

Bargaining in the Chinese Leviathan
An Examination on the Steel Industry after China's SOE Reform

By

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This thesis originated from a simple puzzle when I witnessed mass agonies brought by state-owned enterprises reform at my hometown some thirteen years ago: Whether these survived enterprises truly learned to seek profit maximization as their private counterparts. This puzzle eventually developed to be a research topic in my thesis after years of training in economics and political science. I would like to express my sincere gratitude to my advisor Dr. John Kennedy for helping me in this long process of figuring out a clear research question, finding literatures, choosing appropriate methods, designing fieldwork for data collation, and writing the thesis. Not only was he patient enough to help me with my research, since I first discussed the topic with him in 2008, but he helped me make sense of my own ideas. I know I cannot make it with his lasting assistance, enlightenment and encouragement.

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Abstract

This thesis centers on the competitions between enterprises in the steel industry in China after the SOE (state-owned enterprises) reform, which can be viewed as a case for mass economic reforms within Chinese Leviathan. To examine the effect of the SOE reform on the distributional benefits within actors of state-owned and private enterprises, Knight's relative bargaining power theory is served as the theoretic foundation. Ownership, is equally as two other explanatory predictor, labor force proportion and enterprise profit per capita as the operationalization of inputs in gaining asymmetric resource (production capacity quota) for players of enterprises in the steel industry. Empirical results from data collected in field work indicate that (1) ownership matters only when interactive with economic performance and PEs take the advantage of ownership; (2) regardless of ownership, enterprises gain relative bargaining power when they do contribution to the social stability. Qualitative analysis from the interviews in fields also explains the results with cases.

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I. Introduction

Since Soviet Union and Eastern European communist regimes collapsed in succession at the end of the Cold War, issues relevant to deregulation and privatization of state-owned enterprises (SOEs) in post-socialist reforms of these countries have been increasingly discussed. Specifically, China's great achievements in economic development in later 30 years draw attentions from many Chinese and foreign scholars to investigation on the transitional role of China's SOEs (see Shirk 1994, Zhang 1997, Steinfeld 1998 and Kennedy 2005). Their works mainly focus on the political logic of economic reform policy making in these industries, especially how the whole group of continuing politically influential SOEs performs in an expected market-oriented competition with rivals of private enterprises (PEs) and foreign-invested enterprises. Although literature acknowledges the competitive mechanism of the market economy in China's economic reform, most scholars still hold conservative attitudes towards the extent to which these heavy industrial SOEs obey the rules of a free market and fair competitions as well as government's ambiguous role as both owner of SOEs and supervisor of the competition.

While the ideology of general equilibrium theory (L. Walras, 1874) is widely applied to general explanations on the transitional business-government relations with Chinese characteristics in this post-socialist economic reform, some political economists study the privatization of SOEs in the reform and try to find the partial equilibrium at micro-level. Zhang (1997) is the first domestic scholar who argues the privatization of SOEs as a result of decentralization and regional competitions. Steinfeld (1998) and Kennedy (2005) also begin to link different reform paths of SOEs in China with their industrial characteristics. They specially focus on the reform in the commanding heights industrial that "controls the life-blood of the national economy (kong zhi guo min jing ji

ming mai) and plays a leading role in economic development”¹, such as the steel, electric power, communication, coal and mining industries.

So how about the privatization of SOEs in these heavy industries at the micro-level? Are they become more competitive and profitable in the market arena? For their private rivals in these industries, does the effective economic reform bring them more power in the market competition because they honestly follow the rule of profit maximization? What are their characteristics of the business-government relations in the transitional stage for both SOEs and PEs? This thesis makes some preliminary explorations on the privatization of SOEs in the steel industry in China and the pattern of competitions between SOEs and PEs given a series of external constraints from the government.

