterparts.

We aim to further examine the influence of the 2018 Corporate Governance Code on ESG scores across SOEs and non-SOEs. After observing the existence of a constant increasing trend in ESG scores for both types of enterprises, from the preliminary analysis, we hypothesize that the implementation of this regulatory framework has had a more significant impact on non-SOEs. To test this hypothesis and to reevaluate Hypothesis 1 in a different light, we employ a Difference-in-Difference (DiD) approach using our Propensity Score Matched data set. This method will allow us to observe potential trends in ESG scores over time and assess the differential impact of the regulation on the two groups of enterprises. We introduce the interaction term 'PostReg' between SOE and a time dummy, ($\geq 2019, 1, 0$).

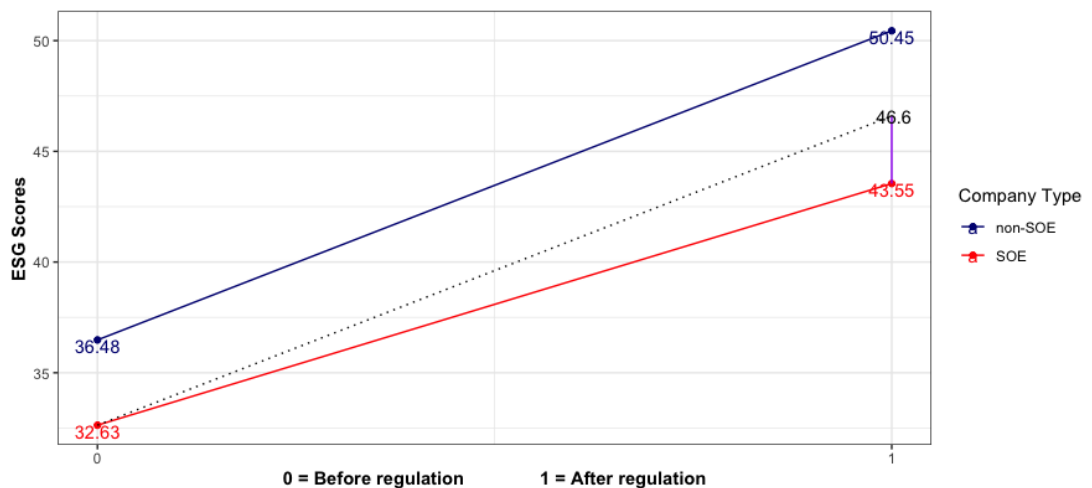
Figure 7.1 below, compares the mean ESG scores of SOEs and non-SOEs before and after the 2018 Regulation. Before the regulation, non-SOEs had a higher average ESG score (36.5) than SOEs (32.6). However, post-regulation, both groups showed increased ESG scores, with non-SOEs reaching 50.4 and SOEs 43.5. The more significant improvement in non-SOEs supports Hypothesis 2 that the 2018 Corporate Governance Code had a greater influence on non-SOEs.

Figure 7.1: Comparative ESG Scores Before and After the 2018 Regulation



We calculate the difference in ESG scores for SOEs and non-SOEs before and after the regulation, showing a 'treatment effect' of -3.05. This negative value indicates that the regulation's impact was less pronounced for SOEs compared to non-SOEs, supporting our second hypothesis. As visualized in Figure 7.2 below, the blue and red lines represent the average ESG scores for non-SOEs and SOEs, respectively, before and after the regulation. The purple line represents a hypothetical scenario. It illustrates what the average ESG score of SOEs would have been after the 2018 regulation if they had followed the same trend as non-SOEs. The divergence of the red line from the purple line reflects the lesser impact of the regulation on SOEs, quantified by the treatment effect of -3.05.

Figure 7.2: DiD Analysis of the Mean ESG Scores Before and After Regulation



The absence of a distinct shift in ESG trends post the 2018 regulation suggests its influence might be limited. However, the observed continuous upward trend in ESG scores pre-regulation, driven by factors such as investor expectations and global pressures, could be overshadowing the regulation’s impact. Consequently, the regulation’s effect might not be explicitly captured in our model. Although this does not affirm a substantial impact of the regulation, it implies the need for further refined analysis to unravel the regulation’s specific contribution amidst the broader, pre-existing, positive ESG trend.

To further explore our second hypothesis, we conduct a DiD regression. This isolates the regulation’s effect on ESG performance by calculating the difference in ESG scores for SOEs (treatment group) and non-SOEs (control group) pre and post-regulation. This approach provides a more nuanced understanding of the regulation’s impact, or rather the lack of it. Below, we present the results for the regression with the interaction term.

