

State Ownership and Firm Performance: Evidence from Korean SOEs

By

Moon Su Kim

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
for the degree of

**MASTER OF PUBLIC POLICY
IN PUBLIC MANAGEMENT**

2011

State Ownership and Firm Performance: Evidence from Korean SOEs

By

Moon Su Kim

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
for the degree of

**MASTER OF PUBLIC POLICY
IN PUBLIC MANAGEMENT**

2011

Professor Joong-Ho Han

State Ownership and Firm Performance: Evidence from Korean SOEs

By

Moon Su Kim

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
for the degree of

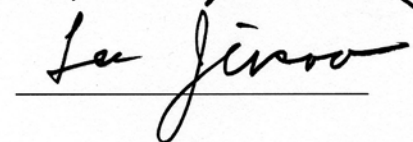
MASTER OF PUBLIC POLICY
IN PUBLIC MANAGEMENT

Committee in charge:

Professor Joong-Ho HAN, Supervisor



Professor Jin Soo LEE



Approval as of May, 2011

ABSTRACT

State Ownership and Firm Performance: Evidence from Korean SOEs

By

Moon Su, Kim

Privately owned firms have been believed to be more efficient and perform better than state owned firms. Despite the notion, the evidence on state owned firms in Korea is scant. After comparing the performances of privately owned firms and government owned firms, we find that privately owned firms have lower profitability with a higher debt ratio. However, among state owned firms, both partial and full privatization improved profitability while reducing employment and liabilities. In summary, our findings support the claim that the less controlled a state owned firm is by the government, the more positive impact it will have on the firm performance.

TABLE OF CONTENTS

Introduction.....	1
I. Literature review	3
<i>a. State owned firm versus privately owned firm</i>	
<i>b. Privatization and Firm performance</i>	
II. A comparison between privately owned firms and state owned firms.....	6
<i>a. Data</i>	
<i>b. Methods</i>	
<i>c. Results</i>	
III. Partial privatization and performance analysis.....	11
<i>a. Data and method</i>	
<i>b. Results</i>	
IV. Privatization and performance analysis.....	14
<i>a. Data and method</i>	
<i>b. Change of performance</i>	
V. Summary and Conclusion.....	20

LIST OF TABLES

1. Univariate tests: Privately owned firms VS State owned firms
2. Regression results: Relative performance of state owned firms
3. Regression results: Relative performance of state owned firms when government shares increase
4. Simple average comparison of performance measures before and after privatization

LIST OF FIGURES

1. Times series of average ROA(return on assets), one of profitability measures
2. Times series of average ROS (return on sales), one of profitability measures
3. Times series of average employees to assets, one of labor intensity
4. Times series of average employees to sales, one of labor intensity
5. Times series of average liabilities to assets, leverage measure

State Ownership and Firm Performance: Evidence from Korean SOEs

By Moon Su, Kim

Privatization, which has started as a part of the denationalization program led by Volkswagen, Germany in 1961, is considered to be one of the most successful economy policies in last half century. Gibbon(2000) estimated that its global size exceeded a billion dollars. One of the main reason for a government all over the world focusing on privatization is inefficiency of state owned firms.

Most of state owned firms are involved in an industry, challenging to exchange and distribute appropriately through a market. Which means that a state owned firms usually gets engaged in an industry where there is market failure. Especially a natural monopoly industry which cost of production is inversely relate to an output at an initial stage of an industry, including a rail industry and a communication industry can be referred as such examples. If privately owned firms led such industries, there is a possibility that a product is produced at a lower level than the requested level of a society and higher prices are set to seek exclusive profits, and efficiency of a competitive market is diminished.

Nevertheless, profit incurred by privatizing a natural monopoly industry has been known to decrease as the industry develops and the demand increases. A communication industry of South Korea was initiated by the government in order to avoid redundant investment by multiple private firms and partially due to lack of funds required to build communication network. However, as communication technologies have been developed and the demand for

communication has expanded, cost efficiency for natural monopoly has dwindled and benefit of a competitive market has relatively increased.

Many studies also suggest that privatization improves firm's performance as Price Waterhouse (1989) mentions that the objectives of privatization are increasing economic efficiency and introducing competition. Vining and Boardman (1992) argues that privately owned firms are more profitable and efficient than state owned enterprises in Canada. Dewenter and Malatesta (2001) finds that privately owned firms are more profitable, use less debt, and have smaller labor intensity analyzing 500 largest firms in the world.

Despite the importance of the issue, however, there have been only few studies which conducted empirical research on privatization in Korea. This research attempts to fill the gap.

To examine the issue, we use three different approaches. First, we carry out a large sample cross-sectional comparison of privately owned firms with state owned firms. It is the similar way of Dewenter and Malatesta(2001), but our data includes 23 state owned firms from 1986 to 2006 unlike previous research using limited number of Korean firms(see Megginson(2005)). In addition, our sample includes top 30 listed firms and government invested institutions in Korea while they use the data from reported in Fortune magazine. Surprisingly, our analysis offers a conflicting result. The result is that state owned firms have superior profitability and lower leverage than privately owned firms.

Second, we examine the effect of partial privatization in Korea. Gupta (2005) suggests that partial privatization make it easy to discriminate between political and managerial perspective because firm is controlled by government while firm's shares are traded. In other words, we can check managerial perspective which is the problem cause by monitoring managers under principle-agent problem, main issue in the inefficiency of state owned firms. Our analysis targeting government invested companies and their government stake shows that the performance of firms considerably improved when the government reduces its ownership.

Third, we also explore the before and after effect of privatization of 3state-owned firms. The firms are privatized after Asian currency crisis in 1997-1998. Although lack of samples limit generalization of our finding, the result shows that privatization improves the performance of firms.

This study provides unique contributions to extant research on Korean SOEs. Our study presents the interesting results that historically Korea state owned firms have better performance unlike common knowledge we know. More importantly, to our knowledge, we provide the first evidence on the effect of partial privatization on firm performance in Korea.

