

The Impact of Overseas Listing of State-Owned Enterprises on Capital Allocation Efficiency—Empirical Evidence from Chinese Listed Enterprises

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Abstract: In recent years, relevant national authorities have issued multiple documents actively supporting qualified domestic enterprises to seek overseas listing. As the most representative enterprises in China, state-owned enterprises (SOEs) should seize this historic opportunity to list overseas and advance the reform process. Against this backdrop, exploring the internal logical relationship between overseas listing and the capital allocation efficiency of SOEs holds significant practical and real-world implications for improving SOEs' capital allocation efficiency and accelerating the reform of their internal mechanisms and structures. This paper selects SOEs listed both domestically and overseas from 2009 to 2023 as the sample, and empirically tests the effect and mechanism of SOEs' overseas listing on capital allocation efficiency from the two dimensions of under-investment and over-investment. The research findings show that: (1) Overseas listing of SOEs can significantly ameliorate capital factor misallocation and improve capital allocation efficiency; (2) Overseas listing of SOEs can reduce the degree of both under-investment and over-investment, thereby optimizing capital allocation efficiency; (3) Overseas listing of SOEs can promote the improvement of corporate governance level, which in turn enhances capital allocation efficiency. At present, China's capital market is not yet mature. Encouraging and supporting SOEs to list overseas has significant practical and real-world implications for improving corporate governance level, enhancing capital allocation efficiency, and promoting the reform process of SOEs.

Keywords: state-owned enterprise (SOE); overseas listing; capital allocation efficiency; corporate governance level

1. Introduction

Over the past 40-plus years of reform and opening-up, the principal contradiction facing Chinese society has transformed from the one between the people's ever-growing material and cultural needs and backward social production to the one between the people's ever-growing needs for a better life and unbalanced and inadequate development. Confronted with the "problem of unbalanced and inadequate development" facing Chinese society in the new era, the traditional extensive economic growth model has become unsustainable, and improving resource allocation efficiency has gradually become a key lever for resolving the principal contradiction facing Chinese society. In the course of China's economic development, SOEs have served as a crucial pillar of national economic development and the core driving force for China's economic growth [1].

Promoting the high-quality development of SOEs is both an inherent requirement for achieving high-quality economic development and the core engine for accelerating the construction of a modernized economic system. At present, the reform of SOEs has entered a deep-water zone. Optimizing the allocation of capital factors has become an important component of SOE reform, and its effectiveness directly influences the stimulation of vitality in various factors of SOEs and the realization of high-quality development goals [2]. On the other hand, from the perspective of the development history of securities markets, China's securities market started late, and its degree of marketization lags significantly behind that of the Hong Kong, China securities market and the U.S. securities market. Can SOEs effectively improve their capital allocation efficiency by listing on more market-oriented overseas developed securities markets? What is the underlying mechanism? This paper primarily investigates the above questions.

Based on this, this paper systematically constructs a theoretical framework for the impact of SOEs' overseas listing on capital allocation efficiency by reviewing relevant literature. On this basis, it takes SOEs listed from 2009 to 2023 as the sample and empirically tests the effect and mechanism of SOEs' overseas listing on capital allocation efficiency by constructing an econometric model. This paper will enrich the relevant literature in the following aspects: (1) It places the improvement of SOEs' capital allocation efficiency within the research perspective of high-level opening-up and systematically analyzes the impact of overseas listing behavior on enhancing SOEs' capital allocation efficiency; (2) It incorporates corporate governance level into the theoretical analysis framework of the impact of overseas listing on capital allocation efficiency, exploring the mechanism through which SOEs' overseas listing affects capital allocation efficiency; (3) It further distinguishes SOE capital allocation efficiency into under-investment and over-investment, conducting an in-depth analysis of the heterogeneity in the impact of overseas listing behavior on capital allocation efficiency.

The remainder of this paper is structured as follows: The second part systematically constructs the theoretical framework for the impact of SOEs' overseas listing on capital allocation efficiency; the third part is the research design, which empirically tests the impact of SOEs' overseas listing on capital allocation efficiency by constructing an econometric model; the fourth part is the empirical analysis, which empirically examines the effect of SOEs' overseas listing on capital allocation efficiency through baseline regression, heterogeneity analysis, and robustness checks; the fifth part is the mechanism test, which empirically examines the mechanism through which SOEs' overseas listing affects capital allocation efficiency using a mediation effect model; the sixth part presents the conclusions and implications.

2. Theoretical Analysis and Research Hypotheses

2.1. The Impact of Overseas Listing of SOEs on Capital Allocation Efficiency

Capital allocation efficiency is the comprehensive efficiency encompassing corporate financial activities such as investment, financing, cash flow, and dividend distribution. The optimal state of corporate capital allocation is one where capital is allocated at the optimal investment level and within the optimal investment structure. Under a perfectly competitive market structure, a firm's capital allocation can be maintained at a state of Pareto optimality, but this is merely an idealized state. The "Efficient Capital Market Theory" proposed by Eugene Fama posits that in a stock market with sound legal frameworks, good functionality, high transparency, and sufficient competition, all valuable information will be timely, accurately, and fully reflected in stock price movements, including the current and future value of enterprises [3]. It follows that the maturity and transparency of capital markets significantly influence the efficiency of corporate resource allocation. Comparatively, the maturity and transparency of overseas capital markets are notably higher than those of the domestic capital market. Promoting the overseas listing of SOEs is not only a process of introducing external competitive mechanisms but also a process of facilitating the free flow of capital.

