

State-Owned Capital Shareholding, Financing Constraints, and Private Firms' Investment Opportunities

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Abstract: China's economy has now entered a stage of high-quality development, with the private economy serving as a vital pillar in driving growth and playing a key role in stabilizing investment. As mixed-ownership reform continues to deepen, the reform focus has gradually shifted from state-owned enterprise restructuring to two-way mixed-ownership reform involving both state-owned and private capital. Reverse mixed-ownership reform has emerged as an important instrument to help private firms overcome resource constraints. However, existing literature pays limited attention to the relationship between reverse mixed-ownership reform and private firms' investment opportunities. Using a sample of A-share listed private firms from 2014 to 2023, this paper empirically examines the impact of reverse mixed-ownership reform on private firms' investment opportunities. The findings indicate that state-owned capital participation enhances private firms' investment opportunities. Mechanism tests reveal that state-owned capital participation improves private firms' investment opportunities by alleviating financing constraints. Further analysis shows that the positive effect of state-owned capital participation on private firms' investment opportunities is more pronounced when private firms are located in regions with weaker legal institutional environments.

Keywords: State capital participation; investment opportunities; private enterprises; state-owned capital

1. Introduction

Over the past four decades since the reform and opening-up, the private economy has become a major engine of China's economic growth, contributing more than 50% of tax revenue, over 60% of GDP, more than 70% of technological innovation achievements and over 80% of urban employment. As China's economy shifts from high-speed growth to high-quality development, stimulating the vitality of private enterprises and stabilizing private investment serve as the

foundation for fostering a new development pattern. For this reason, the Party Central Committee and the State Council have rolled out a series of policies to continuously optimize the development environment for private enterprises. In 2015, the State Council issued guidelines on developing mixed ownership reform for state-owned enterprises, clearly encouraging state-owned capital to invest in non-state-owned enterprises through various forms. This marked the shift of mixed ownership reform from state-owned enterprises introducing private capital unilaterally to a two-way model featuring coordinated growth of state and private capital. In 2023, the Opinions of the CPC Central Committee and the State Council on Promoting the Growth and Expansion of the Private Economy once again emphasized the need to continuously improve the business environment for private enterprises and encourage them to participate in major national strategies via multiple channels. Within this institutional framework, mixed ownership reform at the corporate level mainly manifests in cross-shareholding and integration between state-owned and non-state-owned capital. Its economic significance lies in realizing complementary strengths and mutual advancement through property rights integration^[1].

Despite the enormous economic and social contributions of private enterprises, they have long been in a disadvantaged position in resource allocation. Whether it is the ownership bias in credit rationing or hidden barriers to industrial access, private enterprises face numerous obstacles in identifying and obtaining high-quality investment opportunities. In recent years, with the advancement of mixed ownership reform, state-owned capital's equity participation in private enterprises has become a critical institutional arrangement. Existing studies generally find that the involvement of state-owned capital brings multiple positive effects to private enterprises. From the perspective of corporate governance, state-owned equity can optimize the ownership structure of private enterprises and restrain controlling shareholders' expropriation behavior to reduce agency costs^{[2][3]}. In terms of internal control and information quality, supervision by state shareholders restrains management's earnings manipulation and improves the transparency of accounting information, thus upgrading internal control standards^[4]. From the resource access dimension, the credit endorsement of state-owned capital significantly alleviates private enterprises' financing constraints, enabling them to obtain more bank loans with longer maturities and secure additional government subsidies and tax incentives^{[5][6]}. Further research also proves that reverse mixed ownership reform boosts private enterprises' innovation input and labor investment efficiency, and elevates their ESG performance, which is conducive to sustainable development^{[7][8]}. Nevertheless, although prior literature has explored the governance and resource effects of reverse mixed ownership reform from multiple perspectives, few papers examine whether it can expand private enterprises' investment opportunities. Most existing research focuses on specific corporate behaviors, while neglecting investment opportunities, the core driving force of corporate growth. There remains a research gap regarding how changes in resource endowments translate into investment prospects at the strategic level.