This paper consists of 4 sections. Section one explains other studies about privatization and Section two to four introduce the data, the test methodology, and the result of cross sectional comparison of privately owned and state owned firms, partial privatization, and full privatization. Section five concludes the study.

I. Literature Review

Does transfer of ownership from government to private really improve the performance in reality? Privatization has been ongoing during the past half century. So, there has been enough time and empirical evidences to prove whether privately owned firms are more efficient than state owned firms or not and whether privatization is right way to improve state owned firms economic performance or not. Here, we introduce two kinds of studies. One is researches about the financial and operating performance depending on ownership of firms. And the other one is studies about the performance of privatized firms before and after privatization.

a. State owned firm versus privately owned firm

Boardman and Vining(1989) examine the profitability and efficiency of private corporations, state-owned enterprises, and mixed enterprises which means some portion of its stock is in private hands and some portion of its stock is in public hands among 500 largest manufacturing and mining companies in the world except U.S as made by Fortune in 1983. They use return on equity, return on assets, return on sales, and net income as measures of profitability, and sales per employee and sales per asset as measures of efficiency. The result is that the performance of mixed enterprises and state-owned enterprises are significantly worse than private corporations. And the profitability of mixed enterprises is somewhat lower than state-owned enterprises. So, they argue that mixed enterprise which is partially privatized may show lower profitability than state-owned enterprise and private corporation because of ‘managerial cognitive dissonance’ caused by confliction between public shareholders and private shareholders.

Dewenter and Malatesta(2001) compare performances between privately owned companies and state-owned companies using data from 1975, 1985 and 1995, Fortune reported on the 500 largest corporations. The result is that state-owned companies are significantly less profitable than privately owned companies, and tend to use more leverage and greater labor intensity than privately owned companies.

b. Privatization and firm performance

Many empirical studies support that privatization improves the economic performances. D’Souza and Megginson(1999) examine the before and after privatization economic performance of 85 companies from 28 countries(especially utility and telecommunication industries) privatized in a way of public share offerings from 1990 to 1996. The result is that privatized companies significantly improve their economic performances after

privatization(significant increase in profitability, real sales, operation efficiency and dividend payout, insignificant decrease in employment levels and investment ratio. Gupta (2005) examines the effect of partial privatization having the advantage of checking managerial perspective as stated earlier. The author uses the data of 40 companies partially privatized from the federal government and two companies sold by regional governments in India during 10 years period from 1990 to 2000, and finds that the companies partially privatized have significant improvement on profitability, investment, and labor productivity.

Dewenter and Malatesta(2001) examine the before and after privatization short periods(+1 to +3 and -3 to -1) and long period(+1 to +5 and -10 to -1) performances of 63 companies from 1981 to 1984. The result shows that significant decrease in leverage after privatization, and the profitability mainly increase 3 years before privatization. It means government restructures state-owned companies successfully before selling them. Martin and Parker(1995) examine the performance of eleven firms in Britain such as British Airways, British Gas, British Steel, British Telecom, and so on, which are privatized in the 1980s. And the indicators of performance are profitability and value-added per employee relative to value-added in the economy. The result shows that the value-added growth improves when the privatization announces, and it goes down right away after privatization. Productivity growth is also lower than rest of economy in both the after privatization and recession period.

There is a limited number of studies about privatization and an empirical analysis of privatized firms in Korea. Joo Kyung Tae & Sung Sig Yoon(2006) analyze efficiency of privatization with a production functional model, a cost functional model and functional performance based on the data collected from Dacome, Samsung Fine Chemical, Donghae Pulp, SK telecom, Kia Steel, and LG Metal, privatized in the 90s, from early 80s to 90s. According to the analysis, privatized firms are mainly concerned about output factor

including a high price and increased sales, rather cost factors including the cost and labor costs. For most of studied corporations, financial performance has aggravated after privatization as well as its efficiency rate. Lack of competition, government controls and other complicated matters seem to contribute on such consequences.

Kim Hyun Sook(2007) makes an empirical review on enhancement on business performance and efficiency based on comparison of data from 7 firms, which are once owned by the nation and then privatized in late 90s and early 2000, for 3 years before and after the privatization. For the review, medians before and after the privatization are compared and so as with of the control group through Wilcoxon rank sum inspection, according to the method of Megginson et al(1994). The analysis reveals that privatization positively affects profitability and productivity but not a debt rate and an employment rate.

This study can be differentiated from these previous studies due to following factors. First, previous studies merely focus on an empirical analysis of privatization. Unlike them, we compare the economic performance between state owned firms and privately owned firms. Not only that, we examine changes in a performance according to partial privatization of a state owned firms. Second, on this study, we use rather than analyzing data of specific state owned firms, data from every state owned firms except financial firms controlled by the Framework Act on the Management of Government-Invested Institution in 21 years, from 1986 to 2006, is analyzed.

II. A comparison between privately owned firms and State owned firms

a. Data

We construct two different samples to investigate the impact of state ownership. We match

state owned firms with the top 30 firms¹ by assets among listed companies in Korea each year. State owned firms² are defined following the definition of the Framework Act on the Management of Government-Invested Institutions. We exclude financial firms. We use the samples for a 21 year period, starting from 1986 to 2006. All the information such as sales, assets, employees, and others is on the basis of each firm's balance sheet.

The final data includes 973 firm-year observations. 630 of them are for privately owned firms, and 54% of them belong to manufacturing industries according to the KSIC codes. On the other hand, it is hard to distinguish the main industry of state owned firms because they are consisted of a variety of different industries such as public administration (20%), construction (12%), and real estate activities (12%).