The "investor recognition hypothesis" of overseas listing suggests that the objective existence of market segmentation leads to information asymmetry. The existence of information asymmetry, in turn, results in individually rational behavior among investors, causing them to prefer investing their funds in stocks about which they have sufficient information. This individual rational behavior further generates a "Matthew effect"

in the stock market, preventing the diversification of company-specific risks. Building on this, Merton and others used the size of the investor base as a proxy variable for measuring the degree of investor recognition, pointing out that an increase in the investor base, i. e., an increase in investor recognition, can lower a company's cost of capital [4]. Therefore, the process of SOEs listing overseas is a process of breaking down market segmentation. As enterprises list on overseas capital markets, the degree of attention from overseas media towards SOEs will intensify following the occurrence of their overseas listing behavior [5], and the channels and methods for investors to understand the operating conditions of SOEs become more diversified and multi-dimensional due to the overseas listing, effectively reducing the degree of information asymmetry. Meanwhile, the overseas listing behavior of SOEs can expand the investor base, enhance investor recognition of SOEs, and thereby reduce the specific risks of SOEs. Finally, from the perspective of corporate value, SOEs listing on developed overseas securities markets can attract more investors. This process can simultaneously reduce the financing costs of SOEs and increase their corporate value.

The “bonding hypothesis” of overseas listing argues that overseas capital markets impose stricter requirements on the information disclosure quality of listed enterprises and possess relatively complete supervision and management systems. This subjects enterprises listed overseas to the constraints of “legal bonding” and “reputational bonding”. After listing overseas, SOEs will face international capital markets characterized by more robust laws, higher transparency, and greater competition. They will also be scrutinized by global investors and subject to the supervision of overseas capital markets. Clearly, this process will address the capital misallocation problem arising from low domestic loan interest rates for SOEs and prevent substantial amounts of capital from being concentrated in low-efficiency or inefficient sectors. Facing fierce competition in international capital markets, SOEs must continuously pursue technological upgrading, enhance productivity, and improve capital allocation efficiency to avoid elimination from the market. Based on this, to clarify the relationship between SOEs' overseas listing and capital allocation efficiency, this paper develops the analysis along two dimensions: the impact of SOEs' overseas listing on under-investment and on over-investment, further identifying the impact of Chinese enterprises' overseas listing on capital allocation efficiency. Based on the above theoretical analysis, this paper proposes hypotheses H1 and H2:

H1: *Overseas listing of SOEs can improve capital allocation efficiency.*

H2: *Overseas listing of SOEs can reduce the degree of both under-investment and over-investment.*

2.2. The Mechanism through Which Overseas Listing of SOEs Affects Capital Allocation Efficiency

The overseas listing of SOEs significantly improves corporate governance structure and management efficiency, thereby directly influencing capital allocation efficiency. Compared with China's domestic capital market, developed overseas capital markets impose stricter requirements on enterprises. Overseas listing necessitates that SOEs comply with higher governance standards, particularly concerning information disclosure, financial transparency, and management efficiency.

From the perspective of the “bonding hypothesis”, the process of an enterprise listing on a developed overseas securities market can be seen as a process of “legal bonding” and “reputational bonding”. Under the new development paradigm, after listing overseas, SOEs confront the operational institutional arrangements of developed overseas capital markets, overseas investors, and the supervisory management systems and information disclosure standards of overseas capital markets. From an external governance mechanism perspective, developed overseas capital markets feature complete legal systems and a favorable legal environment, high-efficiency product markets, managerial labor markets, and markets for corporate control, providing important safeguards for SOEs' operational activities. From an internal governance perspective, developed overseas capital markets have corresponding institutional requirements regarding corporate equity structure, board composition, management compensation, and information disclosure. Under their comprehensive supervision systems and high-quality information disclosure standards, the interests of minority shareholders can be effectively protected, principal-agent costs are simultaneously reduced, and the internal governance level of SOEs is correspondingly improved.

On the other hand, a considerable gap still exists between China's legal and institutional environment and that of developed countries. The completeness of the product market, managerial labor market, and market for corporate control is also relatively low. Domestically listed enterprises exhibit problems such as excessively high shareholding ratios of major shareholders, boards of directors that exist "in name only", supervisors appointed based on personal connections ("guanxi"), and significant deficiencies in the information disclosure system, standards, and quality. Among these issues, the quality of corporate information disclosure directly affects the operational efficiency of the securities market. Coupled with the late start of China's securities market, the capital allocation efficiency of domestically listed enterprises is notably low. By listing on developed overseas securities markets and under the requirements of high-standard overseas information disclosure, SOEs can effectively mitigate moral hazard and resolve information asymmetry problems. The complete overseas institutional system can force SOEs to establish and improve mechanisms for the board of directors and board of supervisors, reduce ownership concentration, and urge them to establish and refine modern enterprise systems in accordance with overseas capital market regulations. This exerts pressure on SOEs to enhance their corporate governance level and thereby improve their capital allocation efficiency. Based on the above analysis, hypothesis H3 is proposed:

H3: *Overseas listing of SOEs improves capital allocation efficiency by promoting the enhancement of corporate governance levels.*

3. Research Design

3.1. Model Specification

This paper focuses on studying the impact of SOEs' overseas listing on capital allocation efficiency. Based on the preceding theoretical analysis and research content, the following econometric model is constructed, denoted as Model (1):

$$Einv_{i,t} = \alpha_0 + \alpha_1 Overseas_{i,t} + \sum_j \delta_j Controls_{j,i,t} + \eta_{ind} + \eta_{year} + \varepsilon_{i,t} \quad (1)$$

In Model (1), $Einv$ is the dependent variable, representing the capital allocation efficiency of SOEs; $Overseas$ is the core independent variable, indicating whether an SOE is listed overseas; $Controls$ denotes the control variables; η_{ind} and η_{year} represent industry fixed effects and year fixed effects respectively; i denotes the domestically listed and overseas-listed enterprises covered in this paper; and t denotes time, where $t = 2009, 2010, 2011 \dots 2023$.

