The Impact of Mixed Ownership Reform on Enterprise Performance–An Empirical Study Based on A-Share Listing Corporation in China

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Abstract. This paper, with data of 486 listed companies from 2003 to 2014 over the time span of 12 years, finds that the proportion of non state-owned shares in the Fixed-Effect Model is negatively correlated with the profitability of the company, and it is positively correlated with the company's development capacity; The proportion of circulating stocks has a significant positive impact on the corporate debt solvency and development ability; The proportion of the largest shareholder's shareholding and the proportion of the top ten shareholders are significantly correlated with the total asset growth rate, while separation rate of two rights and total asset growth rate are negatively correlated. Moreover, by using the Difference-in-Difference Model to test the reform policies, the regression results find that the restructuring has a significantly positive impact on corporate profitability and development capacity. The consistency of two methods confirms that the mixed ownership reform policy has a positive role in promoting the profitability, debt solvency and development capability of state-owned listed companies.

Keywords: Mixed ownership reform · Non state-owned shares · Enterprise performance

1 Introduction

The core reforms of state-owned enterprise (SOE) on the three levels are mainly: state-owned assets supervision, state-owned enterprise equity, state-owned enterprise operation. Among the three, SOE equity is the core of state-owned enterprise restructuring. The main core of SOE equity is to actively develop a mixed ownership economy, allowing more state-owned economy and other ownership economy to develop a mixed ownership economy, allowing mixed ownership economy to implement employee holdings, and finally the formation of co-ownership of capital and labor Therefore, the exploration of the relationship between the different ownership structure of various property nature and the performance of enterprises in the first restructuring process and the "second revision" is a

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great guidance for the reform of SOE, and is conducive to a comprehensive understanding of the impact of restructuring on corporate performance.

In theory, the restructuring of SOE will improve the ownership structure of listed companies, improve the governance structure of listed companies, and then is conducive to improving the performance of SOE. This paper attempts to explore the impact of mixed ownership reform on corporate performance and analyze the policy implications of restructuring policy-making in the state-owned enterprises and non-state-owned enterprises, and, through theoretical and empirical analysis, tries to have some reference value to the participants and researchers of SOE reform.

2 Literature Review

2.1 Summary of Relevant Literature Abroad

Researches of foreign scholars on corporate restructuring in the background of the privatization began in the 1980s, and later expanded to a number of countries, including the restructuring of China's SOE [3,5,6]. Djankov and Murrell use the regression method of econometrics to make an empirical research on the enterprises in the transition economy and carry on the detailed model analysis [2]. Megginson and Nash studied the political, public institutions and economic factors in the state-owned enterprises privatization by shares issuance and sale on the public capital markets, conducted a comprehensive discussion of private ownership and supported the view that national policy and legal environment impact financial decisions [9]. Many foreign scholars have make related researches on the economic policy of corporate governance, such as Pagano and Volpin [10].

2.2 Summary of Relevant Literature in China

Since reform and opening up, China has been experiencing a slow process of economic transition. From the mid and late 1990s, due to the establishment of the modern enterprise system emphasized by the Third Plenary Session of the 14th CPC, the inefficiency of SOE drew the attention of the majority of Chinese scholars to the researches on the efficiency of SOE. Yao [15] based on the data analysis of the third industrial census, concluded that the rise of non-state economic components may promote the overall level of China's industrial improvement. Liu using the 1995 national industrial census data, found that among the variety of ownership enterprises, SOE has the lowest efficiency [7]. Liu and Li used [8] the data from 451 competitive enterprises (1994–1999) to make an empirical research and obtain the negative impact of state ownership on corporate performance, and conclude that non-state capital is positively correlated with firm performance. During this period, many scholars have studied the impact of ownership changes on corporate performance [4,13]. Song Ligang, Yao [12] also found a clear time trend, the effect of restructuring is most stable for those enterprises with a moderate length of restructuring history and