We use descriptive statistics to compare the size between the two groups. The average value of annual assets for privately owned firms is 4,956 billion won, which is less than the average value of 5,861 billion won of state owned firms. In terms of sales standards, privately owned firms amount to 5,015 billion won, which is three times higher than the average value of 1,679 billion won of state owned firms. When comparing the medians, the figure of assets and sales for privately owned firms is respectively 3,279 billion, and 2,503 billion won whereas the average for state owned firms comes to 791 billion, 282 billion won.

b. Methods

Our question is to test whether privately owned firms have better performance than state owned firms, following Dewenter and Malatesta (2001). To estimate performance, we examine the key indicators of profitability, labor intensity, and leverage. We measure

¹. We use TS2000 program by Korea Listed Companies Association for gathering accounting information.

².The data is from 'The balance sheet of the government invested institution' published by the government.

profitability with return on total assets (ROA), and return on sales (ROS). For the measuring labor intensity, we introduce two different methods. Employees by total assets and employees by sales, and for leverage, we calculate total liabilities divided by total assets.

We first calculate the mean of each indicator to make a simple comparison, and divide the 21 year period into three periods (1986-1992, 1993-1999, 2000-2006) in order to see the periodic characteristics. We then perform multivariate regression to see the relative performances of state owned firms using the year fixed effect and the firm fixed effect to control for year and industry factors which affect the indicators as we mention above.

c. Results

The results are not what we expect; State owned firms have higher profitability and lower leverage than privately owned ones. The ROS of privately owned firms is 0.019, which is a third of state owned firms, and their difference is statistically significant at the level of 1%. Also, privately owned firms turn out to have a liabilities to assets ratio of 0.705 compared to those of the state owned firms with a liabilities to assets ratio of 0.573. The difference is also statistically significant at the 0.01 level. State owned firms are expected to show a higher leverage due to lax management and lower interest rates driven by the governmental debt guarantees. Instead, privately-owned firms show a higher debt ratio.

The results from the Dewenter and Malatesta(2001), and the analysis model employed for our research, show that the profitability and leverage of privately owned firms are far better than the ones of state owned firms, which is opposite to our results. However, when it comes to labor intensity, State owned firms have a tendency to use more labor than privately owned ones, which match the results from the analysis model. Privately owned firms produce lower figures in both the employees to assets ratio and the employees to sales ratio, while the

difference between state owned and privately owned firms is statistically significant at 1 %.

Table1

Univariate tests: Privately owned firms VS State owned firms

This table shows a comparison of a performance of a state owned firms(government invested institutions) with of top 30 privately owned firms for 21 years from 1986 to 2006. To clearly see features of each period, a period of 21 years are divided into 3 periods (1986-1992, 1993-1999, 2000-2006) to be compared.

		Privately owned firms average (a)	observation	State owned firms average (b)	observation	t-statistics for difference (a-b)
	Return on assets	0.021	630	0.021	342	-0.000
	Return on sales	0.019	630	0.056	342	-0.036***
Total	Employees/assets	3.898	630	5.790	343	-1.892***
	Employees/sales	4.790	630	11.292	342	-6.501***
	Liabilities/assets	0.705	630	0.573	343	0.132***
	Return on assets	0.014	210	0.036	142	-0.022***
	Return on sales	0.010	210	0.104	142	-0.094***
86-92	Employees/assets	7.919	210	9.441	143	-1.522
	Employees/sales	9.300	210	18.461	142	-9.161***
	Liabilities/assets	0.775	210	0.518	143	0.257***
	Return on assets	0.004	210	0.006	107	-0.002
	Return on sales	-0.004	210	0.025	107	-0.029
93-99	Employees/assets	2.484	210	3.324	107	-0.839*
	Employees/sales	3.555	210	8.179	107	-4.624***
	Liabilities/assets	0.758	210	0.613	107	0.145***
	Return on assets	0.045	210	0.017	93	0.028***
	Return on sales	0.053	210	0.017	93	0.036
00-06	Employees/assets	1.292	210	3.014	93	-1.722**
	Employees/sales	1.516	210	3.925	93	-2.409***
	Liabilities/assets	0.581	210	0.610	93	-0.029

* p < 0.10, ** p < 0.05, *** p < 0.01

From 1986 to 1992, state owned firms demonstrate higher profitability, while privately owned firms finally catch up with them from 2000 to 2006. Although they both show lower labor intensity than before, privately owned firms are more labor-intensive than state owned firms. Meanwhile, privately owned firms have a higher leverage in the past, but now, state owned and privately owned firms recently report similar ratios.

Table2.
Regression results: Relative performance of state owned firms
(Top 30 privately owned firms as benchmark)

This table shows a regression analysis of a business performance of a state owned firms(government invested institutions) with top 30 privately owned firms (based on assets) for 21 years from 1986 to 2006, with the firm fixed effect and the year fixed effect. To estimate a business performance, ROA and ROS, which measures productivity, and employees to assets and employees to sales which reveal labor intensity are used along with liabilities to assets, which measures a leverage. Dgov is dummy variable distinguishing state owned firms from privately owned firms.

Explanatory variables	Dependent Variables				
	ROA	ROS	Employees /assets	Employees /sales	Liabilities /assets
Dgov	0.021** (2.63)	0.019 (0.48)	1.849 (1.42)	-2.078 (-0.47)	-0.301*** (-3.30)
ln asset	-0.014** (-3.02)	0.026 (1.12)	-4.126*** (-3.63)	3.433** (2.34)	-0.002 (-0.06)
ln sales	0.019** (3.41)	-0.020 (-0.64)	2.231** (2.58)	-3.208** (-2.37)	-0.005 (-0.19)
Constant	-0.037 (-0.91)	-0.041 (-0.24)	36.472*** (4.81)	7.932 (1.00)	0.779*** (3.24)
Firm fixed effect	yes	yes	yes	yes	yes
Year fixed effect	yes	yes	yes	yes	yes
Observation	972	972	973	713	714
Pseudo R-squared			0.097	0.126	-2.327

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 2 illustrates the relative performance of state owned firms compared with that of privately owned firms based on a regression analysis controlling for year and industry factors. The Dgov coefficient of the ROA, one of the profitability indicators, is a positive number and statistically significant at 5%. The coefficient on the Dgov of the liability to assets, leverage, is -0.301, which is highly significant. For labor intensity, the coefficients of the two measurements are that one shows positive numbers while the other one shows negative numbers. However they are not statistically significant. The results indicate that state owned firms have higher profitability and lower leverage than privately owned firms. Simply put, state owned firms perform better.