A. Literature Review on History and Status Quo

The founding People’s Republic of China established a Soviet-type centrally planned economy, which is also called a “command economy”. China’s command economy is featured by the state ownership of industrial enterprises with an extensive growth strategy designed to achieve high rates of growth and establish a heavy industrial base. (Brown & Neuberger, 1968; Ward, 1980). Since the Chinese Communist Party (CCP) made the decision to launch the Economic Reform and Openness Policy in their Third Plenary Session of the 11th Central Committee of CCP in 1978, reforms in agriculture, collective and private business, labor incentives and foreign investment and trade have stimulated the Chinese domestic economy and provided support for the industrial reform drive. Nonetheless, the path of China’s industrial reform is much

¹ This interpretation is from the text in the Report Delivered at the 15th National Congress of the Communist Party of China on September 12, 1997, Jiang Zemin.

rockier than the path taken by reforms in other area (Shirk, 1994). Industrial reforms, especially those in the commanding heights domain, are inherently redistributive and ran up against opposition from powerful central bureaucracies who see nothing objectionable about the other kinds of reforms listed before. Steinfeld (1998) ascribed China's ailing SOEs in the steel industry to the ambiguous property rights and the absence of the final authorized proxy based on his three case studies, viewing China as a troubled transitional nation in post-socialist reforms.

Even though further economic reform in heavy industries still hurt interests of political elites in China, CCP was very conscious with the growing burden from gigantic corporations in these industries as a potential threat to the achievements of market economy. A deliberate of economic restructuring policy, especially its core spirit of "well managing large enterprises while adopting a flexible policy toward small ones" (zhua da fang xiao) on SOEs, was clearly initiated at the 15th National Congress of CCP in fall 1997. The economic restructuring strategy, after the Economic Reform and Openness Policy in 1978, further legalized and expanded the growth of PEs in China's heavy industries. Although Kennedy's (2005) field studies on the business-government relations still emphasized the asymmetric strength between SOEs and PEs in the steel industry, his literature and cases implied that PEs did have a growing important role in the state policy-making and began to seek for the business lobby to protect their self-interests. Although data indicates that steel SOEs accounts for 12.3% in all enterprises but contributes 56.8% of national production at the end of 2003; meanwhile, statistics from China Markets Yearbook in 2005 also shows that, among all 2,429 firms in the steel smelting and steel rolling subsectors, only 5% are SOEs and the collective-owned enterprises account for 16%.

As a crucial strategy in the “national policy” of Economic Reform and Openness Policy, China had applied to reconvert her status of a signatory in the General Agreement on Tariffs and Trade (GATT) since 1986 and finally became a new member of the World Trade Organization (WTO)² on December 11, 2001. China became world’s largest steel producer in 1996 and world’s largest steel consumer in 2001. The membership in WTO benefits China’s steel exports with reciprocal treatment from other member countries with a reduction in tariffs as well as non-tariff barriers on exports (Fernandez, 2007). As the inexpensive labor force and land costs assist with the export of low-end steel products, China has been the largest steel exporter in the world since the first half of 2006.

China’s steel industry, which used to be the staggering commanding heights in the public domain and competitions with PEs were rare, now becomes prosperous and even globally influential. For most of enterprises in this industry, as long as they produce qualifies steel productions, the domestic and international market has an abundant capacity to consume, which brings the production capacity of enterprises to a crucial role for their economic benefits. For two major actors, SOEs and PEs, whether it is a win-win situation or their strength go wax and wane in a zero-sum game during the transitional period? Furthermore, how do they react to do a competition for gaining the production capacity?

Although Chinese government advocates the market economy much, the National Development and Reform Commission (NDRC) still formulates strict industries polices for all the enterprises in these “commanding heights” industries as an

² The 75 GATT members and the European Communities became the founding members of the WTO on January 1, 1995. The contracting parties who founded the WTO ended official agreement of the "GATT 1947" terms in the end of 1995. Whereas GATT was a set of rules agreed upon by nations, the WTO is an institutional body. expanded its scope from traded goods to trade within the service sector and intellectual property rights.

external supervisor. The regulation of production capacity in the steel industry is a crucial aspect that determines the economic performance directly and reflects the production potential for enterprises. Renamed in 2003 as a successor of the State Planning Commission and State Development Planning Commission that previously managed China's Soviet-type "command economy", NDRC has principle functions³ in formulating and implementing macro-economic policies, monitoring and adjusting the performance of the national economy, examining and approving major construction projects and so forth.