for the enterprises that implemented restructuring between 1997 and 1999. Bai and Tao [1] used the panel data of the national industrial enterprises from 1998 to 2003 to analyze the economic and social benefits of the SOE restructuring, and concluded that the economic benefits of the state-controlled enterprises are better while the social benefits of the non-state-owned enterprises are better, and that the restructuring effect will continue for some time. Yang et al. [14] found that although the number of employees decreased after the restructuring of collective enterprises, the wage benefits per capita and taxation increased significantly, indicating that in general the restructuring of collective enterprises had a positive effect on social welfare. Sheng [11] used the multiplier method based on the tendency scoring matching to analyze the micro-data of Chinese industrial enterprises from 1999 to 2007, and concludes that the marketization and the introduction of competition mechanism makes the reform of SOE play a role in promoting social welfare. In the ongoing process of enterprise restructuring, some scholars use the Double-differential Model to compare the effects of the restructuring policy. Li and Qiao adopted the Double-differential Model for China's industrial data from 1999 to 2006, and found that the economic performance of state-owned enterprises improved significantly in 2003, and that the overall economic performance of SOE improved. Chen and Tang based on the national industrial data from 1999 to 2007, study the social burden and the policy burden on the enterprises with the Double-differential Model, and find that the mixed ownership reform can reduce the policy burden of SOR, and that the reform efficiency of monopoly mixed ownership is higher than that of the competitive industry.

3 An Empirical Study on Enterprise Performance by Mixed Ownership Reform

3.1 Data Sources

This paper uses the 486 listed companies listed in China's A-share market from 2003 to 2014, including all the industry classification of the SFC in 2014, with a total of 5832 effective observations, and set the dummy variable for the industry and the three economic zones. According to the "State Council's work report on the state-owned enterprise reform and development" published in 2012, more than 90% of the state-owned enterprises have completed the shareholding reform.

3.2 Definitions of Variables

(1) Corporate Performance Indicators

We use the company's financial indicators to measure the corporate performance indicators. ① Profitability is replaced by ROA of total assets. The return of the total assets(ROA) is the ratio of the net profit to the total assets of the enterprise over a certain period of time. The higher the value of ROA, the higher the profitability of the enterprise. ② Debt solvency is measured by the

Debt Asset ratio (DAR), which is the percentage of total liabilities at the end of the period divided by the total amount of assets. It is an important measure of the level of corporate liabilities and the degree of risk. ③ The growth capacity is measured by the sustainable growth rate (SGR) and the total asset growth rate (TAGR). The SGR is the highest growth rate that can be achieved by the non-issuance of new shares and maintaining the current operating efficiency and financial policy. So, this indicator represents a suitable pace of development The growth rate of the total assets is the ratio of the total assets increase of the year to its total assets at the beginning of the year, so it reflects the growth of the assets. The growth of the assets is an important aspect of the development of the enterprises. Enterprises of high growth rate can maintain the steady growth of assets.

(2) Explain the Variables

① Mixed ownership restructuring index: the proportion of non-state-owned shares (nonNSOS). Because the GTA CSMAR database contain the capital structure of all the listed companies including the total number of shares and the number of state-owned shares, so the proportion of non-state shares can be calculated.

② The proportion of circulating capital shares (LTBL): the ratio of the circulating shares to the total shares of the company. The greater the proportion of circulating shares, the more the stock reflects the true value of the company.

③ Proportion of sponsor shares (POP) is the ratio of the total number of sponsor shares to the total capital shares of the company. The sponsor shares refer to the special shares offered by the listed company to the founder(s) of the company.

④ The proportion of the largest shareholder holdings (POFLS): the ratio of the number of shares held by the largest shareholder to the total number of shares.

⑤ The proportion of the top ten shareholders holding (POTTS): the ratio of the number of shares held by the top ten shareholders to the total number of shares.

⑥ The separation rate of two rights (SRTR): the difference between the control of the actual controller of the listed company and his or her ownership.

We use the Herfindahl index to measure the concentration of the industrial market. The higher the Herfindahl index, the higher the degree of market concentration, and the higher the degree of monopoly. Other explanatory variables include total assets, total liabilities, paid-in capital, gross operating income, total operating costs, equity multiplier, equity ratio, flow ratio, quick ratio, total number of shareholders, and income tax.

As the listed companies that we have selected basically involve in the SFC industry classification of 2014, and these listed companies registered in the three major economic zones of the eastern and central regions. Therefore, for the study of the industry, several major industry categories are focused on, such as (1) electricity, heat, gas and water production and supply, (2) manufacturing, (3) real estate and (4) wholesale and retail. For the study of the regions, the three

major economic zones in the eastern, central and western regions, two dummy variables are set as (East) for the East region and (West) for the West region. Of the 486 listed companies selected, 268 are located in the eastern region, 114 are in the central region and 106 are in the western region.

