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Does Mixed Ownership Reform affect  
entrepreneurship of state-owned enterprises?  
Evidence from China

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## **Abstract**

China's mixed ownership reform has sparked significant interest due to its influence on the expansion of state-owned enterprises. These enterprises, now emerging as global players, exhibit intricate expansion strategies shaped by the reform's dynamics. This research paper addresses the empirical puzzle surrounding the impact of mixed ownership reform on the expansion of Chinese state-owned enterprises, particularly those engaged in entrepreneurial activities. While prior studies predominately explore expansion within traditional manufacturing sectors, this study complements existing research and shed light on firm performance under reform influences.

Framed within the context of entrepreneurship's role in industry innovation, this paper argues that mixed ownership reform stimulates entrepreneurial activities within state-owned enterprises. Specifically, the study's empirical findings provide insight into the positive influence of mixed ownership reform on state-owned enterprises' financial investment and R&D activities, promoting innovation and entrepreneurship. In addition, the research further uncovers that mixed ownership reform enhances TFP levels within state-owned enterprises. The analysis of mixed-ownership reform will aid policymakers in tailoring strategies for effective reform implementation, guiding policy considerations for future mixed ownership reform endeavors.

## 1. Introduction

### 1.1 Empirical Puzzle

How does China's mixed ownership reform influence the expansion of state-owned firms? An essential component of business landscape, state-owned enterprises internationalize aggressively and are becoming global players. These firms, nonetheless, demonstrate complex expansion strategies under the influence of mixed-ownership reform. To investigate this phenomenon, this research article examines the empirical puzzle concerning the impact of mixed-ownership reform on the expansion of Chinese state-owned enterprises.

While earlier scholarship investigates firm expansion in traditional manufacturing industry, their research neglects to examine other types of firms in the industrial ecosystem, which renders the analysis incomplete. Contrary to traditional firms which rely on existing market patterns, other firms do not draw on existing repositories of knowledge and capabilities.<sup>1</sup> Entrepreneurial firms, for instance, introduce new products and services into the industrial ecosystem, extending and reshaping the industry, thereby adapting to a world of change and uncertainty.<sup>2</sup> By focusing on entrepreneurial firms, this research article explores the question concerning whether China's mixed-ownership reform promote, or hinder, entrepreneurial activities in state-owned enterprises. By substantiating, or undercutting, proposed hypotheses in earlier scholarship, this research article will complement previous analysis.

This research article, in turn, will examine the influence of mixed ownership reform on

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<sup>1</sup> Krackhardt, David, *Entrepreneurial Opportunities in an Entrepreneurial Firm: A Structural Approach*, *Entrepreneurship Theory and Practice* 19, 1995, 69

<sup>2</sup> Langlois, Richard, *The Entrepreneurial Theory of the Firm and the Theory of the Entrepreneurial Firm*, 2005, 15

firm expansion in entrepreneurial firms. This empirical puzzle, nonetheless, underlies two dimensions. On one level, the research project aims to investigate the relationship between state ownership and entrepreneurship. At which point does the state intervene, or withdraw, from entrepreneurial firms? What is the rationale on the part of government in implementing these choices? On another level, the research article intends to evaluate how varying levels of state-owned shares exert influence on entrepreneurial activities of state-owned firms. By extrapolating the proposed hypotheses and models into the domain of entrepreneurship, this research article will develop a unified mechanism explaining firm performance under influences of mixed-ownership reform.

Critical to industrial growth, entrepreneurship are key vehicles through which innovations are developed and diffused. Investigating the forces that shape the growth of entrepreneurial activities of state-owned firms, in turn, will help policymakers adapt and support to a constantly-evolving industrial ecosystem. This research article will not only address the gap in earlier scholarship by examining entrepreneurial activities of state-owned firms, but also illuminate the underlying drivers that propel the state to encourage, or, hinder innovations and research development at varying stage of firm expansion.

## **1.2. Existing Literature: State ownership and Entrepreneurship**

A vast literature devotes attention to how state ownership affects firm performance. Political scientist Kiattichai Kalasin and Alvaro Cuervo-Cazurra highlights, for instance, that state ownership resulting in international expansion follows an S-curve pattern.<sup>3</sup>Categorizing

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<sup>3</sup>Kalasin K, Cuervo-Cazurra A, Ramamurti R. *State Ownership and International Expansion: The S-Curve Relationship*. *Global Strategy Journal*. 2020, 3

firms into three levels of state ownership, the article predicts that, while firms with low-state ownership have a limited level of international expansion, firms with a medium level of state ownership have an increasing level of international expansion, firms with a high level of state ownership have a decreasing level of international expansion.<sup>4</sup> Emphasizing the offsetting effects between the resource provision from the state vis-à-vis government inference and control, the research article predicts that the two conflicting forces both exert influence on firm expansion at varying levels of state ownership, thereby yielding an S-curve model.<sup>5</sup>

While there is abundant literature investigating the impact of state ownership exerted on firm expansion, relatively few works have systematically analyzed the relationship between state ownership and entrepreneurship. The concept of entrepreneurship, in fact, remains multifaceted. Emphasizing innovation, risk-taking, and opportunity recognition, scholars highlight behavioral patterns of entrepreneurs, such as autonomy, creativity, and the ability to mobilize resources.<sup>6</sup> For instance, political scientist David Krackhardt defines *entrepreneurship* as a “process by which individuals—either on their own or inside organizations—pursue opportunities without regard to the resources they currently control”.<sup>7</sup> Here Krackhardt underlies two dimensions: On the one hand, entrepreneurs are individuals who pursue opportunities outside the traditional industrial domain. Rather than holding sufficient formal authority to assign resources, entrepreneurs garner resources through bargaining, influence, and persuasion in a broad set of informal networks.<sup>8</sup> On the other hand, entrepreneurial firms are nascent firms or proto-firms

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<sup>4</sup> Cuervo-Cazurra, *State ownership and international expansion*, 3

<sup>5</sup> Cuervo-Cazurra, *State ownership and international expansion*, 5

<sup>6</sup> Krackhardt, *Entrepreneurial Opportunities in an Entrepreneurial Firm*, 2

<sup>7</sup> Krackhardt, *Entrepreneurial Opportunities in an Entrepreneurial Firm*, 2

<sup>8</sup> Krackhardt, *Entrepreneurial Opportunities in an Entrepreneurial Firm*, 54



adaptable in a world of change and uncertainty. Flexible to changes and novelty, entrepreneurial firms introduce innovative solutions to varying circumstances in the real world.<sup>9</sup>

On a macro level, earlier scholarship explores relationship between entrepreneurship and industry growth. Scholars perceive entrepreneurship as a driver of innovation.<sup>10</sup> Indeed, entrepreneurship and innovation are closely linked. The literature explores how entrepreneurs identify and exploit opportunities for innovation, fostering technology growth, and industry disruptions.<sup>11</sup> Moreover, the concept of entrepreneurial ecosystems focuses on the interplay of various factors, including institutions, policies, networks, and resources that support entrepreneurship at regional or national level.<sup>12</sup> Scholars analyze the elements of entrepreneurial ecosystems and their impact on entrepreneurial activity, success rates, and economic outcomes. The literature examines the financing challenges faced by entrepreneurs and the role of venture capital in supporting new ventures. Studies explore funding sources, such as angel investors, crowdfunding, and government programs, and their impact on entrepreneurial success.<sup>13</sup>

### **1.3 Argument: Testing the S-curve model in the domain of entrepreneurship**

While existing literature has forged the foundation for the study of the entrepreneurial activities of mixed ownership reform, there are still shortcomings. On one level, the existing literature on mixed ownership reform focus on state-owned enterprises, ignoring the two-way nature of mixed ownership reform—*interaction and collaboration between the public and private sectors*—and the existence of mixed private enterprises. On another level, a multitude

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<sup>9</sup> Sara et al, *Sources of Knowledge Used by Entrepreneurial Firms in the European High-Tech Sector*, 55

<sup>10</sup> Di Guo et Kun Jiang, *Venture Capital Investment and the Performance of Entrepreneurial Firms*, 375

<sup>11</sup> Agarwal et Shah, *Knowledge Sources of Entrepreneurship*, 1109

<sup>12</sup> Grilli et al, *Government, Venture Capital and the Growth of European High-Tech Entrepreneurial Firms*, 1523

<sup>13</sup> Desai, Gompers et Lerner, *Capital Constraints and Entrepreneurial Firm Dynamics: Evidence from Europe*, 52

of existing literature evaluate the influence of mixed ownership reform from the perspectives of *quantitative changes*, while the *qualitative changes* in entrepreneurial activities have been rarely examined against the backdrop of mixed ownership reform. Following in this vein, this research article intends to address the gap in earlier literature by testing the S-curve model in the domain of entrepreneurship.

This research article argues that mixed-ownership reform exerts positive influence on entrepreneurial activities of state-owned enterprises. By decomposing the empirical puzzle into three major components, namely (1) Mixed Ownership Reform and Financial Investment (2) Mixed-Ownership Reform and R&D Investment (3) Mixed-Ownership Reform and Level of Total Factor Productivity, this study provides a comprehensive analysis. Unlike earlier scholarship that examines these three dimensions independently, this research article adopts an integrated analytical framework to explore their interconnections.

Firstly, this research article finds that the mixed ownership reform exerts a positive influence on the financial investment of state-owned firms. Non-state ownership shareholder participation promotes investment in financial assets of state-owned enterprises, thereby encouraging entrepreneurial activities. Secondly, this research article finds that mixed ownership reform exerts a positive influence on Research and Development Investment. This research article argues that mixed ownership reform promotes R&D Investment of state-owned enterprises, thereby allocating resources to innovations, promoting entrepreneurial activities.

Thirdly, this research article examines the influence of the mixed ownership reform exerted on the level of TFP in state-owned enterprises. This research article argues that mixed ownership reforms promote the level of TFP in state-owned enterprises, thereby encouraging growth of

innovation and entrepreneurial activities; Finally, this research article conducts heterogeneity tests on state-owned enterprises. This research article finds that the mixed ownership reform casts varying level of influence on state-owned enterprises from different regions and from a multitude of industries.

#### **1.4. Marginal Contribution**

The marginal contribution of this research article is twofold. On one level, this research article employs most updated data sources from 2013-2017, enhancing the relevance and applicability of its findings. On another level, this study goes beyond the conventional examination of firm performance and expansion following mixed-ownership reform by focusing on innovation and entrepreneurial activities as its primary outcomes.

While existing literature delves into the impact of mixed ownership reform on firm performance, this research article addresses the gap by exploring its influence on fostering innovation and entrepreneurial activities within state-owned enterprises. This perspective provides a deeper understanding of the potential benefits of mixed-ownership reform in driving entrepreneurial activities and fostering innovation in the state-owned enterprises sector.