Table 7.4: Difference-in-Difference Regression Results (with Interaction Term)

Dependent Variable: ESG	Std. Error
SOE1	-3.850* (1.830)
PostReg	13.964*** (1.848)
SOE1:PostReg	-3.050 (2.618)
Constant	36.481*** (1.343)
Observations	632
R2	0.155
Adjusted R2	0.151
Residual Std. Error	16.397 (df = 628)
F Statistic	38.420*** (df = 3; 628)

Note: *** p<0.01, ** p<0.05, * p<0.1

The SOE1 variable represents the difference in ESG scores between SOEs and non-SOEs before the regulation. The negative coefficient of -3.850, significant at the 10% level, suggests that before the regulation, SOEs had, on average, lower ESG scores compared to non-SOEs, controlling for other factors. The PostReg variable captures the average effect on ESG scores of the 2018 Corporate Governance Code

for all companies. The positive and highly significant coefficient of 13.964 implies that there was a considerable increase in ESG scores after the introduction of the regulation across all companies, again controlling for other factors. However, it is essential to note that these effects are average trends and cannot necessarily isolate the impact of the regulation from other factors that could influence ESG scores over time, as previously discussed. It is also worth noting that the SOE1:PostReg interaction term, intended to measure the differential effect of the regulation on SOEs relative to non-SOEs, is not statistically significant. This suggests that, while the regulation has had a positive impact on ESG scores overall, it has not led to a significantly different effect for SOEs compared to non-SOEs, contradicting our initial hypothesis 2. We extend our analysis with a new regression, including control variables, to see if the results change.

Table 7.5: Difference-in-Difference Regression Results (with Control Variables)

Dependent Variable: ESG	Std. Error
SOE1	-5.180*** (1.512)
PostReg	8.484*** (1.609)
Total Assets	4.060*** (0.503)
ROA	16.360 (11.810)
P/B	-0.247 (0.187)
Leverage	0.066 (0.555)
Age	-0.151 (0.082)
CSR.Committee	13.758*** (1.173)
SOE1:PostReg	-0.729 (2.167)
Constant	-59.209*** (11.809)
Observations	632
R2	0.431
Adjusted R2	0.423
Residual Std. Error	13.516 (df = 622)
F Statistic	52.432*** (df = 9; 622)

Note: *** p<0.01, ** p<0.05, * p<0.1

Table 7.5 shows the results after we introduced control variables to account for other factors influencing ESG scores. The SOE1 coefficient is significant and negative (-5.180***), showing SOEs have lower ESG scores than non-SOEs. The PostReg coefficient remains positive and significant (8.484***), while the variable suggests a positive impact of the regulation on ESG scores, it could also be capturing an ongoing upward trend that was happening regardless of the regulatory change. Further research could help disentangle these effects and provide more insights into the true impact of the 2018 regulation. Furthermore, the interaction term SOE1:PostReg is not significant, indicating no differential effect of the regulation on SOEs. Among the control variables, Total Assets and presence of a CSR committee show a significant positive effect on ESG scores. Other control variables, including Age, ROA, P/B, and Leverage, are not statistically significant. The results suggest the 2018 regulation had a general positive impact on ESG scores, but the specific effect on SOEs is less clear when other factors are considered.

After investigating the 2018 Code of Corporate Governance specific effect on ESG scores and assessing certain control variables' influence, we are now shifting our focus to better understand the factors impacting ESG scores, thereby enhancing causal inference. We will utilize a panel regression approach, which will account for both cross-sectional and time series data, allowing us to draw more robust conclusions about what causes ESG score changes. Panel data regression, particularly fixed or random effects models, allows for controlling unobserved time-invariant heterogeneity, potentially overlooked by ATE, PSM, and DiD. Although our initial preference leaned towards the fixed effects model, due to the Hausman test, it proved unfeasible when applied to SOEs. We chose to move forward with pooled regression as our method of analysis due to certain practical constraints. Nevertheless, this method still enables concentration on key variables, providing reliable estimates of their impacts on ESG scores. Table 7.6 below shows the results of our pooled regression analysis conducted for the entire sample. Detailed interpretations of each variable's influence on ESG scores will follow.

Table 7.6: Pooled Panel Data Regression (2015-2022)

Dependent Variable: ESG		Std. Error
SOE1	-6.237***	(1.117)
Total Assets	4.379***	(0.518)
ROA	8.685	(12.177)
P/B	-0.030	(0.191)
Leverage	-0.178	(0.574)
Age	-0.015	(0.083)
CSR.Committee	15.922***	(1.170)
Constant	-65.866***	(12.189)
Observations	632	
R2	0.388	
Adjusted R2	0.381	
F Statistic	56.538*** (df = 7; 624)	

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

We observe that the coefficient for SOE1 is -6.237, significant at the 0.01 level, indicating that SOEs have a lower ESG score on average than non-SOEs, when controlling for other factors. Total Assets shows a significant positive impact on ESG scores. For every unit increase in TA, the ESG score increases by 4.379 units, holding other variables constant. This result suggests larger companies tend to have higher ESG scores, which we will look more into. CSR.Committee also shows a significant positive impact, implying that the presence of a CSR committee within a company is highly associated with higher ESG scores. In contrast, the influence of ROA, P/B ratio, Leverage, and Age on ESG scores is not significant in this regression model.