3.3 Design of the Measurement Model and Empirical Results

(1) The Impact of Restructuring on Corporate Performance of Listed Companies C An Analysis of Fixed-effect Model.

First of all, in order to study the impact of restructuring on the performance of listed companies, that is, the changes of the proportion of non-state equity in the overall equity changes, we need to control other factors that affect the performance. Both observable and unobservable factors can affect the corporate performance, so the observable factors are added to the regression model; for the unobservable factors that are not observable but will not vary over time, we can use the Fixed-Effect Model for their estimation, so the Fixed-effect Model is constructed as follows:

$$Y_{it} = \alpha + \beta_1 \text{nonNSOS}_{it} + \beta_i i = 26 X_{it} + \gamma_{it} \text{control}_{it} + \varepsilon_{it}. \quad (1)$$

Y_{it} is the performance index of the listed company i in the year t, LTBL_{it} is the proportion of circulating capital shares of the company i in the year t, and $\sum_{i=2}^{6} X_{it}$ are other important explanatory variables. The five explanatory variables are explained as follow: LTBL_{it} is the proportion of circulating capital shares of the company i in the year t, POP_{it} is the ratio of the total number of sponsor shares to the total capital shares of the company i in the year t, POFLS_{it} is the ratio of the number of shares held by the largest shareholder to the total number of shares of the company i in the year t, POTTS_{it} is the ratio of the number of shares held by the top ten shareholders to the total number of shares of the company i in the year t, and SRTR_{it} is the separation rate of two rights the company i in the year t. $\sum \text{control}_{it}$ is the other control variables used to improve the accuracy of the study. ε it is a random perturbation term and α, β_1, β_2, β_3, β_4, β_5, β_6 are the coefficients to be estimated. The results of model 1 are listed in Table 1.

From Table 1 on the results of restructuring effects, we find that: with the non-state-owned shares increasing, the profitability declines, sustainable growth rate decreases, but the total asset growth rate increases significantly. The proportion of circulating shares has a positive impact on the total assets growth rate and Debt Asset ratio. The proportion of circulating shares is correlated to the total asset growth rate at the significance level of 1%, and the proportion of circulating shares is correlated to Debt Asset ratio at the significance level of 5%.

(2) An Analysis of the Effectiveness of Mixed Ownership Reform Policy on Corporate Performance of Listed Companies C a Difference-In-Difference Model Analysis.

In order to further effectively separate the impact of mixed ownership reform on the performance of listed companies, the Difference-In-Difference can effectively overcome the selective deviation of the sample in the regression process.

Table 1. Impact of restructuring on corporate performance of listed companies (Fixed-effect Regression).

	Profitability Return of the total assets (ROA)	Debt solvency debt asset ratio (DAR)	Development capacity Sustainable growth rate (SGR)	Total asset growth rate (TAGR)
Proportion of Non state-owned shares	−0.100***	−0.12	−2.029***	0.217**
	(0.0374)	(0.0826)	(0.6470)	(0.0863)
Proportion of circulating shares	0.0109**	0.0363***	0.0643	0.0134
	(0.0048)	(0.0107)	(0.0836)	(0.0112)
Proportion of sponsor shares	0.0341**	−0.00746	0.912***	−0.0247
	(0.0170)	(0.0376)	(0.2950)	(0.0393)
Proportion of largest shareholder holdings	−0.000233	0.00125	0.00641	0.00367***
	(0.000517)	(0.00114)	(0.00895)	(0.00119)
Proportion of top ten shareholders holding	0.000611	0.00321**	0.00412	0.00381***
	(0.000574)	(0.00127)	(0.00992)	(0.00132)
The separation rate of two rights	−0.000218	−0.00216	−0.00559	-0.00433***
	(0.000684)	(0.00151)	(0.0118)	(0.00158)
The Herfindahl index	−0.0252	−0.352**	−0.247	−0.331**
	(0.0664)	(0.147)	(1.15)	(0.153)
Constant	−0.0659	0.924**	−1.417	−1.002**
Intercept term	(0.174)	(0.385)	(3.014)	(0.402)
Observations	4,111	4,111	4,110	4,107
R-squared	0.067	0.38	0.011	0.048

Note: The values in parentheses are the standard deviation. The superscripts ***, ** and * indicate that the estimated coefficients are significant at the 1%, 5% and 10% levels respectively.