As a result, this research article offers theoretical references and empirical evidence that substantiate the influence of mixed ownership reform on state-owned enterprises. Policymakers can use these insights to make informed decisions and tailor strategies to maximize the benefits of mixed-ownership reform in different contexts. guiding future reforms and improvements in the state-owned enterprises sector.

#### **1.5 Sections Layout**

This research article will proceed in the following four sections. Firstly, this research will

review the existing literature and identify the gaps that the existing literature cannot explain. Moreover, this research will add a new dimension—entrepreneurship—into the theoretical framework to further analyze the impact of state ownership on firm performance, incorporating these measurements into the analytical framework.

Next, this research article will test the proposed hypotheses, design firm-level research between state ownership and entrepreneurship, while observing the impact of entrepreneurship on firm performance. This research article provides multiple regression analysis between state-owned shares and entrepreneurship. The dataset, extracted from Chinese A-share listed companies from 2013-2017 from CSMAR, contains 36,837 of 6,4386 enterprises that participated in the survey based on the validity and relevance of their responses to this research.

Lastly, this research article will present and discuss empirical findings whether substantiating, or undercutting, the S-curve pattern in earlier scholarship. The research findings provide empirical evidence for further policy consideration for mixed-ownership reform.

## **2. Mixed Ownership Reform in China: A Summary**

Introducing private capital into state-owned enterprises, China's mixed ownership reform stipulates a set of economic policies aiming to encourage competition and innovation.<sup>14</sup>In essence, the Chinese government initiates the mixed-ownership reform to address the inefficiencies and stagnation of state-owned enterprises resulting from their monopoly and bureaucratic inefficiencies.<sup>15</sup>Through introducing private capital and management expertise, the mixed ownership reform ambitions to transform state-owned firms into market-orientated

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<sup>14</sup> The State Council of the People's Republic of China, White Paper entitled *How to Implement Mixed Ownership Reform*, China Economic Herald, 2021, 1-2

<sup>15</sup> The State Council, *How to Implement Mixed Ownership Reform*, 1-2

enterprises while maintaining state control.<sup>16</sup>

In fact, mixed ownership reform introduces private capital in state-owned enterprises through various channels. As the Chinese government aims to bring in private investors with capital, expertise, and managerial talent to promote the firm performance, joint ventures, equity investments, and asset restructuring becomes major channels through which private ownership filters into state-owned enterprises.<sup>17</sup>

Implementing mixed ownership reform, nonetheless, varies across different regions and enterprises. By refining approaches and monitoring pilot outcomes, the Chinese government make adjustments and adaptations to achieve the objectives of the reform. The objective of the mixed ownership reform lies in three dimensions: 1) Promote the economic efficiency of state-owned enterprises by introducing market competition and creating incentives for innovation and entrepreneurial activities 2) Increase the transparency and accountability of state-owned enterprises by introducing private investors in order to better evaluate firm performance and stipulate entrepreneurial strategies 3) Introducing private capital to reduce the financial burden on the government for financing infrastructure projects and other state-owned enterprises-related investments.<sup>18</sup>

There are multiple case studies showcasing the implications of mixed ownership reform. For instance, the mixed-ownership reform has been implemented in China's largest and influential state-owned enterprises, such as China Unicom, China Eastern Airlines, and China

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<sup>16</sup> The State Council, *How to Implement Mixed Ownership Reform*, 1-2

<sup>17</sup> The State Council, *How to Implement Mixed Ownership Reform*, 1-2

<sup>18</sup> The State Council, *How to Implement Mixed Ownership Reform*, 1-2

National Petroleum Corporation.<sup>19</sup>In particular, one prominent case study lies in the reform of China's state-owned enterprises in the telecommunication sector, specifically with the enterprise China Unicom. Through mixed-ownership reform, China Unicom has made progress in fields such as network construction, digital transformation, and the development of new services. In addition, China Unicom pursued partnerships with strategic investors to explore opportunities in areas such as 5G technology, cloud computing, and Internet of Things (IoT).<sup>20</sup>

The case of China Unicom under the influence of mixed-ownership reform, in turn, highlights the benefits of introducing private capital and management expertise into state-owned enterprises. By fostering operational improvements, innovation, and competitiveness, the mixed-ownership reform of China Unicom signifies a step toward introducing market-orientated reforms and private investors engagement in the telecommunication sector.<sup>21</sup>In this way, China Unicom enhances its competitiveness by leveraging private sector expertise and resources, while maintaining state control to safeguard national interest on behalf of Chinese government.

Nevertheless, the mixed-ownership reform has confronted resistance from vested interests within the Communist Party due to their reluctance to cede control to private investors.<sup>22</sup>Therefore, it is important to evaluate the specific outcomes and long-term impacts of the mixed-ownership reform to assess its overall implications. Becoming an essential component of China's economic reform programs, the mixed ownership reform paves the way for more

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<sup>19</sup> State-owned Assets Supervision and Administration Commission of the State Council and Ministry of Finance, *State-owned Equity Supervision and Administration Measures for Listed Companies*, China Securities Regulatory Commission Order No. 36 2018.5.16

<sup>20</sup> The State Council and Ministry of Finance, *State-owned Equity Supervision and Administration Measures for Listed Companies*, 1-2

<sup>21</sup> The State Council and Ministry of Finance, *State-owned Equity Supervision and Administration Measures for Listed Companies*, 1-2

<sup>22</sup>The State Council and Ministry of Finance, *State-owned Equity Supervision and Administration Measures for Listed Companies*, 1-2

innovative and efficient state-owned enterprises, along with a stronger private sector in China.

## **2.1 Earlier Period: Mixed Ownership Reform From 1976 To 2013**

The mixed ownership reform was implemented in 1976 and continued until 2013.<sup>23</sup> Since 1976, the Chinese government has introduced township enterprises and supplements, the separation of government and enterprises, as well as reform of stock market system, to the mixed-ownership reform.<sup>24</sup> Hence, the state-owned enterprises reform program has been implemented for nearly 40 years.

During the early stages (1976-1992), Chinese government initiated economic reforms.<sup>25</sup> Furthermore, in the late 1970s and early 1980s, the government allowed limited private economic activities and small-scale enterprises—'township and village enterprises'(TVEs)—which played a significant role in promoting China's early economic growth. In fact, during this period, the Chinese government also experimented with various forms of mixed ownership in selected industries, such as joint ventures with foreign companies.<sup>26</sup>

Following this vein, during the *Reform and Opening Up* era (1992-2001), the Chinese government has expanded the scope of mixed ownership reform. In 1992, Deng Xiaoping's famous *Southern Tour* signifies a renewed commitment to economic reform and opening up to foreign investment. Notably, the government began implementing reforms to diversify the ownership structure of state-owned enterprises and enhance their efficiency, including

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<sup>23</sup>Ross Garnaut, Ligang Song and Yang Yao, *Impact and Significance of state-owned enterprise restructuring in China*, The China Journal, No.55, January 2006, 36-39

<sup>24</sup>Garnaut et al, *Impact and Significance of state-owned enterprise restructuring in China*,36-39

<sup>25</sup>Garnaut et al, *Impact and Significance of state-owned enterprise restructuring in China*,39

<sup>26</sup>Garnaut et al, *Impact and Significance of state-owned enterprise restructuring in China*,39

introducing shareholding systems, allowing limited private investment, and promoting the listing of state-owned enterprises on stock exchanges.<sup>27</sup>

Finally, during 2001-2013, the Chinese government has accelerated reforms. In the early 2000s, the government launched an extensive restructuring program for the state-owned enterprises, ambitioning to improve their performance and competitiveness.<sup>28</sup> This progress reveals that, the focus has shifted to tertiary industries, such as energy, telecommunications, and finance. In particular, the government sought to introduce private investors, including private domestic and foreign forms, to inject capital, technology, and managerial expertise into these industries.<sup>29</sup> Moreover, the reform also initiated pilot programs, allowing private investors to purchase significant stakes in selective state-owned enterprises. As a result, the pilot programs led to an emergence of new corporate structures, including mixed-ownership companies and diversified ownership structures.<sup>30</sup>

The mixed-ownership reform is one of the longest and the most successful reforms on property right ownership, and has promoted the efficiency in both production and resource allocation. In the contemporary era, the mixed-ownership reform serves as the core of the current state-owned enterprises reform in China. While the 1976-2013 period covers the major development in the process, mixed ownership reform continued beyond 2013, allowing private and foreign capital to play a greater role in the Chinese economy.

## **2.2 Policies Announcements in 2013: Mixed Ownership Reform**

In 2013, the Chinese government, under the leadership of President Xi Jinping, issued

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<sup>27</sup>Garnaut et al, *Impact and Significance of state-owned enterprise restructuring in China*,36-39

<sup>28</sup>Garnaut et al, *Impact and Significance of state-owned enterprise restructuring in China*,36-39

<sup>29</sup>Garnaut et al, *Impact and Significance of state-owned enterprise restructuring in China*,36-39

<sup>30</sup>Garnaut et al, *Impact and Significance of state-owned enterprise restructuring in China*,36-39



policy announcements and guidelines putting forward mixed ownership reform.<sup>31</sup> November 15, 2013, the 3<sup>rd</sup> Plenary Session of the 18<sup>th</sup> Communist Party of China (CPC) Central Committee highlighted the mixed-ownership reform of state-owned enterprises. Ambitioning to deepen the reform of state-owned enterprises, the Plenary Session pointed out that the purpose of the reform is to promote the sustainable development of the Chinese economy. Specifically, the Third Plenary Session of the 18<sup>th</sup> Central Committee of the Communist Party of China highlighted the necessity of developing a mixed ownership economy with the mutual integration of state-owned capital, collective capital, and non-public capital. It also recommended that private capital be allowed to participate in state-owned capital investment projects.<sup>32</sup>

Moreover, the Chinese government stipulated key sectors and initiates of mixed-ownership reform. In August 2015, CPC and the State Council addressed more details on the mixed-ownership reform, which is the 1+N files.<sup>33</sup> In addition to building pilot programs, these files stipulated rules on equity sales and IPOs, calling for introducing private capitals in competitive industries.<sup>34</sup> By consequence, these Chinese government accelerated the pace of equity sales and initial public offerings (IPOs) by state-owned enterprises.<sup>35</sup> By allowing private and foreign investors to acquire stakes in state-owned enterprises, the mixed ownership reform diversifies ownership structures within enterprises. In addition, the IPOs allow state-owned enterprises to

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<sup>31</sup> The State Council, *Community of the Third Plenary Session of the Fourteenth Central Committee of the Communist Party of China*, 2008.7.10,1-3

<sup>32</sup> The State Council, *Guiding Opinions of Central Committee of the Communist Party of China and the State Council on Deepening the Reform of State-Owned Enterprises*, 2015, 1-3

<sup>33</sup> The State Council, *Guiding Opinions of Central Committee of the Communist Party of China and the State Council on Deepening the Reform of State-Owned Enterprises*, 2015, 1-3

<sup>34</sup> The State Council, *Guiding Opinions of Central Committee of the Communist Party of China and the State Council on Deepening the Reform of State-Owned Enterprises*, 2015, 1-3

<sup>35</sup> The State Council, *Guiding Opinions of Central Committee of the Communist Party of China and the State Council on Deepening the Reform of State-Owned Enterprises*, 2015, 1-3

access capital markets and raise funds for firm expansion and entrepreneurial activities.<sup>36</sup>

The mixed ownership reform continued to evolve during 2016 and 2023. On September 2016, the National Development and Reform Commission (NDRC) proposed the guideline that reform should improve the operating ability and innovation efficiency by setting up a corporate governance structure with coordinated operation and effective control and perfecting the market-oriented incentive and restraint mechanisms. Moreover, on December 2016, the Central Economic Work Conference signified Mixed Ownership Reform as an important breakthrough in deepening the reform of SOEs.