3.2. Description of Variables and Indicators

1. Dependent Variable (Einv) is the capital allocation efficiency of SOEs. According to the connotation of capital allocation efficiency, this paper bases its approach on the method by Richardson for measuring corporate investment efficiency and integrates research by Li Wenwen, Chen Xiaodong, Xu Qian, and others to establish a model for calculating the capital allocation efficiency of SOEs, denoted as Model (2) [6–9]:

$$Inv_t = a_0 + a_1 Growth_{t-1} + a_2 Lev_{t-1} + a_3 Cash_{t-1} + a_4 Age_{t-1} + a_5 Size_{t-1} + a_6 Ret_{t-1} + a_7 Inv_{t-1} + \sum Industry + \sum Year + \varepsilon \quad (2)$$

In Model (2), Inv_t represents the actual new investment expenditure of the company in year $t =$ capital expenditures + increase in investments—cash received from the sale of fixed assets—decrease in investments—net cash flow from other investing activities; $Growth_{t-1}$ represents the company's growth opportunities in year $t - 1$, measured by Tobin's Q ; Age_{t-1} represents the company's age in year $t - 1$, expressed as the logarithm of (current year—listing year + 1); Lev_{t-1} represents the company's financial leverage ratio in year $t - 1$, expressed as the asset-liability ratio; $Cash_{t-1}$ represents the company's cash flow situation in year $t - 1$, expressed as net cash flow from operating activities/total assets at the beginning of the year; $Size_{t-1}$ represents the company's asset size in year $t - 1$, expressed as the natural logarithm of total assets; Ret_{t-1} represents the company's stock return in year $t - 1$, expressed as (current period stock market value—previous period stock market value)/previous period stock value. Inv_{t-1} represents the new investment expenditure in year $t - 1$; $\sum Industry$ represents

industry dummy variables, classified according to the China Securities Regulatory Commission's 2012 industry standards, where manufacturing industries with the code starting with "C" are identified by the first 2 digits, and other industries by the first 1 digit; \sum Year represents year dummy variables; ε represents the residual estimated by the model. For Model (2), OLS regression is performed by year to obtain the model residuals. The absolute value of the residual represents the degree of deviation between the firm's actual capital expenditure and the ideal state. To facilitate the interpretation of coefficients in the empirical results, this paper follows the research of Zhou Qian and others by multiplying this variable by -1 to obtain the capital allocation efficiency of SOEs (Einv) [10]. A larger Einv indicates higher capital allocation efficiency of the company.

2. Core Independent Variable (Overseas) indicates whether an SOE is listed overseas. When an SOE is listed outside Chinese Mainland, it is recorded as Overseas = 1; conversely, when an SOE is listed inside Chinese Mainland, it is recorded as Overseas = 0.

3. Control Variables. According to relevant research by scholars [11–15], this paper sequentially controls for the firm's Return on Assets (ROA), Asset Turnover Ratio (ATO), Cash Flow Ratio, Book-to-Market Ratio (BM), FirmAge, and Management Expense Ratio (Mfee). In the specific analysis process, this study controls for industry (η_{ind}) and year (η_{year}) fixed effects respectively. Detailed variable definitions are presented in Table 1:

Table 1. Variable Definitions.

Variable Category	Variable Symbol	Variable Description	Specific Definition
Dependent Variable	Einv	Capital Allocation Efficiency	Absolute value of the residual in Equation (1)
Core Independent Variable	Overseas	Overseas Listing	Equals 1 when the SOE is listed outside Chinese Mainland; equals 0 when the SOE is listed inside Chinese Mainland.
Control Variables	ROA	Return on Assets	Net Profit/Total Assets
	ATO	Asset Turnover Ratio	Operating Revenue/Average Total Assets
	Cashflow	Cash Flow Ratio	Net Cash Flow from Operating Activities/Total Assets
	BM	Book-to-Market Ratio	Book Value of Equity/Total Market Value
	FirmAge	Firm Age	Logarithm of (Current Year – Establishment Year of the Company + 1)
	Mfee	Management Expense Ratio	Administrative Expenses/Operating Revenue

This paper selects 215 overseas-listed SOEs, with listing locations primarily concentrated in the United States and Hong Kong, China. Simultaneously, based on the research content, 374 domestically listed SOEs are matched as the control group. Among them, data for overseas-listed SOEs are sourced from the WIND database, while data for domestically listed SOEs are sourced from the CSMAR database. Furthermore, this paper supplements some missing values using stock data query software such as Hithink RoyalFlush, as well as corporate annual reports and relevant financial data. Samples with non-normal trading statuses, such as financial firms, ST and *ST firms, are excluded. The time dimension selected for this paper spans from 2009 to 2023. To ensure the scientific validity and credibility of the research conclusions, this paper excludes listed financial companies, ST and PT listed companies, cross-listed companies, and companies with severely missing or abnormal data during the specific research process. Meanwhile, to mitigate estimation bias caused by extreme values in the empirical research process, this paper conducts winsorization on each variable at the 1% and 99% percentiles. The descriptive statistics for the aforementioned variables are presented in Table 2.