However, this comparison can be limited in terms of the methods of analysis and time background. The sample group of state owned firms includes various industries such as public administration, construction, and real-estate development, while half of the samples of privately owned firms is consisted of the manufacturing businesses. Accordingly, when the two groups are compared, the industrial characteristics in each group can be ignored. In addition, considering that the early stages of the economic development in Korea are led by the government, we cannot ignore the state owned firms with their monopolistic market power. Thus, more careful judgment is required for the results of the analysis. Considering these limitations, in the next section, we exclude private companies, and examine the state owned firms' performance based on changes of the government stake.

III. Partial privatization and performance analysis

a. Data and method

The sample for partial privatization includes government-invested institutions designated

by the Framework Act on the Management of Government-Invested Institutions from 1986 to 2006 and excludes financial organizations. A total of 23 firms are observed with 343 samples. For accounting information and government stake, the sample firms' balance sheet and income statements are used. In particular, for government stakes, to clarify the ownership of the firm, pure government stakes excluding stakes held by public institutions and government-run banks are considered.

In this section, to overcome the aforementioned limitations, instead of raising a question on whether privately owned firms are more effective than state owned firms, the research explores another question; whether the privatization of state owned firms, especially partial privatization, has a positive effect on their management performance. In other words, it explores the relationship between a decrease in government stake in state owned firms and their performance.

Performance indicators include profitability, labor intensity, and leverage which are also employed for the comparison between privately owned and state owned firms, while ROA and ROS are utilized for measuring profitability. For labor intensity, employees to assets and employees to sales are used while for leverage, liabilities to assets are used. To understand how the indicators change when government shares in a state owned firm increases, the multiple regression analysis is employed. To control for year and industry factors during the analysis, the year fixed effect and the firm fixed effect are also used.

b. Results

Table3 shows that the more shares the government has in a public institution, the more negative effects it has on all performance indicators which are independent variables. The coefficients for the ROA and ROS to measure performance are negative numbers and are

statistically significant at 1% and 5% respectively. The results suggest that state owned firm with a higher government stake has lower profitability. In other words, lower government stake could lead to higher profitability. For example, when the ROS coefficient is -0.457 and the government stake drops from 100% to 50%, a $0.229(-0.457 \times -0.5)$ increase in return on sales

Table 3

Regression results: Relative performance of state owned firms when government shares increase

This table shows a regression analysis of a business performance of a state owned firms (government invested institutions) due to partial privatization for 21 years from 1986 to 2006, with the firm fixed effect and the year fixed effect. To estimate a business performance, ROA and ROS, which measures productivity, and employees to assets and employees to sales which reveal labor intensity are used along with liabilities to assets, which measures leverage. Gov_shr is dummy variable distinguishing state owned firms with higher government stake from state owned firms with lower government stake.

Explanatory variables	Dependent Variables				
	ROA	ROS	Employees /assets	Employees /sales	Liabilities /assets
Gov_shr	-0.082*** (-3.12)	-0.457** (-2.19)	6.321* (1.75)	12.046 (1.45)	0.308* (1.87)
ln asset	-0.017*** (-3.88)	0.037 (1.16)	-6.150*** (-5.19)	-0.244 (-0.16)	0.018 (0.38)
ln sales	0.020*** (3.84)	-0.036 (-0.91)	4.247*** (3.83)	-3.618 (-1.42)	-0.026 (-0.53)
Constant	0.093** (2.48)	0.489 (1.51)	36.246*** (4.49)	56.910*** (3.58)	0.266 (1.06)
Firm fixed effect	yes	yes	yes	yes	yes
Year fixed effect	yes	yes	yes	yes	yes
Observation	342	342	342	342	342
Pseudo R-squared			0.128	0.056	0.317

* p < 0.10, ** p < 0.05, *** p < 0.01

For labor intensity, the coefficient for employees to assets is a positive number, 6.321 and statistically significant. It means that an increase in government stake results in more employment by state owned firms. It joins the conclusions of most research, pointing out the high employment rate of public companies, meaning that public companies hire more workers than private businesses (Maxim Boycko et al, 1996) and that privatization could lead to reduction in employment (D'Souza and Megginson, 1999). In addition, the coefficient for employees to sales is 12.046, two times higher than that of employees to assets. As its statistical significance is about 15%, which is lower than usual but still significant, and the figure supports the research's argument on the relationship between government stake and employment. The coefficient for liabilities to assets is a positive 0.308 and statistically significant at 10%. In short, leverage is in direct proportion to government stake.

According to the analysis, as government stake in a state owned firm decreases, its profitability improves while employment and debt contract. It indicates that partial privatization has a positive effect on profitability, labor intensity, and leverage. In the next section, the research examines the close relationship between government stake and its economic performance through performance analysis on fully-privatized state owned firms.