Up until 2023, four batches of mixed-ownership reform pilot were steadily advancing. SASAC and NDRC announced on 4.18.2019, that 100 firms will be included in the 4<sup>th</sup> batch of pilot.<sup>37</sup> For instance, the main targets of the fourth batch of pilots are “expanding quantity” and “expanding the field.”<sup>38</sup> These policies suggest that China’s mixed-ownership reform allows private capital to merge with state-owned enterprises to establish a more efficient and enterprise system, attracting private capital, encouraging innovation and improving the efficiency of state-owned enterprises.<sup>39</sup> Following this vein, the mixed ownership reform serves as an essential component of broader economic reforms promoting sustainable and inclusive growth.

### **3. Literature Review: Theoretical Foundation and Empirical Evidence**

#### **3.1. Mixed Ownership Reform: Helping Hand VS Hindering Hand**

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<sup>36</sup> The State Council, *Guiding Opinions of Central Committee of the Communist Party of China and the State Council on Deepening the Reform of State-Owned Enterprises*, 2015, 1-3

<sup>37</sup> The State Council, *Guiding Opinions of Central Committee of the Communist Party of China and the State Council on Deepening the Reform of State-Owned Enterprises*, 2015, 1-3

<sup>38</sup> Yuan et al, *Mixed-ownership Reform and Strategic Choice of Chinese State-Owned Enterprises*, 2023

<sup>39</sup> The State Council, *Guiding Opinions of Central Committee of the Communist Party of China and the State Council on Deepening the Reform of State-Owned Enterprises*, 2015, 1-3

The S-curve model, in fact, reflects two theoretical drivers: the resource-based view, and the state ownership advantages, as well as the agency theory, and the multilevel agency problems of state-owned enterprises.<sup>40</sup> Existing literature suggests that, the state-ownership advantages and multilevel agency problems offset each other to different degrees at varying levels of state ownership, thereby yielding an S-curve.<sup>41</sup> The following section will elaborate on the helping and hindering influence of state ownership, providing theoretical foundations to evaluate the impact of mixed ownership reform.

### 3.1.1 Helping Hand: The Resource-Based View

The resource-based view, according to existing literature, refers to the helping hand influence. Emphasizing how resources are allocated to promote firm performance, the resource-based theory predicts that state ownership becomes a source of competitive advantage.<sup>42</sup>

Existing literature suggests that state ownership advantages become significant in emerging economies.<sup>43</sup> Government participates in economic development, provisioning state-owned enterprises with financial resources.<sup>44</sup> Specifically, government allocates financial resources to state-owned enterprises from either state-owned banks or government budget.<sup>45</sup> Through providing financial resources through preferential regulation and policy support, government empowers state-owned enterprises to compete in both domestic and international market.<sup>46</sup> In

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<sup>40</sup> Cuervo-Cazurra, *State ownership and international expansion*, 386–418

<sup>41</sup> Cuervo-Cazurra, *State ownership and international expansion*, 386–418

<sup>42</sup> Kai Wan et Xiao Lin Yu *Impact of mixed ownership reforms on firm innovation—empirical evidence from China*, *Journal of Applied Economics*, 2022, 1339-1354

<sup>43</sup> Tao Chen, *Institutions, board structure, and corporate performance: Evidence from Chinese firms*, *Journal of Corporate Finance*, 2015, 217–237

<sup>44</sup> Ryan W. Tang & Chengli Shu & Kevin Z. Zhou, *State ownership of Chinese firms and their outward foreign direct investment: Political and economic contingencies*, 2022, 1097–1123

<sup>45</sup> Mei Yu, *State ownership and firm performance: Empirical evidence from Chinese listed companies*, *China Journal of Accounting Research*, <http://dx.doi.org/10.1016/j.cjar.2013.03.003>

<sup>46</sup> Cai Guilong, Zheng Guojian, Ma Xinxiao and Lu Rui, *Decentralization and Mixed-ownership Reform in China*, *Economic Policy Research*, 2018, 99-111

this way, government in emerging economies protect state-owned enterprises, strengthening their performance.<sup>47</sup>

Following in this vein, the resource-based view highlights the role of government. On one level, government enables state-owned enterprises to accumulate critical resources.<sup>48</sup> For instance, preferential regulation and protection from government help promote competitiveness of state-owned enterprises, thereby encouraging state-owned enterprises dominate a majority of market shares in domestic industries.<sup>49</sup> In addition, government subsidies allow state-owned enterprises to survive amid hostile economic environment.<sup>50</sup> On another level, the state-ownership advantages, in turn, shape investment decisions of state-owned enterprises.<sup>51</sup> Benefitting from government support and subsidized financing, state-owned enterprises are more willing to undertake large, risky investment decisions.<sup>52</sup> Due to soft budget constraints from government, state-owned enterprises are prone to make riskier investment decisions, while the state absorbs financial losses to prevent state-owned enterprises from going bankrupt.<sup>53</sup>

Therefore, the state ownership advantages promote firm performance, thereby encouraging investment decisions of state-owned enterprises.<sup>54</sup> State-owned enterprises often enjoy preferential financing, enabling them to engage in foreign investments, including cross-border acquisitions. With government support, state-owned enterprises are equipped to address entry

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<sup>47</sup> Guilong et al, *Decentralization and Mixed-ownership Reform in China*, 99-111

<sup>48</sup> Tao Chen, *Institutions, Board Structure, and Corporate Performance*, 217

<sup>49</sup> Tao Chen, *Institutions, Board Structure, and Corporate Performance*, 217

<sup>50</sup> Tao Chen, *Institutions, Board Structure, and Corporate Performance*, 218

<sup>51</sup> Tao Chen, *Institutions, Board Structure, and Corporate Performance*, 218

<sup>52</sup> Tao Chen, *Institutions, Board Structure, and Corporate Performance*, 220

<sup>53</sup> Cuervo-Cazurra, *State ownership and international expansion*, 386–418

<sup>54</sup> Cuervo-Cazurra, *State ownership and international expansion*, 386–418

barriers and potential disputes with host country governments. These measurements empower them to compete in international markets and expand their operations extensively across different countries.

### **3.1.2. Hindering Hand: The Agency Theory and Multilevel Agency Problems**

Existing scholarship suggests that state ownership exerts hindering influence on state-owned enterprises. Agency theory examines the coordination of relationship between economic actors. The agency theory, nonetheless, underscores the multilevel agency problems in corporate governance.<sup>55</sup> Multilevel agency problems arise when there is a mismatch between firm strategy and resource allocation decision within state-owned enterprises.<sup>56</sup> As state-owned enterprises operate in competitive industries, they confront principal-agent problems.<sup>57</sup> To reduce agency costs, state-owned enterprises implement measures to mitigate the principal-agent problems within the organization. In this way, while stronger competitive pressures force enterprises to reduce agency costs to capture larger market share, state ownership exerts detrimental impact on state-owner enterprises.<sup>58</sup>

The corporate governance literature identifies the separation of ownership and control in state-owned enterprises.<sup>59</sup> Studies have indicated that reducing the state's ownership can help alleviate the agency problems that arise between managers and shareholders.<sup>60</sup> In contrast, private owners have a stronger incentive to pursue profits, which leads to more effective monitoring of management performance.<sup>61</sup> Researchers have specifically investigated the

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<sup>55</sup> Cuervo-Cazurra, *State ownership and international expansion*, 386–418

<sup>56</sup> Cuervo-Cazurra, *State ownership and international expansion*, 386–418

<sup>57</sup> Cuervo-Cazurra, *State ownership and international expansion*, 339

<sup>58</sup> Cuervo-Cazurra, *State ownership and international expansion*, 339

<sup>59</sup> Cuervo-Cazurra, *State ownership and international expansion*, 339

<sup>60</sup> Mei Yu, *State Ownership and Firm Performance*, 2

<sup>61</sup> Mei Yu, *State Ownership and Firm Performance*, 2

impact of state ownership on the performance of Chinese publicly listed companies (PLCs). Empirical evidence suggests that when the government maintains a majority ownership, the standard principal-agent problem is exacerbated by a multiple-principal problem.<sup>62</sup> This phenomenon occurs because the government's objectives are not solely focused on profit maximization. These findings support the notion that state ownership hinders efforts to reduce agency costs within state-owned enterprises.<sup>63</sup> In this way, the research confirms the inhibiting influence of state ownership in mitigating agency costs. The separation of ownership and control in state-owned enterprises, compounded with the government's multiple objectives, creates challenges in optimizing firm performance.<sup>64</sup>

Other scholars examine the political and economic contingencies of state ownership.<sup>65</sup> State-owned enterprises, according to earlier scholarship, are legally independent owned, or partly owned by a government.<sup>66</sup> The extent of state ownership exerted on enterprises, in turn, depends on the ownership stake held by the government and its bureaus.<sup>67</sup> State ownership, in fact, may incur institutional constraints imposed by state owners. Through exerting regulatory pressures on state-owned enterprises, state-owned enterprises are obligated to meet government objectives.<sup>68</sup> In this way, the political and economic contingencies of state ownership function as a hindering hand to state-owned enterprises.