Now, to understand whether firm size mediates these effects, we will divide the sample into two categories: small firms (those below the median size) and large firms (those above the median size). We will then re-run the regression analysis for each group separately and compare the results, which should provide insights into whether and how these influences differ by firm size. The results are presented below in Table 7.7.

Table 7.7: Pooled Regression Results by Firm Size: Small vs Large

Dependent Variable: **ESG**

Model: Pooled	Small Firms	Large Firms
SOE1	-3.274* (1.580)	-9.052*** (1.612)
Total Assets	6.113*** (1.217)	4.979*** (1.044)
ROA	24.260 (15.732)	-4.016 (19.127)
P/B	-0.108 (0.228)	0.003 (0.389)
Leverage	0.925 (0.726)	-2.088* (0.972)
Age	-0.342** (0.118)	0.321** (0.115)
CSR.Committee	15.241*** (1.654)	16.631*** (1.607)
Constant	-100.712*** (27.392)	-83.759** (25.408)
Observations	316	316
R2	0.327	0.363
Adjusted R2	0.312	0.349
F Statistic	21.423*** (df = 7; 308)	25.090*** (df = 7; 308)

Note: *p<0.1; **p<0.05; ***p<0.01

Starting with the variable SOE1, the negative coefficient for both small and large firms suggests that state ownership is linked with lower ESG scores. This finding further aligns with our prior results and contradicts our initial hypothesis 1, which postulated that state ownership would lead to higher ESG scores. However, this effect is stronger and more statistically significant for large firms (-9.052*** vs -3.274*), suggesting that firm size does mediate this relationship to some extent. Similarly, the influence of Total Assets is positive and significant for both small

and large firms, suggesting that an increase in firm size is associated with higher ESG scores. Interestingly, the effect is slightly stronger for small firms (6.113*** vs 4.979***), implying that firm size might amplify the impact of total assets on ESG scores for smaller firms. This might appear counter intuitive, as one might expect larger firms, especially state-owned ones, to have more resources to invest in ESG initiatives, (Drempetic et al., 2020). However, it might be the case that these larger state-owned enterprises face unique constraints or incentives that make them less likely to achieve high ESG scores. These could include bureaucratic inertia, conflicting policy objectives, or less pressure from shareholders to focus on ESG, (Fuadah et al., 2022).

When it comes to ROA and P/B ratios, we do not see a significant effect in either small or large firms. In contrast, the leverage factor shows a positive, non-significant impact on ESG for small firms but has a negative, significant influence for large firms (-2.088*), which indicates that firm size might reverse the effect of leverage on ESG scores. For Age, the effect is significant and in opposite directions for small and large firms, suggesting that older small firms have lower ESG scores, while older large firms have higher ESG scores. This further demonstrates that firm size can significantly moderate the influence of age on ESG performance. The presence of a CSR committee is positively and significantly associated with ESG scores for both small and large firms, but the effect is slightly stronger for large firms. This indicates that the presence of a CSR committee can benefit firms of all sizes in terms of ESG performance, but the advantage may be slightly greater for larger firms.

Overall, the results from Table 7.7 reveal significant variations in how factors influence ESG performance across small and large firms. This underscores the importance of considering firm size when evaluating determinants of ESG performance. It further suggests that firm size does indeed mediate the effects of several variables on ESG scores. Following these insights, we now turn our attention to the entire sample, moving away from the firm size restrictions. To further evaluate the robustness of our findings and explore any additional patterns, we will conduct a linear regression for the whole sample period, adjusting for industry-wide effects and outliers. The results are presented in Table 7.8 below, followed by an interpretation.

Table 7.8: Linear Regression and Adjusted Linear Regression (2015 – 2022)Dependent Variable: **ESG**

	Linear Reg	Adj. Linear Reg
SOE1	-6.237*** (1.117)	-3.719*** (1.04054)
Total Assets	4.379*** (0.518)	3.914*** (0.52810)
ROA	8.685 (12.177)	9.303 (12.46727)
P/B	-0.030 (0.191)	0.184 (0.19633)
Leverage	-0.178 (0.574)	-0.553 (0.56891)
Age	-0.015 (0.083)	0.177* (0.08252)
CSR.Committee	15.922*** (1.170)	16.575*** (1.05966)
Constant	-65.866*** (12.189)	-70.246*** (11.436)
Industry Dummy	No	Yes
Observations	632	606
R2	0.388	0.930
Adjusted R2	0.381	0.926
Residual Std. Error	13.999 (df = 624)	11.914 (df = 577)
F Statistic	56.538*** (df = 7; 624)	23.686*** (df = 28; 577)

Note: *p<0.1; **p<0.05; ***p<0.01

The findings from the initial linear regression, based on the original PSM data set, are consistent with our earlier analysis. SOE1 shows a significant negative impact on ESG scores, indicating that state-owned enterprises have lower ESG scores. The Total Assets variable maintains its positive association with ESG scores, implying that larger firms tend to perform better on ESG criteria. The presence of a CSR Committee also significantly contributes to higher ESG performance. Other variables like ROA, P/B, Leverage, and Age do not exhibit significant relationships with ESG scores.

