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Does the Impact of State Ownership on Financial Performance of Firms Vary across different Sectors in China?

Abstract *This study explores the impact of state ownership on the performance of Chinese listed firms. This study uses annual data of 143, state-owned 1,235, private enterprises for a period of 2011 to 2015. We use Ordinary Least Square method to find whether firm profitability and ownership are associated with each other or not. The results of whole sample indicate that over all firm performance and state ownership are negatively associated in China. However, the negative connection between state ownership and financial performance changes as we run the regression across different sectors.*

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Introduction

The literature provides extensive research work on the connection between state control and profitability of the companies. Smith, (1877) first proposed the concept that ownership and financial performance of corporations are linked to one another. The division of ownership and control in modern corporate environment is very important to ensure that management behaves in the interest of shareholders. Specifically, introducing large shareholders in state owned enterprises can reduce entrenchment of the owner (state) and the managers. Since major shareholders have both incentives and resources for controlling management and protecting wealth of minority shareholders. The two prominent theoretical thoughts, Property right theory (Villalonga, 2000) and residual claimant theory (Rowthorn and Chang, 1993) underline that non-SOE's are better than SOE's in both profitability and efficiency. The property right theory claims that right of the shareholders are much clear and more protected in non-SOEs than SOEs. Such inequalities in shareholders right, leads to effective monitoring and better management performance in private enterprises (Alchain, 1965; McCormick and Meiners, 1988).

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The connection between SOE and firm profitability is empirically investigated by many researchers around the world. Dewenter and Malatesta (2001) empirically investigates the impact of state control on firm profitability, they found that government enterprises are less profitable than private enterprises. Boardman and Vining (1989) examine the firm performance and efficiency of state and private enterprises in Canada. There results indicate that private firms outperform public firms in both productivity and competitiveness. Pryke, (1982) analyses and compares the firms' profitability of private and state controlled enterprises in across different sectors. His results showed that non-SOE in these three industries were better in both efficiency and profitability, than state controlled enterprises. Ahuja and Majumdar, (1998) analysed the performance of government owned firms in India, over the period of 1987 to 1991. Their result shows that state owned enterprises are poor in firm performance. Bashir, Riaz, Butt and Parveen, (2013) examine the impact of ownership on the performance of firms in Pakistan for the period of 2007 to 2011. Their result shows that private companies are better in firm performance than the government owned companies. Davis, (1971) examines the private and state owned companies in airlines industry of Australia. Their result shows no significant differences in the firm performance of private and state owned enterprises. Kole and Mulherin, (1997) analyse and compare firm profitability of private and SOEs in US. Their findings indicate that private sector performance was not substantially different from that of state-owned enterprises. Ahmed and Hadi, (2017) analyse the connection between ownership and profitability of firms in MENA region. Their finding indicates that managerial ownership is negatively linked to profitability, while large shareholders and government ownership is positively connected to the firms' profitability.

The system of corporate ownership is distributed in developed as well as new developing countries. However, due to well-established legal framework and managerial labour market, the right of minority shareholders in developed countries is strongly secured as compared to emerging and developing countries (Claessens and Fan, (2002)). China is an important emerging country that is transforming toward a market economy. Due to weak law enforcement and poor legal infrastructure, Chinese companies have concentrated ownership, poor protection for investor's rights and limited disclosure. Chinese publically listed company's main shareholders include private, state or institutional shareholders. During the early economic reform the Chinese government has privatized many small and medium state owned enterprises but still many Chinese companies have concentrated state ownership.

Several empirical studies have looked into the phenomena of the connection between state ownership and firm profitability in China. However, finding from existing studies on the connection between state control and profitability are not clear. Xu and Wang, (1999) empirically examined the effect of ownership on firm profitability for the period of 1993 to 1995. The study result indicates a negative relationship between state control and business profitability. Kang and Kim, (2002) investigated the association between ownership and firm performance in China. Their result shows that enterprises owned by state are poor in performance partially privatized enterprises. Sun and Tong (2003) examined the connection between state control and profitability of Chinese companies. Their result shows that firms controlled by state are poor in performance than private companies. Similarly Qi et al., (2000) examine a sub set of the listed Chinese companies and found that state control and firm profitability were adversely related. The effect of state control on fir profitability was

analysed by Sun et al,.(2002) using data of Chinese listed. Their study reveals different result from the above mentioned. They claim that state ownership is positively linked with profitability. Yu, (2013) empirically investigates the connection between state control and profitability of firms for a period of 2003 to 2010. The result shows that coefficient of state dummy have a positive effect on the performance of the firm.

Such divergent result from the existing studies may be resulted because of different model specification, sample selection techniques or because of ignoring the sect oral differences. All of the above mentioned studies have not accounted for the sect-oral level difference, which is, running regression across different sectors. It is therefore very important to investigate the link between state ownership and profitability of the firms across different sectors.