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<sup>62</sup> Mei Yu, *State Ownership and Firm Performance*, 2

<sup>63</sup> Mei Yu, *State Ownership and Firm Performance*, 3

<sup>64</sup> Mei Yu, *State Ownership and Firm Performance*, 3

<sup>65</sup> Tang, Shu et Zhou, *State Ownership of Chinese Firms and Their Outward Foreign Direct Investment: Political and Economic Contingencies*, 110-111

<sup>66</sup> Tang, Shu et Zhou, *State Ownership of Chinese Firms and Their Outward Foreign Direct Investment: Political and Economic Contingencies*, 115

<sup>67</sup> Tang, Shu et Zhou, *State Ownership of Chinese Firms and Their Outward Foreign Direct Investment: Political and Economic Contingencies*, 115

<sup>68</sup> Tang, Shu et Zhou, *State Ownership of Chinese Firms and Their Outward Foreign Direct Investment: Political and Economic Contingencies*, 116

Indeed, the subject of mixed ownership reform has inspired a multitude of empirical studies. Previous studies suggest that mixed ownership reform reduces agency costs and moderate government interference.<sup>69</sup> By consequence, mixed ownership reform will not only furnish resources but also will reduce strategic burdens of state-owned enterprises. Moreover, further studies investigate how institutional environment influence board structure, thereby exerting impact on firm performance of state-owned enterprises.<sup>70</sup> Scholars suggest that the mixed ownership reform will not only augment resource advantages—the ‘helping hand’—but also will alleviate institutional constraints—the ‘hindering hand’—derived from state ownership.<sup>71</sup> Following in this vein, mixed ownership reform will reduce agency costs and ease financing constraints, thereby promoting investment on entrepreneurial activities and innovation.<sup>72</sup>

### **3.2. Mixed-Ownership Reform: State Ownership and Financial Investment**

Mixed ownership reform gains traction in existing literature as a strategy to attract financial investment. Specifically, this section examines the impact of mixed ownership reform on attracting investment, the mechanisms through which state ownership influences investment decisions, and the factors that shape the outcomes of mixed ownership reform in the context of financial investment.

A multitude of scholarship investigates the influence of mixed ownership reform on financial investment.<sup>73</sup> Previous studies suggest that mixed ownership structures--combining state, private, and foreign ownership--will enhance the perceived investment attractiveness of

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<sup>69</sup> Tang, Shu et Zhou, *State Ownership of Chinese Firms and Their Outward Foreign Direct Investment: Political and Economic Contingencies*, 116

<sup>70</sup> Cuervo-Cazurra, *State ownership and international expansion*, 345

<sup>71</sup> Cuervo-Cazurra, *State ownership and international expansion*, 345

<sup>72</sup> Tang, Jiao, Xu, Yang et al, *Entrepreneurial Finance Meets Government Investment at Initial Public Offering: The Role of Minority State Ownership*, *Corporate Government Review*. 2018, 26:97–117.

<sup>73</sup> Tang et al, *Entrepreneurial Finance Meets Government Investment at Initial Public Offering*, 97

state-owned enterprises.<sup>74</sup> Through diversifying ownership and reducing government control, mixed ownership reform creates a more favorable investment climate, thereby stimulating both domestic and foreign investment flows.<sup>75</sup> Moreover, existing scholarship suggests that mixed ownership reform effectively removes the soft budget constraints.<sup>76</sup> For instance, researchers examine how state-ownership affects financial constraints on investment of Chinese-listed firms.<sup>77</sup> Research finds that, mixed ownership reform does not reduce state-owned enterprises' financial constraints on investment.<sup>78</sup> Specifically, state-ownership does not lead to more borrowing from the Chinese banking sector, implying that state-ownership does not necessarily reduce the firm's financial constraints via the state-controlled banking sector.<sup>79</sup> Hence, state-owned enterprises remain their competitive edge while operating in a market environment.<sup>80</sup>

Furthermore, scholars have identified various mechanisms through which mixed ownership reform influences investment decisions.<sup>81</sup> On one level, mixed ownership structures enhance firm transparency and corporate governance practices, providing investors with greater confidence in the management of resources and minimizing agency problems.<sup>82</sup> On another level, mixed ownership reform promotes access to capital markets and facilitate the integration of financial resources, thereby increasing investment opportunities and capital inflows. In this way,

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<sup>74</sup> Tang et al, *Entrepreneurial Finance Meets Government Investment at Initial Public Offering*, 97

<sup>75</sup> Barclay E. James, Paul M. Vaaler, *Minority Rules: Credible State Ownership and Investment Risk Around the World*, *Organization Science*, 2018, 653-677

<sup>76</sup> James et al, *Minority Rules*, 655

<sup>77</sup> James et al, *Minority Rules*, 655

<sup>78</sup> James et al, *Minority Rules*, 655

<sup>79</sup> James et al, *Minority Rules*, 655

<sup>80</sup> Hsiang-Chun Michael Lin et al, *State-Ownership and Financial Constraints on Investment of Chinese-Listed Firms: New Evidence*, *The European Journal of Finance*, 2012, 497-513

<sup>81</sup> Lin et al, *State-Ownership and Financial Constraints on Investment of Chinese-Listed Firms: New Evidence*, 497

<sup>82</sup> Lin et al, *State-Ownership and Financial Constraints on Investment of Chinese-Listed Firms: New Evidence*, 497



mixed ownership reform enable enterprises to leverage the expertise, networks, and resources of private and foreign partners, attracting strategic investment and fostering innovation.

Empirical evidence further substantiates the positive correlation between mixed ownership structure and financial investment. Previous studies find that state-owners—largest block holders—are more committed to pursue their own sociopolitical agenda than maximizing profit for their shareholders in state-owned enterprises.<sup>83</sup> On the contrary, statistical evidence suggests that managerial owners, who receive ownership shares, will discourage investment, thereby inhibiting the enterprises' ability to pay dividends. Therefore, researcher finds a negative correlation between management ownership and making investment decisions. In this way, state ownership exerts a positive influence while managerial ownership exerts a negative impact on investment decisions.

Other scholars provide further perspectives regarding the mechanisms through which state ownership influences investment decisions. On the one hand, scholars believe that enterprises allocate financial assets out of precautionary savings.<sup>84</sup> In fact, long-term cycle of entity investment leads to high adjustment cost of changing investment expenditure. Interruption of investment project will, in turn, causes financial losses to the enterprise.<sup>85</sup> As financial assets have strong liquidity and low adjustment costs, enterprises will reduce the cost of financial distress by selling financial assets to smooth investment.<sup>86</sup> Therefore, scholars predict that

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<sup>83</sup> Wei He et al, *Ownership Structure and Investment Decisions of Chinese SOEs*,48-57

<sup>84</sup> Yongwei Ye et Zengfu Li, *Mixed reform of State-Owned Enterprises and Corporate Financial Asset Allocation*, Financial Policy Research, 2021 No.3, General No.489

<sup>85</sup> Ye et Li, *Mixed reform of State-Owned Enterprises and Corporate Financial Asset Allocation*, Financial Policy Research, 2021,114-130

<sup>86</sup> The phenomenon of selling financial assets to smooth investment refers to the 'reservoir effect'. Yuan et al, *Research on the Influence of Mixed-Ownership Reform on Exploratory Innovation of SOEs: The Mediation Effect of Agency Conflict and Financing Constraint*,12

enterprises will increase their holdings of financial assets to cope with the influence of future cash flow uncertainty on corporate investment.<sup>87</sup>

On the other hand, other scholars identify the purpose of financial asset allocation lies in pursuing short-term interests.<sup>88</sup> Compared with the real investment sector, the real estate industry and the financial industry are profitable industries.<sup>89</sup> In fact, investment returns are much greater than the return on physical investments.<sup>90</sup> Incentivizing to obtain short-term excess returns, managers' investment horizons will be shortened, and they are more inclined to speculative arbitrage through the allocation of financial assets. Following in this vein, mixed ownership structure will result in managers adapting investment strategies to pursue short-term interests.<sup>91</sup>

Finally, existing scholarship identifies factors shaping the outcomes of mixed ownership reform and financial investment.<sup>92</sup> In particular, the institutional environment plays a crucial role. A supportive legal framework, regulatory clarity, and investor protection mechanisms can enhance the effectiveness of mixed ownership reform in attracting investment. In addition, the quality of corporate governance practices, including board structure, transparency, and accountability, influences investor perceptions and decision-making. Moreover, industry characteristics, market competition, and firm-specific factors such as profitability, growth prospects, and risk profiles also shape the outcomes of mixed ownership reform in terms of

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<sup>87</sup> Ye et Li, *Mixed reform of State-Owned Enterprises and Corporate Financial Asset Allocation*, Financial Policy Research, 2021,114-130

<sup>88</sup> Ye et Li, *Mixed reform of State-Owned Enterprises and Corporate Financial Asset Allocation*, Financial Policy Research, 2021,114-130

<sup>89</sup> Ye et Li, *Mixed reform of State-Owned Enterprises and Corporate Financial Asset Allocation*, Financial Policy Research, 2021,114-130

<sup>90</sup> Yuan, *Research on the Influence of Mixed-Ownership Reform on Exploratory Innovation of SOEs*, 15

<sup>91</sup> Guo Sheng Zhang et Qi Hui Nie, *Research on the Investment Effect of Dividends of State-Owned Enterprises Based on the Dual Perspectives of Investment Efficiency and Investment Risk*, Corporate Management, 2022.1, 47-57

<sup>92</sup> Zhang et Nie, *Research on the Investment Effect of Dividends of State-Owned Enterprises Based on the Dual Perspectives of Investment Efficiency and Investment Risk*, Corporate Management, 47-57

financial investment.

### **3.3. Mixed Ownership Reform: State Ownership and R&D Investment**

Mixed ownership reform has been implemented as a strategy to improve innovation of state-owned enterprises. While examining the implication between mixed ownership reform and research and development Investment, this section will explore how mixed-ownership reform affects the level and efficiency of R&D Investment in state-owned enterprises, along with the underlying mechanisms that drive these effects.

Existing scholarship highlights challenges in cultivating innovation and entrepreneurial activities in state-owned enterprises. State ownership, due to its divergent objectives and incentives compared to private ownership, exerts influences on the level and efficiency of R&D investment in state-owned enterprises.<sup>93</sup> Indeed, state-owned enterprises confront agency problems and bureaucratic constraints, which hinder their ability to allocate resources effectively towards R&D activities.<sup>94</sup> For instance, scholars use panel datasets of Chinese manufacturing enterprises to evaluate the extent to which state ownership benefits, or impedes, innovation. Research finds that, while state ownership enables enterprises to obtain crucial R&D resources, government interference also renders enterprises less efficient in employing resources to generate innovation.<sup>95</sup> Empirical evidence suggests that a minority state ownership will facilitate innovation and entrepreneurial activities.