Investment opportunities constitute the core factor shaping corporate investment decisions and future value appreciation^[9]. Identifying and seizing high-quality investment opportunities is essential for private enterprises to break growth bottlenecks and achieve transformation and upgrading. This paper argues that state-owned capital shareholding expands private enterprises' investment opportunities primarily by easing financing constraints. Financing constraints are a major barrier to private enterprises' investment activities. Even if profitable projects with positive net present value exist, private enterprises cannot turn potential opportunities into tangible investments without sufficient and low-cost capital support. With access to policy resources and credit endorsement, state-owned capital participation broadens private enterprises' financing channels and cuts financing costs, strengthening their capacity to identify and capture high-quality investment projects. Furthermore, the effectiveness of all corporate strategies is subject to

institutional contexts. Across different regions of China, there are striking disparities in the level of rule of law, property rights protection and marketization, which lead to heterogeneous effects of state-owned capital shareholding. In regions with sound legal systems and adequate property rights protection, market mechanisms dominate resource allocation, and private enterprises can access resources and seize opportunities through fair competition, so the marginal utility of state-owned capital's attached resources is limited. In contrast, regions with weak rule of law and insufficient property rights protection feature high transaction costs and great uncertainty for private enterprises. Under such circumstances, state-owned capital shareholding exerts more prominent institutional compensation and resource substitution effects, exert a stronger boosting influence on investment opportunities. Different from previous studies focusing on micro corporate behaviors, this paper adopts a strategic perspective of investment opportunities to reveal how reverse mixed ownership reform empowers private enterprises, expanding the research scope on the economic consequences of mixed ownership reform. Based on the resource-based view, this paper constructs a new theoretical logic explaining how state-owned capital participation enhances private enterprises' capacity to identify and seize high-quality investment opportunities by mitigating financing constraints. In addition, heterogeneity analysis considering regional legal environments provides refined empirical evidence for differentiated promotion of mixed ownership reform.

2. Theoretical Analysis and Research Hypotheses

2.1. State-Owned Capital Shareholding and Private Enterprises' Investment Opportunities

The resource-based view holds that enterprises' capacity to identify and utilize external investment opportunities is restricted by their stock and structure of strategic resources such as knowledge and social connections^[10]. Under perfect market conditions, investment opportunities are equally available to all market participants. However, in China's transitional economy, a large number of high-return projects related to key resources, infrastructure and cutting-edge technology are not fully allocated by price signals, but embedded with institutional and political attributes. Private enterprises boast solid operational foundations matching market demand, yet they face institutional restrictions arising from ownership differences and struggle to enter industries with high access thresholds and policy controls.

State-owned capital shareholding removes institutional barriers restricting private enterprises from capturing investment opportunities through three channels. First is information acquisition. According to financial friction theory, information asymmetry drives up corporate transaction costs. Private enterprises, usually young and small-scale, cannot timely grasp capital market trends and face great uncertainty when cooperating with investors and suppliers. Meanwhile, China's financial supervision and capital market efficiency still have room for improvement, leading to high capital costs and heavy financial pressure on private enterprises. Equity participation by state-owned capital addresses this dilemma. Relying on extensive information channels and resource networks, state shareholders supply private enterprises with abundant market and industrial data, narrowing the information gap between firms and external environments^[11]. Reduced information asymmetry helps private enterprises accurately evaluate investment projects and avoid decision-making losses caused by information deficiency, raising their likelihood of securing high-quality investment opportunities. Second is the acquisition of institutional legitimacy. Within the framework of industrial access and administrative licensing, state-owned equity participation provides compliance support for private enterprises. The credit endorsement brought by state shareholding weakens administrative barriers and hidden ownership discrimination, enabling private enterprises to enter previously inaccessible industries and significantly expanding the scope of available investment projects^[12]. Third is the expansion of political connections. State-owned capital shareholding is not merely an adjustment of ownership structure, but a core channel for private enterprises to establish

institutionalized political connections. It facilitates access to long-term government-industry cooperation networks and regular industrial cooperation systems maintained by state shareholders. Acting as an organizational link, state equity participation opens external resource channels and makes up for private enterprises' insufficient social resources, greatly increasing their chances to access diversified investment projects^[13]. To sum up, by providing policy information, institutional legitimacy and expanded political connections, state-owned capital shareholding effectively improves private enterprises' ability to identify and seize positive-NPV projects. Accordingly, this paper proposes Hypothesis 1:

H1: State-owned equity participation exerts a significant positive promoting effect on private enterprises' investment opportunities.