The adjusted linear regression model takes into consideration the impact of industry-wide effects, represented by industry dummies. Additionally, it mitigates the potential influence of outliers. To counter the impact of these outliers, we employed Cook’s distance, as depicted in Figure B.1 in the Appendices. We removed observations that exceeded a commonly used threshold of $4/n$, ensuring that our regression model is not overly influenced by these particular data points, (Pinho et al., 2015). In this refined analysis, the impact of state ownership on ESG scores remains significant but less pronounced, suggesting that some of the previous effect could be attributed to industry-wide effects and outliers. The positive influence of Total Assets on ESG scores and the significant contribution of a CSR Committee to ESG performance persist in this model. Additionally, we observe a positive relationship between Age and ESG scores that was not apparent in the initial regression, indicating that older firms tend to have higher ESG scores. In order to further delve into the nuanced effects of state ownership on ESG performance, our focus in the following section will shift towards the ESG category scores. This granular analysis will allow us to observe if, and how, state-owned enterprises prioritize ESG initiatives differently than their privately-owned counterparts. This will put to test our third hypothesis:

H3: State-owned enterprises will prioritize ESG initiatives differently than their state-owned counterparts, which will be reflected in the ESG category scores.

This exploration revolves around the impact of state ownership utilizing the ten ESG category scores. Each category represents a unique facet of a company’s ESG performance, (a detailed description of the ten category scores can be found in *Appendices: A*). To validate this hypothesis, we will carry out ten regressions using each ESG category score as the dependent variable, based on the PSM adjusted data set. This approach will uncover the precise ESG areas impacted by state ownership. The results of this analysis are presented in Table 7.9 on the next page, followed by a discussion.

Note: The regressions (1) – (10) have the following dependent variables:

<i>Resource use score (1)</i>	<i>Workforce score (4)</i>	<i>Management score (8)</i>
<i>Emissions score (2)</i>	<i>Human rights score (5)</i>	<i>Shareholder score (9)</i>
<i>Innovation score (3)</i>	<i>Community score (6)</i>	<i>CSR strategy score (10)</i>
	<i>Product responsibility score (7)</i>	

Table 7.9: Category Scores as Dependent Variable (OLS Regressions)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SOE1	-9.097*** (1.813)	-4.505 (1.828)	-4.699 (2.329)	-4.278 (1.743)	-4.013** (1.380)	-7.229*** (1.680)	-2.050 (2.442)	4.239 (2.258)	-26.621*** (2.040)	-4.268** (1.648)
Total Assets	6.018*** (0.839)	5.547*** (0.846)	9.030*** (1.077)	3.481*** (0.807)	3.359*** (0.638)	5.395*** (0.777)	3.201** (1.130)	3.079** (1.045)	-0.682 (0.944)	4.735*** (0.763)
ROA	52.447* (20.300)	26.296 (20.460)	-68.182** (26.069)	24.556 (19.518)	5.890 (15.448)	3.673 (18.808)	4.934 (27.339)	32.494 (25.275)	-58.191* (22.836)	24.962 (18.451)
P/B	-0.679* (0.333)	0.157 (0.335)	1.855*** (0.427)	-0.249 (0.320)	0.169 (0.253)	0.975** (0.308)	-0.405 (0.448)	-1.569*** (0.414)	-0.917* (0.374)	-0.701* (0.302)
Leverage	0.161 (0.957)	-2.432* (0.964)	0.877 (1.229)	-1.599 (0.920)	0.608 (0.728)	-2.567** (0.886)	-0.119 (1.288)	1.183 (1.191)	0.098 (1.076)	0.782 (0.870)
Age	0.153 (0.136)	0.648*** (0.137)	-0.040 (0.175)	0.168 (0.131)	0.172 (0.104)	-0.051 (0.127)	0.036 (0.185)	-0.284 (0.169)	0.025 (0.154)	0.105 (0.125)
CSR.Committee	32.037*** (1.896)	26.513*** (1.911)	4.565 (2.435)	15.238*** (1.823)	11.622*** (1.443)	24.639*** (1.757)	4.620 (2.554)	4.620 (2.361)	-0.984 (2.133)	42.187*** (1.723)
Constant	-117.305*** (19.738)	-107.965 (19.894)	-187.406 (25.347)	-38.617* (18.977)	-74.651*** (15.020)	-102.831*** (18.287)	-43.298 (26.582)	-14.263 (24.576)	78.572*** (22.204)	-77.337*** (17.940)
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	606	606	606	606	606	606	606	606	606	606
Adjusted R2	0.443	0.362	0.151	0.303	0.243	0.189	0.175	0.069	0.242	0.577
Std. Error	22.210	22.386	28.522	21.355	16.902	20.578	29.912	27.654	24.985	20.188
F Statistic	69.651***	49.938***	16.405***	38.635***	28.763***	21.093***	19.368***	7.417***	28.631***	119.033***