IV. Privatization and performance analysis

a. Data and method

In the wake of the Asian financial crisis in 1997 to 1998, the Korean government announced 'The privatization and innovation in management plans for state owned companies' to improve management efficiency of state owned firms by introducing competition principles for them, and establishing responsible management. At that time,

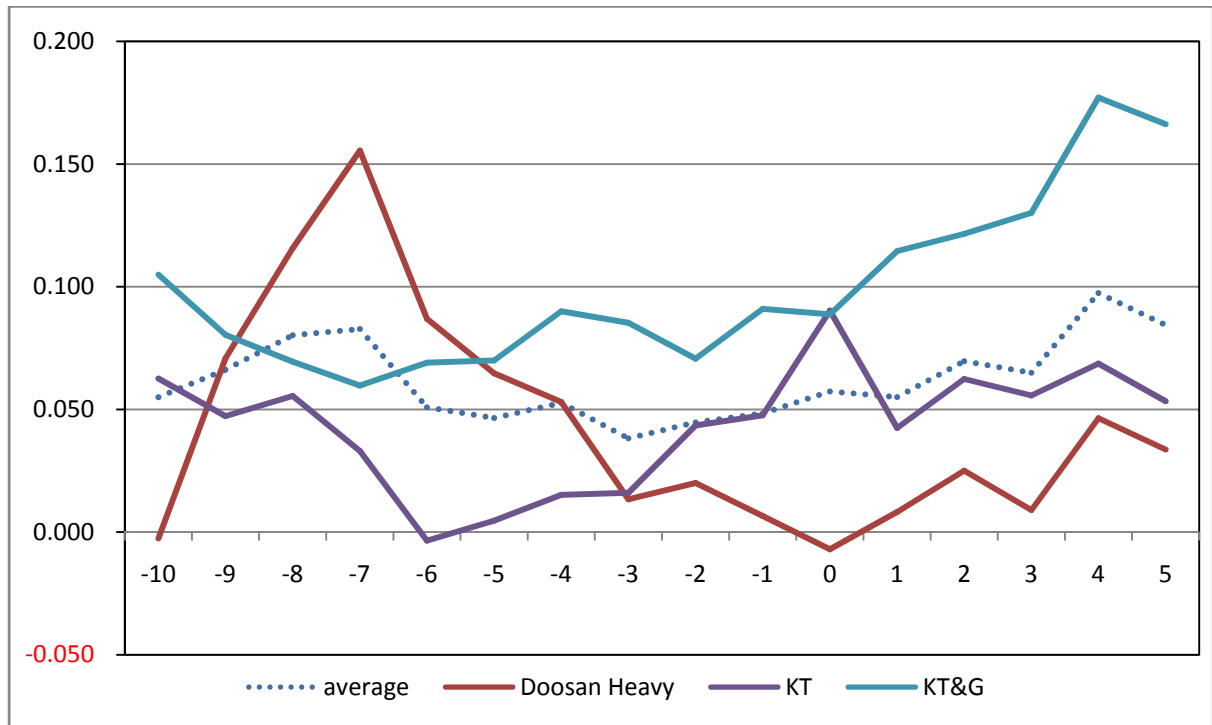
privatized firms were National Textbooks, KTB Investment & Securities, DOPCO, POSCO, Hankook Heavy Industries (present Doosan Heavy Industries), KT, and KT&G. Among them, we choose three public corporations, Doosan Heavy Industries, KT, and KT&G for our analysis since those firms are government invested institutions before privatization.

The performance comparison between before and after privatization is to be studied using the regression analysis for the time period from ten years before privatization to five years afterwards or as short as from three years before privatization to three years afterwards, as in the study of Dewenter and Malatesta (2001). However, since the number of samples are limited and that data is not enough, the time series comparison and simple average comparison approaches are used. We use graphs to compare the performances of three privatized firms for a 16 year period including 10 years before and 5 years after privatization performance of the privatized firms, and find the differences by testing simple average comparison of performance indicators before and after privatization. The indicators include profitability, labor intensity, and leverage.

b. change of performance

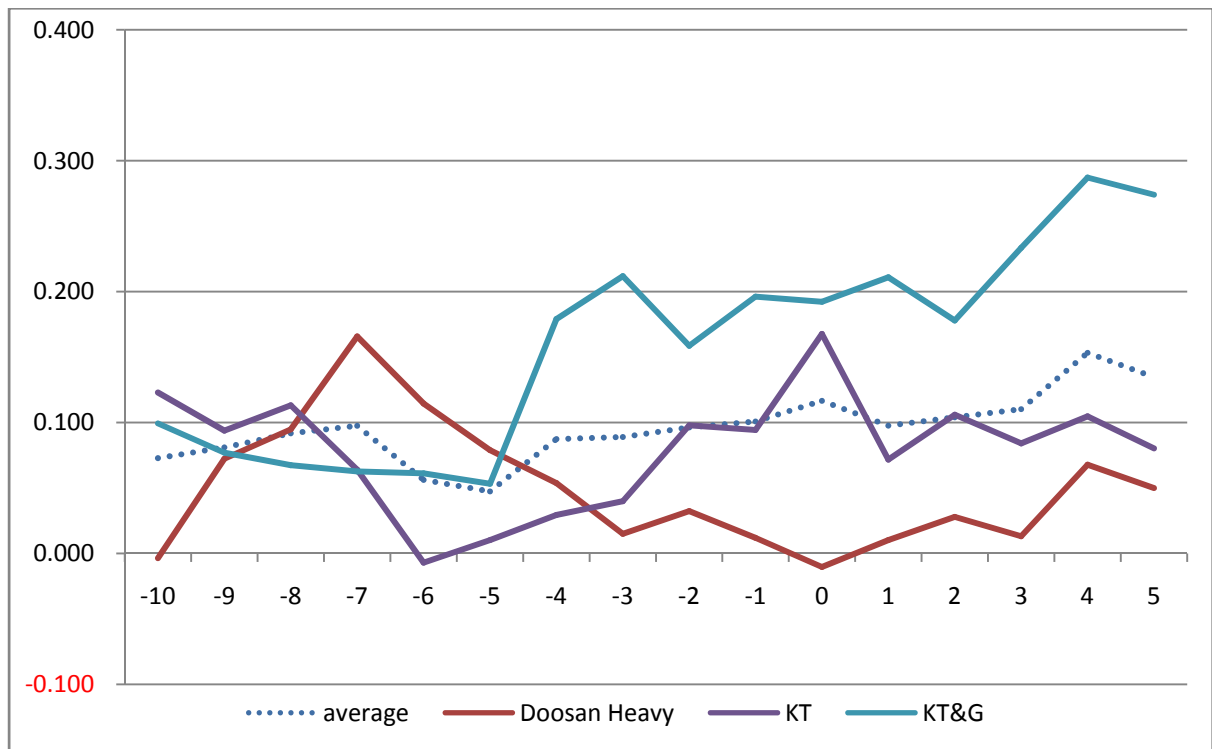
Figures 1 and 2 depict the changes in the ROA and ROS of state owned firms, and performance measurements for 16 years (ten years before privatization and five years afterwards) in graphs. The averages from both are on the increase after privatization, which means their profitability is also rising. What is peculiar about those graphs are that profitability indicators for KT go up before privatization, but after that, they steeply decline for a while and surge again.