Measuring and comparing the impact of restructuring policies on listed companies requires a more definite restructuring time point. From the micro level, we, in the process of handling the enterprise sample data, have recognized that China's restructuring process is a gradual reform, will always go through a number of steps or stages in order to achieve the final restructuring goals So the restructuring time point remains difficult to define from the micro level. At the macro level, the reform of state-owned enterprises has gone through five stages The emphasis on deepening the reform and on the development of mixed ownership economy began in the fourth stage with the "Decisions of the CPC Central Committee on Several Issues Concerning the Improvement of the Socialist Market Economic System" reviewed and approved by the Third Plenary Session of the 16th CPC Central Committee. Then the State Council SASAC has put forward two notices: "General Office of the State Council forwarded the SASAC Notice on Regulating

the Reform of State-owned Enterprises" and "Opinions on Further Standardizing the Reform of State-owned Enterprises". Most of the equity nature changes of the listed companies from the CSMAR database occurred around 2006, and the number of publications on the restructuring of China's state-owned enterprises at the China National Knowledge Infrastructure (CNKI) reached its peak point in 2006. So in our literature the restructuring time point is roughly determined on this basis. Since the targets of SOE reform process are state-owned enterprises, and non-state enterprises are not involved in, so Difference-In-Difference model can be built. The specific procedures are as follow:

The data sample is divided into two groups: one is the state-owned enterprises labeled as $D1_i = 1$ (known as the test group, i.e., enterprise i is a state-owned enterprise), and the other group is non-state-owned enterprises (including private and foreign capital) labeled as $D1_i = 0$ (Known as the control group, i.e., enterprise i is a non-state-owned enterprise). Therefore, in the implementation of SOE restructuring policy, it is clear that only the SOE as the test group are affected, so the impact of restructuring policy on SOE can be expressed as E $(Y|D1_i = 1)$, and the impact of restructuring policy on non-state-owned enterprises can be expressed as $\mathrm{E}(Y|D1_i = 0)$. So we can express the net effect of restructuring policy on the performance of SOE as:

$$E(Y|D1_i = 1) - E(Y|D1_i = 0). \tag{2}$$

In order to explore the dynamic impact of the restructuring process, we carry out the time difference on this basis. Because the restructuring policy at different times will have differences, the test group and the control group will change with the policy time. One period labeled as $D2_i = 1$ is after the implementation of the restructuring policy, the other period labeled as $D2_i = 0$ is before the implementation of the restructuring policy. Therefore, we must also compare the performance changes before and after the restructuring policy, in which the performance impact after the implementation of restructuring policy can be expressed as $E(Y|D2_i = 1)$, and the performance impact before the implementation of restructuring policy can be expressed as $E(Y|D2_i = 0)$, so we can get the impact of restructuring policy at the time level:

$$E(Y|D2_i = 1) - E(Y|D2_i = 0). \tag{3}$$

So in order to measure the policy impact changes of the test group and the control group at the same time level, we can make the following adjustment to get the difference caused by restructuring policies:

Table 2. An analysis of the effect of mixed ownership reform policy on the performance of listed companies (difference-in-difference model regression).

	Profitability	Debt solvency	Development capacity	Total asset growth rate (TAGR)
	Return of the total assets (ROA)	Debt Asset ratio (DAR)	Sustainable growth rate (SGR)	
D1 before and after restructuring	0.00598	0.0269	−0.397*	0.141***
	−0.0139	−0.0307	−0.241	−0.0323
D2 test groupor	−0.0460***	0.00209	0.091	−0.0201
Control group	(0.0177)	(0.0392)	(0.307)	(0.0412)
D3 Interactive item	0.0566***	−0.0345	−0.0455	0.0852*
(D1*D2) coefficient of Policy effect	(0.0206)	(0.0455)	(0.357)	(0.0479)
nonNSOS	−0.095***	−0.125	−1.893***	0.171**
Portion of Non state-owned shares	(0.0371)	(0.082)	(0.643)	(0.0863)
LTBL	0.0110**	0.0371***	0.0591	0.0166
Proportion of circulating shares	(0.00476)	(0.0105)	(0.0826)	(0.0111)
POP	0.0309*	−0.00356	0.871***	−0.025
Proportion of sponsor shares	(0.017)	(0.0376)	(0.295)	(0.0396)
POFLS	−0.00029	0.000958	0.00697	0.00337***
Proportion of largest shareholder holdings	(0.000513)	(0.00113)	(0.00889)	(0.00119)
POTTS	0.000712	0.00313**	0.00499	0.00395***
Proportion of top ten shareholders holding	(0.000572)	(0.00127)	(0.00992)	(0.00133)
SRTR	−0.000392	−0.00223	−0.0056	−0.0043***
The separation rate of two rights	(0.000681)	(0.00151)	(0.0118)	(0.00158)
h	−0.0281	−0.295**	−0.5	−0.286*
The Herfindahl index	(0.0656)	(0.145)	(1.139)	(0.153)
Constant	−0.0407	0.727**	−0.864	−1.215***
	(0.167)	(0.369)	(2.889)	(0.388)
Observations	4,111	4,111	4,110	4,107
R-squared goodness of fit	0.7013	0.3809	0.0339	0.1518

