Share-Issue Privatization in China: 2002-2008

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The purpose of this article is to evaluate the effectiveness of China's incremental approach to de-nationalization, share-issue privatization, wherein the government sells shares of state-owned enterprises to the public, while retaining an ownership position in the firm. The effectiveness of this approach to de-nationalization will be evaluated based on four widely-used measures of firm well-being and productivity--returns on assets, returns on sales, sales per employee, and profits per employee, based on data retrieved from the China Stock Market and Accounting Research (CSMAR) Database and the Private Listed Companies Database.

Introduction

Like many contemporary transitioning economies, China embarked on an aggressive privatization scheme beginning in the 1990s. This program has had mixed results on the performance of those firms affected.[1] A confounding factor in the Chinese experience has been that firms are not entirely denationalized upon incorporation or the issuance of shares; rather, the government has opted for a more piecemeal approach to denationalization. Under its share-issue privatization scheme, the Chinese government sells shares of state-owned enterprises (SOEs) to the public, while concurrently retaining its own ownership position in the firm. This has led to a reevaluation of what constitutes the "privatization event": when is a firm truly privatized? The assumption had been that the privatization event occurs at the time the firm is incorporated and this assumption remains relevant to many other privatization schemes. However, responding to China's incremental approach, scholars have postulated that the "privatization event" occurs when a majority position can be formed by a single private shareholder or a group of private shareholders who may wrest control of the organization from the government.[2]

In accordance with studies illustrating that corporate governance does not change until a private shareholder or group of private shareholders may take a majority position,[3] this paper defines the "privatization event" as when the largest shareholder is a private entity. Four widely-used measures of firm well-being and productivity—returns on assets (ROA), returns on sales (ROS), sales per employee, and profits per employee—were calculated from data found on the China Stock Market and Accounting Research (CSMAR) Database,[4] and data gathered from the Private Listed Companies Database[5] was used to identify the privatization year of each company included in the study. The purpose of this paper is to evaluate—based those measures above—the effectiveness of China's share-issue privatization scheme, specifically the privatization cohorts from 2002 to 2008. This paper builds upon the extant literature studying China's privatization regime, which is mostly focused on earlier periods of privatization.

Background

As the world's second-largest economy and one still in transition to a modern capitalist system, China's liberalization and privatization program sets a major precedent for other economies that are going through the same process. China has reduced the share of its SOEs as a percent of gross domestic product from approximately 77.6 percent in 1994 to less than 30 percent in 1998.[6] Due to the incremental nature of its privatization program, share-issue privatization, whereby an SOE undergoes an initial public offering (IPO) and shares of the enterprise are sold to the public, the Chinese government remains a significant and often majority shareholder in former SOEs. Because of this privatization scheme, rather than the outright transfer of ownership from public to private, the nature of the transformation of these firms has differed from that of firms under other, more direct, privatization schemes.

1 See Li and Yueh (2011); Sun and Tong (2003); Rousseau and Xiao (2008); Lin et al (2009).

2 e.g., Rousseau and Xiao (2008).

3 See Sun and Tong (2003) and Rousseau and Xiao (2008)

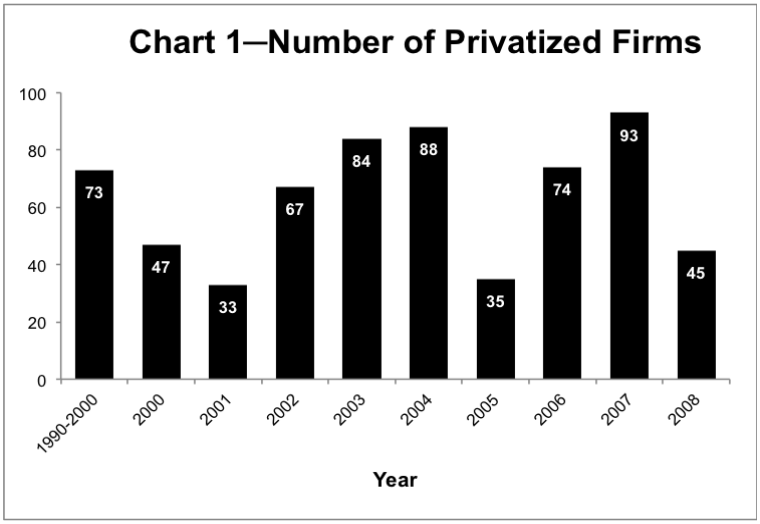
4 Shenzhen GTA Information Technology Co. Ltd. Shenzhen, China.