Economists who are interested in the central planned economy and its transition study China's steel industry most in common literatures. They do analysis and descriptions on a chronically basis with detailed narrations. Hogan is one of them and his book (1999) on the present status and future potential of the steel industry discusses the growth of state-owned enterprises mainly, predicts a crude steel production of 124-130 million of ton by the year 2020 and a prosperous steel industry in the 21st century (Hogan, 62). Written in mid 1990s, this book has anticipated a great consumption need for serving nation's infrastructure and a catalyst for the growth of industrial activities (Hogan, 55-57).

Political scientists also have explorations on this topic and their works are contemporary. Steinfeld (1998) is a pioneer working on the "post-socialist enterprises reform" in China. He tests institutional tools of property rights theory and concludes its disability on explaining transitional systems and large industrial producers (Steinfeld, 38-44). He also does fieldwork and case studies for three giant SOEs in China to observe

³ Information source of the principle functions of NDRC is from its official website at <http://en.ndrc.gov.cn/brief/default.htm>. This also can be obtained from the annual report from its parent agency of State Council.

the commanding heights in transition and gets a touch of pessimistic feelings on destructive state-intervention for these SOEs (Steinfeld, 249-255). Kennedy (2005) investigates the SOE reform in a different view. His field work emphasizes on the business lobby of newly acceding private enterprises. Kennedy also starts to bring the environmental protection issue (89-93) to the bunch of constrains that influences on the business-government relations in heavy industries in China, and concludes large SOEs still get some exemptions to due to their relative political influences over PEs. My thesis entitled “Bargaining in the Chinese Leviathan” as an echo to Yang’s (2004) “Remaking the Chinese Leviathan”. His works doesn’t merely centers on a certain economic factors in China but discuss the politics of governances under market transition era since SOE reform (year of 1997 to 2003) as a whole. When mingled with market incentives, government makes formal and informal adjustments to institutional changes, with the purpose of maintaining authoritarian rule while implementing economic reform (21-24). Yang’s work provides me with an economic and political frame and an external prospective from the counterpart of enterprises, the government.

B. Research Question and Some Remarks

Emergence of institutional arrangements, the SOE reform with economic restructuring policy in 1997 seems to be of great significance to the advancement of the industry; nonetheless, this argument will be far from reliable without supporting. Knight (1992) develops his theories on the bargaining and asymmetries of power in institutional changes and argues that the key feature of the bargaining theory of institutional emergence is the fundamental relationship between resource asymmetries. Mainly based on Knight’s theories, this thesis will specifically answer the research question that: How does the pattern of resource asymmetries between state-owned enterprises and private

enterprises with supervision from National Development and Reform Commission change in the steel industry in China?

Previous work either emphasis on the role of ownership alone for enterprises in the competition subsidy from government, or set SOEs and PEs as individual groups to do separate studies. When focus on the political logic of SOE reforms, economic logic of these enterprises as seekers for profit maximization is sometimes absent. I did field work and research for thesis in China in summer 2008 and early spring 2009 for data collection and interviews. This paper discusses the role of ownership and economic performance for both all the enterprises as a whole group, and makes comparison between these two types of enterprises. NDRC is captured as an agent for the “Chinese Leviathan”, the government, which supervises business factors while keeps trying to separate business from government. The reform, competitions, and business-government relation in the steel industry, is described as a case for analysis on the procedure of remaking “Chinese Leviathan”.

Additionally, this work uses mixed methods with quantitative studies and qualitative analysis, combing statistical descriptions and inferences for first-hand data from filed work in China and literally explanations of interviews with workers, managers at enterprises, and officials in local government.

II. Theories

Based on the literature review and background retrospection of the general research question, this thesis explains the changing pattern in China’s steel industry and the business-government relations as results of the institutional changes brought by China’s economic reform, especially the SOE reform started in 1997. Before discussing

in detail the actors of SOEs and PEs as well as the dual-role of NDRC as an agent of government, I would like to focus on the groundbreaking works of Knight (1992) and North (1990) to build a theoretical foundation for further studies. Interpretations on these theories in the research questions provide a guideline to generate a clear hypothesis and good measurements for the variables.