Note: The values in parentheses are the standard deviation. The superscripts ***, ** and * indicate that the estimated coefficients are significant at the 1%, 5% and 10% levels respectively.

$$\{E(Y|D1_i = 1) - E(Y|D1_i = 0)\} - \{E(Y|D2_i = 1) - E(Y|D2_i = 0)\}. \quad (4)$$

The net effect of this restructuring policy not only measures the impact of the policy before and after its implementation, but also measures the policy differences between the test group and control group. So we have this regression model of Difference-In-Difference (Model 2):

$$Y_{it} = \alpha + \beta_1 D1_i + \beta_2 D2_i + \beta_3 D3_i + \beta_i i = 49X_{it} + \gamma_{it}\text{control}_{it} + \varepsilon_{it}. \quad (5)$$

Y_{it} is the performance index of the listed company i in the year t, and $D1_i$ is the dummy variable between groups, where $D1_i = 1$ is the test group, $D2_i$ is the time dummy variable; and $D3_i$ is the interactive item. $D3_i = D1_i \times D2_i$; β_3 is the Difference-in-Difference statistics, that is, the differences brought about by policy. Since other variables in Model Two are derived from the Model One, so the definition and interpretation of these variables in Model Two are not repeated here. For brevity we only list the regression results of several variables that related to the proportion of non-state equity, and the results and discussion of other variables are omitted. The results of Model (2) are shown in Table 2:

Table 2 shows the regression results for Model (2). The regression results between the companies that implement mixed ownership reforms and those that do not implement mixed ownership reforms show that difference-in-difference statistics for the Interactive item D3 is very significant for the total net profit margin, and is relatively significant for the total assets growth rate. In addition, the difference-in-difference statistics β_3 coefficient is significantly positive, indicating that compared to the enterprise without reform, the enterprise with reforms have greatly improved their profitability and development capability. The effect of the mixed ownership restructuring policy is not significant to the difference-in-difference statistics β_3 coefficient in the regression of the debt solvency, which indicates that the effect of the mixed ownership reform policy is not reflected. From Table 2, we can also see that with the increase in the proportion of non-state-owned shares, the decline in profitability and sustainable growth rate is relatively alleviated compared with the results in Table 1, indicating that the restructuring policy has played a role in improving the profitability of enterprises.

4 Conclusions and Suggestions

The empirical conclusion is as follows:

(1) With the increase in the proportion of non-state-owned shares, the total asset net profit margin decreases, and the sustainable growth rate decreases, but the total assets growth rate increases significantly; the proportion of circulating shares has a positive impact on the total assets growth rate and Debt Asset ratio; Both the proportion of the largest shareholders holding and the proportion of the top ten shareholders holding are positively correlated with the total asset growth rate, while the separation rate of two rights is negatively correlated with the total assets growth rate. The vertical comparison indicates that the increase

in the proportion of non-state equity can improve the development capacity of enterprises, increase its debt solvency and reduce its profitability.

(2) The policy effect of Mixed ownership reform: Compared with enterprises that have not been reformed, the enterprises that are reformed have a greater improvement in profitability and development capability. The policy effect of mixed ownership reform is not reflected in the debt solvency the results of other explanatory variables in the Difference-in-difference Model are in good agreement with the regression results of the Fixed-effect Model, which indirectly confirm that the mixed ownership reform policy has a positive role in promoting these financial measure of state-owned listed companies such as profitability, debt solvency and development capability.

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