Moreover, scholars perceive mixed ownership reform as a means to stimulate R&D

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<sup>93</sup> Azzam et Alhababsah, *Does State Ownership Affect R&D Investments? Evidence from China*, Cogent Business & Management, 1-14

<sup>94</sup> Xiaoqian Zhang, Mingqiang Yu, Gaoquan Chen, *Does mixed-ownership reform improve SOEs' innovation? Evidence from state ownership*, China Economic Review, Volume 61,2020, 2-20

<sup>95</sup> Chunling Li et al, *Does the Mixed Ownership Reform Affect the Innovation Strategy Choices of Chinese State-Owned Enterprises*,2020, 2587

investment in state-owned enterprises. Studies suggest that introducing private or strategic investors will enhance the efficiency and effectiveness of R&D investment in multiple ways.<sup>96</sup> Through bringing market-orientated perspectives, stronger financial discipline, and managerial expertise, private investors endeavor to promote resource allocation and innovation outcomes in state-owned enterprises.<sup>97</sup> In addition, while industrial competition becomes higher, the efficiency in transforming R&D investment into innovation output increases.<sup>98</sup> While the agency theory views state ownership as detrimental to innovation, institutional environment determines that governments in emerging economies exert critical influences on regulatory policies and control over resources. In this way, implications on state ownership and innovation are enlarged and exacerbated in emerging economies.<sup>99</sup>

A multitude of studies provide empirical evidence concerning the relationship between state ownership and R&D investments in the context of emerging economies.<sup>100</sup> Empirical evidence reveals that state ownership exerts positive influence on R&D investment decisions. In addition, research finds that state ownership also exerts positive influence on board monitoring intensity.<sup>101</sup> Through investigating the role of state ownership in R&D investment in China, these studies exert implications for stakeholders, providing counter-evidence to the common

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<sup>96</sup> Haohan Luo, Xiao Wu, Ying Wu, *Mixed Ownership Reform of State-Owned Enterprises and R&D Investment*, Mathematical Problems in Engineering, 2022,14

<sup>97</sup> H. Wei, E. Xie and J. Gao, R&D Investment and Debt Financing of High-Tech Firms in Emerging Economies: The Role of Patents and State Ownership, in *IEEE Transactions on Engineering Management*, 1-15

<sup>98</sup> M. Usman, S. Xiao, R. U. Ashraf and F. Lian, *Role of ownership structure in firm R&D investment decision: Evidence from Chinese high-tech industry*,2017, 1-5

<sup>99</sup> Lei Li, *Mixed Ownership Reform of State-owned Enterprises, Deviant Strategy and Investment Efficiency*, Department of Management and Corporate Governance, Shandong University,2022

<sup>100</sup> Azzam et al, *Does State Ownership Affect R&D Investments? Evidence from China*, Business & Management, 1-14

<sup>101</sup> Azzam et al, *Does State Ownership Affect R&D Investments? Evidence from China*, 1-14

impression regarding the negative impact of state ownership on firm performance.<sup>102</sup>

Furthermore, scholars identify mechanisms through which mixed-ownership reform influences R&D investment in state-owned enterprises. On one level, private or strategic investors introduce market competition for performance improvement, leading to a reallocation of resources towards R&D activities.<sup>103</sup> On another level, mixed-ownership reform enhances corporate governance practices, increases managerial accountability, and improves the transparency and efficiency of R&D investment decision-making processes.<sup>104</sup> In this way, state-owned enterprises, with access to external financing and capital markets, compounded by mixed-ownership reform, gain funding sources for R&D investment.

Nonetheless, R&D investment serves as a double-edge sword in developing innovations. While substantial R&D investment can increase enterprises' potential to establish long-term competitive advantages, it also causes high levels of transaction costs hindering accessibility to debt financing.<sup>105</sup> For instance, previous studies adopt a panel dataset comprising Chinese high-tech manufacturing enterprises. Research finds that R&D investment exerts a negative influence on debt financing of state-owned enterprises.<sup>106</sup> In particular, R&D investment promotes an enterprises' likelihood of having a patent, which in turn facilitates access to debt financing. In this way, state ownership makes the negative influence of R&D investment more salient as a moderator, it also moderates the positive influence of patents on debt financing in an inverted

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<sup>102</sup> Azzam et al, *Does State Ownership Affect R&D Investments? Evidence from China*, 1-14

<sup>103</sup> Jiang, W, & Zeng, Y., *State Ownership, Bank loans, and corporate investment*, *International Review of Economics and Finance*, 2014,1-24

<sup>105</sup> Xiaoqian Zhang, Mingqiang Yu, Gaoquan Chen, *Does mixed-ownership reform improve SOEs' innovation? Evidence from state ownership*, *China Economic Review*, Volume 61,2020, 2-20

<sup>106</sup> Chunling Li et al, *Does the Mixed Ownership Reform Affect the Innovation Strategy Choices of Chinese State-Owned Enterprises*,2020, 2587

U-shaped pattern. Following in this vein, research reveals that R&D-intensive enterprises face financing constraints, yet patents and state ownership can relax or tighten the constraints.<sup>107</sup>

Notably, government policies and institutional environment play significant roles in R&D investment and mixed-ownership reform. On one hand, supportive policies that encourage R&D activities, protect intellectual property rights, and provide incentives for innovation will amplify the positive influence of mixed-ownership reform on R&D investment.<sup>108</sup> On the other hand, an institutional environment with well-functioning capital markets, a strong legal framework, and effective regulation can foster an ecosystem conducive to increased R&D investment in mixed-owned state-owned enterprises.<sup>109</sup> For instance, empirical studies investigate influence of institutional and managerial ownership structures on R&D investment decision within state-owned enterprises. Evidence shows that ownership structures such as institutional and also managerial have negatively and significantly influence on firm R&D investment.<sup>110</sup> In addition, state ownership has positive moderation role in relation of institutional ownership with firm R&D investment while no moderating effect of state ownership in relationship among managerial ownership and firm R&D spending decision.<sup>111</sup>

Building on these perspectives, this research article intends to address the gap by examining the extent to which various ownership structures affect firms' R&D investment decisions within

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<sup>107</sup> Haohan Luo, Xiao Wu, Ying Wu, *Mixed Ownership Reform of State-Owned Enterprises and R&D Investment*, *Mathematical Problems in Engineering*, 2022,14

<sup>108</sup> H. Wei, E. Xie and J. Gao, R&D Investment and Debt Financing of High-Tech Firms in Emerging Economies: The Role of Patents and State Ownership, in *IEEE Transactions on Engineering Management*, 1-15

<sup>109</sup> H. Wei, E. Xie and J. Gao, R&D Investment and Debt Financing of High-Tech Firms in Emerging Economies: The Role of Patents and State Ownership, in *IEEE Transactions on Engineering Management*, 1-15

<sup>110</sup> Chunling Li et al, *Does the Mixed Ownership Reform Affect the Innovation Strategy Choices of Chinese State-Owned Enterprises*, 2020, 2587

<sup>111</sup> Haohan Luo, Xiao Wu, Ying Wu, *Mixed Ownership Reform of State-Owned Enterprises and R&D Investment*, *Mathematical Problems in Engineering*, 2022,14

state-owned enterprises.<sup>112</sup> By delving into this aspect, the study intends to offer valuable empirical evidence that can inform policy-making and guide managerial decisions concerning mixed-ownership reform and R&D investment within state-owned enterprises.<sup>113</sup>

### **3.4. Mixed-Ownership Reform: State Ownership and Total Factor Productivity (TFP)<sup>114</sup>**

Mixed-ownership reform has been widely adopted as a means to improve the performance and efficiency of state-owned enterprises. To investigate the relationship between state ownership, mixed-ownership reform and TFP, this section will examine how mixed-ownership reform affects TFP in state owned enterprises, along with underlying mechanisms that drive these effects.

Existing scholarship shows that state-owned enterprises confront difficulties in achieving high levels of TFP. Hindering factors include bureaucratic constraints, agency problems, and lack of market discipline.<sup>115</sup> Emphasizing social objectives and political interference, state ownership may hinder the efficiency and innovation capabilities of state-owned enterprises, thereby affecting their TFP performance. For instance, previous studies investigate the impact of the mixed-ownership reform on the level of TFP within state-ownership enterprises. Empirical evidence shows that, compared with other state-owned enterprises, the level of TFP of pilot enterprises has been significantly improved through mixed-ownership reform.<sup>116</sup> Specifically,

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<sup>112</sup> Song, Zhi-Hong & Wang, Xue & Lee, Dong-Mei, *The Influence of Ownership Structure on Firms' R&D Investments: An Empirical Investigation*, 2021 European Journal of Business and Management Research. 103-107.

<sup>113</sup> Zhang Fan, Mixed Ownership Reform and SOEs' TFP: Evidence from Chinese Listed Company, School of Economics & Management, Southeast University, 2-21

<sup>114</sup> Harris, Richard; Hashimzade, Nigar; Ding, Sai (2016) : Political Connections, State Ownership and Productivity in China, CESifo Working Paper, No. 6236, Center for Economic Studies and Institute

<sup>115</sup> Zhang Fan, Mixed Ownership Reform and SOEs' TFP: Evidence from Chinese Listed Company, School of Economics & Management, Southeast University, 2-21

<sup>116</sup> Nigel Driffield and Jun Du, Privatization, State Ownership and Productivity: Evidence from China, Economics and Strategy Group, Aston University, 10

research finds a positive correlation between levels of TFP and reducing state-owned shares.<sup>117</sup>

Following in this vein, mixed ownership reform has been proposed as a strategy to enhance the TFP of state-owned enterprises. Through introducing private or strategic investors, mixed-ownership reform brings market-oriented practices, managerial expertise, and financial discipline to state-owned enterprises, which potentially improve their TFP performance. In addition, studies also suggest that introducing private investors can enhance competition, incentivize efficiency improvements, and promote innovation, leading to increased TFP in mixed-owned enterprises. In particular, scholars examine the relationship between the transfer of ownership between the public and private sectors of Chinese industry, along with its impacts on firm performance. Evidence shows that privatization of state-owned shares significantly contributes to productivity growth.<sup>118</sup>

Moreover, scholars propose multiple mechanisms predicting the influence of mixed-ownership reform exerted on TFP in state-owned enterprises. On one level, private investor can introduce market discipline, performance incentives, and more efficient resource allocation practices, which can positively impact TFP. On another level, mixed-ownership reform facilitates technology transfer, knowledge spillovers, and access to external networks and resources, thereby enhancing innovation capabilities and TFP. In this way, the improved corporate governance practices associated with mixed-ownership structures can lead to better monitoring, accountability, and strategic decision-making—all of these factors contribute to growth of TFP level.