2.2. State-Owned Capital Shareholding, Financing Constraints and Private Enterprises' Investment Opportunities

Expanding investment opportunities only solves the problem of project selection, while financing capacity determines whether potential opportunities can be converted into tangible investments^[14]. The resource-based view regards financial capital as a core strategic resource indispensable for integrating heterogeneous resources and realizing investment. The prevalence of financing constraints among Chinese private enterprises has reached a consensus in academia^[15]. Trapped in financing difficulties, private enterprises cannot translate investment opportunities into actual spending even if abundant projects exist^[16]. State-owned capital shareholding alleviates private enterprises' financing predicaments through multiple paths, establishing a complete capital transmission chain from opportunity identification to real investment.

First, state equity participation increases internal capital via tax incentives and government subsidies. Close ties between state shareholders and local governments prompt authorities to adopt fiscal and tax policies to support private enterprises with state investment for the sake of employment growth, tax revenue and industrial upgrading. Existing studies confirm that state-owned capital participation brings more subsidies and tax breaks to private firms, directly boosting internal financing capacity^[17]. Tax preferences and government subsidies jointly form the first layer of capital guarantee for corporate investment.

Second, state shareholding expands credit scale and reduces financing costs. In China's bank-dominated financial system, state-owned capital serves as a reliable implicit guarantee for financial institutions. The existence of state equity sends signals of stable operation and low default risk to commercial banks and bond markets, mitigating information asymmetry and ownership bias on the capital supply side^[18]. Empirical evidence shows that state-owned capital participation eases private enterprises' financing constraints and accelerates the adjustment of capital structure^[19]. With state equity backing, private enterprises break collateral limits, obtain higher credit lines at lower interest rates, and enjoy greater flexibility in investment decisions when facing attractive projects.

Third, state-owned equity broadens equity financing channels. Corporate management holds private information about operation and prospects, while external investors lack full data to accurately value private enterprises. Coupled with small scale, short operation history and insufficient collateral, private enterprises face high equity financing costs. Through institutional links with governments, state shareholders send credible signals to capital markets, helping investors distinguish these firms from ordinary private enterprises and raising investors' willingness to hold stocks^[20]. As an important capital market event, reverse mixed ownership reform attracts more media coverage and analyst tracking, alleviating information asymmetry between private enterprises and external investors^[21]. Additionally, after state capital takes shares, supervision intensity over private enterprises rises. Driven by the fiduciary responsibility of preserving and appreciating state-owned assets, state shareholders implement effective internal supervision,

pushing private enterprises to improve information disclosure standards and further enhance equity financing capacity^[22].

In summary, state-owned equity boosts private enterprises' internal capital accumulation and external financing capacity through tax incentives, government subsidies and credit support. Alleviated financing constraints allow firms to mobilize adequate funds timely when facing profitable projects and convert investment opportunities into real investments. Thus, Hypothesis 2 is put forward:

H2: Reverse mixed ownership reform improves private enterprises' investment opportunities by alleviating financing constraints.

2.3. Heterogeneity of Regional Legal Institutional Environments

According to institutional theory, the effects of all organizational activities are differentiated by regional formal institutional conditions^[23]. In regions with sound legal systems and sufficient property rights protection, market rules are transparent and contracts are enforced by judicial authorities. Private enterprises can access resources and seize opportunities through market competition, so state-owned capital's supplementary resources carry limited marginal value. In contrast, regions with weak rule of law and inadequate property rights protection feature disorderly market order, unreliable contract enforcement and ambiguous government intervention boundaries. Private enterprises bear high transaction costs and low investment willingness. Under such circumstances, state-owned capital shareholding plays a more prominent role in institutional compensation and resource substitution, generating a stronger positive impact on investment opportunities. Therefore, Hypothesis 3 is proposed:

H3: The promoting effect of state-owned capital shareholding on private enterprises' investment opportunities is more pronounced in regions with poor legal institutional environments, compared with regions with sound legal systems.