Figure 1. Times series of average ROA(return on assets), one of profitability measures



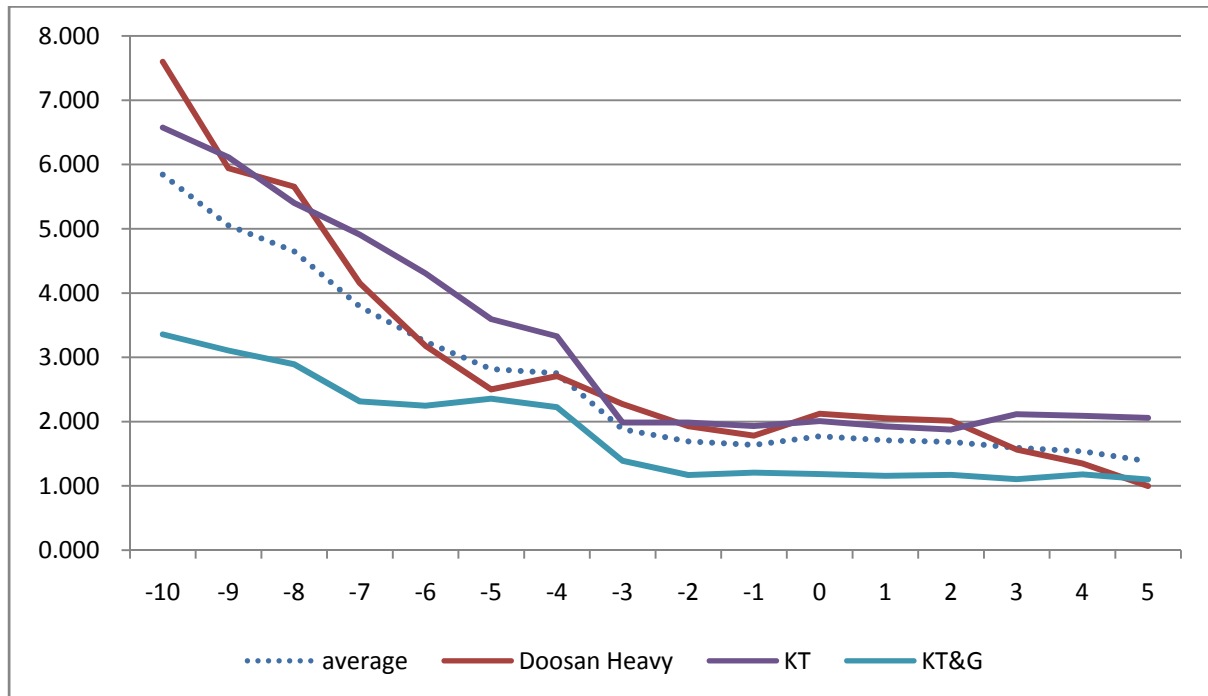
Note: Vertical, horizontal axis depicts ratio and event year respectively. Year 0 is when privatization occurred.

Figure 2. Times series of average ROS (return on sales), one of profitability measures



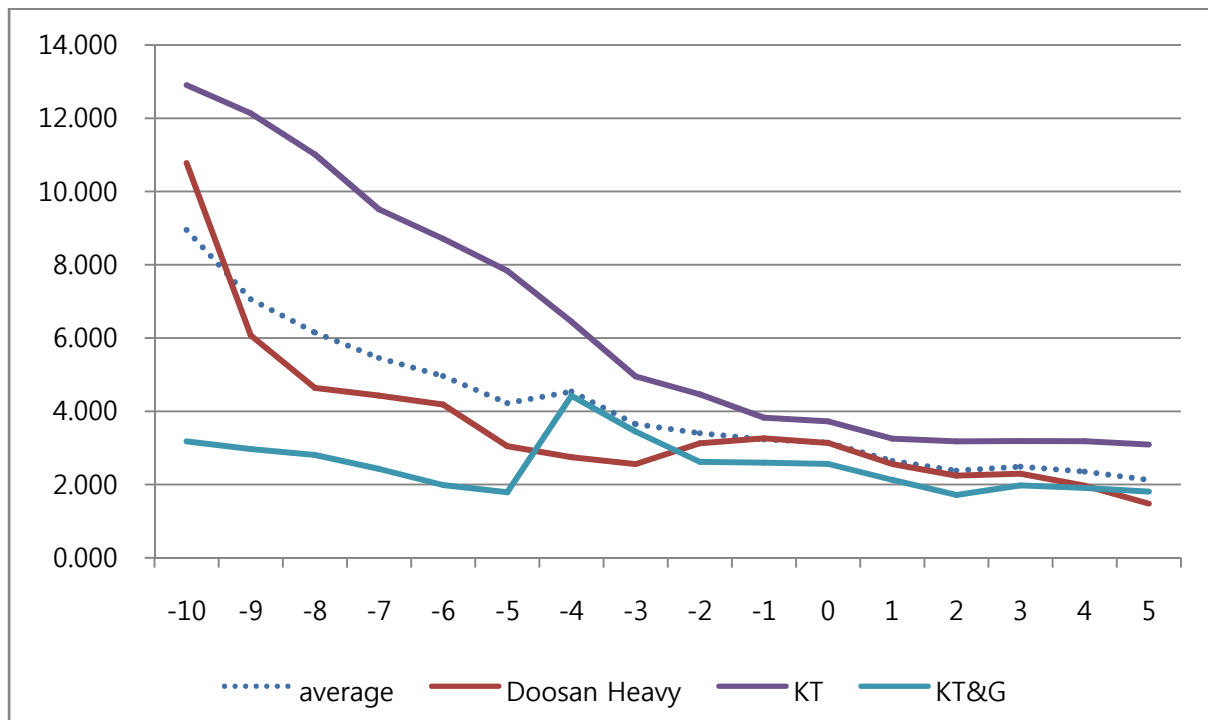
Note: Vertical, horizontal axis depicts ratio and event year respectively. Year 0 is when privatization occurred.