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<sup>117</sup> Nigel Driffield and Jun Du, *Privatization, State Ownership and Productivity: Evidence from China*, Economics and Strategy Group, Aston University, 10

<sup>118</sup> Nigel Driffield and Jun Du, *Privatization, State Ownership and Productivity: Evidence from China*, Economics and Strategy Group, Aston University, 10



Furthermore, scholars investigate the innovative efficiency within state-owned enterprises. On the one hand, innovative efficiency refers to output of patents per dollar spending of R&D expenditure. Evidence indicates that, while a minority of state-owned enterprises are substantially more innovatively efficient than non-state-owned enterprises, the relative innovative efficiency of minority state-owned enterprises is more pronounced among counterparts with high financial constraints. Statistical evidence reveals that partial state ownership will be favorable to accessibility to talent, connections, and technological resources, which will enable efficient TFP outcomes from R&D investment.<sup>119</sup> On the other hand, other scholars construct a Schumpeterian-type model of growth with managerial time allocation between productive activities and accumulating political connections.<sup>120</sup> Using firm-level data from China, research finds that enterprises with lowest level of political affiliation and state ownership achieve highest level of TFP.<sup>121</sup>

This research article aims to offer empirical evidence that will enhance our understanding of the relationship between political connections and the level of Total Factor Productivity (TFP) in state-owned enterprises. By shedding light on these dynamics, the study intends to provide insights to inform policy-making decisions regarding mixed-ownership reform and TFP performance within state-owned enterprises. Furthermore, the research article seeks to assist state-owned enterprise managers in making informed decisions regarding their corporate strategies. By understanding the impact of political connections on TFP, managers can devise

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<sup>119</sup>Xiaping Cao, Douglas Cumming, Sili Zhou, *State ownership and corporate innovative efficiency*, *Emerging Markets Review*, 5-8

<sup>120</sup>Harris, Richard; Hashimzade, Nigar; Ding, Sai (2016) : Political Connections, State Ownership and Productivity in China, CESifo Working Paper, No. 6236, Center for Economic Studies and Institute

<sup>121</sup> Xiaodong Xing, *Financial Development, Entrepreneurship and Total Factor Productivity*, 2019

strategies to foster productivity and overall performance.

### **3.5 Entrepreneurship: Financial Investment, R&D Investment, and TFP Level**

Existing literature identifies different incentive mechanisms for promoting, or inhibiting financial investment.<sup>122</sup> Financial investment plays a crucial role in supporting innovation and R&D development. Increased financial resources facilitate innovation through funding R&D projects, acquiring advanced technologies, and implementing innovation-driven strategies. Private investors are willing to allocate funds to R&D investment, which will lead to enhanced R&D investment efficiency and higher TFP level in state-owned enterprises.

Following in this vein, the relationship between entrepreneurship, mixed ownership, and the level of TFP can be described as follows: (1) state ownership influences entrepreneurship (2) state ownership influences TFP (3) entrepreneurship influences TFP. On one level, state ownership can influence the level of entrepreneurship within an enterprise. If state-owned enterprises can embrace more entrepreneurial principles, it may lead to a higher level of innovation and creativity in their operations. On another level, state ownership exerts a direct impact on TFP. The management and decision-making structures within state-owned enterprises can affect their overall efficiency and productivity levels. Building on these perspectives, the level of entrepreneurship within an enterprise can directly influence its level of TFP. Enterprises that prioritize innovation and take calculated risks are more likely to achieve higher levels of productivity and efficiency in their operations.

## **4. Hypotheses and Research Design**

### **4.1 Hypotheses**

Building on the above analysis of the interplay between financial investment, R&D Investment, and TFP level, this research article presents the following hypotheses to assess the influence of mixed ownership reform exerted on entrepreneurship in state-owned enterprises.

**H1:** The mixed ownership reform has a positive effect on SOE's financial investment.

**H2:** The mixed ownership reform has a positive effect on SOE's R&D Investment.

**H3:** The mixed ownership reform has a positive effect on the level of TFP in SOE Enterprises.

## 4.2 Empirical Strategy

### 4.2.1 Mixed Ownership Reform and Financial Investment

To evaluate the influence of mixed ownership reform exerted on financial investment, the regression model is set up as follows:

$$FinancialInvestment_{i,t} = \beta_1 + \beta_2 nation_{i,t} + \gamma controls_{i,t} + \epsilon_{i,t}$$

$$Investgaincash_{i,t} = \beta_1 + \beta_2 nation_{i,t} + \gamma controls_{i,t} + \epsilon_{i,t} \quad (1)$$

$$Investexpdcashi_{i,t} = \beta_1 + \beta_2 nation_{i,t} + \gamma controls_{i,t} + \epsilon_{i,t} \quad (2)$$

$$cashfloiinvest_{i,t} = \beta_1 + \beta_2 nation_{i,t} + \gamma controls_{i,t} + \epsilon_{i,t} \quad (3)$$

$$Investcash_{receii}_{i,t} = \beta_1 + \beta_2 nation_{i,t} + \gamma controls_{i,t} + \epsilon_{i,t} \quad (4)$$

$$equityinvest_{longi}_{i,t} = \beta_1 + \beta_2 nation_{i,t} + \gamma controls_{i,t} + \epsilon_{i,t} \quad (5)$$

Here the coefficient of independent variables indicate that, if  $\beta_2 > 0$ : state-owned shareholder participation promotes investment in financial assets of state-owned enterprises; if  $\beta_2 < 0$ : state-owned shareholder participation inhibits investment in financial assets of state-owned enterprises.

This regression model reveals the relationship between the participation of state-owned shareholders and the investment in financial assets of state-owned enterprises. However, it

cannot identify the motivation behind the allocation of corporate financial assets in the process of mixed ownership reform. Therefore, this thesis will further analyze the rationale of state-owned enterprises in allocating financial asset during mixed ownership reform.

#### 4.2.2 Mixed Ownership Reform and R&D Investment

To evaluate the influence of mixed ownership reform exerted on R&D Investment, the regression model is set up as follows:

$$R\&D\ Investment\{i, t\} = \beta_1 + \beta_2\ log\ nation\{i, t\} + \gamma\ controls\{i, t\} + \epsilon_{i, t}$$

$$\log IGrant_{i, t} = \beta_1 + \beta_2 \log nation_{i, t} + \gamma controls_{i, t} + \epsilon_{i, t} \quad (1)$$

$$\log IGrantAvgYears_{i, t} = \beta_1 + \beta_2 \log nation_{i, t} + \gamma controls_{i, t} + \epsilon_{i, t} \quad (2)$$

$$\log UGrantAvgYears_{i, t} = \beta_1 + \beta_2 \log nation_{i, t} + \gamma controls_{i, t} + \epsilon_{i, t} \quad (3)$$

Here the coefficient of independent variables indicate that, if  $\beta_2 > 0$ : state-owned shareholder participation promotes R&D Investment of state-owned enterprises; if  $\beta_2 < 0$ : state-owned shareholder participation inhibits R&D Investment of state-owned enterprises.

This regression model reveals the correlation between the participation of state-owned shareholders and the investment in research and development of state-owned enterprises. Following prior studies, the variable ‘R&D investment’ is measured as the ratio of R&D expenditure to sales. Given that R&D investment is strongly related to sales, the ratio of R&D investment to sales helps control for size effects and heteroskedasticity, and facilitate a comparison of R&D investment across firms. Here the  $i$  and  $t$  represents the enterprise and the year, respectively. Through conducting the regression model, this thesis will examine the rationale of state-owned enterprises in allocating resources to research and development activities during mixed ownership reform.

### 4.2.3 Mixed Ownership Reform and Level of Total Factor Productivity (TFP)

To evaluate the influence of mixed ownership reform exerted on the level of TFP, the regression model is set up as follows:

$$TFP_{it} = Y_{i,t} - \beta_{lit} - \beta_{kit} - \beta_{mit}$$

This regression model reveals the correlation between the participation of state-owned shareholders and the level of TFP within the state-owned enterprises. In this study, the variable  $Y(i,t)$  represents the firm's innovation capacity in year  $t$ , which is measured by innovative input. Specifically, the measurement of innovation output includes the number of patent applications, including invention patents, utility model patents, and design patents.<sup>123</sup>

Moreover,  $SOE(i,t)$  is a dummy variable that measures the nature of property rights. It equals 1 when firm  $i$  belongs to state-owned enterprises in year  $t$ . In addition,  $Post(t)$  is a time dummy variable for the mixed-ownership reform, which equals 1 when the year is after 2013. In particular,  $X(i,t)$  denotes a series of control variables, including corporate financial leverage, profitability, firm growth, firm size, corporate liquidity assets, the number of employees, and tangible assets.<sup>124</sup>

## 4.3 Variable Description

### 4.3.1 Independent Variable

This research article adopts the ratio of state-owned equity in state-owned enterprises to

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<sup>123</sup> This measurement of TFP follows the regression model provided by the following article: [Levinsohn, J., & Petrin, A. \(2003\). Estimating Production Functions Using Inputs to Control for Unobservables. Review of Economic Studies, 70\(2\), 317–341;](#) Wang, M., Huang, Y., An, Z., & Wei, C. (2023). Reforming the world's largest heating system: Quasi-experimental evidence from China. *Energy Economics*, 117, 106417. Here the regression model also contains  $SOE(i,t)$ ,  $Post(t)$ , and  $X(i,t)$  as dummy variables.

<sup>124</sup> Gabriele Rovigatti, Vincenzo Mollisi, 2018, Theory and Practice of Total-Factor Productivity Estimation: The Control Function Approach using Stata, *Stata Journal*, 18(3): 618–662

define the occurrence of mixed ownership reform. Mixed ownership reform involves introducing private or non-state ownership in state-owned enterprises aiming to promote their efficiency, competitiveness, and overall performance. The ratio of state-owned equity is calculated by dividing the state-owned equity ( $share\_nation$ ) by the total equity ( $equity\_total$ ) of the state-owned enterprise.<sup>125</sup> By multiplying the result by 100%, the ratio is converted to a percentage, representing the proportion of state-owned equity in the total equity of the enterprise. As a result, the ratio of state-owned equity is a continuous variable.

In addition, this research article employs the log function to measure the ratio of state-owned equity, stabilizing variance and reducing the impact of extreme values. By taking the logarithm of this ratio and using regression modeling, the study aims to yield insights into the relationship between ownership structure and the performance of state-owned enterprises during the reform.

#### **4.3.2 Dependent Variable**

The research article adopts a multitude of dependent variables respectively. To evaluate the influence of mixed ownership reform exerted on financial investment, this research article employs dependent variables listed as following:

**Table 1: Dependent Variables of Financial Investment**

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<sup>125</sup> Kai Wan & Xiaolin Yu (2022) Impact of mixed ownership reforms on firm innovation—empirical evidence from China, *Journal of Applied Economics*, 1345

Dependent Variable	Meaning	Measurement
cashflow_invest	cash generated by investment activities net traffic	record the cash flow resulting from the purchase or sale of long-term assets and investment
investgain_cash	dividends on equity, bond investments, cash benefits such as real interests equity, bond investment cash	positive cash inflow from investment activities
investexpd_cash	expenditure	cash outflows made to acquire equities and bond as part of an enterprise' portfolio
investcash_recei	recovery of investment; received cash	cash inflows resulting from the return of the initial investment
equityinvest_long	long-term equity issuance of stock and bond investment	long-term commitment of capital by investors in purchasing stocks and bonds

According to the existing literature, the measurement of financial investment is divided into various categories, including equity investment, bond investment, cash flow from investment activities, return on investment, risk-adjusted returns, investment turnover, and long-term vis-à-vis short-term investments. This research article selectively uses dependent variables from the categories to assess the impact of mixed ownership reform on financial investment.