5 The SinoFin Information Services.

6 Sun and Tong (2003), pp. 183.

Lin et al (2009) find a negative relationship between state ownership and firm performance and a positive relationship between public and employee share ownership.[7] Rousseau and Xiao (2008) identify two perspectives to explain the inefficiencies associated with SOEs. One is the "managerial view" whereby weak monitoring of SOE management, the lack of a responsible private owner, and the absence of publicly traded shares, by which market sentiment may be gauged, create an inefficient environment. Another is the "political view" whereby the strong state influence on a firm constrains the operating environment and distorts firm objectives, especially those objectives related to employment. The state may influence an SOE to simply employ more of the population to take away unemployment pressures and to hire politically-connected individuals. Furthermore, the state presence and backing of these firms dampens the negative consequences of risky or poor operational decisions, leading to increased risk-taking.

China's incremental approach to privatization has yielded mixed changes in such measures as returns on assets, returns on sales, sales per employee, and profits per employee, whereas more direct approaches to privatization have yielded more uniform results. In their 2003 study of 634 SOEs that have participated in China's share-issue privatization scheme from 1994-1998, Sun and Tong (2003) found "signs of increases in earnings, real sales, and employee productivity" but no improvement in earnings for these companies.[8] They argue that continued state ownership of SOEs even after the share-issue privatization event has "a negative impact on firm performance." This sentiment is echoed by Lin et al (2009) who state that while the SOE restructuring has improved firm efficiency, "partial privatization without transfer of ownership and control to the public has remained a major source of inefficiency."[9]



Thus, the share-issue privatization scheme has created a hybrid ownership structure of the firms affected, which has prompted the search for a more sound definition of the "privatization event" that better fits the Chinese experience. Noting that "China's SOEs have *not* in general become more profitable after their initial public offerings," Rousseau and Xiao (2008) argue that the privatization event is best defined as when the primary shareholder in the firm is a private rather than state entity.[10] This paper utilizes this definition of the privatization event as it evaluates the success of China's share-issue privatization scheme.

Data from the Private Listed Companies Database was used to assess the privatization event by noting when largest owner shifted from the state to a private entity. Chart 1 above, "Number of Privatized Firms," shows how many firms experienced this shift in the period from 1990-2000 and for each year from 2000 to 2008, according to the Private Listed Companies Database. In the period investigated in this study, 2002-2008, there were approximately 486 firms that exhibited a shift in the largest owner from the state to a private entity through share-issue privatization. It is from this sample of 486 SOEs the conclusions of this paper are based.

Given the theoretical framework associating state ownership and decreased firm performance, it may be reasonable to expect that firm performance would increase once the ownership dynamic has shifted from state control to private control. Based on their investigation of 116 firms which had undergone the transition from state control to private control from 1994 to 2002, Rousseau and Xiao (2008) support the claim that the share-issue privatization scheme has been effective at improving firm performance.

This paper will build upon the Rousseau and Xiao (2008) study by investigating the performance of firms that have undergone the state-to-private transition in the period from 2002 to 2008. In accordance with the theoretical framework explained above and the experience of similar privatization studies, this paper tests the following hypothesis: the performance of firms should