Figure 3. Times series of average employees to assets, one of labor intensity measures



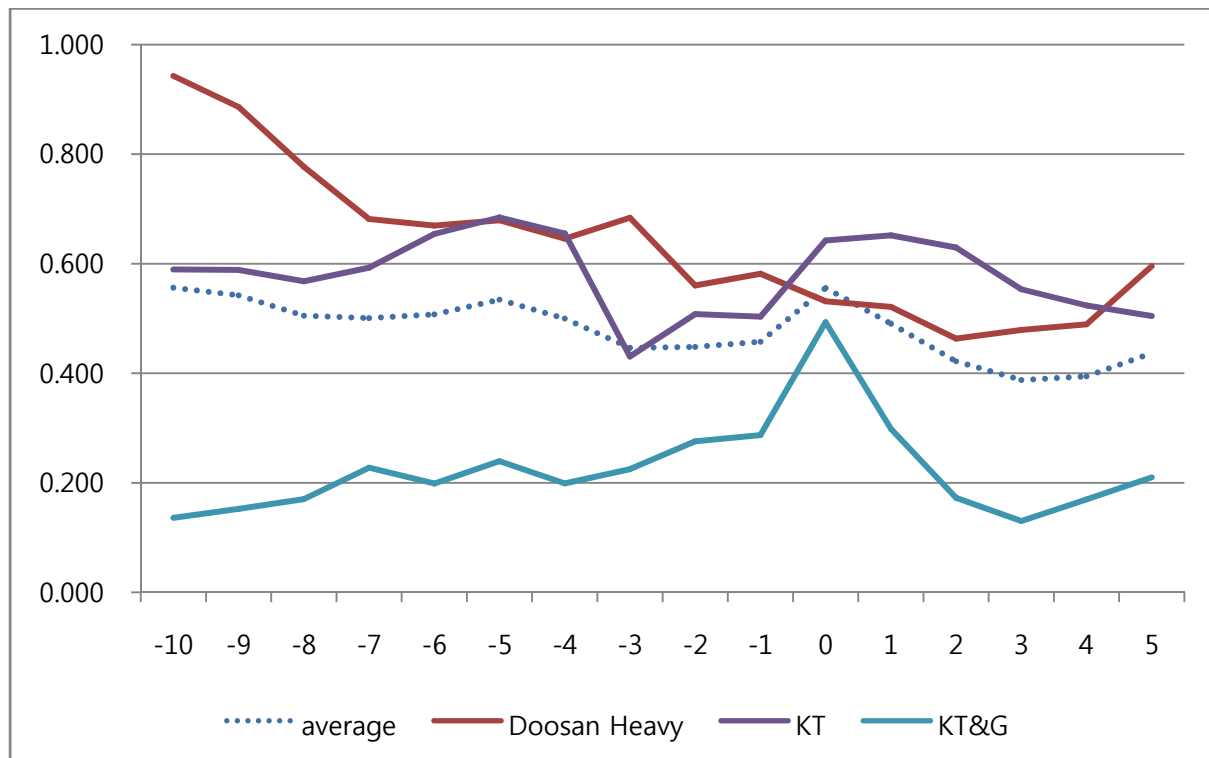
Note: Vertical, horizontal axis depicts ratio and event year respectively. Year 0 is when privatization occurred.

Figure 4. Times series of average employees to sales, one of labor intensity measures



Note: Vertical, horizontal axis depicts ratio and event year respectively. Year 0 is when privatization occurred.

Figure 5. Times series of average liabilities to assets, leverage measure



Note: Vertical, horizontal axis depicts ratio and event year respectively. Year 0 is when privatization occurred.

According to Figures 3 and 4, two graphs for employees to assets and employees to sales show that the firms' labor intensity goes down as time goes by, which means their productivity improves. What is noticeable is that labor intensity improves remarkably before privatization, but there is no remarkable improvement right before or after privatization.

Figure 5 is a graph for liabilities to assets which represents leverage. For KT and KT&G, the liabilities to assets is on a sharp rise just before privatization and then declines after privatization, while that of Doosan Heavy steadily goes down.

Table 4 is a simple average comparison of three state owned firms' profitability, labor intensity, and leverage before and after privatization. Two approaches are used to set the period for the comparison of performance indicators; first, comparison of the averages for ten years before privatization, and those for five years afterwards, Second, comparison of the

averages for three years before privatization, and those for three years afterwards.

Table 4

Simple average comparison of performance measures before and after privatization

This table shows simple average comparison with two approaches; First, long term comparison of the averages for ten years before privatization, and those for five years afterwards, second, short term comparison of the averages for three years before privatization and those for three years afterwards.