Moreover, to assess the influence of mixed ownership reform exerted on Research and Development Investment, this research article employs the following dependent variables:

**Table 2: Dependent Variables of Research and Development Investment**

Dependent Variable	Meaning/Measurement	Data Source
IGrant	number of invention patents granted in the year	CSMAR
IGrantAvg Years	average number of years authorized in the year	CSMAR
Ugrant	number of utility model patents granted in the year of utility model authorization	CSMAR
UGrantAveYears	utility model patent granted in the current year (average number of years)	CSMAR
Dgrant	design patent granted in the current year	CSMAR

Dgrantavgyears	number average number of years design patents from application to grant	CSMAR
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According to the existing literature, the measurement of research and development investment can be divided into various indicators, including R&D expenditures, R&D Intensity, R&D as percentage of operating expenses, number of R&D projects or initiatives, Patents and Intellectual Property (IP) Registrations, R&D Personnel Count, R&D Investment by geographic region. This research article selects multiple dependent variables from the categories, with each dependent variable provides insights into the level, intensity, and the nature of R&D spending, which can help understand how adjustment in ownership structures may influence research and innovation activities within state-owned enterprises.

### 4.3.3 Control Variables

To conduct the firm-level analysis, this research article also includes multiple control variables. The control variables are listed as follows:

**Table 3: Control Variables**

Name of the Variable	Measurement	Data Sources
enterprise size	natural logarithm of total assets	CSMAR
enterprise age	natural logarithm of the number of years of enterprise establishment	CSMAR
corporate profitability	ratio of net profit to total assets	CSMAR
enterprise debt ratio	ratio of total liabilities to total assets	CSMAR
enterprise cash holdings	ratio of enterprise cash holdings to total assets of enterprises	CSMAR
equity concentration TOP10	shareholding ration of the top10 shareholders	CSMAR
board size	number of borad members	CSMAR
growth	operating income growth rate	CSMAR

Specifically, the effects of enterprise size, growth, and profitability are controlled using the natural logarithm of an enterprise' year-end total assets, total liabilities as a proportion of total assets. By including these control variables in the analysis, this research article isolates the



specific effect of mixed ownership reform while considering the potential influence of enterprise size, leverage, and financial performance.

### **4.3 Data Sources and Sample Selection**

#### **4.3.2 The selection of the year of 2013**

With the proposal of the Third Plenary Session of the Eighteen in 2013 to actively develop the mixed-ownership economy, the phenomenon of state ownership reform introducing non-state-owned strategic investors becomes apparent. As the information disclosure of R&D investment and property ownership of listed state-owned enterprises has become more sophisticated, the year of 2013 provides an appropriate starting point for research and a reliable data source to conduct the analysis.

#### **4.3.3 Sample Selection**

This research article designs a firm-level quantitative research. To evaluate the impact of mixed ownership reform on financial investment and entrepreneurial activities, this section employs firm-level data from the 2013-2017 period of Chinese A-share listed State Ownership Enterprises. The primary dataset, extracted from China Securities Market and Accounting Research (CSMAR) and entitled *Balance Cashflow Profit Market Index Basic Information Equity Governance yearly*, contains 36,837 state-owned enterprises that have or have not participated in the mixed-ownership reform. Production and Operation of state-owned enterprises are also recorded.

Moreover, this firm-level database will be merged with another CSMAR dataset--Patent Grant Status Table (1992-2017)—which is for use by the National Institute of Development, Peking University only. Dataset produced from research institution guarantees reliability and

simplicity of obtaining that data from listed state-owned enterprises, along with better capability of listed enterprises in the case of responding to policy calls to report their progress during mixed-ownership reform. In addition, this section will also merge the CSMAR dataset with other datasets, including R&D Investment, Innovation Output, The Nature of the Top Ten Shareholders of the Enterprise, Data of the Shareholding Ratio and Shareholder Affiliation, and the Investment of Corporate Financial Assets, to conduct the quantitative analysis. The final sample includes 36,837 firm-year observations representing individual state-owned enterprises.

Finally, this research article conducts heterogeneity tests on state-owned enterprises selected for mixed ownership reform, evaluating the impact of mixed ownership reform on divergent industries and regions in China. To conduct heterogeneity tests, this section will merge the CSMAR dataset with another dataset entitled Notes on the 2017 National Economic Industry Classification.

## **5. Empirical Analysis & Interpretation**

### **5.1. Results Analysis**

#### **5.1.1 Mixed-Ownership Reform and State-Owned Enterprises' Financial Investment**

Based on the OLS analyses, the relationship between mixed-ownership reform and financial investment appears positive. Table 1 displays the first round of OLS analyses, where financial investment is defined as dividends on equity, bond investments, cash benefits (such as interest), as well as recovery of investment asset from received cash.

The first column of Table 1 measures the influence of mixed-ownership reform exerted on state-owned enterprises. Column (1) reports the relationship between the ratio of state-owned equity and investment gained from cash benefits. This research finds a positive correlation

between the ratio of state-owned equity and financial investment. Investment gained from cash inflow goes up by 0.245 percent when the ratio of state-owned equity increases 10 percent. This statistical finding provides evidence that the mixed ownership reform promotes financial investments of state-owned enterprises, thereby encouraging entrepreneurial activities. In this way, the hypothesis (H1) is confirmed.

**Table 4: OLS of Mixed-Ownership Reform’s Influence on Financial Investment**

VARIABLES	(1) Cash inflow from Investment	(2) Cash inflow from Investment	(3) Cash inflow from received cash	(4) Cash inflow from Received cash
Share of Private Participation (log)	0.0245*	0.0227*	0.679***	0.681***
Constant	0.989***	0.829***	11.41***	9.166***
Control	No	Yes	No	Yes
Observations	25,754	25,732	25,754	25,732
R-squared	0.544	0.545	0.576	0.577

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The results in column (2) add control variables. The control variables include the total liabilities, free cash flow at the fiscal year-end, total profits and assets, number of independent directors, and number of executive directors within state-owned enterprises. Column (2) reports that investment gained from cash inflow goes up by 0.227 percent when the ratio of state-owned equity increases 10 percent. This result provides further evidence that mixed ownership reform promotes financial investment state-owned enterprises.

Moreover, Column (3) reports the relationship between the ratio of state-owned equity and investment asset from received cash. This research article finds a positive relationship between state-owned equity and investment asset. Investment from received cash goes up by 6.79 percent when the ratio of state-owned equity increases 10 percent. This statistical finding provides

further evidence that the mixed ownership reform promotes financial investment within state-owned enterprises.

In addition, the results in column (4) include control variables, including total liabilities, free cash flow, total profits and assets, number of independent directors, and number of executive directors within state-owned enterprises. Column (4) reports a positive relationship between state-owned equity and investment asset. Investment asset from received cash goes up by 6.81 percent when the ratio of state-owned equity increases 10 percent. Taken together, all of these statistical findings substantiate hypothesis (H1).

### 5.2.2 Mixed-Ownership Reform and R&D Investment

According to the OLS analyses, the relationship between mixed ownership reform and R&D Investment appears positive. Table 2 displays OLS analyses, where R&D Investment is defined as the number of invention patents granted in the year, the average number of years from application to grant of an invention patent, the average number of utility model patent granted in the current year.

**Table 5: OLS of Mixed-Ownership Reform’s Influence on R&D Investment**

VARIABLES	(1) Invention	(2) Invention Patents(avg)	(3) Utility Patents(avg)
Share of Private Participation (log)	-0.0122	0.00326	-0.000376
Constant	-0.820*	1.480***	0.443***
Control	Yes	No	No
Observations	8,677	6,724	6,419
R-squared	0.805	0.665	0.689

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 2 reports the regression estimates. The models relating the ratio of state-owned equity to research and development investment suggests that R&D Investment serves as an important signal in terms of measuring entrepreneurial activities within state-owned enterprises. Nonetheless, the statistical findings indicate that the correlation between mixed ownership reform and research and development investment is not statistically significant.

For instance, Column (1) reports a negative relationship between state-owned equity and number of invention patents granted in a year. Number of invention patents goes down by 0.12 percent when the ratio of state-owned equity increases 10 percent. In a similar vein, column (2) reports a positive relationship between ratio of state-owned equity and the average number of years from application to grant of an invention patent. The average number of years from application to grant of an invention patent goes up by 0.0326 percent when the ratio of state-owned equity increases 10 percent. In addition, column (3) reports a negative relationship between ratio of state-owned equity and the average number of utility model patent granted in the current year. The average number of utility model patent granted goes down by 0.00376 percent when the ratio of state-owned equity increases 10 percent. However, it's important to note that these findings are statistically insignificant.

Therefore, this paper fails to substantiate Hypothesis (H2). It is noteworthy to consider the mixed nature of these results. Many state-owned enterprises do not prioritize innovation and still rely on conventional production methods. Their innovation activities are often driven by financial factors rather than patent-based research & development. By consequence, the ratio of state-owned equity may not significantly influence research and development activities.

### **5.2.3 Mixed Ownership Reform and Level of Total Factor Productivity (TFP)**

Based on the OLS analyses, the relationship between mixed ownership reform and level of total factor productivity appears positive. Table 3 displays the OLS analyses, where total factor productivity (TFP) is measured by adopting LP productivity estimator and OP productivity estimator. It is noteworthy that the patent data within the CSMAR dataset is limited, which only covers patent for certain companies rather than the entire sample. Therefore, the observations related to patent data only represents a portion of the entire sample's knowledge.

**Table 6: OLS of Mixed Ownership Reform's effect on level of Total Factor Productivity**

VARIABLES	(1) Total Factor Productivity (LP estimator)	(2) Total Factor Productivity (OP estimator)
Share of Private Participation(log)	0.0461*** (0.00788)	0.0665*** (0.00760)
Constant	10.06*** (0.00288)	13.82*** (0.00273)
Observations	18,685	25,287
R-squared	0.853	0.837

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Column (1) adopts LP productivity estimator to measure the influence of the mixed-ownership reform on the level of TFP within state-owned enterprises. This research article finds a positive relationship between the ratio of state-owned equity and the level of total factor productivity. Productivity goes up by 0.461 percent when the ratio of state-owned equity increases 10 percent. In this way, this statistical evidence shows that, compared to other state-owned enterprises, the level of TFP of pilot enterprises has been significantly improved through mixed-ownership reform.

