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Research on the Influence of Mixed Ownership Reform on TFP of Enterprises

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Abstract

In the context of the New Era of socialism with Chinese characteristics, the reform of mixed ownership has been identified as a major strategic form to further deepen China's enterprise reform. Therefore, under the background of mixed ownership reform, further promoting the reform of micro-subject in China's manufacturing industry plays an important role in improving the total factor productivity of enterprises. In this paper, Hansen panel threshold regression model is used to study the threshold effect of mixed ownership reform on enterprise total factor productivity. The empirical study shows that there is a non-linear relationship between the total factor productivity of enterprises in the mixed ownership reform. In addition, from the perspective of equity mixing degree of state-owned manufacturing enterprises, it is pointed out that there is an optimal proportion of equity mixing degree of state-owned manufacturing enterprises, that is, when the equity mixing degree of state-owned mixed ownership enterprises is about 58.4%, its total factor productivity level can reach the highest.

Keywords

Equity mix, TFP, Threshold regression.

1. Introduction

At the beginning of the reform and opening up, China put forward measures to reform the mixed ownership of state-owned enterprises. So far, these years have also achieved obvious results, which can greatly improve the total factor productivity of enterprises by optimizing the ownership structure of enterprises. Therefore, mixed ownership reform as the most Chinese characteristics of the reform form.

Chan, Wang, Zheng, Jefferson and Rawski (1988) were the first scholars to study the impact of mixed ownership reform on enterprise productivity. Their research showed that after the implementation of mixed ownership reform, the growth rate of total factor productivity of enterprises was significantly improved compared with that before. Shleifer et al. (1994) believed that the privatization reform of state-owned enterprises should be actively encouraged, so as to make enterprises maintain a high level of productivity.Liu xing and liu wei (2007) found through their research that there was a close relationship between ownership structure and enterprise productivity. When the ownership concentration degree is higher, several big shareholders will consider their own interests and prefer to avoid risks, and this conservative behavior will limit the innovation and operation ability of the enterprise. On the contrary, xu erming and xu kai (2012) believe that when the stock rights are gradually dispersed, the balance degree between the stock rights will be strengthened due to the inconsistency of the objectives of the shareholders, which is conducive to the improvement of enterprise productivity. In addition, different types of shares have different resource channels. If they can cooperate and communicate with each other, share information and resources, it is no doubt not a win-win move to improve the total factor productivity of enterprises. Is

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different from the previous study of proportion of state-owned shares, the proportion of state-owned shares is related, even and ma lili (2015) put forward the concept of equity mixing degree, thinks that the index can not only well reflect the state-owned shares and the state-owned shares of optimal ratio, but also reflect the part of the heterogeneous equity balance degree, foreign shareholders in the composition of mixed ownership structure can indirectly impact on enterprise performance. Qiao huibo (2020) believes that the key to the success of the reform is to form an optimal shareholding structure. By investigating the gaming process of mixed ownership reform of state-owned enterprises in China with shareholders and non-state-owned shareholders, he finds that the shareholding structure of mixed ownership enterprises has a significant relationship with enterprise performance.

Existing researches mainly focus on the proportion of state-owned shares and non-state-owned shares in enterprises, the performance of enterprises and the innovation efficiency of enterprises, but lack the research on the degree of equity mix in mixed ownership enterprises and the total factor productivity of enterprises. The degree of equity mixing can not only directly reflect the proportion of state-owned shares and the proportion of non-state-owned shares), that is, whether state-owned enterprises or non-state-owned enterprises, the measurement of the proportion of heterogeneous shareholders introduced), but also, to some extent, indicate the degree of balance between one heterogeneous shareholder and the other. Therefore, this paper will analyze the impact of mixed-ownership reform on enterprise total factor productivity by referring to the index of equity mix proposed by ma lianfu (2015).

2. Model Selection and Description

The panel threshold model was proposed by Hansen (1999) and is widely used by academia. The threshold panel model has the advantage of eliminating the need to confirm whether there is a linear relationship between the variables, and directly applied to the threshold model to detect whether there are threshold values and threshold numbers that vary with the threshold variable, and can also be obtained spontaneously according to the interval of the threshold Threshold variable formula in each interval.

By combing the existing literature, it is preliminarily concluded that there may be a nonlinear relationship between the relationship between mixed equity and TFP of enterprises. Taking TFP as the explained variable and OMD as the threshold variable, this paper investigates the influence of mixed equity on total factor productivity of enterprisesTherefore, construct a threshold regression model:

$$\mathrm{TFP_{it}} = u_{it} + \beta_1 \mathrm{OMD_{it}} \mathrm{I}(\mathrm{OMD} \le \gamma_1) + \beta_2 \mathrm{OMD_{it}} \mathrm{I}(\gamma_1 \le \mathrm{OMD} \le \gamma_2) + \cdots + \beta_{n+1} \mathrm{OMD_{it}} \mathrm{I}(\mathrm{OMD} > \gamma_n) + \beta \mathrm{Control} + \varepsilon_{it} \quad (1)$$

Where, OMDis the threshold variable, $y_{it}$is the dependent variable and the independent variable,λ is the threshold value, and I is the function of the threshold variable, and $\varepsilon_{it}$is the error term. By comparing the size between OMD andλ, the sample can be divided into two intervals. The difference of the two β_1,$\beta_2$intervals lies in the difference of the regression coefficients.