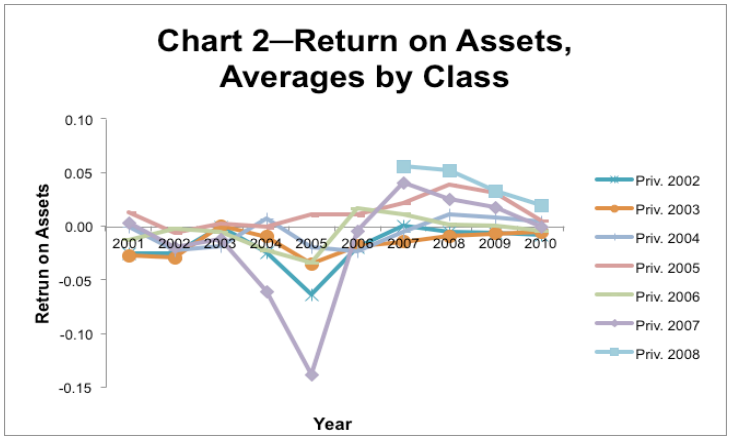
7 Lin et al (2009), pp. 205.
8 Sun and Tong (2003), pp. 186.
9 Lin et al (2009), pp. 205.
10 Rousseau and Xiao (2008).

be improved after the privatization event.

EMPIRICS

To test the hypothesis, that the performance of firms should be improved after the privatization event, this paper investigates the returns on assets, returns on sales, sales per employee, and profits per employee of firms that have undergone the state-to-private transition in the period from 2002 to 2008 both before and after the privatization event. Data was gathered on these firms' assets, sales, operating income, and net income from the CSMAR database from the years 2001 to 2010. Firms' privatization events were gathered from the SinoFin Private Listed Companies Database—only those firms whose privatization events fell between 2002 and 2008 were of interest to this paper. Employment information was also gathered from the CSMAR database; however, this information only ran from 2001 to 2008, limiting the performance measures of sales per employee and profits per employee to that period.

For the purpose of constructing these measures, the information from these three disparate sources, approximately 2,216 exchange-listed firms for each of the ten years from 2001 to 2010, were combined into a single data file. Then, for each firm, returns on assets, $ROA = \frac{(net\ income)}{(total\ assets)}$; returns on sales, $ROS = \frac{(net\ income)}{sales}$; sales per employee, $\frac{sales}{(number\ of\ employees)}$, and finally profits per employee, $\frac{(net\ income)}{(number\ of\ employees)}$ were calculated.To construct benchmarks of these measures against which to compare each privatization cohort, the simple arithmetic mean of each measure was calculated for each year across all exchange-listed firms. To help reduce skew caused by outliers—the possible result of poor measurement—the top and bottom 0.5% of values were censored from the calculations of these benchmark measures. The data gathered thereby is expressed in Table 1. These same variables were similarly gathered for each privatization cohort from 2002 through 2008. In each of the privatization cohorts, the topmost and bottommost values were eliminated from the calculations, similarly to the calculations of the benchmark measures, to reduce skew and the influence of measurement error. From the calculated measures of each of the privatization cohorts, the corresponding benchmark measure was subtracted to improve the comparability of each of the privatization cohorts. The results for each $\left(M_{n^{th}cohort,benchmarked} = M_{n^{th}cohort} - M_{benchmark}\right)$ measure gathered from this process are shown in the charts below:

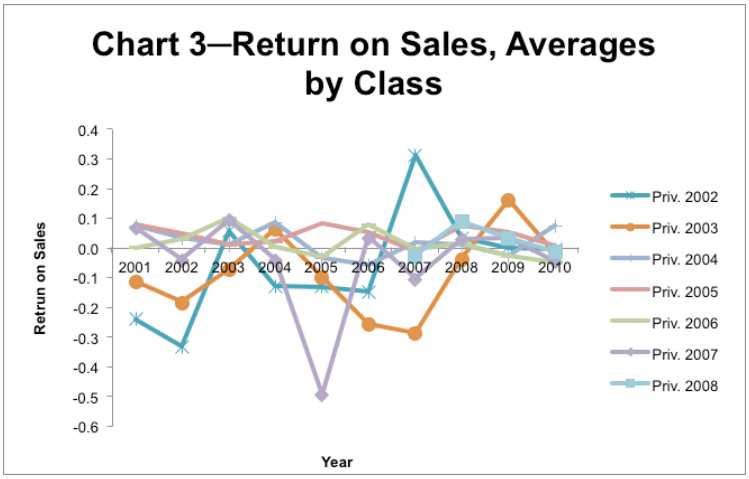


Please note, that for each of these charts, y=0 would be the corresponding benchmark value