Table 2. Descriptive Statistics of Main Variables.

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
Einv	4431	-0.0493	0.0521	-0.475	-0.000196
Overseas	4431	0.476	0.499	0	1
ROA	4431	0.0372	0.0685	-0.481	0.290
ATO	4431	0.599	0.457	0.0129	2.925
Cashflow	4431	0.0498	0.0816	-0.429	0.436
BM	4431	1.245	1.355	-0.196	13.36
FirmAge	4431	2.942	0.417	1.099	3.989
Mfee	4431	0.0973	0.156	0.00244	3.005

4. Empirical Analysis

4.1. Baseline Regression

Using a sample of SOEs listed domestically and overseas in China from 2009 to 2023 to regress Model (1), the regression results of the impact of SOEs' overseas listing on capital allocation efficiency are presented in Table 3.

Table 3. Baseline Regression Results of the Impact of SOEs' Overseas Listing on Capital Allocation Efficiency.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Overseas	0.0111 *** (0.002)	0.0123 *** (0.002)	0.0121 *** (0.002)	0.0124 *** (0.002)	0.0055 *** (0.002)	0.0059 *** (0.002)	0.0070 *** (0.002)
ROA		-0.0506 *** (0.015)	-0.0530 *** (0.015)	-0.0552 *** (0.015)	-0.0441 *** (0.015)	-0.0441 *** (0.015)	-0.0546 *** (0.016)
ATO			0.0067 *** (0.002)	0.0067 *** (0.002)	0.0077 *** (0.002)	0.0077 *** (0.002)	0.0059 *** (0.002)
Cashflow				0.0148 (0.011)	0.0173 (0.011)	0.0173 (0.011)	0.0170 (0.011)
BM					0.0060 *** (0.001)	0.0060 *** (0.001)	0.0058 *** (0.001)
FirmAge						0.0022 (0.002)	0.0023 (0.002)
Mfee							-0.0242 *** (0.007)
Constant	-0.0546 *** (0.001)	-0.0532 *** (0.001)	-0.0571 *** (0.002)	-0.0578 *** (0.002)	-0.0632 *** (0.002)	-0.0697 *** (0.006)	-0.0665 *** (0.006)
Observations	4431	4431	4431	4431	4431	4431	4431
R-squared	0.027	0.031	0.034	0.034	0.050	0.051	0.055
Industry FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
r2_a	0.0215	0.0254	0.0280	0.0283	0.0441	0.0441	0.0486
r2_within	0.0104	0.0146	0.0175	0.0180	0.0342	0.0344	0.0391
F	44.02	25.44	19.44	15.56	36.13	30.15	26.50

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Values in parentheses are robust standard errors.

The regression results in Table 3 show that the core independent variable (Overseas) in columns (1) to (7) passes the statistical significance test at the 1% significance level, and the coefficient sign is positive. This indicates that the overseas listing of SOEs contributes to improving their capital allocation efficiency, Hypothesis 1 is supported. In addition, the control variables Return on Assets (ROA), Asset Turnover Ratio (ATO), Book-to-Market Ratio (BM), and Management Expense Ratio (Mfee) all pass the significance test at the 1% level. Among these, the coefficient signs for Return on Assets (ROA) and Management Expense Ratio (Mfee) are negative, while the coefficient signs for Asset Turnover Ratio (ATO) and Book-to-Market Ratio (BM) are positive.

4.2. Heterogeneity Analysis

To more accurately grasp the relationship between SOEs' overseas listing and capital allocation efficiency, this section further develops the analysis along two dimensions: the impact of SOEs' overseas listing on under-investment and the impact on over-investment, thereby further identifying the impact of SOEs' overseas listing on capital allocation efficiency.

Table 4. Baseline Regression Results of the Impact of SOEs' Overseas Listing on Under-investment and Over-investment.

Variable	Under- Investment (1)	Under- Investment (2)	Over- Investment (3)	Over- Investment (4)
Overseas	-0.0118 *** (0.002)	-0.0084 *** (0.003)	-0.0097 *** (0.003)	-0.0035 (0.003)
ROA		0.0557 *** (0.020)		0.0467 * (0.025)
ATO		-0.0101 *** (0.002)		-0.0018 (0.004)
Cashflow		-0.0094 (0.016)		-0.0302 (0.018)
BM		-0.0051 *** (0.001)		-0.0076 *** (0.001)
FirmAge		-0.0031 (0.002)		-0.0024 (0.003)
Mfee		0.0310 *** (0.009)		0.0109 (0.009)
Constant	0.0516 *** (0.002)	0.0672 *** (0.007)	0.0582 *** (0.002)	0.0716 *** (0.011)
Observations	2378	2378	2053	2053
R-squared	0.039	0.078	0.028	0.052
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
r2_a	0.0284	0.0655	0.0161	0.0372
r2_within	0.0135	0.0536	0.00599	0.0302
F	27.47	17.52	12.03	10.54

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Values in parentheses are robust standard errors.

The regression results in Table 4 show that in columns (1) and (2), the core independent variable passes the statistical significance test, and the coefficient sign is negative, indicating that the overseas listing of SOEs can reduce the degree of corporate under-investment and optimize capital allocation efficiency. In column (3), the core independent variable (Overseas) passes the statistical significance test, and the coefficient sign is negative. In column (4), the core independent variable (Overseas) does not pass the statistical significance test, but the

coefficient sign remains negative, suggesting that the overseas listing of SOEs can reduce the degree of over-investment and improve capital allocation efficiency, although its effect is notably smaller than its effect on reducing under-investment. These findings support Hypothesis 2.