3. Research Design

3.1. Sample Selection and Data Sources

This paper selects A-share listed private enterprises from 2014 to 2023 as initial samples to explore how state-owned capital equity participation affects private enterprises' investment opportunities. The sample undergoes the following screening procedures: (1) Exclude firms in banking, securities, insurance and other financial industries that may cause estimation bias; (2) Eliminate ST and PT listed companies; (3) Delete observations with severe missing values for core variables; (4) Apply 1% two-tailed winsorization to all continuous variables. Finally, 18,498 valid firm-year observations are obtained. All research data are sourced from the CSMAR Database.

3.2. Variable Definitions

3.2.1. Dependent Variable

Referring to Fu & Zhou (2022)^[9], Tobin's Q is adopted to measure investment opportunities, calculated as:

$$\text{Tobin } Q = (\text{Market value of tradable shares} + \text{Net asset value of non-tradable shares} + \text{Total long-term liabilities} + \text{Total short-term liabilities}) / \text{Total year-end assets}$$

3.2.2. Independent Variables

Following Lü & Wang (2024)^[20], two indicators are constructed to measure state-owned capital shareholding:

soe1: Dummy variable. Equals 1 if the top ten shareholders include state-owned or state legal person shareholders, otherwise 0.

soe2: Continuous variable, representing the total shareholding ratio of all state-owned shareholders among the top ten shareholders.

3.2.3. Control Variables

Drawing on Fu & Zhou (2022)^[9], the control variables include board size (Board), separation of chairman and general manager (Dual), corporate growth (Growth), ownership balance (Banlance), proportion of independent directors (Indep), asset-liability ratio (Lev), listing age (Age), shareholding of the largest shareholder (First), return on total assets (ROA) and firm size (Size). Year fixed effects and industry fixed effects are controlled to eliminate unobservable time-invariant and industry-invariant factors.

Table 1. Variable Definitions.

Variable Type	Symbol	Full Name	Definition
Dependent Variable	TobinQ	Investment Opportunity	Tobin's Q value
Independent Variable	soe1	Existence of State Shareholders	1 if state shareholders exist among top ten shareholders, else 0
	soe2	State Shareholding Ratio	Total share percentage of all state shareholders in top ten shareholders
	Lev	Asset-Liability Ratio	Total liabilities / Total assets
	Banlance	Ownership Balance	Shareholding of 2nd–5th largest shareholders / Shareholding of the largest shareholder
	Board	Board Size	Total number of directors on the board
Control Variable	Age	Listing Age	Years since the firm went public
	First	Largest Shareholder's Stake	Shareholding ratio of the controlling shareholder
	Indep	Independent Director Ratio	Number of independent directors / Total board members
	ROA	Return on Total Assets	Net profit / Average total assets
	Growth	Corporate Growth Rate	Year-on-year growth rate of operating revenue
	Size	Firm Size	Natural logarithm of total assets
	Dual	Chairman-CEO Duality	1 if the chairman concurrently serves as general manager, else 0

3.3. Model Specification

Baseline regression model for testing H1:

$$\text{TobinQ}_{i,t} = \alpha + \beta_1 \text{Soe}_{i,t} + \sum \text{Controls}_{i,t} + \text{Year} + \text{Ind} + \varepsilon_{i,t} \quad (1)$$

Where i denotes firm and t denotes year; Soe includes soe1 and soe2; Controls stands for the set of control variables; Year and Ind represent year and industry fixed effects respectively; ε is the random error term. A significantly positive β_1 verifies H1.

Mediation effect models for testing H2 (following Wen & Ye, 2014)^[24]:

$$M_{i,t} = \alpha + \beta_1 \text{Soe}_{i,t} + \sum \text{Controls}_{i,t} + \text{Year} + \text{Ind} + \varepsilon_{i,t} \quad (2)$$

$$\text{TobinQ}_{i,t} = \alpha + \beta_1 \text{Soe}_{i,t} + \beta_2 M_{i,t} + \text{Year} + \text{Ind} + \varepsilon_{i,t} \quad (3)$$

$M_{i,t}$ refers to mediating variables financing constraint (Fc) and government subsidy (Sub), which jointly reflect the capital guarantee channel. Other variable definitions remain consistent with Model (1).