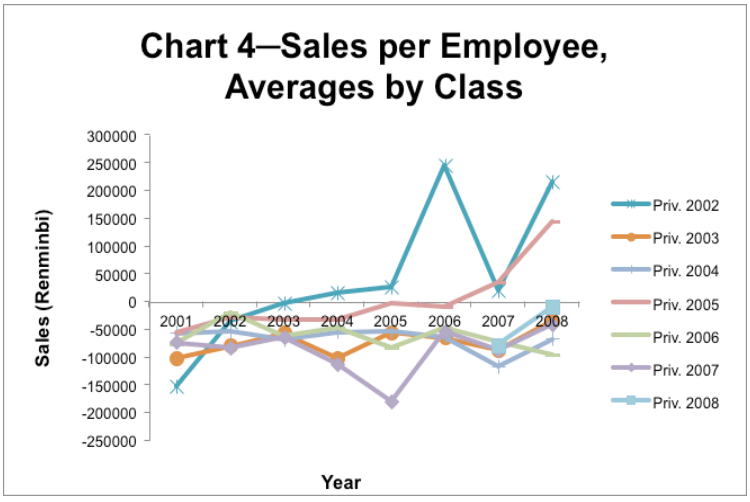
Table 1—Benchmark Measures

Year	ROA	ROS	Sales/Employee	Profits/Employee
2001	1.19%	-3.06%	¥ 91,988	¥ 80,855
2002	0.88%	-9.23%	¥ 72,832	¥ 54,081
2003	1.32%	-10.67%	¥ 81,840	¥ 61,015
2004	1.09%	-9.57%	¥ 72,464	¥ 46,406
2005	0.15%	-8.86%	¥ 68,388	¥ 34,519
2006	1.92%	-1.18%	¥ 99,666	¥ 77,390
2007	4.69%	12.56%	¥ 164,058	¥ 170,122
2008	2.58%	2.78%	¥ 101,460	¥ 116,809
2009	3.42%	7.41%		
2010	5.00%	11.04%		

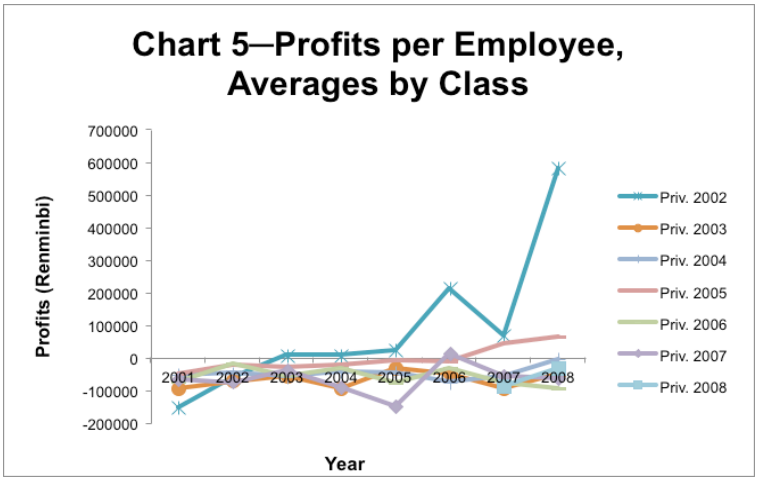
Please note that the values for Sales/Employee and Profits/Employee are expressed in Chinese Renminbi