4.3. Analysis of Empirical Results

The above empirical research findings indicate that: (1) The overseas listing of SOEs can improve capital allocation efficiency; (2) The overseas listing of SOEs can reduce the degree of both under-investment and over-investment, thereby enhancing capital allocation efficiency, but the effect of SOEs' overseas listing on reducing over-investment is notably smaller than its effect on reducing under-investment.

The reasons why SOEs' overseas listing can significantly improve capital allocation efficiency are as follows: (1) Compared with China's domestic securities market, developed overseas securities markets are closer to perfectly competitive markets. Combined with resource allocation theory, under perfectly competitive market conditions, resource allocation will achieve Pareto optimality, which in turn enables SOEs' overseas listing to contribute to improved capital allocation efficiency. (2) Combining the "bonding hypothesis" and the "investor recognition hypothesis" of overseas listing, the process of SOEs listing overseas is a process of "reputational bonding" and "legal bonding". Under the new development paradigm, SOEs listing overseas directly face the operational institutional arrangements of developed overseas capital markets, overseas investors, and the supervisory management systems and information disclosure standards of overseas capital markets, thereby bonding with the overseas capital market. Clearly, the developed overseas capital market will force SOEs to conduct their production and operational activities in accordance with its corresponding standards. Under the relatively complete institutional constraints of the overseas capital market, capital allocation efficiency is enhanced. On the other hand, as the process of SOEs' overseas listing advances, the investor base expands, the degree of investor protection and recognition continuously increases, the corporate cost of capital consequently decreases, and corporate risks are diversified, thereby promoting SOEs to enhance capital allocation efficiency. (3) Overseas listing behavior helps resolve many issues existing in the SOE reform process. By listing overseas, problems in SOE reform, such as a lack of operational autonomy and low efficiency, can be addressed to a certain extent. The institutional design of overseas capital markets is more standardized and refined compared to domestic ones, and these institutions can be mandatorily enforced. Issues such as the integration of government and enterprise functions and the selection of agents in SOEs will be effectively alleviated or resolved, thereby allowing SOEs' overseas listing to significantly improve capital allocation efficiency.

The reasons why SOEs' overseas listing can reduce the degree of under-investment and over-investment are as follows: (1) China's securities market started relatively late. Compared with overseas securities markets, the degree of marketization of China's securities market is significantly lower. Listing SOEs on overseas securities markets with a higher degree of marketization helps give play to the decisive role of the market in resource allocation and reduces the degree of over-investment and under-investment. (2) The effect of SOEs' overseas listing on reducing over-investment is notably smaller than its effect on reducing under-investment. The fundamental reason for this lies in the fact that SOEs bear more social functions and are, to a certain extent, influenced by government policies or objectives. The investment behavior of SOEs cannot truly align with the principle of maximizing market efficiency, leading to non-market-oriented investment decisions made to achieve policy objectives.

4.4. Robustness Check

To further verify the scientific validity and reliability of the above empirical research conclusions, this section employs robustness check methods such as excluding sample values from special years, placebo tests, and Entropy Balancing Matching (EBM) to conduct robustness checks on the empirical test results of the three dimensions mentioned above.

4.4.1. Excluding Sample Values from Special Years

From a temporal perspective, in June 2013, a liquidity crisis emerged in China's financial market, with the interbank offered rate soaring, triggering the "money shortage" event. This not only affected the money market but also spread to the stock and trust markets, exacerbating the "financing difficulty" and "high financing cost" faced by Chinese enterprises [16]. Furthermore, China's stock market experienced a "stock market circuit breaker" in 2015, where the Shanghai Composite Index underwent a turbulent process of rapid ascent to 5000 points followed by a sharp decline. This led to increased uncertainty in the financial market, directly affecting corporate debt and equity financing costs. Considering the particularities of 2013 and 2015, this section excludes samples from these two years to conduct a robustness check on the research conclusions of the three dimensions mentioned above. The test results are presented in Table 5.

Table 5. Regression Results After Excluding Sample Values from Special Years.

Variable	Capital Allocation Efficiency (1)	Under-Investment (2)	Over-Investment (3)
Overseas	0.0062 *** (0.002)	-0.0087 *** (0.003)	-0.0020 (0.004)
Constant	-0.0680 *** (0.006)	0.0683 *** (0.007)	0.0740 *** (0.012)
Observations	3886	2115	1771
R-squared	0.056	0.077	0.055
Controls FE	YES	YES	YES
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
r2_a	0.0489	0.0642	0.0393
r2_within	0.0399	0.0513	0.0323
F	24.47	16.07	9.305

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Values in parentheses are robust standard errors.

The regression results in Table 5 show that: In column (1), the core independent variable (Overseas) passes the statistical significance test at the 1% significance level, and the coefficient sign is positive, which is consistent with the results in Table 3. In column (2), the core independent variable (Overseas) passes the statistical significance test at the 1% significance level, and the coefficient sign is negative, consistent with the results in Table 4. In column (3), the core independent variable (Overseas) does not pass the statistical significance test, but the coefficient sign is negative, indicating to a certain extent that SOEs' overseas listing can reduce the degree of over-investment, a conclusion consistent with that in Table 4. Based on the above analysis, it can be seen that after excluding sample values from special years, the empirical research conclusions remain reliable.