A. Institutions, Path Dependence and Relative Bargaining Power Theory

North defines institutions as “the rules of the game in a society or, formally, are the humanly devised constraints that shape human interaction” (1990, 3). Both formal rules and informal rules and the type and effectiveness of enforcement shape the whole character of the game. North argues that institutions affect the performance of economy by their effect on the costs of exchange⁴ and production. This is the conception of transaction costs in new institutional economy, which is initiated by Coase (1937) and widely known through Williamson (1981) and Cheung (1987). North uses transaction costs to explain the path of institutional change. When the incomplete market and fragmentary information feedback are characterized by significant transaction costs, the historically derived perceptions of the actors shape the choices that they make and there exists the path dependence (North, 1990, 93-94). Different from Shirk’s (1994) political logic of the economic reform in China, North’s path dependence theory provides the economic logic to economic issues of the lagged reactions of sectors in “command economy” to the post-socialist reforms. Specially, this provides explanations

4 Douglass North is the co-recipient of 1993’s Nobel Prize in Economics and his studies concentrate on the area of Institutional economics and economic history. His works are essential part of the foundation for the theoretical framework of the neo-institutional studies in political science.

on the remaining asymmetric power of SOEs in the commanding heights industries and government's continuing favor to them as the role of the owner of SOEs.

While North's interpretations on institutions and path dependence are suitable for some static phenomena, Knight's (1992, 127-135) theories are more powerful in explaining dynamic institutional changes as well as the bargain of distributional benefits among actors. According to Knight, social actors produce social institutions in the process of seeking distributional advantage in the conflict over substantive benefits. Those actors with a relative bargaining advantage can force others to comply with institutions. He argues that "the key feature of the bargaining theory of institutional emergence is the fundamental relationship between resource asymmetries, on the one hand, and credibility, risk aversion, and time preference, on the other". Knight's theories on the bargaining and asymmetries of power assist studies based on his theories with directions to observe the institutional emergence (where there are distributional conflicts).

Knight's theory answers the question of, "how the constraints are generalized as a social institution governing the community as a whole" (127). His theory treats each player in the game of gaining relative bargaining power equally. Within such a coherent community, differences of players in categories like credibility, risk aversion and so forth, can be viewed as explanatory predictors for resources asymmetries. Therefore, for patterns of an existing asymmetric relationship between actors like SOEs and PEs in China's steel industry, his theoretic work provides key characters of predictors to probe the resource asymmetries in the competition between actors.

B. Hypothesis

Based on Knight's theory, the research question in Part I of this thesis can be re-phrased as: Which kind of explanatory predictors in the community of China's steel industry causes resources asymmetries in the competitions between enterprises? I need to point out that, the community of steel industries consists of state-owner and private enterprises, yet their ownership is not the only tag that identifies one from each other.

For the concept of asymmetric resources in the competition, I first operationalize it as the production capacity that is strictly regulated by the NDRC. NDRC formulates industrial policies and coordinate the re-adjustment of China's industrial structure; it therefore has a target and official quota for the annual national steel production based on the industrial policies and re-adjustment. Based on the abundant consumption need of domestic and international steel market predicted by Hogan (1999) and verified by the Fernandez's empirical studies in 2007, the quota of production capacity become asymmetric resources in the competition for all enterprises in this industry without any doubt.

This operationalization helps me break the research question into a couple of hypotheses. For each of predictors, I can do hypothesis tests on its association with the response of production capacity. North's viewpoints on path dependence and Knight's "credibility, risk aversion, and time preference" facilitate me with theoretical tools to find suitable concrete variables to operationalize explanatory predictors. I will mainly do qualitative studies with operationalization, measurements of these predictors, and conduct statistical inference on hypothesis test results in details in the following part.

III. Application

A. Operationalization, Measurement and Data Source

Before I elaborate the application of supporting theories, operationalization of the explanatory predictors should be defined for clearly illustrations. North uses transaction cost to explain the path dependence phenomenon in institutional changes. The path of privatization of state-owned enterprises, especially in heavy industries, is much rockier and slower than other economic factors. This is not only due their roles in controlling the national economy, but also a huge transaction cost of removing the foundation stone of “planned economy” in the authoritarian regime. As one of the past and present commanding heights industries in China, ownership matters for steel enterprises in the relations with their supervisor and reaction towards the implements of industrial policies, even environmental policies (Kennedy, 2005). NDRC requires direct foreign investment to the steel industry in China to have joint-stock form with domestic capital, therefore, enterprises with foreign investment as categorized as PEs. In addition, township and village enterprises are also codes as PEs. Hence, I measure the variable of ownership as a dummy variable with two levels: state-owned and private. This variable is coded as 1 for SOE and 0 for PE.