Note: *p<0.1; **p<0.05; ***p<0.01

The results presents compelling evidence in favor of our hypothesis. In five out of the ten ESG categories investigated, the SOE1 coefficient, which denotes the impact of state ownership, proved to be statistically significant and negative. This negative relationship suggests that SOEs, compared to non-state-owned firms, tend to score lower in these categories. The following ESG scores were influenced by state ownership:

1. Resource use score (SOE1 = -9.097***): This highly significant finding suggests that state-owned companies are less efficient in resource utilization than their private counterparts, reflecting a lower prioritization of this ESG aspect. Our findings align with a study conducted by researchers in China, which found that SOEs tend to have higher levels of pollution due to their lower energy efficiency and higher resource utilization (Wang et al., 2022). This suggests that SOEs may prioritize resource use differently, possibly due to unique operational contexts or regulatory pressures.

2. Human rights score (SOE1 = -4.013**): SOEs also lag in terms of respecting and promoting human rights, although the magnitude of this effect is smaller than that of resource use. The United Nation points out that the performance of SOEs on issues of governance and human rights is mixed, with reported cases of harm caused to workers and communities throughout SOEs' operations (UN Report, Geneva, 2016).

3. Community score (SOE1 = -7.229***): The strong negative relationship implies that SOEs might be less invested in community development and engagement initiatives. We know from prior research that a large portion of SOEs tend to have higher levels of pollution, (Wang et al., 2022).

4. Shareholder score (SOE1 = -26.621***): The largest negative effect is observed in the shareholder category. This suggests that state-owned enterprises may have a different approach towards shareholders, possibly due to their unique governance structures and stakeholder dynamics. (L.-W. Lin, 2013) argue that the Chinese state-owner is not an ordinary controlling shareholder, which could explain the different approach towards shareholders observed in SOEs. This unique governance structure and stakeholder dynamics in SOEs could potentially lead to a lower shareholder score, as suggested by our findings.

5. CSR strategy score (SOE1 = -4.268**): The significant negative coefficient indicates that SOEs might be less proactive in integrating CSR into their strategic planning and operations. This is supported by another study conducted in China, which found that while reductions in state ownership may lead to a decrease in CSR activities, this does not necessarily mean that SOEs are more strategic in their approach to CSR. It could be that these CSR activities are driven more by government mandates or regulations rather than a strategic focus on CSR, (F. U. Khan et al., 2019). This suggests that the unique governance structures and stakeholder dynamics of SOEs may influence their approach towards CSR, potentially leading to a more compliance-driven rather than strategic approach.

It is important to note that these effects vary in magnitude, suggesting that state ownership impacts different ESG categories to different extents. However, the consistent negative relationship across these categories underscores that state ownership does indeed influence the prioritization of ESG initiatives. We observe that the size of the company, represented by Total Assets, held a statistically significant, positive relationship with all category scores, except the shareholder score. This suggests larger firms generally perform better across various ESG categories, possibly due to increased resources and stakeholder expectations. This pattern is consistent with our prior results and underlines the importance of firm size in the implementation and success of ESG initiatives.

The presence of a dedicated CSR Committee significantly influenced ESG scores positively in 6 out of 10 categories, underlining its crucial role in ESG performance. While other factors like ROA, P/B ratio, Leverage, and Age also showed occasional significant effects, they were not as consistent as state ownership, Total Assets, and the CSR Committee.

Now, as we approach the end of our thesis, we will conclude our main findings about state ownership and its influence on ESG performance. We will revisit our three hypotheses and their outcomes, focusing on the impact, or rather the lack of, of regulatory changes. This will set the stage for the final, discussion in our conclusion.

8 Conclusion

In the conclusion of this master's thesis, we have constructed a multi-layered exploration into the relationship between state ownership and ESG performance in Chinese companies. Over the course of three distinct yet interconnected hypotheses, we have utilized regression analyses to derive critical insights, thereby advancing our understanding of this complex and intricate issue.

In the first hypothesis, we examined the overarching relationship between state ownership and overall ESG performance. The analyses conducted on the sample data revealed a significant negative correlation between state ownership and ESG scores, leading us to conclude that state-owned enterprises SOEs perform worse in terms of ESG than their private counterparts. Furthermore, we discovered that the size of the company, as indicated by total assets, had a positive relationship with ESG scores. This underlines that larger companies are generally better positioned to implement ESG initiatives, possibly due to greater resources and higher stakeholder expectations, (Drempetic et al., 2020).