4. Empirical Results Analysis

4.1. Descriptive Statistics

Table 2 reports descriptive statistics of core variables. The value of TobinQ ranges from 0.921 to 8.044 with a mean of 2.115, indicating large gaps in investment opportunities across sample firms. The mean of soe1 is 0.408, meaning 40.8% of firm-year observations have state shareholders. The average soe2 is 1.584 with a maximum value of 20.290, showing state-owned capital holds significant shares in some private enterprises. Statistics of other control variables align with typical characteristics of A-share listed private firms.

Table 2. Descriptive Statistics.

Variable	Observations	Mean	Std. Dev.	Min	Median	Max
TobinQ	18498	2.115	1.222	0.921	1.725	8.044
soe1	18498	0.408	0.491	0.000	0.000	1.000
soe2	18498	1.584	3.445	0.000	0.000	20.290
Growth	18498	0.221	0.573	-0.641	0.084	3.635
Lev	18498	0.362	0.185	0.051	0.347	0.837
Size	18498	21.905	1.008	20.069	21.769	24.988
First	18498	0.315	0.132	0.086	0.298	0.675
Indep	18498	0.379	0.049	0.333	0.375	0.500
ROA	18498	0.049	0.067	-0.220	0.049	0.236
Age	18498	6.860	6.373	0.000	5.000	26.000
Dual	18498	0.422	0.494	0.000	0.000	1.000
Banlance	18498	0.867	0.617	0.067	0.710	2.946
Board	18498	8.016	1.419	5.000	9.000	12.000

4.2. Correlation Analysis

Table 3 presents pairwise correlation results. The correlation coefficient between soe1 and TobinQ is 0.070, significant at the 1% level; the coefficient of soe2 and TobinQ is 0.035, also significantly positive at 1%. This preliminary evidence supports H1. Most correlation coefficients between variables are lower than 0.5, eliminating severe multicollinearity risks.

Table 3. Correlation Matrix

Variable	TobinQ	soe1	soe2	Growth	Lev	Size
TobinQ	1					
soe1	0.070***	1				
soe2	0.035***	0.554***	1			
Growth	0.052***	0.002	-0.005	1		
Lev	-0.177***	0.077***	0.071***	0.074***	1	
Size	-0.253***	0.224***	0.139***	0.095***	0.475***	1
First	-0.028***	-0.024***	-0.093***	-0.021***	-0.056***	-0.012
Indep	0.037***	-0.049***	-0.102***	-0.004	-0.033***	-0.079***
ROA	0.167***	-0.002	-0.022***	0.134***	-0.340***	0.005
Age	0.011	0.257***	0.198***	0.011	0.303***	0.442***
Dual	0.019***	-0.067***	-0.070***	-0.003	-0.076***	-0.116***
Banlance	-0.003	-0.061***	0.075***	0.017**	-0.062***	-0.057***
Board	-0.046***	0.092***	0.147***	0.014*	0.076***	0.172***

Table3. Cont

Variable	First	Indep	ROA	Age	Dual	Banlance	Board
First	1						
Indep	0.043***	1					
ROA	0.198***	0.000	1				
Age	-0.190***	-0.053***	-0.206***	1			
Dual	0.064***	0.104***	0.029***	-0.171***	1		
Banlance	-0.687***	-0.024***	-0.013*	-0.091***	-0.032***	1	
Board	-0.072***	-0.680***	0.011	0.103***	-0.115***	0.057***	1

Note: *, **, *** represent significance at the 10%, 5% and 1% levels respectively.

4.3. Baseline Regression Results

Table 4 reports baseline regression results of Model (1). Coefficients of soe1 and soe2 are both significantly positive at the 1% level, fully verifying H1. Economically speaking, firms with state shareholders see their TobinQ rise by approximately 6.7% ($0.166 \times 0.491 / 1.222$); every 1% increase in state shareholding ratio lifts investment opportunities by 3.4% ($0.012 \times 3.445 / 1.222$), confirming substantial economic significance of the effect.