In the following study we use a dummy variable, state-ownership, to explore the connection between state control and profitability of listed companies in China. The impact of state ownership on firm profitability is also considered for the difference in the sector where a particular firm belong. This research employs an approximation of the Ordinary Least Square to investigate the relation described above.

Rest of the paper is organized as follows. Section two presents data, empirical model and variables used in the study. Section three discusses empirical results and section four presents conclusion.

Data and Empirical Model

Data

This study includes seven different sectors' data (construction (BVD 10), chemical, rubber, plastic and non-metallic products (BVD 06), machinery and other equipment (BVD 08), metals and metal products (BVD 07), primary sector (BVD 01), services sector (BVD 17), and Transport (BVD 13)) . This study uses Annual data of 143, public and 1,235, private listed firms for a period of 2011 to 2015. All the financial and instructional data is extracted from Orbis. This study sample does not include any financial enterprises because their debt levels are driven by regulation. As a consequence, these firms' debt-like liabilities are not comparable with non-financial firms' debt (Zhengwei, 2013).

Empirical Model

The model used in this study assumes that financial performance (FP) is determined by Leverage (L), tangibility (T_{icsy}), size ($\ln TA_{icsy}$), and Tobin's Q (TQ_{icsy}) of firm I sector s in year y. To investigate the connection between state control and profitability, dummy variable is created. Therefore SOE_{ics}, is a dummy variable equivalent to one if a company is owned by the state. Firm profitability is the ratio between earnings before interest and taxes and total assets, leverage is calculated as total debts over total assets, tangibility is equal to net tangible assets over total assets, Size is the natural log of total assets measured in billion US$ and growth is the fraction of market capitalization and total assets.

The empirical model is given below:

$$FP_{isy} = \alpha_{isy} + \gamma_1 \mathrm{L}_{isy} + \gamma_2 T_{isy} + \gamma_3 lnTA_{isy} + \gamma_4 TQ_{isy} + \gamma_5 SO_{is} + \delta_y + \delta_s + \mu_{isy} \quad 1)$$

Equation 1 γ_1 to γ_5 shows the estimated coefficient of all variables, δ_y and δ_s represents Year specific and sector fixed effect and μ_{isy} shows the error term. The statistical significance of $\gamma_5$show the effect of state ownership on firm performance in Chinese listed companies. To further investigate the effect of ownership on firm profitability at different sectors, firm specific fixed effects δ_s is eliminated from equation 1.

Empirical Outcome

Table 1. Correlation result

Variables	ROA	Leverage	Tangibility	Size	Tobin's Q
ROA	1				
Leverage	-0.230***	1			
Tangibility	0.050***	-0.037***	1		
Size	0.119***	0.282***	-0.186***	1	
Tobin's Q	0.133***	-0.201***	-0.033***	-0.066***	1

**** show significance 1 percent levels*

Table 1 present the correlation between dependent and independent variables. The result shows that firm performance and other firm variable are significantly correlated. Leverage is significantly negatively correlated, while tangibility, size and Tobin's Q are significantly positively correlated with firm performance.

Table 2 shows descriptive statistics of all the variables in our model across different sectors. The average mean value of firm performance (ROA) is significantly lower for state owned enterprises in the following sectors; Chemical, rubber, plastic and non-metallic products, Machinery & other equipment and Metals & metal products, while firm performance of state enterprises is significantly higher in services, primary and transport sector. Among the entire sectors, average mean value of size is significantly higher, whereas the average mean value of growth is significantly lower for SOE. Leverage is significantly lower for private enterprises among all sectors except for the transport sector.

Table 2: Descriptive Statistics

Chemical, Rubber, Plastic and Non-Metallic Products						
Variables	**Ownership**	**Number of Observations**	**Mean**	**Median**	**SD**	**T-stat**
ROA	SOE	130	0.035	0.034	0.086	-1.797*
	NSOE	1675	0.047	0.041	0.077	
Leverage	SOE	130	0.560	0.575	0.208	5.619***
	NSOE	1675	0.447	0.444	0.222	
Tangibility	SOE	130	0.927	0.956	0.106	-0.289
	NSOE	1675	0.929	0.951	0.079	
Size	SOE	130	13.932	13.879	1.050	7.476***
	NSOE	1675	13.150	13.068	1.156	
Tobin's Q	SOE	130	0.978	0.684	0.988	-3.636***
	NSOE	1675	1.650	1.040	2.089	
Construction						