3. Index Selection and Data Description

The main explanatory variables and explained variables involved in this article are the degree of equity mixing and the enterprise's TFP. Among them, the TFP is derived from the calculation. The selected control variables mainly include: FC, R& D, Size, Debt, Growth, ROA.

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All data is mainly obtained from the CSMAR database and WIND database. The sample is 125 state-owned enterprises from 2013 to 2018, with a total of 750 sets of valid data.

4. Empirical Process and Result Analysis

4.1. Threshold Effect Test

In order to determine whether there is a non-linear threshold effect between the state-owned enterprise's equity mixing degree and TFP in Model 1. This chapter uses STATA14.0 to test the threshold model, and the results are shown in Table 1.

Table 1: Results of self-sampling inspection where threshold exists

	Model	F	P	Critical value		
				1%	5%	10%
TFP_OP	Single threshold	23.06**	0.03	22.272	18.642	16.127
	Double threshold	8.42	0.42	24.109	17.47	14.595
TFP_LP	Single threshold	18.33**	0.029	27.77	18.046	15.32
	Double threshold	8.91	0.45	24.877	18.064	15.013

Note: ***, **, and * are significant at the levels of 1%, 5%, and 10%, respectively; the p-value and the critical value are the results obtained after 400 simulations using the Bootstrap method.

It can be seen from the test results that the model has passed the threshold effect test. Under the condition that the equity mix degree is the threshold variable, its single threshold effect passes the significance test at the 5% confidence level, and the double threshold effect fails the significance. The test shows that the mixed ownership reform of state-owned enterprises has a nonlinear relationship with TFP, and a single threshold panel should be constructed for estimation.

4.2. Estimated Threshold

When it is determined that there is a threshold effect, the threshold value is estimated. The specific results are shown in Table 2, which are the results of threshold estimates and 95% confidence intervals with the threshold value of mixed equity.

Table 2. Threshold estimates and confidence intervals

Model	Number of thresholds	Threshold estimate	95% confidence interval
TFP_OP	Single threshold	0.584	[0.578, 0.586]
	Double threshold		
	Ito1	0.584	[0.578,0.586]
	Ito2	0.834	[0.832, 0.843]
TFP_LP	Single threshold	0.618	[0.604, 0.621]
	Double threshold		
	Ito1	0.618	[0.604, 0.621]
	Ito2	0.837	[0.829, 0.840]

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

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According to the above empirical analysis, the single threshold value estimated by the OP method and the LP method in model 1 is basically the same. Here, the OP method is the main estimation method, and the threshold value is 0.584, which is the threshold of the degree of equity mixing. The effect is divided into two intervals, namely OMD (OMD ≤ 0.584, OMD),(0.584 ≤ OMD).

4.3. Threshold Model Estimation

Through regression on the single threshold model, the results are shown in Table 3.

Table 3. Single threshold model regression estimation results

Variable	TFP_OP coefficient	TFP_LP coefficient
$OMD(OMD \leq 0.638)$	0.143**	0.157**
	(3.04)	(3.14)
$OMD(0.638 < OMD)$	-0.096***	-1.076***
	(-2.69)	(-2.87)
R&D	0.415**	0.441**
	(4.74)	(4.82)
FC	-0.234**	-0.281**
	(-2.42)	(-2.74)
Size	0.358***	0.349***
	(5.13)	(4.89)
Debt	0.641***	0.543***
	(6.590)	(6.324)
Growth	-0.024***	-0.013***
	(-5.770)	(-4.32)
ROA	1.932***	1.843
	(10.72)	(10.23)
year	0.114***	0.113***
	(6.990)	(6.85)
_cons	-0.413	-0.431***
	(-0.800)	(-0.86)
N	125	125
R^2	0.484	0.496

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

It can be seen from Table 3 that when the enterprise equity mix degree is located in different intervals, the equity mix degree has a non-linear effect on the enterprise's TFP. Specifically, when the degree of equity mixing is below the threshold of 0.584, that is, within the range of the first interval, the mixed equity has a significant positive promotion effect on the TFP of the enterprise. At this time, the elastic coefficient of the intensity of the mixed equity is 0.143. The t value was 3.04, and it passed the significance test at the 1% confidence level. With the increase of the degree of corporate equity mixing, that is, when the degree of corporate equity mixing crosses the first threshold, the regression coefficient of the degree of equity mixing changes, which is -0.096, the t value is -2.69, and it is at a 1% confidence level Passed the significance test.