In our second hypothesis, we shifted focus to the influence of the 2018 Corporate Governance Code on ESG performance, positing a more pronounced impact on non-state-owned enterprises compared to SOEs. Analysis of the pre- and post-regulation data showed a marked increase in ESG scores for both SOEs and non-SOEs, although non-SOEs experienced a more significant enhancement. The 'treatment effect' of -3.05 reflected this differential impact, supporting our initial hypothesis. However, when we dug deeper using the Difference-in-Difference (DiD) regression method, the picture became less clear. Although the overall positive impact of the 2018 regulation on ESG scores was evident, the differential effect on SOEs was less pronounced and statistically insignificant once other factors were controlled for. This does not negate the potential influence of the regulation on SOEs, but suggests its specific impact may be less than initially hypothesized, and could be overshadowed by broader, pre-existing positive trends in ESG performance.

In the third, and final hypothesis, we investigated how SOEs prioritize ESG initiatives compared to their private counterparts using the ten ESG category scores as our measure. Our regression analyses revealed that SOEs scored lower in nine out of ten categories. However, only five of these—resource use, human rights, community involvement, shareholder rights, and CSR strategy—were statistically significant. This pattern further underscores the distinct impact of state ownership on the prioritization and effectiveness of ESG initiatives. It is worth noting that the presence of a dedicated CSR Committee significantly and positively influenced ESG scores across multiple categories, highlighting its crucial role in enhancing ESG performance.

In conclusion, this thesis provides a comprehensive exploration of the interplay between state ownership and ESG performance. By utilizing rigorous statistical analysis and thoughtful interpretation, we have deepened our understanding of this critical relationship, thereby contributing to the body of knowledge surrounding corporate ESG practices.

9 Future Research

As we conclude our study on the impact of regulatory changes and ownership structures on ESG performance in Chinese firms, we recognize the potential for further exploration.

Data Source and Methodology: The ESG scores utilized in this study were sourced solely from Eikon Refinitiv. Future research could benefit from incorporating data from other providers like Bloomberg, MSCI, and Sustainalytics, which employ their unique methodologies to score ESG performance. Cross-analysis across different rating systems could help validate our findings and offer a broader understanding of ESG performance among Chinese firms. Such a multifaceted approach would control for potential biases associated with a single source, fostering a more balanced and robust analysis.

Regulatory Impact on SOEs and Non-SOEs: Despite the overall positive influence of the 2018 Corporate Governance Code on ESG performance, the differential impact on SOEs and non-SOEs remains unclear. This suggests the need for further investigation employing refined methodologies to distinguish the specific effects of this regulatory framework amidst the broader positive trend in ESG performance. This could potentially lead to customized regulatory suggestions for enhancing ESG performance, particularly in SOEs.

SOEs' ESG Prioritization: The distinct prioritization of ESG initiatives by SOEs, as identified in our third hypothesis, invites in-depth exploration. Understanding the why and how behind this prioritization, potentially through interviews or case studies, could be illuminating. Investigating the motivations, barriers, and incentives surrounding SOEs' ESG adoption could provide valuable insights.

Role and Constitution of CSR Committees: The thesis identifies the presence of a CSR Committee as a positive influencer of ESG scores. However, the characteristics that define an effective CSR Committee are unexplored. Future studies could investigate the attributes of these committees (such as size, diversity, expertise) and their relationship with ESG performance, thereby yielding actionable insights for firms aiming to bolster their ESG initiatives.

10 References

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Appendices

A Description of the ESG Category Scores

Table A.1: Description of the ten ESG Category Scores

Resource use score (E)	A company's performance and capacity to reduce use of energy, water, or materials, more eco-efficient and to find solutions by improving supply chain management.
Emissions score (E)	A company's commitment and effectiveness in operational processes to reduce environmental emissions.
Innovation score (E)	A company's ability to reduce environmental costs and burden for its customers, thereby explore new technologies and processes, or eco-designed products to create new market opportunities.
Workforce score (S)	A company's effort to ensure job satisfaction, health and safety at the workplace, maintaining diversity and equal opportunities and develop opportunities for its workforce.
Human Rights score (S)	A company's effectiveness in terms of respecting fundamental human rights conventions.
Community score (S)	A company's effort to be a good citizen, protecting health, and respecting business ethics.
Product Responsibility score (S)	A company's capacity to produce quality goods and services, integrating health and safety, and data privacy.
Management score (G)	A company's effort towards following best practice corporate governance principles.
Shareholder score (G)	A company's effectiveness towards equal treatment of shareholders and use of anti-takeover devices.
CSR Strategy score (G)	A company's practice to communicate that it integrates E,S and G dimensions into its daily decision-making processes.