Secondly, I use a concept of labor force proportion to operationalize the “risk aversion” in the relative bargaining power theory. Social stability is always a most important issue for the ruling party and central government. The political propaganda of “The overwhelming priority is stability” (wending shi yadao yiqie de qianti) is learnt not only from bloody confrontation between state and society in 1989, but societal grievances of “laid-off” issues brought economic reform as well (Yang, 2002). The ruling authoritarian would rather pay the price of economic stagnation if necessary to relief the agonies from a high unemployment rate (Gallagher, 2005). Since both actors (enterprises)

and external supervisor (government) are risk-averse, labor force proportion is selected as my second predictor. For the measurement of this variable, I use an aggregate data (Manheim et. al., 2006). The number of employees in the enterprise is the numerator and the denominator should be total labor force at local. Yet data of total labor force at the region of each enterprises are not available when I collected the data, instead I use the total number of population in such regions from national census book, with an assumption of approximate same rate of labor force over whole population in each region. For enterprises whose major employees are from municipal, district and township level, I calculate the total number of population in the region with corresponding level.

A third predictor is the profit per capita of each enterprise. That the economic performance is a vital essential to survive in the market economy has become a common sense for all the enterprises since the economic reform. The goal of SOE reform is to make SOEs seekers of profit maximization (Liu et. al., 2004). So I choose profit as an indicator to measure how competitive each enterprise is in term of economic performance. According to the regulation from China's State-owned Assets Supervision and Administration Commission (SASAC), SOEs have the responsibility of handing partial of their profit to their owner⁵ (state, that's government in national, provincial or municipal level). Therefore, I calculate the value of this variable for each observation with a total annual profit plus taxes of the enterprise divided by the number of employees. The unit for this variable is millions of Chinese RMB.

The response, production capacity, is manually calculated based on information and rules learnt from field work. And its unit is millions of ton of crude steel. I went to three steel SOEs and one PE, interviewed with workers and management personnel in these enterprises, got access to the official Yearbook compiled by China Iron and Steel

⁵ Zhongyang Qiye Touzi Jiandu Guanli Zhanxing Banfa, published by Zhongguo Fazhi Chubanshe, 2006.

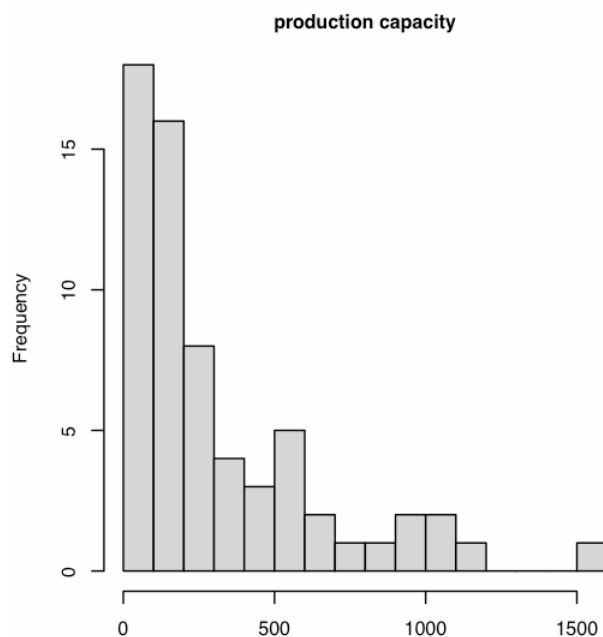
Association, and also learnt how to calculate a real production capacity of each enterprise based on their descriptive reports on changes of equipments for crude steel production. A real number and reported number sometimes have big differences and this is will further discussed later in the thesis.

B. Descriptive Statics and Hypothesis Test

My data was collected during the field work in summer 2008 and early spring 2009 in China. All of response and three predictors are for the market in the year of 2004, which is one year after the end of SOE reform. There are 64 observations in the data set and I get a list of the name of enterprises from the China Iron and Steel Yearbook 2005 (summaries of the previous year of 2004). Two of observations have missing data. Table 7 at Appendix has all 64 observations with four variables.