Variables	Ownership	Number of observation	Mean	Median	SD	T-stat
ROA	SOE	45	0.035	0.027	0.033	0.421
	NSOE	175	0.032	0.031	0.045	
Leverage	SOE	45	0.759	0.814	0.157	4.458***
	NSOE	175	0.622	0.640	0.191	
Tangibility	SOE	45	0.871	0.939	0.190	-0.804
	NSOE	175	0.898	0.993	0.204	
Size	SOE	45	17.106	17.791	1.582	14.007***
	NSOE	175	14.177	14.288	1.152	
Tobin's Q	SOE	45	0.148	0.062	0.165	-3.250**
	NSOE	175	0.702	0.393	1.134	
Machinery and Other Equipment						
Variables	**Ownership**	**Number of Observations**	**Mean**	**Median**	**SD**	**T-stat**
ROA	SOE	210	0.021	0.021	0.078	-4.689***
	NSOE	2500	0.045	0.039	0.071	
Leverage	SOE	210	0.621	0.647	0.194	12.667***
	NSOE	2500	0.430	0.431	0.211	
Tangibility	SOE	210	0.969	0.972	0.021	6.240***
	NSOE	2500	0.939	0.959	0.069	
Size	SOE	210	14.532	14.451	1.385	17.811***
	NSOE	2500	13.043	12.972	1.143	
Tobin's Q	SOE	210	0.784	0.452	0.936	-5.903***
	NSOE	2500	1.500	1.005	1.738	
Metals and Metal Products						
Variables	**Ownership**	**Number of Observations**	**Mean**	**Median**	**SD**	**T-stat**
ROA	SOE	100	-0.002	0.006	0.066	-4.613***
	NSOE	557	0.028	0.026	0.059	
Leverage	SOE	100	0.621	0.670	0.179	5.128***
	NSOE	557	0.506	0.536	0.211	
Tangibility	SOE	100	0.950	0.983	0.083	1.985*
	NSOE	557	0.933	0.957	0.082	
Size	SOE	100	15.297	15.164	1.086	12.421***
	NSOE	557	13.530	13.291	1.346	
Tobin's Q	SOE	100	0.569	0.369	0.627	-3.812***
	NSOE	557	1.337	0.785	1.994	
Services Sector						
Variables	**Ownership**	**Number of Observations**	**Mean**	**Median**	**SD**	**T-stat**
ROA	SOE	80	0.073	0.065	0.046	2.865**
	NSOE	770	0.049	0.041	0.075	
Leverage	SOE	80	0.527	0.566	0.203	2.059**
	NSOE	770	0.470	0.478	0.240	
Tangibility	SOE	80	0.965	0.991	0.046	2.861**
	NSOE	770	0.927	0.972	0.117	
Size	SOE	80	14.374	14.166	1.356	7.164***

	NSOE	770	13.123	12.881	1.498	
Tobin's Q	SOE	80	0.985	0.689	0.941	-2.516**
	NSOE	770	1.851	0.943	3.063	
Primary Sector						
Variables	**Ownership**	**Number of Observations**	**Mean**	**Median**	**SD**	**T-stat**
ROA	SOE	85	0.025	0.025	0.078	2.988**
	NSOE	260	0.025	0.025	0.078	
Leverage	SOE	85	0.555	0.560	0.148	2.470**
	NSOE	260	0.494	0.515	0.211	
Tangibility	SOE	85	0.913	0.951	0.085	0.217
	NSOE	260	0.911	0.942	0.101	
Size	SOE	85	15.764	15.304	1.723	13.238***
	NSOE	260	13.380	13.224	1.336	
Tobin's Q	SOE	85	0.544	0.441	0.435	-4.452***
	NSOE	260	1.504	0.932	1.971	
Transport Sector						
Variables	**Ownership**	**Number of Observations**	**Mean**	**Median**	**SD**	**T-stat**
ROA	SOE	65	0.068	0.068	0.050	2.852**
	NSOE	245	0.049	0.044	0.046	
Leverage	SOE	65	0.398	0.376	0.190	-3.380***
	NSOE	245	0.495	0.496	0.209	
Tangibility	SOE	65	0.956	0.983	0.069	2.119**
	NSOE	245	0.920	0.962	0.130	
Size	SOE	65	14.601	14.832	1.449	2.213**
	NSOE	245	14.166	13.939	1.398	
Tobin's Q	SOE	65	0.850	0.706	0.783	0.232
	NSOE	245	0.889	0.489	1.288	

, ** and * show significance at 10, 5 and 1 percent levels, respectively.*

This study employed the estimation technique of Ordinary Least Square (OLS) to investigate the connection between the state control and the firm profitability in listed Chinese firms. All the estimated models in table 2 and 3 are statistically significant with considerable R-squared. The result of F-statistics is statistically significant in the entire models (base model- model 7) and shows that the explanatory variables do determine frim performance. The base model in table 3 shows the result of the full sample. Among the explanatory variables the effect of leverage on firm's profitability is adverse, whereas in Chinese listed firms, the impact of size and tangibility on the profitability of the company is positive. The effect of state ownership on firm performance is negative and statistically significant. The parameter of state ownership (-0.012), reflects the average impact of state dummy on financial profitability of all the companies operating in different sectors. These results indicate that the overall effect of state ownership on firm performance is negative in China. The results of full sample are in line with the previous findings (Qi et al., 2000; Sun et al., 2002).