4.4.2. Placebo Test

To test whether the capital allocation efficiency of SOEs is influenced by unobservable variables and other factors, and to rule out the impact of spurious correlations on the empirical research conclusions, this section follows the research of scholars such as [16, 17]. The true correspondence between the core independent and dependent variables in the sample is disrupted, and regression tests are re-conducted after random matching. This process is repeated 500 times, and the kernel density estimation plots of the spurious coefficients and spurious *t*-values obtained from the regressions are acquired. Following this research method, robustness checks are conducted on the empirical research results of the three dimensions mentioned above respectively. The distribution of spurious coefficients, *p*-values, and *t*-values of the core independent variables for each dimension is shown in Figures 1–3, respectively.

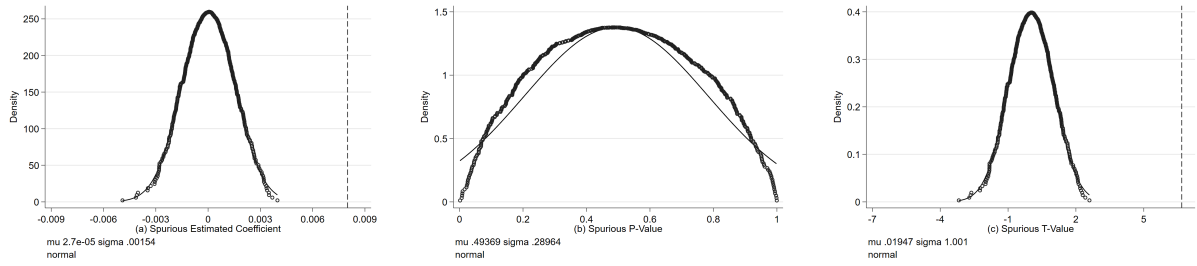


Figure 1. Placebo Test on the Impact of SOEs’ Overseas Listing on Capital Allocation Efficiency.

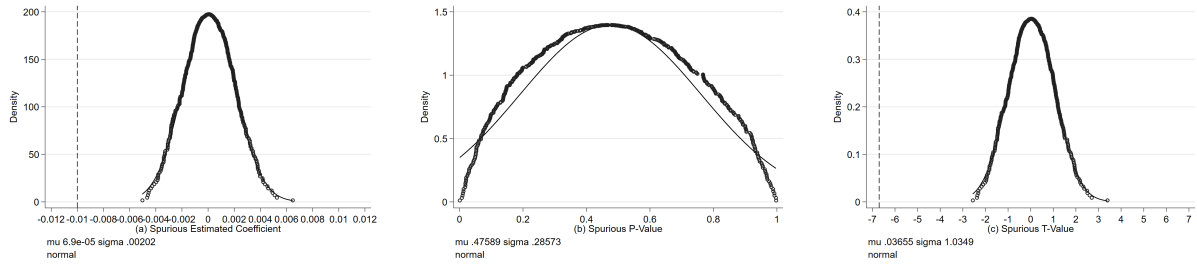


Figure 2. Placebo Test on the Impact of SOEs’ Overseas Listing on Under-investment.

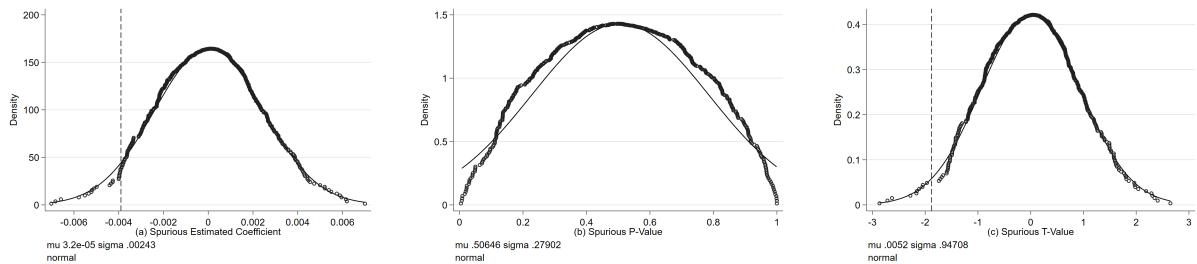


Figure 3. Placebo Test on the Impact of SOEs’ Overseas Listing on Over-investment.

The results of the placebo tests for the above three dimensions show that the mean coefficients and mean t-values of the core independent variables in each dimension are all close to 0 and generally follow a normal distribution with a mean of 0. In contrast, the coefficients and t-values of the true core independent variables are far from the spurious values, indicating that the randomly sampled listing outcomes would not significantly affect the capital allocation efficiency of SOEs, and the research conclusions are robust.

4.4.3. Entropy Balancing Matching (EBM)

To mitigate the impact of sample self-selection bias, this section refers to the research of [18,19], and others, employing the Entropy Balancing Matching (EBM) method to conduct robustness checks on the regression results of the three dimensions mentioned above. The specific operational procedure is as follows: (1) The sample is divided into groups, with overseas-listed enterprises set as the treatment group (Treat = 1) and domestically listed enterprises set as the control group (Treat = 0), using the control variables from the original model as covariates. (2) The first, second, and third moments of the covariates in the treatment and control groups are adjusted to achieve exact matching under different moment constraints. (3) The weighted and balanced sample is re-tested to obtain the regression results for the various dimensions mentioned above, as shown in Table 6.

Table 6. Regression Results from Entropy Balancing Matching.