Figure 1

Histogram of Response Production Capacity.

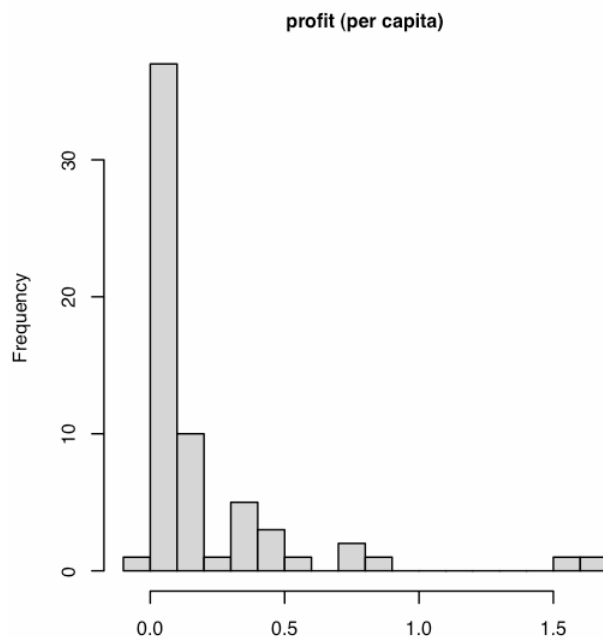


I make some histograms for the response and predictors for the descriptive statics. The outlier in the response in Figure 1 above, production capacity is Bao Steel, whose production capacity is 1514 million of ton and be the largest steel enterprise in China. Located in Shanghai alone Yangtze River, it is also one of three SOEs directly supervised by State Council.

Bao Steel is also the outlier in Figure 2 below of the predictor, profit per capita, with profit per capita of 1.662 million of Chinese currency. Nanjing Steel in Jiangsu Province, which is also an SOE alone Yangtze River, gets the second place in profit per capita of 1.515 million of Chinese currency. All other enterprises are at the level below 1.0 million per capita and more than half of enterprises (exact number is 38) are in the range less than 0.1 million.

Figure 2

Histogram of Predictor Profit per capita.

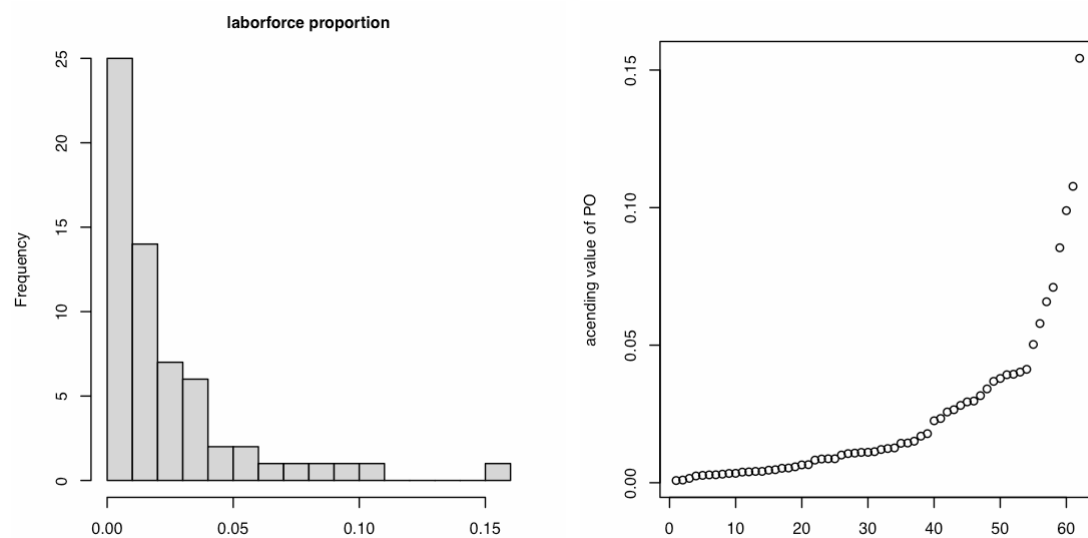


For the variable of labor force proportion, I make both histogram and plot for the analysis. It is clearly there are three levels for values of these variables. Zweig (2001) considers most of remaining SOEs as large size as approximately 90% of small and medium size SOEs are privatized since SOE reform in 1997, which brings pressures on solving a mass unemployment issue from SOE reform packages between 1998-2001.