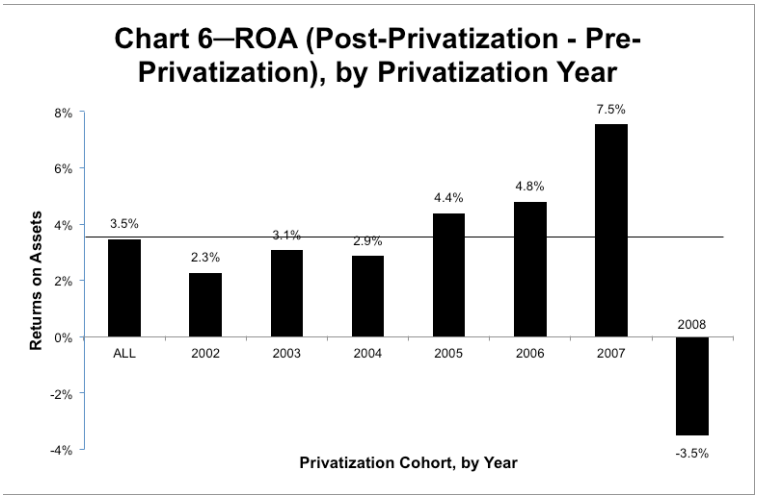
It might be seen from a simple ocular inspection, at least on some of these measures, that the measure after the privatization event is higher than that before the event. However, this does not provide a rigorous means of testing the hypothesis that the performance of these firms was improved after the privatization event. In order to test this hypothesis more rigorously, the averages of each measure *before* the privatization event and *after* the event have been drawn from the aggregate of all privatized firms over the 2002-2008 period. For example, looking at the 2002 privatization cohort, the 2001 values would be put into a "pre-privatization" column while those values from 2003-2010 would be put into a "post-privatization" column.



Looking at the 2005 privatization cohort, the 2001-2004 values would be put into the "pre-privatization" column and the 2006-2010 values would be put into the "post-privatization" column. To compare the post- to pre-privatization states, from the "pre-privatization" column, the simple arithmetic mean was calculated, and from the "post-privatization" column the same value was calculated.



Finally, two t-Tests, statistical tests of whether two sample means are equal, for each of the four measures, one assuming equal variances, the other assuming unequal variances, were conducted with the following hypotheses: H_0: the mean difference of each measure pre- and post-privatization is zero and H_1: the mean difference is not zero.[11] The results of these t-Tests are shown in Tables 2-4. These findings provide robust evidence to reject the null hypothesis of the t-Test, that the difference of each measure pre- and post-privatization is zero. Rather, this data provides strong support for



the hypothesis of this paper, that the performance of the firms post privatization should be stronger than pre

11 Please note that H_0 signifies the "null hypothesis," which is the assumed difference between the two means, and that H_1 signifies the "alternative hypothesis," which will be accepted if and only if there is a preponderance of evidence supporting the rejection of the null hypothesis. In this case, a preponderance of evidence is defined as there being less than a 5% chance (the α-value) of observing a mean difference as great as or greater than that observed, assuming the null hypothesis holds.

Table 2—t Critical Values — TWO TAILED

ASSUMING	Critical Value (α=0.05)
EQUAL VARIANCES	±1.96
UNEQUAL VARIANCES	±1.96

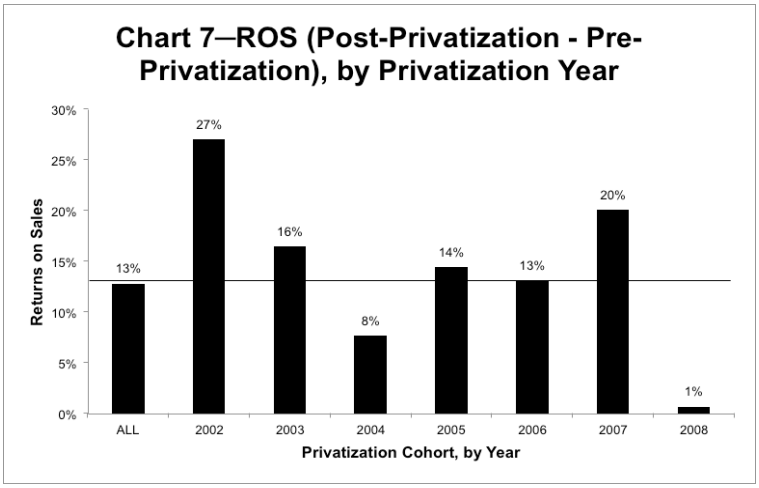
Table 3—t Stat Mean(Pre-)=Mean(Post-Privatization) — TWO TAILED