Variable	Capital Allocation Efficiency (1)	Under-Investment (2)	Over-Investment (3)
Overseas	0.0120 *** (0.003)	-0.0174 *** (0.004)	-0.0046 (0.004)
Constant	-0.0668 *** (0.008)	0.0649 *** (0.009)	0.0780 *** (0.013)
Observations	4431	2378	2053
R-squared	0.081	0.153	0.058
Controls FE	YES	YES	YES
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
r2_a	0.0742	0.142	0.0431
r2_within	0.0553	0.106	0.0297
F	22.42	12.57	9.845

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Values in parentheses are robust standard errors.

The results in Table 6 show that: In column (1), the core independent variable (Overseas) passes the statistical significance test at the 1% significance level, and the coefficient sign is positive, which is consistent with the results in Table 3. In column (2), the core independent variable (Overseas) passes the statistical significance test at the 1% significance level, and the coefficient sign is negative, consistent with the results in Table 4. In column (3), the core independent variable (Overseas) does not pass the statistical significance test, but the coefficient sign is negative, indicating to a certain extent that SOEs' overseas listing can reduce the degree of over-investment, a conclusion consistent with that in Table 4. This indicates that after correcting for sample self-selection bias, the findings for the three dimensions mentioned above remain robust.

The above robustness check results indicate that after conducting tests using three commonly employed robustness check methods—excluding sample values from special years, placebo tests, and Entropy Balancing Matching (EBM)—the research conclusions obtained are consistently in line with the previous findings. This fully demonstrates the high scientific validity and credibility of this paper's empirical research conclusions and confirms that the research conclusions are robust.

5. Mechanism Analysis

5.1. Model Specification

Since the Third Plenary Session of the 14th CPC Central Committee in 1993, the issue of corporate governance has consistently received high attention from the Party and the state. A series of laws and documents, such as the “Code of Corporate Governance for Listed Companies”, the “Opinions on Strengthening the Party's Leadership in Improving Corporate Governance in Central Enterprises”, the “Measures for the Compliance Management of Central Enterprises”, the “Company Law of the People's Republic of China”, and the “Notice Regarding the Differentiated Application of Corporate Governance and Other Relevant Regulatory Provisions for Some Non-Bank Institutions”, all explicitly mention enhancing corporate governance levels. It is undeniable that the corporate governance level is an important factor affecting the capital allocation efficiency of Chinese enterprises. To this end, this paper incorporates the corporate governance level into the analysis framework of the impact of SOEs' overseas listing on capital allocation efficiency. Based on the preceding theoretical analysis and combined with the calculation results of the corporate governance levels of listed SOEs, this section further constructs a mediation effect model to test

whether the mechanism through which SOEs' overseas listing impacts capital allocation efficiency follows the previously proposed hypothesis H3, i.e., that SOEs' overseas listing improves capital allocation efficiency by promoting the enhancement of corporate governance levels.

Based on this, this section follows the approach of scholars such as [20], introducing the mediator variable of Corporate Governance Level (Gov) on the basis of Model (1) to identify the impact of the core independent variable (Overseas) on the mediator variable (Gov), denoted as Model (3):

$$Gov_{i,t} = \gamma_0 + \gamma_1 Overseas_{i,t} + \sum_j \lambda_j Controls_{j,i,t} + \eta_{ind} + \eta_{year} + \varepsilon_{i,t} \quad (3)$$

In Model (3), Gov is the mediator variable (corporate governance level of domestically listed and overseas-listed SOEs), Overseas is the core independent variable (whether an SOE is listed overseas), Controls denotes the control variables, η_{ind} and η_{year} represent industry fixed effects and year fixed effects, respectively, i denotes the domestically listed and overseas-listed SOEs covered in this paper, and t denotes time, where t = 2009, 2010, 2011... 2023. Among them, the corporate governance level (Gov) is obtained through calculation (Referring to previous research [21–25], this paper selects three first-level indicators—board of directors, equity structure, and information disclosure—along with nine second-level indicators, and applies the entropy weight method to calculate the corporate governance levels of Chinese domestically listed and overseas-listed SOEs. Due to space limitations, the calculation steps are not presented in the text), and the control variables (Controls) are consistent with Model (1), including Return on Assets (ROA), Asset Turnover Ratio (ATO), Cash Flow Ratio (Cashflow), Book-to-Market Ratio (BM), Firm Age (FirmAge), and Management Expense Ratio (Mfee).

5.2. Empirical Research Results

Following the analytical approach of Jiang Ting and others, this paper uses a sample of SOEs listed domestically and overseas from 2009 to 2023 to regress Model (3). Based on the regression conclusions of Model (2), it specifically analyzes the mechanism through which SOEs' overseas listing impacts capital allocation efficiency. The specific test results of the mechanism through which SOEs' overseas listing impacts capital allocation efficiency are presented in Table 7.

The regression results in Table 7 show that: In columns (1) and (2), the core independent variable (Overseas) passes the statistical significance test at the 1% significance level, and the coefficient signs are both positive. This indicates that SOEs' overseas listing can improve capital allocation efficiency and that SOEs' overseas listing can enhance corporate governance levels. From this, it can be determined that the impact of SOEs' overseas listing on capital allocation efficiency operates through the mediating mechanism of corporate governance level. In columns (3) and (4), the core independent variable (Overseas) passes the statistical significance test at the 1% significance level, with one negative and one positive coefficient sign; from this, it can be determined that SOEs' overseas listing can reduce the degree of under-investment, and this effect is influenced by the mediating variable of corporate governance level. In column (5), the core independent variable (Overseas) does not pass the statistical significance test, while in column (6), it passes the statistical significance test at the 1% level, with a positive coefficient sign, indicating that the impact of SOEs' overseas listing on the degree of over-investment does not conform to the aforementioned mechanism.