Table 4. State-Owned Capital Shareholding and Private Enterprises' Investment Opportunities

Variable	(1) TobinQ	(2) TobinQ	(3) TobinQ	(4) TobinQ
soe1	0.108*** (6.22)	0.166*** (9.66)		
soe2			0.008*** (2.89)	0.012*** (4.61)
Growth		0.103*** (6.21)		0.102*** (6.19)
Lev		0.216*** (3.44)		0.192*** (3.06)
Size		-0.405*** (-29.98)		-0.394*** (-29.29)
First		-0.254*** (-2.62)		-0.275*** (-2.84)
Indep		0.479** (2.18)		0.507** (2.30)
ROA		3.665*** (20.58)		3.682*** (20.65)
Age		0.038*** (20.44)		0.039*** (21.28)
Dual		0.015 (0.90)		0.014 (0.88)
Banlance		-0.032* (-1.68)		-0.046** (-2.43)
Board		-0.006 (-0.69)		-0.006 (-0.70)
Constant	2.071*** (200.56)	10.338*** (34.38)	2.102*** (233.16)	10.154*** (33.78)
N	18,495	18,495	18,495	18,495
AdjR ²	0.167	0.267	0.166	0.265
Year	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes

Note: Figures in parentheses are t-statistics, the same applies to subsequent tables.

4.4. Robustness Tests

4.4.1. Lagged Independent Variables

To mitigate reverse causality bias, one-period lagged soe1 and soe2 are adopted for regression. Table 5 shows core coefficients remain significantly positive, proving the baseline conclusion robust.

Table 5. Robustness Test: Lagged Independent Variables

	(1)	(2)
Variable	TobinQ	TobinQ
L.soe1	0.155*** (8.02)	
L.soe2		0.013*** (4.53)
Controls	Yes	Yes
Constant	10.095*** (30.54)	9.888*** (29.96)
N	14,813	14,813
AdjR ²	0.290	0.288
Year	Yes	Yes
Ind	Yes	Yes

4.4.2. Adjust Sample Period

The COVID-19 pandemic from 2020 disturbed corporate investment behavior. We narrow the sample to 2014–2019 to eliminate pandemic interference. Table 6 confirms consistent results.

Table 6. Robustness Test: Pre-Pandemic Subsample

	(1)	(2)
Variable	TobinQ	TobinQ
soe1	0.215*** (9.22)	
soe2		0.019*** (5.14)
Controls	Yes	Yes
Constant	13.014*** (31.53)	12.739*** (30.84)
N	8,750	8,750
AdjR ²	0.403	0.400
Year	Yes	Yes
Ind	Yes	Yes

4.4.3. Control Firm Fixed Effects

Unobservable firm-specific traits may bias estimation. We adopt firm fixed effect models. Table 7 shows soe1 and soe2 stay positive and significant at 1%.

Table 7. Robustness Test: Firm Fixed Effects

	(1)	(2)	(3)	(4)
Variable	TobinQ	TobinQ	TobinQ	TobinQ
soe1	0.106*** (5.75)	0.108*** (6.06)		
soe2			0.013*** (3.00)	0.014*** (3.45)
Controls	Yes	Yes	Yes	Yes
Constant	2.078*** (214.64)	12.623*** (18.07)	2.100*** (233.32)	12.582*** (17.99)
N	18,273	18,273	18,273	18,273
AdjR ²	0.572	0.597	0.571	0.596
Year	Yes	Yes	Yes	Yes
Id	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes

4.4.4. Alternative Independent Variable

Following Bie et al. (2023)^[25], we construct soe3 = state shareholding / non-state shareholding as a substitute indicator.

Table 8 still yields positive significant coefficients.

Table 8. Robustness Test: Alternative Independent Variable

	(1)	(2)
Variable	TobinQ	TobinQ
soe3	0.356*** (3.06)	0.453*** (4.06)
Controls	Yes	Yes
Constant	2.102*** (235.73)	10.116*** (33.69)
N	18,495	18,495
AdjR ²	0.166	0.264
Year	Yes	Yes
Ind	Yes	Yes

4.5. Endogeneity Tests

4.5.1. Two-Stage Least Squares (2SLS)

Referring to Wang et al. (2026)^[26], lagged soe1 and soe2 are chosen as instrumental variables to resolve reverse causality. First-stage regressions show significant correlation between instruments and endogenous variables. Second-stage results in Table 9 & 10 confirm the core conclusion. Kleibergen-Paap LM statistic rejects underidentification; Kleibergen-Paap F statistic rules out weak instruments.