ASSUMING	ROA	ROS	Sales/Employee	Profits/Employee
EQUAL VARIANCES	-6.88	-4.22	-3.28	-2.97
UNEQUAL VARIANCES	-8.19	-4.80	-4.35	-4.03

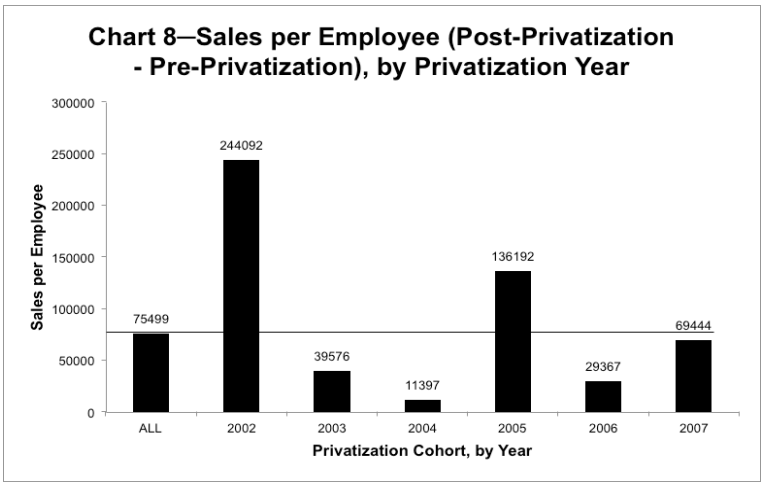
Table 4—Probability Mean(Pre-)=Mean(Post-Privatization) — TWO TAILED

ASSUMING	ROA	ROS	Sales/Employee	Profits/Employee
EQUAL VARIANCES	7.19E-12	2.55E-05	0.0010	0.0029
UNEQUAL VARIANCES	5.27E-16	1.71E-06	1.44E-05	5.85E-05

privatization. To further illustrate this point, please see Charts 6-9, which show the difference of each measure post-privatization minus pre-privatization. A positive value indicates that the measure was greater after the privatization event than before.

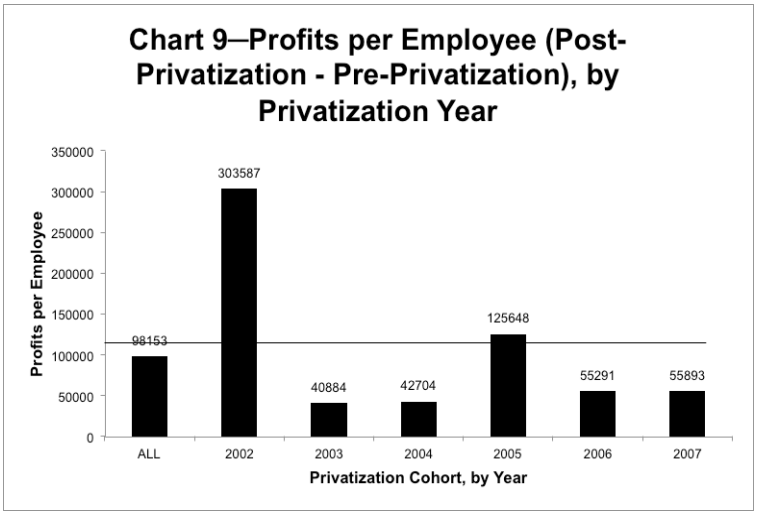


Further supporting the t-Tests, an ocular inspection of these charts shows, with the exception of the returns on assets of the 2008 privatization cohort, that improvements in firm performance have almost always occurred after the privatization event. It is important to note that these results *alone* are not enough to establish causation between the privatization event and the improvements in firm performance. However, given the theoretical framework outlined before, this does provide evidence to support the idea that privatization exerts a positive effect on firm performance, at least based on these measures of firm performance.