Source: eikon.refinitiv.com (2023)

B Model Diagnostics

Table B.1: Variance Inflation Factors (VIF) for Multicollinearity

	SOE	TA	ROA	P.B	Leverage	Age	CSR
Small Firms							
VIF	1.0226	1.1821	1.8198	1.6938	1.4014	1.0331	1.0764
Large Firms							
VIF	1.0868	1.0871	1.7052	1.2404	1.5176	1.0410	1.0352
Adjusted Linear Regression							
VIF	1.0098	1.2303	1.6769	1.5107	1.3522	1.0116	1.1041

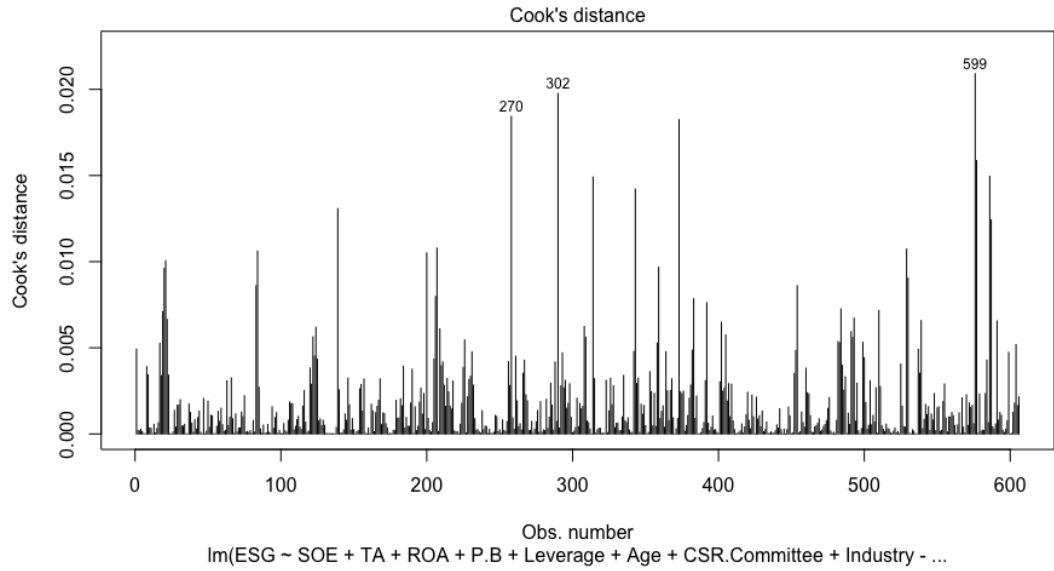
Table B.2: Breusch-Pagan Tests for Heteroskedasticity

Dependent Variable	p-value
ESG Score	0.018
Resource Use Score	0.176
Emissions Score	0.005
Environmental Innovation Score	0.015
Workforce Score	0.000
Human Rights Score	0.000
Community Score	0.000
Product Responsibility Score	0.000
Management Score	0.382
Shareholders Score	0.014
CSR Strategy Score	0.000

Table B.3: Breusch-Godfrey Tests for Autocorrelation

Dependent Variable	p-value
ESG Score	0.012
Resource Use Score	0.000
Emissions Score	0.000
Environmental Innovation Score	0.000
Workforce Score	0.000
Human Rights Score	0.000
Community Score	0.000
Product Responsibility Score	0.000
Management Score	0.000
Shareholders Score	0.000
CSR Strategy Score	0.000

Figure B.1: Cook's Dinstance



C Correlation Matrices

Table C.1: Correlation Matrix for Control Variables

	ESG	TA	ROA	P.B	Leverage	Age	CSR
ESG	1	0.397	-0.104	-0.199	0.026	-0.026	0.540
TA	0.397	1	-0.216	-0.311	0.150	-0.052	0.312
ROA	-0.104	-0.216	1	0.484	-0.438	0.005	-0.137
P.B	-0.199	-0.311	0.484	1	0.014	0.071	-0.159
Leverage	0.026	0.150	-0.438	0.014	1	0.036	0.006
Age	-0.026	-0.052	0.005	0.071	0.036	1	0.011
CSR	0.540	0.312	-0.137	-0.159	0.006	0.011	1