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4.4. Analysis of Threshold Effect Results

According to the above empirical analysis, it can be concluded that there is a non-linear correlation between the equity mix of state-owned listed companies and the TFP of the company, and there is a significant threshold effect. When the enterprise equity mix degree is at a low level (OMD≤0.584), the impact coefficient is positive, indicating that the enterprise equity mix degree will promote the improvement of the enterprise's TFP; when the enterprise equity mix degree crosses the first threshold (0.584 <OMD), the coefficient of influence is negative, and the degree of equity mix will inhibit the increase of the enterprise ’s TFP. Therefore, it shows a similar inverted "U" relationship, and the reason for this is mainly because:

First of all, when the corporate equity mix ratio is less than 0.584, it is actually only the process of gradually denationalizing the state-owned enterprise. At this time, the enterprise ’s voice is still in the hands of the state-owned shareholders. However, the enterprise ’s TFP will increase with the increase in the degree of corporate equity mixing;

Secondly, with the reform of mixed ownership, the company ’s shareholding structure is gradually improving, and heterogeneous shareholders have a mutual check and balance effect. Non-state-owned shareholders also have certain decision-making power. At this time, the innovation capacity and vitality of non-state-owned shareholders will also follow The entry of non-state-owned shareholders is enhanced. Until the non-state-owned shareholders introduced by the state-owned enterprises reach 0.584, that is, when the enterprise's equity mix degree reaches the confidence interval [0.578, 0.586], the enterprise's TFP reaches the highest.

Finally, when the mix of corporate equity is higher than the threshold of 0.584, the proportion of non-state-owned shareholders in the enterprise is too high, which inhibits the increase of the enterprise's TFP. It can be seen that the appropriate degree of equity mixing can enable shareholders of different property rights to coordinate organically. If this area is exceeded, the separation of rights between heterogeneous shareholders of state-owned enterprises becomes serious, and the internal governance effect also decreases, which affects the company ’s Increase in factor productivity.

4.5. Robustness Test

In this paper, the TFP estimated by the OP method and the LP method is selected as the explanatory variable. Through empirical results, the results estimated by the two methods are consistent, and the threshold is 58.4%. Therefore, the panel threshold effect has passed the robustness test.

5. Conclusions and Suggestions

The reform of mixed ownership is an important issue concerning China's economic development and the survival of enterprises. This paper combines the data such as the degree of equity mixing and the enterprise's total required productivity level to empirically study the relationship between mixed ownership reform and the enterprise's TFP.

Firstly, the degree of equity mix has a non-linear effect on corporate TFP, and this effect has a single threshold effect. When the corporate equity mix degree is at a low level, it is not conducive to the improvement of corporate TFP, but as the equity mix degree continues to increase, corporate TFP also increases. When the equity mix degree crosses the first threshold of 58.4%, it will instead inhibit the relationship between equity mix degree and the enterprise's TFP. Therefore, it is concluded that the equity mixing degree and the TFP of listed state-owned enterprises in the manufacturing industry of China show an inverted "U" trend. When the equity mixing degree ratio is 58.4%, the enterprise TFP reaches the optimal level.

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Secondly, there is a significant positive correlation between the degree of equity mixing and the TFP of an enterprise. The degree of equity mix represents the depth of non-state-owned shareholders on the one hand, and the degree of checks and balances between state-owned and non-state-owned shareholders on the other hand. Only when the ratio of state-owned and non-state-owned equity in a mixed ownership enterprise is at a specific ratio, The complementary advantages generated between different types of equity can also promote the enterprise's TFP.

Based on the above research conclusions, the policy implications are as follows:

Firstly, continuing to promote mixed ownership reform and increase the participation of non-state-owned enterprises. Promote in-depth advancement of mixed ownership reform and development of mixed ownership economy to a strategic height as a political system. Under the current research, in the process of mixed ownership reform of state-owned enterprises, there is a significant positive correlation between the participation of non-public shares and TFP of state-owned enterprises. Factor productivity has better performance.

Secondly, building a diversified and balanced shareholding structure and find a suitable degree of shareholding mix. From the perspective of mixed ownership enterprises, the degree of equity mixing helps to resolve the conflict of interests between equity, so that the two can have a more equal right to speak for the company, and ultimately allows state-owned and non-state-owned equity to effectively exert their respective advantages Place. By reducing the degree of interest friction between heterogeneous equity, it can promote the smooth and harmonious operation of the enterprise and have a positive effect on improving the company's TFP level.

Thirdly, standardizing internal checks and balances and establish a sound supervision mechanism. It is necessary to handle the economic relations of shareholders of different natures, adhere to the principle of complementary advantages and strong alliances, effectively balance the interests of all parties, realize the diversified design of equity, and avoid the behavior of "one share is dominant" and a certain shareholder operates the company. Appeared to ensure that the shareholding structure is relatively balanced, and form a relationship of mutual supervision and mutual restriction between different shareholders.

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