Table 9. IV Estimation (soe1)

Variable	(1) soe1	(2) TobinQ
soe1		0.285*** (7.98)
L_soe1	0.543*** (70.34)	
Controls	Yes	Yes
Constant	-0.556*** (-5.46)	
N	14,813	14,813
AdjR ²	0.369	0.124
Year	Yes	Yes
Ind	Yes	Yes
Kleibergen-Paap Wald rk F	4948.28	
Kleibergen-Paap rk LM	3174.90***	

Table 10. IV Estimation (soe2)

Variable	(1) soe2	(2) TobinQ
soe2		0.016*** (4.53)
L_soe2	0.861*** (108.26)	
Controls	Yes	Yes
Constant	-1.352*** (-3.00)	
N	14,813	14,813
AdjR ²	0.793	0.125
Year	Yes	Yes
Ind	Yes	Yes
Kleibergen-Paap Wald rk F	11719.86	
Kleibergen-Paap rk LM	844.75***	

4.5.2. Propensity Score Matching (PSM)

To address self-selection bias, PSM with 1:1 nearest neighbor matching (caliper=0.05) is implemented, with all control variables as covariates. Balance test (Table 11) shows standardized bias below 10% after matching, satisfying parallel trend assumption. Regression on matched sample (Table 12) still generates significantly positive coefficients for soe1 and soe2.

Table 11. PSM Balance Test

Variable	Mean		Standard	t-statistic	
	Treatment group	Control group	Deviation / %	t-value	P> t
Board	8.174	8.1592	1.0	0.63	0.527
Dual	0.382	0.378	0.8	0.50	0.615
Growth	0.222	0.229	-1.3	-0.77	0.442
Banlance	0.822	0.807	2.4	1.52	0.129
Indep	0.376	0.375	2.1	1.27	0.203
Lev	0.379	0.378	0.9	0.54	0.589
Age	8.837	8.794	0.7	0.38	0.703
First	0.311	0.311	0.1	0.05	0.957
ROA	0.048	0.048	0.1	0.06	0.950
Size	22.177	22.178	-0.1	-0.05	0.961

Table 12. PSM Sample Regression

Variable	(1)	(2)
	psm	psm
soe1		0.156*** (6.80)
soe2	0.015*** (4.25)	
Controls	Yes	Yes
Constant	10.193*** (24.01)	10.118*** (23.76)
N	8,907	8,907
AdjR ²	0.279	0.281
Year	Yes	Yes
Ind	Yes	Yes

5. Further Analysis

5.1. Mechanism Test

Adequate capital support is a prerequisite for firms to translate investment opportunities into tangible projects. Private enterprises generally face severe financing difficulties that restrict their capacity to seize profitable projects. State-owned capital shareholding alleviates financing constraints through two channels: internal government subsidies and external debt & equity financing, thus expanding investment prospects. We adopt FC index to measure financing constraints and the ratio of government subsidies to operating revenue to capture subsidy intensity. Bootstrap sampling (5000 times) is applied to verify mediation effects. Table 13 and Table 14 show the indirect effect confidence intervals exclude zero, confirming the mediating role of financing constraints and government subsidies, which supports H2.

Table 13. Mediation Test: Government Subsidies (Sub)

Variable	(1) TobinQ	(2) Sub	(3) TobinQ	(4) TobinQ	(5) Sub	(6) TobinQ
Sub			4.284*** (7.15)			4.342*** (7.26)
soe1	0.166*** (9.66)	0.002*** (5.77)	0.159*** (9.29)			
soe2				0.012*** (4.61)	0.000*** (7.22)	0.011*** (4.14)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	10.338*** (34.38)	0.030*** (7.63)	10.211*** (34.21)	10.154*** (33.78)	0.029*** (7.58)	10.028*** (33.60)
N	18,495	18,495	18,495	18,495	18,495	18,495
Bootstrap	Coef.	P-value	95% confidence interval	Coef.	P-value	95% confidence interval
Direct Effect	0.1590***	0.000	[0.126,0.192]	0.0110***	0.000	[0.006,0.016]
Indirect Effect	0.6812***	0.000	[0.449,0.913]	0.0477***	0.000	[0.021,0.074]
AdjR ²	0.267	0.177	0.271	0.265	0.179	0.268
Year	Yes	Yes	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes	Yes	Yes