Table 7. Mechanism Test of the Impact of SOEs' Overseas Listing on Capital Allocation Efficiency.

Variable	Capital Allocation Efficiency (1)	Corporate Governance Level (2)	Under-Investment (3)	Corporate Governance Level (4)	Over-Investment (5)	Corporate Governance Level (6)
Overseas	0.0070 *** (0.002)	0.0577 *** (0.002)	-0.0084 *** (0.003)	0.0577 *** (0.002)	-0.0035 (0.003)	0.0577 *** (0.002)
ROA	-0.0546 *** (0.016)	0.0780 *** (0.011)	0.0557 *** (0.020)	0.0780 *** (0.011)	0.0467 * (0.025)	0.0780 *** (0.011)
ATO	0.0059 *** (0.002)	0.0001 (0.002)	-0.0101 *** (0.002)	0.0001 (0.002)	-0.0018 (0.004)	0.0001 (0.002)
Cashflow	0.0170 (0.011)	0.0191 ** (0.008)	-0.0094 (0.016)	0.0191 ** (0.008)	-0.0302 (0.018)	0.0191 ** (0.008)
BM	0.0058 *** (0.001)	-0.0009 (0.001)	-0.0051 *** (0.001)	-0.0009 (0.001)	-0.0076 *** (0.001)	-0.0009 (0.001)
FirmAge	0.0023 (0.002)	-0.0046 ** (0.002)	-0.0031 (0.002)	-0.0046 ** (0.002)	-0.0024 (0.003)	-0.0046 ** (0.002)
Mfee	-0.0242 *** (0.007)	-0.0230 *** (0.004)	0.0310 *** (0.009)	-0.0230 *** (0.004)	0.0109 (0.009)	-0.0230 *** (0.004)
Constant	-0.0665 *** (0.006)	0.0497 *** (0.006)	0.0672 *** (0.007)	0.0497 *** (0.006)	0.0716 *** (0.011)	0.0497 *** (0.006)
Observations	4431	4431	2378	4431	2053	4431
R-squared	0.055	0.345	0.078	0.345	0.052	0.345
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
r2_a	0.0486	0.341	0.0655	0.341	0.0372	0.341
r2_within	0.0391	0.306	0.0536	0.306	0.0302	0.306
F	26.50	274.9	17.52	274.9	10.54	274.9

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Values in parentheses are robust standard errors.

6. Conclusions and Implications

Using data from state-owned listed enterprises from 2009 to 2023 as the research sample, this paper empirically analyzes the impact of SOEs' overseas listing on capital allocation efficiency. The results indicate that SOEs' overseas listing can improve capital allocation efficiency. Subsequently, a further heterogeneity analysis is conducted, developing along two dimensions—the impact of SOEs' overseas listing on under-investment and on over-investment—to further identify the effect of SOEs' overseas listing on capital allocation efficiency. The research findings show that SOEs' overseas listing can reduce the degree of both under-investment and over-investment, optimizing capital allocation efficiency, and the effect of SOEs' overseas listing on reducing under-investment is stronger than its effect on reducing over-investment. Through robustness tests using three commonly used methods—excluding sample values from special years, placebo tests, and Entropy Balancing Matching (EBM)—the obtained research conclusions consistently align with the previous findings, demonstrating that the conclusions are robust. Finally, a mechanism test is conducted, with results indicating that SOEs' overseas listing can promote the improvement of corporate governance levels, which in turn enhances capital allocation efficiency. Simultaneously, SOEs' overseas listing can reduce the degree of under-investment, and this effect is influenced by the corporate governance level.

Accordingly, this paper draws the following implications: On the one hand, SOEs should proactively seize the opportunity to list overseas. Promoting the overseas listing of SOEs is both a process of introducing external

competitive mechanisms and a process of facilitating the free flow of capital. After listing overseas, SOEs will face international capital markets characterized by more robust laws, higher transparency, and greater competition. They will also be scrutinized by global investors and subject to the supervision of overseas capital markets. Clearly, this process addresses the capital misallocation problem arising from low domestic loan interest rates for SOEs and prevents substantial amounts of capital from being concentrated in low-efficiency or inefficient sectors. Facing fierce competition in international capital markets, SOEs must continuously pursue technological upgrading, enhance productivity, and improve capital allocation efficiency to avoid elimination from the market. SOEs should further improve their internal governance mechanisms and structures. The process of SOEs perfecting their internal governance mechanisms is both a process of continuously enhancing efficiency and a process of gradually reducing dependence on the government. As the corporate governance mechanisms of SOEs continue to improve, their international competitiveness progressively rises, their reliance on financial institutions such as banks correspondingly decreases, and their capital allocation efficiency continuously increases, effectively resolving prominent issues existing in SOEs. On the other hand, the implications for the government are as follows: The government should actively promote the implementation and effectiveness of policies related to the overseas listing of SOEs, guide the reform of SOEs' internal governance mechanisms and structures, and reduce policy tilts and support for non-critical sectors and industries, thereby enhancing the overall capital efficiency of SOEs. Furthermore, the government should proactively accelerate the process of marketization, thereby reducing intervention in the operational activities of SOEs and truly enabling the market to play a decisive role in resource allocation.

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