Furthermore, column (2) adopts OP productivity estimator to measure the influence of the mixed-ownership reform on the level of TFP. This research article finds a positive relationship between the ratio of state-owned equity and the level of total factor productivity. Productivity

goes up by 0.665 percent when the ratio of state-owned equity increases 10 percent. Taken together, all of this evidence confirms Hypothesis (H3) that mixed ownership reform exerts a positive effect on TFP level in state-owned enterprises.

These outcomes underline the potential benefits of mixed ownership reform in fostering improvements in TFP levels. The dual application of LP and OP productivity estimators bolsters the consistency and robustness of these findings, further supporting the notion that mixed ownership reform plays a pivotal role in enhancing TFP within state-owned enterprises.

## Conclusion

This research article has undertaken a comprehensive exploration of the intricate relationship between China's mixed ownership reform and the expansion of state-owned enterprises. By dissecting the empirical puzzle of how mixed ownership reform influences these enterprises, and by delving into the interplay between state ownership, entrepreneurship, and firm performance, this study has provided a comprehensive understanding of the multifaceted dynamics at play. The integration of entrepreneurship as a crucial variable has enriched the study's analytical framework, enabling a more holistic perspective on the impact of reform.

Through empirical analyses, the paper unearthed significant insights into the complex interactions between mixed ownership reform and various dimensions of state-owned enterprise behavior. The positive association between reform and financial investment demonstrated the reform's role in incentivizing entrepreneurial activities within SOEs. Nevertheless, this paper didn't substantiate the correlation between mixed-ownership reform and research and development investment. Rather than valuing patent-based research & development, SOEs rely on conventional production methods. Furthermore, the consistent positive correlation between mixed ownership reform and Total Factor Productivity (TFP) levels underscored the reform's potential in enhancing productivity, fostering growth, and adaptation within SOEs.

The findings of this study offer a comprehensive and nuanced understanding of how mixed ownership reform impacts the behavior and performance of state-owned enterprises. These insights will aid policymakers and practitioners navigating the



complexities of reform implementation. The dual lens of entrepreneurship and innovation provides a robust basis for crafting context-sensitive strategies that maximize the benefits of reform, fostering both economic growth and adaptability in an ever-evolving business landscape.

By illuminating the intricacies of reform's influence and providing empirical evidence to substantiate key hypotheses, this research article not only contributes to the theoretical discourse but also offers practical implications for policy formulation and implementation. As China's mixed ownership reform continues to shape the trajectory of state-owned enterprises, the findings and insights presented in this paper will guide future endeavors, providing a roadmap for harnessing the potential of reform to foster entrepreneurship, innovation, and sustainable growth.

In a world characterized by constant change and evolving economic landscapes, the significance of understanding reform's implications for state-owned enterprises cannot be overstated. This research article seeks to provide a foundational reference, adding valuable insights to the ongoing dialogue surrounding mixed ownership reform and its transformative potential in the realm of entrepreneurship, innovation, and state-owned enterprise dynamics.

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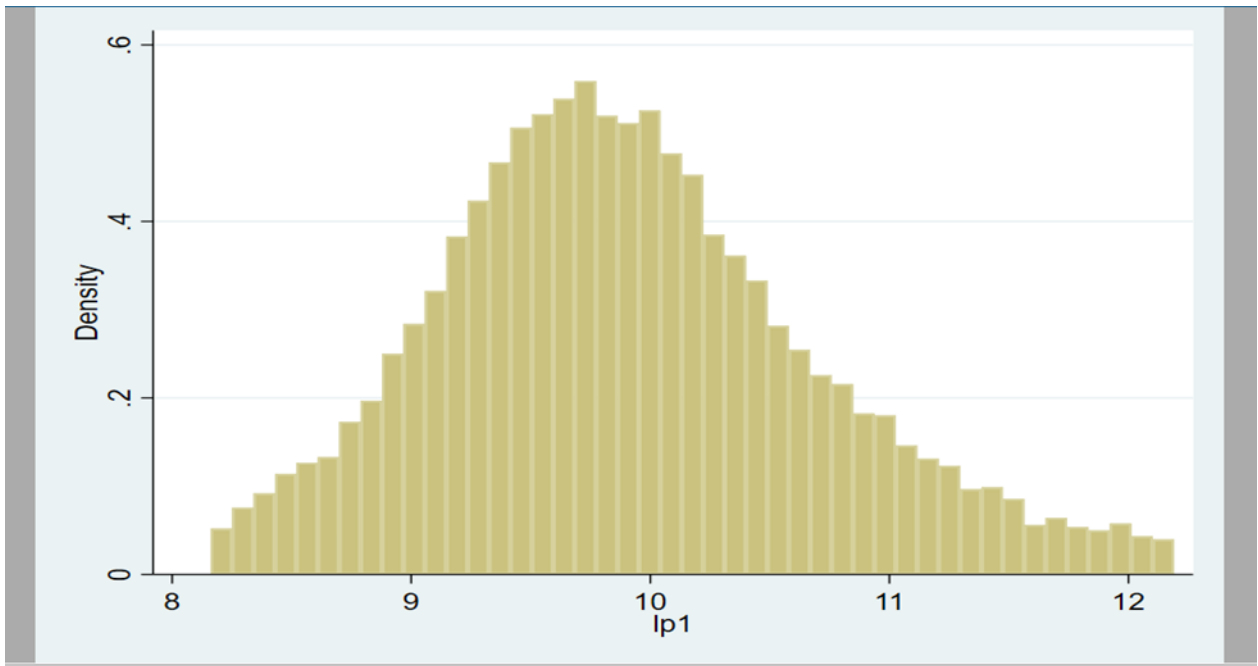
## Appendix I: Timeline of Mixed-Ownership Reform in China

Date	Announcer	Policies and Guidelines: Content
1984.3.1	No.4 Document by CPC Central Committee	Introduce Township enterprise into consumer industry as a supplement of China's SOEs in manufacturing industry.
1993.11	The 3 <sup>rd</sup> Plenary Session of the 14 <sup>th</sup> CPC Central Committee	Decision on Several Issues Concerning the Establishment of a Socialist Market Economic Structure.
2003.3	The 10 <sup>th</sup> people's congress	The establishment of SASAC
2005.4	China Securities Regulatory Commission	Reform of split shares
2013.11	The 3 <sup>rd</sup> Plenary Session of the 18 <sup>th</sup> CPC Central Committee	The Central Committee of the communist party of China have decided on major issues concerning comprehensively deepening reform. Actively developing a diversified ownership economy by mixed-ownership reform.
2014.7	SASAC	Establishing the pilot for central enterprises to develop Mixed-ownership economy.
2015.8	1+N Files	i)Improving the efficiency of capital allocation and operation in SOEs ii)Perfecting the modern enterprise system and improving efficiency of SOEs
2015.9	The State Council	I) Promoting the innovative efficiency of SOEs in competitive industries and field through the mixed-ownership reform II) Accelerating technological innovation, Management innovation and business model Innovation in SOEs focusing on R&D innovation through Introducing non-state capital III) Alleviating the damage of agency problem by setting Up an operating mechanism with multiple ownership Structure, effective internal constraints, and flexible

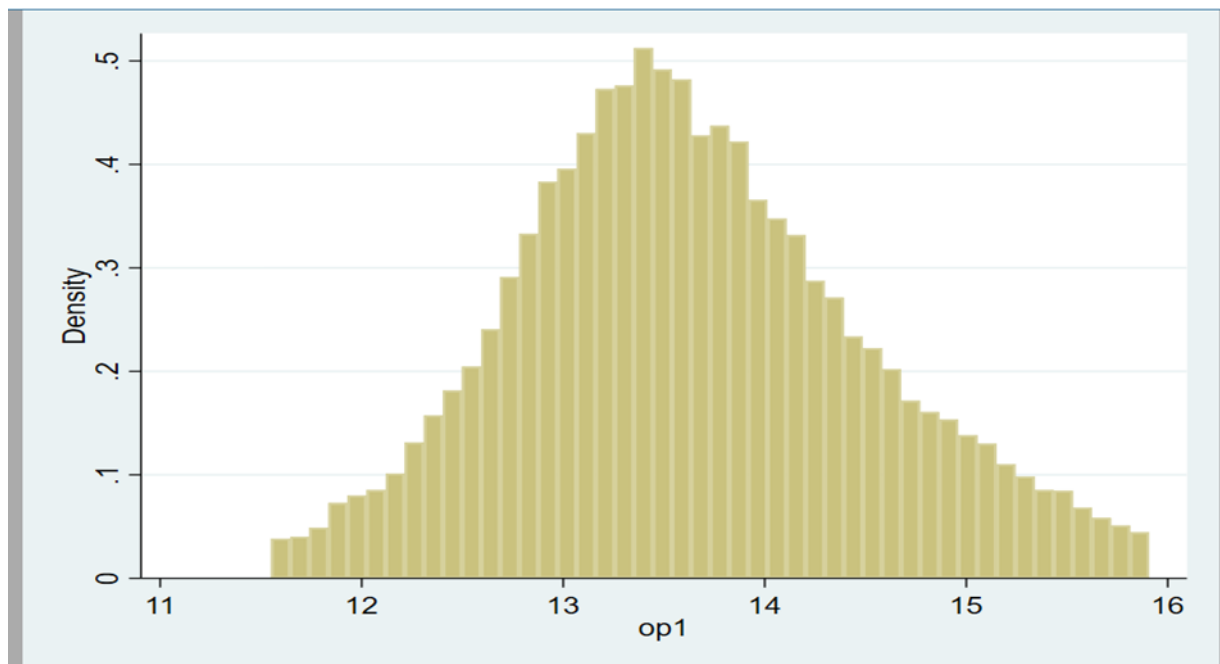
		<p>operation</p> <p>IV) Weakening the influence of administrative Appointment by building up a corporate governance mechanism with clear property rights and incentive system.</p>
2016.2	SASAC media conference	Establishing the pilot for ESOP (Employee Stock Ownership Plan) in SOEs.
2016.9	National Development and Reform Commission	<p>Proposed the guideline that reform should improve the Operation ability and innovation efficiency.</p> <p>By setting up a corporate governance structure with coordinated operation and effective control and perfecting the market-oriented incentive and restraint mechanisms.</p>
2016.12	Central Economic Work Conference	<p>Mixed Ownership Reform is an important breakthrough</p> <p>In deepening the reform of SOEs.</p>
2017.4	SASAC	The designs of the 1 <sup>st</sup> and 2 <sup>nd</sup> batches of reform pilot
2018.10	SASAC	The designs of the 3 <sup>rd</sup> batches of reform pilot
2019.4	SASAC	The designs of the 4 <sup>th</sup> batches of reform pilot



**Appendix II: Histogram of TFP level Using LP estimator & OP estimator**



**Graph 1: LP Estimator**



**Graph 2: OP Estimator**