DISCUSSION

This paper has evaluated the success of China's share-issue privatization scheme in the period from 2002 to 2008. The incremental nature of China's privatization program has confounded a number of studies in the past, and this may be because even after the IPO, the government often maintains its position in the firm as the largest shareholder. The continued government ownership may dampen firm efficiency; two



views that seek to describe how this may occur are the "managerial view" and the "political view." The managerial view posits that the inefficiency associated with government ownership stems from the lack of a private entity responsible for the firm's performance. There are few incentives for increasing firm performance accorded to firm management, and the negative consequences of poor management are reduced because of government backing. The political view holds that the inefficiency is due to distorted firm objectives—a push for higher employment of the population, pressure to hire politically well-connected individuals.

These views on firm efficiency provide reason to suspect that once the government is no longer the largest single shareholder in a firm, firm performance should improve and that this improvement should be due, at least in part, to the privatization event. The findings of this study provide robust evidence in support of that assertion. The t-Tests in particular, which compared the means of firm performance measures before the privatization event to after the privatization event, show that firm performance was almost certainly improved after the privatization event, with a confidence level well above 95%. It must again be noted that the robust results of the t-Test are not alone entirely enough to attribute causation to the privatization event. However, it was not only for one privatization cohort of the 2002 to 2008 period that improvements in firm performance were found, but for every single cohort on every measure, with the single exception of the 2008 cohort on the returns on assets measure, which may be attributable to the global recession which began just after the privatization of this cohort. Furthermore, the views on firm efficiency expressed above provide a theoretical framework to support the idea that the privatization event was the causal variable exciting that change in firm performance. Thus, in the view of this paper, it seems that China's share-issue privatization scheme has had a strongly beneficial effect on firm performance, and that continued support of this program by the Chinese government would seem warranted by their experience with the program so far.

References

China Stock Market and Accounting Research (CSMAR) Database, 2011. (2011). Shenzhen GTA Information Technology Co. Ltd. Shenzhen, China.

Li, Xiao Mei Li and Linda Yueh. (2011). "Does Incorporation Improve Firm Performance." *Oxford Bulletin of Economics and Statistics, 73*. pp. 753-770.

Lin, Chen, Yue Ma, and Dongwei Su. (2009). "Corporate Governance and Firm Efficiency: Evidence from China's Publicly Listed Firms." *Managerial and Decision Economics*. pp. 193-209.

Private Listed Companies Database, 2011. (2011). Beijing: The SinoFin Information Services.

Rousseau, Peter L., and Sheng Xiao. (2008). "Change of control and the success of China's share-issue privatization." *China Economic Review*. pp. 605-613.

Sun, Qian and Wilson H.S. Tong. (2003). "China share issue privatization: the extent of its success." *Journal of Financial Economics, 70*. pp. 183-222.

Appendix A – Hypothesis Test Results

ROA

t-Test: Two-Sample Assuming Equal Variances

	Pre-	*Post-*
Mean	-0.006803524	0.027894918
Variance	0.008190431	0.01608896
Observations	732	2373
Pooled Variance	0.014228236	
Hypothesized Mean Difference	0	
df	3103	
t Stat	-6.880310629	
P(T<=t) one-tail	3.60E-12	
t Critical one-tail	1.645344838	
P(T<=t) two-tail	7.19475E-12	
t Critical two-tail	1.960728787	

t-Test: Two-Sample Assuming Unequal Variances

	Pre-	*Post-*
Mean	-0.006803524	0.027894918
Variance	0.008190431	0.01608896
Observations	732	2373
Hypothesized Mean Difference	0	
df	1694	
t Stat	-8.185525253	
P(T<=t) one-tail	2.63551E-16	
t Critical one-tail	1.645753632	
P(T<=t) two-tail	5.27101E-16	
t Critical two-tail	1.961365365	

ROS

t-Test: Two-Sample Assuming Equal Variances

	Pre-	*Post-*
Mean	-0.10198974	0.026020517
Variance		0.566679006
Observations	730	2364
Pooled Variance		
Hypothesized Mean Difference	0	
df	3092	
t Stat	-4.2165455	
P(T<=t) one-tail	1.27593E-05	
t Critical one-tail		
P(T<=t) two-tail	2.55187E-05	
t Critical two-tail		

t-Test: Two-Sample Assuming Unequal Variances

	Pre-	*Post-*
Mean	-0.10198974	0.026020517
Variance		0.566679006
Observations	730	2364
Hypothesized Mean Difference	0	
df	1538	
t Stat		
P(T<=t) one-tail	8.57757E-07	
t Critical one-tail		
P(T<=t) two-tail	1.71551E-06	
t Critical two-tail		