D PSM Matching

Figure D.1: Pre-Matched Density Plot of Total Assets

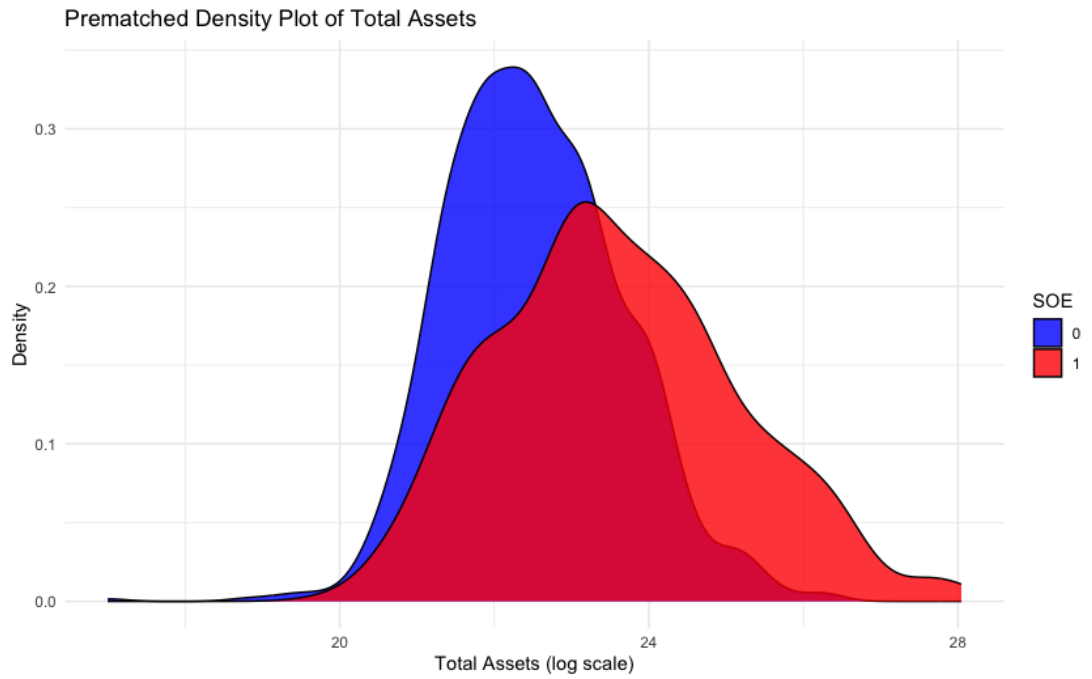


Table D.1: Summary of Balance for Matched Data

	Means Treated	Means Control	Std. Mean Diff.	Var. Ratio
distance	0.3541	0.3514	0.0137	1.0487
Total Assets	23.0938	23.0749	0.0124	1.0413

Table D.2: Matched Sample Size

	Control	Treated
All	1040	504
Matched	413	413
Unmatched	627	91
Discarded	0	0

Figure D.2: Post-Matched Density Plot of Total Assets

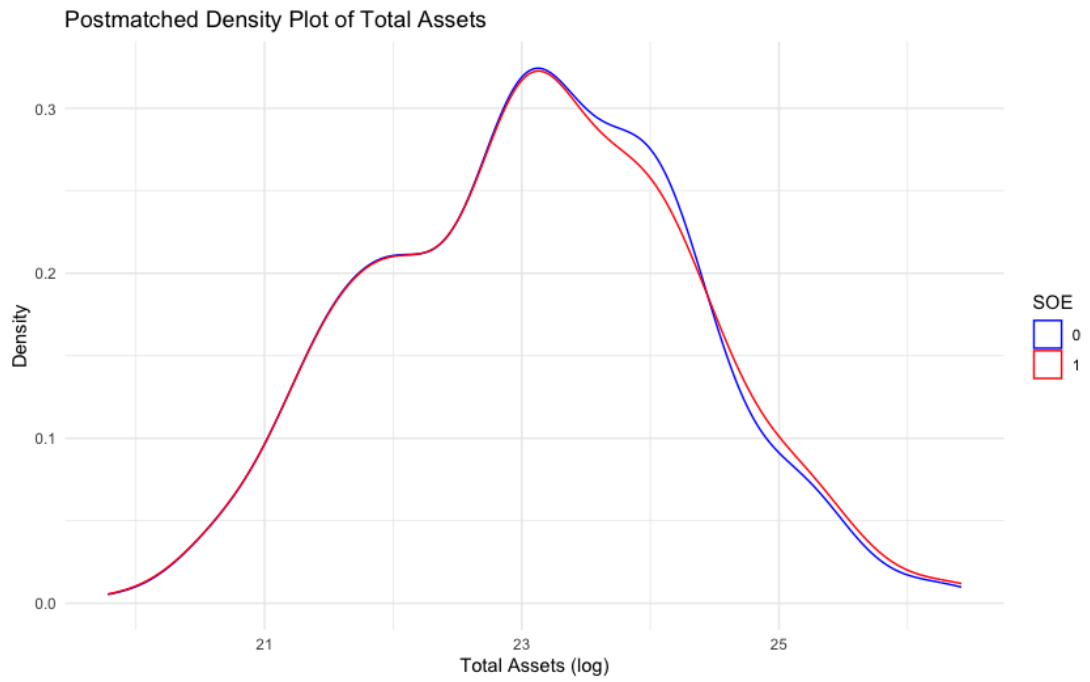


Figure D.3: Pcores matched on Total Assets