Table 14. Mediation Test: Financing Constraints (Fc)

Variable	(1) TobinQ	(2) Fc	(3) TobinQ	(4) TobinQ	(5) Fc	(6) TobinQ
Fc			-3.830*** (-42.31)			-3.841*** (-42.48)
soe1	0.166*** (9.66)	-0.009*** (-4.57)	0.132*** (8.58)			
soe2				0.012*** (4.61)	-0.001*** (-3.63)	0.008*** (3.48)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	10.338*** (34.38)	4.936*** (136.07)	29.239*** (53.17)	10.154*** (33.78)	4.943*** (136.26)	29.136*** (53.05)
N	18,495	18,495	18,495	18,495	18,495	18,495
Bootstrap	Coef.	P-value	95% confidence interval	Coef.	P-value	95% confidence interval
Direct Effect	0.1323***	0.000	[0.103,0.162]	0.0081***	0.001	[0.003,0.013]
Indirect Effect	-0.5068***	0.000	[-0.623,-0.391]	-0.0310***	0.001	[-0.049,-0.013]
AdjR ²	0.267	0.812	0.400	0.265	0.812	0.398
Year	Yes	Yes	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes	Yes	Yes

5.2. Heterogeneity Analysis

We divide the full sample into high and low legal environment groups based on the median of market intermediaries and legal environment index from Fan's marketization report. Table 15 shows coefficients of *soe1* and *soe2* are larger and more significant in the low rule-of-law group. Fisher's test with 1000 Bootstrap repetitions confirms significant inter-group coefficient differences, which supports H3.

Table 15. Heterogeneity by Regional Legal Institutional Environment

	(1)	(2)	(3)	(4)
	High	Low	High	Low
Variable	TobinQ	TobinQ	TobinQ	TobinQ
<i>soe1</i>	0.130*** (5.20)	0.212*** (8.92)		
<i>soe2</i>			0.008* (1.94)	0.016*** (4.45)
Controls	Yes	Yes	Yes	Yes
Constant	7.732*** (17.87)	12.665*** (30.51)	7.605*** (17.55)	12.377*** (29.94)
N	8,973	9,519	8,973	9,519
AdjR ²	0.163	0.361	0.161	0.357
Year	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes
Inter-group Coefficient Difference		0.010		0.069
P-value				

6. Conclusions and Policy Implications

With deepened mixed ownership reform shifting from one-way state-owned enterprise reform to integrated development of state and private capital, reverse mixed ownership reform has become a critical path for private enterprises to break resource constraints. Using panel data of A-share listed private firms from 2014 to 2023, this paper empirically examines how state-owned capital shareholding affects private enterprises' investment opportunities. The results show that state-owned capital participation significantly expands private enterprises' investment opportunities. Mechanism tests reveal that state equity eases financing constraints through government subsidies and improved debt & equity financing capacity, which serves as the transmission channel linking reverse mixed ownership reform and investment prospects. Heterogeneity analysis indicates the positive effect is stronger in regions with underdeveloped legal systems.

Based on the empirical findings, three policy suggestions are put forward: First, authorities should promote two-way mixed ownership reform in a progressive manner. Existing reform focus has long centered on private capital entering state-owned enterprises, while reverse mixed ownership reform deserves equal attention. Balanced integration of state and private capital can build a mutually beneficial ownership system. Reasonable state equity participation will not interfere with private firms' independent operation, but effectively unlock their investment potential.

Second, local governments should encourage state-owned capital to take shares in private enterprises, especially in regions with weak legal and market systems. State shareholders can deliver credit endorsement and resource support to mitigate private firms' financing hardships, boosting both the vitality of private economy and the guiding capacity of state capital, jointly driving industrial upgrading and high-quality economic transformation.

Third, private enterprises should actively seize opportunities brought by mixed ownership reform and introduce appropriate state shareholders to build standardized institutional political connections. By supplementing insufficient social resources and lowering investment risks, private firms can identify more high-value projects, consolidate core competitiveness and realize long-term transformation and high-quality growth.

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