Table 3: Estimating the Effect of State Ownership on Financial Performance

Variables	Base Model	Chemical Industry	Construction	Machinery Industry
Leverage	-0.138***	-0.178***	-0.092***	-0.120***
	(-28.380)	(-18.580)	(-4.720)	(-15.510)
Tangibility	-0.003	0.023	-0.036***	0.002
	(-0.440)	(-1.040)	(-3.470)	(0.120)
Size	0.015***	0.026***	0.005*	0.016***
	(17.190)	(11.220)	(2.030)	(9.100)
Tobin's Q	0.002**	0.007*	-0.010***	0.004**
	(-2.910)	(2.570)	(-3.340)	(2.860)
SOE	-0.012***	-0.008	-0.007	-0.021***
	(-4.790)	(-1.410)	(-1.140)	(-4.110)
Fixed Effect				
Sector	16.320***	-	-	-
Year	61.550***	20.670***	1.980*	18.940***
Number of obs.	6890	1800	220	2710
F-statistic	80.010***	51.160***	10.520***	35.370***
R-squared	0.183	0.268	0.32	0.138
Ad. R-squared	0.181	0.264	0.291	0.135
RMSE	0.064	0.066	0.035	0.066

Table 4. Estimating the Effect of State Ownership on Financial Performance

Variables	Metal Products	Primary Sector	Services Sector	Transport
Leverage	-0.111***	-0.129***	-0.134***	-0.126***
	(-8.280)	(-7.870)	(-6.800)	(-11.130)
Tangibility	-0.063*	0.003	-0.0265	-0.01
	(-2.290)	(0.220)	(-0.830)	(-0.680)
Size	0.006**	0.014***	0.012***	0.002
	(2.700)	(5.470)	(5.710)	(1.090)
Tobin's Q	-0.003	0.003	0.003	-0.002
	(-1.890)	(0.290)	(1.570)	(-0.850)
SOE	-0.030***	0.013*	0.009	0.005
	(-4.260)	(2.510)	(1.200)	(0.990)
Fixed Effect				
Sector	-	-	-	-
Year	8.310***	6.010***	13.790***	1.680
Number of obs.	655	850	345	310
F-statistic	18.670***	12.470***	13.850***	16.160***
R-squared	0.219	0.138	0.288	0.303
Ad. R-squared	0.209	0.129	0.269	0.282
RMSE	0.054	0.068	0.063	0.04

, ** and * show significance at 10, 5 and 1 percent levels, respectively.*

Model 1-7 shows the effect of state ownership on financial performance of firms across the different sectors in China. The results in table 3 and 4 shows that the effect

of leverage on profitability is significantly negative for all selected sectors. These findings suggest that leverage is an important determinant of firm profitability. The effect of tangibility on firm performance is significantly negative in construction and metal product industries. The effect of size on firm performance is positive and significant in all the selected sectors except for transport industry. Growth has a significant and positive effect on firm performance in chemical product and machinery equipment sectors, whereas, in construction sector growth and financial performance are negatively associated. The association between state dummy and firm profitability changes as we run the regression across different sectors. The result shows that coefficient of state dummy has a negative and significant effect on the profitability of the firms in the following sectors; machinery and other equipment and Metals and metal products, while positive in service sector. Whereas there is no significant link between state dummy and company profitability among other sectors. These results indicate that the impact of state control on firm financial performances do vary across companies operating in various sectors.

Conclusion

In this study the effect of ownership on the firm profitability is examined for Chinese listed firms**.** This study uses annual data of 143, public and 1,235, private owned enterprises for a period of 2011 to 2015. This study employed the estimation technique of Ordinary Least Square (OLS) to investigate the relationship between state control and firm profitability in listed Chinese firms. The results of whole sample indicate that over all firm performance and state ownership are negatively associated in China. However, the negative connection between state ownership and financial performance changes as we run the regression across different sectors. The result shows that coefficient of state dummy have a significant and negative effect on the performance of the firms in the following sectors; machinery and other equipment and Metals and metal products, while positive in service sector. Whereas among other sector no significant connection between the state's dummy and firms performance exist. These findings show that the impact of state dummy on financial performance differs across firms operating in different sectors.

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