SALES/EMPLOYEE

t-Test: Two-Sample Assuming Equal Variances

	Pre-	*Post-*
Mean	9447.626974	84946.35737
Variance		3.67596E+11
Observations	726	1433
Pooled Variance	2.54996E+11	
Hypothesized Mean Difference	0	
df	2157	
t Stat		
P(T<=t) one-tail	0.000523603	
t Critical one-tail	1.645560362	
P(T<=t) two-tail	0.001047205	
t Critical two-tail	1.961064393	

t-Test: Two-Sample Assuming Unequal Variances

	Pre-	*Post-*
Mean	9447.626974	84946.35737
Variance		3.67596E+11
Observations	726	1433
Hypothesized Mean Difference	0	
df	1864	
t Stat		
P(T<=t) one-tail	7.21821E-06	
t Critical one-tail	1.645671509	
P(T<=t) two-tail	1.44364E-05	
t Critical two-tail	1.961237475	

PROFITS/EMPLOYEE

t-Test: Two-Sample Assuming Equal Variances

	Pre-	*Post-*
Mean		101106.9039
Variance		7.70242E+11
Observations	726	1433
Pooled Variance	5.25031E+11	
Hypothesized Mean Difference	0	
df	2157	
t Stat		
P(T<=t) one-tail		
t Critical one-tail		
P(T<=t) two-tail		
t Critical two-tail		

t-Test: Two-Sample Assuming Unequal Variances

	Pre-	*Post-*
Mean		101106.9039
Variance		7.70242E+11
Observations	726	1433
Hypothesized Mean Difference	0	
df	1710	
t Stat		
P(T<=t) one-tail	2.92643E-05	
t Critical one-tail		
P(T<=t) two-tail	5.85286E-05	
t Critical two-tail		

Appendix B – Pre- and Post-Privatization Values and Differences

PRE-PRIVATIZATION

COHORT	ROA	ROS	SALES/EMP.	PROFITS/EMP.
ALL	-0.006803524	-0.10198974	9447.626974	2953.798797
2002	-0.013721595	-0.268522639	-61376.42741	-71476.11543
2003	-0.017670886	-0.212949005	-7674.124807	-13764.04891
2004	-0.003111553	-0.037693565	22605.81033	13054.23497
2005	0.012745806	-0.043438269	42848.77685	32307.21962
2006	-0.006210952	-0.06126055	18883.42495	6129.818606
2007	-0.024695416	-0.123882259	-8656.339059	1352.266263
2008	0.103008386	0.099125287		

POST-PRIVATIZATION

COHORT	ROA	ROS	SALES/EMP.	PROFITS/EMP.
ALL	0.027894918	0.026020517	84946.35737	101106.9039
2002	0.009008793	0.001422287	182715.3457	232111.2661
2003	0.013035057	-0.048116891	31902.24811	27120.05712
2004	0.025640753	0.038709036	34002.70806	55758.14592
2005	0.056659203	0.100639536	179040.6272	157954.9185
2006	0.041826541	0.069505585	48250.52825	61420.77971
2007	0.050710869	0.077009649	60787.38609	57245.74208
2008	0.068040091	0.105748278		

POST - PRE

COHORT	ROA	ROS	SALES/EMP.	PROFITS/EMP.
ALL	0.035	0.128	75498.730	98153.105
2002	0.023	0.270	244091.773	303587.382
2003	0.031	0.165	39576.373	40884.106
2004	0.029	0.076	11396.898	42703.911
2005	0.044	0.144	136191.850	125647.699
2006	0.048	0.131	29367.103	55290.961
2007	0.075	0.201	69443.725	55893.476
2008	-0.035	0.007	0.000	0.000