		Pre years (-10,-1)	Post years (+1,+5)	Difference	Pre years (-3,-1)	Post years (+1,+3)	Difference
Profitability							
Return on assets	average	0.057	0.074	0.018	0.044	0.063	0.019
	Doosan Heavy	0.058	0.024	-0.034	0.013	0.014	0.001
	KT	0.032	0.057	0.024	0.036	0.053	0.018
	KT&G	0.079	0.142	0.063	0.082	0.122	0.040
Return on sales	average	0.082	0.120	0.038	0.095	0.104	0.009
	Doosan Heavy	0.064	0.034	-0.030	0.020	0.017	-0.003
	KT	0.066	0.089	0.023	0.077	0.087	0.010
	KT&G	0.117	0.237	0.120	0.189	0.208	0.019
Labor intensity							
Employees to assets	average	3.337	1.582	-1.754	1.738	1.663	-0.075
	Doosan Heavy	3.772	1.595	-2.177	1.994	1.877	-0.117
	KT	4.013	2.011	-2.001	1.966	1.970	0.004
	KT&G	2.225	1.141	-1.084	1.254	1.143	-0.111
Employees to sales	average	5.165	2.400	-2.765	3.430	2.506	-0.924
	Doosan Heavy	4.486	2.111	-2.375	2.985	2.369	-0.616
	KT	8.183	3.181	-5.002	4.416	3.209	-1.207
	KT&G	2.826	1.908	-0.918	2.889	1.940	-0.949
Leverage							
liabilities to assets	average	0.500	0.426	-0.074	0.451	0.433	-0.017
	Doosan Heavy	0.711	0.510	-0.201	0.609	0.488	-0.121
	KT	0.578	0.573	-0.005	0.481	0.612	0.131
	KT&G	0.211	0.196	-0.015	0.263	0.200	-0.062

After comparing the averages of the long-term and short-term periods, the results are the

same; for most firms studied, profitability increases while labor intensity and debt-ratio declines, thus suggesting that performance indicators are improved after privatization.

Both the time series comparison and simple average comparison indicate that privatization has a positive impact on the performance of state owned firms. This also supports the argument in the last section that when the government stake decreases, a firm's economic performance improves.

5. Summary and Conclusion

This research starts with a question of whether privately owned firms perform better than state owned firms. The privately owned firms' sample group includes top 30 businesses in terms of assets, while the state owned firms' sample group targets government-invested institutions, and their performances are compared to find an answer to the question. The result is not what we expect; privately owned firms report lower profitability with a higher debt ratio than state owned firms. In addition, the results from the univariate comparison and the multivariate regression using the firm fixed effect and the year fixed effect indicate the same.

However, there is a certain limit in this comparison due to government owned firm's monopolistic market position and the different industrial characteristics between sample groups of privately owned firms and state owned firms.

Therefore, considering solely on state owned firms we analyze how change in government stake has effect on state owned firm's performance. First, the performance analysis for partial privatization is carried out to find out the impact of a decrease in the government stake on performance. The results suggest that the less stake the government has in the government owned firms, the more its profitability increases, while employment and liabilities decrease.

To learn whether the same case can be made for fully privatized firms, we check the performance before and after privatization of three privatized firms during the Asian financial crisis. It is confirmed that as in partial privatization, these firm's performances improve after privatization.

This research suggests that there is a close relationship between the state ownership and firm's economic performance, while less state ownership means better performance.

APPENDIX

Government Invested Institutions (1986-2006)

Name	Period	Privatization
Korea Agro-Fisheries Trade Corporation	1986-2006	-
Korea Chemical Corporation	1986-1993	2000.12
Korea Coal Corporation	1986-2006	-
Korea Electric Power Corporation	1986-2006	-
Korea Exchange	1986-1987	-
Korea Expressway Corporation	1986-2006	-
Korea Gas Corporation	1986-1996	-
Korea Land Corporation	1986-2006	-
Korea Minting and Security Printing Corporation	1986-2006	-
Korea National Housing Corporation	1986-2006	-
Korea National Oil Corporation	1986-2006	-
Korea Overseas Development Corporation	1986-1991	-
Korea Railroad Corporation	2005-2006	-
Korea Resources Corporation	1986-2006	-
Korea Rural Corporation	1986-2006	-
Korea Telecom	1986-1996	2002.05
Korea Tobacco & Ginseng	1987-1996	2002.10
Korea Tourism Organization	1986-2006	-
Korea Trade-Investment Promotion Agency	1986-2006	-
Korea Water Resources Corporation	1986-2006	-
Korea Workers' Compensation & Welfare Service	1986-1994	-
Korean Broadcasting System	1986-1988	-
National Textbook Corporation	1986-1993	1998.11(Merged)

BIBLIOGRAPHY

Boardman, Anthony E, Vining, Aidan R. 1989. Ownership and Performance in Competitive Environments: A Comparison of the Performance of Private, Mixed, and State-Owned Enterprises, *Journal of Law and Economics* 32(1): 1-33

Gibbon, Henry. 1998. Worldwide economic orthodoxy, *Privatisation International* 123; 4-5

Hyun Sook Kim. 2007. An Empirical Analysis on the Economic Performance of Privatized Public Firms in Korea. *Korea Journal of Public Finance* 22(1): 35-60

Juliet D'Souza and William L. Megginson. 1999. The financial and operating performance of privatized firms during the 1990s. *The Journal of Finance* 54(4): 1397-1438

Joo Kyung Tae & Sung Sig Yoon. 2006. A Study on the Effectiveness of the Privatization Policy of the Public Enterprise. *Korea Journal of Public Administration* 44(3): 68-92

Kathryn L. Dwenter and Paul H. Malatesta. 2001. State-owned and privately owned firms: An empirical analysis of profitability, leverage, and labor intensity. *The American Economic Review* 91(1):320-334

Maxim Boycko, Andrei Shleifer, Robert W. Vishny. 1996. A Theory of Privatisation. *The Economic Journal* 106(435): 309-319

Meggison, W.L., 2005. *The financial economics of privatization*. Oxford University Press, USA.

Nandi Gupta. 2005. Partial privatization and firm performance. *The Journal of Finance* 60(2): 987-1015

Stephen Martin, David Parker. 1995. Privatization and Economic Performance Throughout the UK Business Cycle. *Managerial and Decision Economics* 16(3): 225-237

Vining, Aidan R, Boardman, Anthony E. 1992. Ownership versus competition: Efficiency in public enterprise. *Public Choice* 73(2): 205-239