Figure 3 & 4

Histogram of Predictor Labor force Proportion (PO).

Plot of Labor force Proportion (ascending).



For each level of labor force proportion variable, I make further investigation on the ownership in Table 1 below. It is true that, there is no private enterprises at the category of high labor force proportion. The outlier is Pan Steel with a rate of 0.154, a large SOE at Sichuan Province.

I make a one-sided Fisher’s exact test (1922)⁶ with a hypothesis that “SOEs tend to have a higher level of labor force proportion than PEs”. This test gets a p-value of 0.1336, which indicates I need to reject the hypothesis at 90% (let alone 95%)

⁶ This is a statistical significance test used in analysis of contingency tables where sample sizes are small. The significance of the deviation can be calculated exactly without approximation.

confidence level. So statistically, SOEs don't have a higher level of labor force proportion than PEs.

Table 1

	Labor force Proportion			Total
	Low (≤ 0.013)	Medium (0.013, 0.05)	High (≥ 0.05)	
State-owned Enterprises	25	18	8	51
Private Enterprises	9	2	0	11
Total	34	20	8	62

I make a simple regression model of response, production capacity, on three predictors, ownership, labor force proportion and profit per capita. I also add an interactive term of ownership on profit per capita to this model. For the standard on model selection of predictors, I would discuss in theory and statistically at section C in this part. Before move to section C, preliminarily statistical inferences are made below for getting an outline of the model.

Table 2

Determinants of Production Capacity with an Interaction: Ownership interactive with Profit per capita.

	Estimate	Standard Error	p-value
(Intercept)	2.821	98.008	0.997
Ownership: SOE	127.711	106.984	0.238
Laborforce Proportion	4517.349	1103.02	0.000*
Profit (per capita)	1984.168	661.33	0.004*
Ownership: SOE \times Profit	-1491.357	669.102	0.030*
N	62		
Residual Standard Error	244.973		
R^2	0.479		

* $p \leq 0.05$

Table 2 above shows the regression results of the model. It is clearly that both predictors of labor force proportion and profit per capita have a strong linear relationship with the production capacity while the ownership itself doesn't account anything for gaining the bargaining power. However, the interaction of ownership on

profit per capita matters at 95% confidence level. When an enterprise is a PE, one unit of increase in profit per capita increases 1491 unit of production capacity. The estimate of coefficient for labor force proportion is the largest one, which is in good accordance with the overwhelming priority role of social stability. For SOEs, the effect of interaction nearly offsets the effect from the economic benefit, that's to say, when an SOE earn one more unit of profit per capita, this doesn't contribute much for gaining more production capacity.

C. Model Selection in Theory and Statistics

There are three predictors for my model selection procedure and my selected one is:

$$\text{Production Capacity} = 2.821 + 127.711 \times \text{Ownership} + 4517.349 \times \text{Labor Force Proportion} + 1984.168 \times \text{Profit Per Capita} - 1491.375 \times \text{Ownership} \times \text{Profit Per Capita}$$

I first make a model without interaction and the results are in Table 5 at Appendix. Estimates of coefficients for labor force proportion and profit per capita are highly significant in that model and the p-value for the estimate of coefficient of ownership is 0.833. Such a high p-value shows no influences of ownership in gaining asymmetric resources, which is in contradiction with North's path dependence theory on institutional change. Therefore, I try to add an interaction for ownership. The reason that I don't choose an interaction on labor force proportion is because the association between ownership and labor force proportion. Although a p-value of 0.1336 in Fisher's exact test for Table 1 doesn't help me accept the null hypothesis of "SOEs tend to have a higher level of labor force proportion than PEs", literatures (Zweig, 2001 and Yang, 2002) still indicates some association between these two variables.

Besides the theoretical evidence for only one interaction, I also do some statistical tests to verify my judgment. For a full model with two interactions, ownership on both labor force proportion and profit per capita, I do an ANOVA (analysis of variance) test, F-test (Fox, 1997) to find a most fitted model for the data set. Table 6 in Appendix gives results of this model. Akaike information criterion (AIC) measure the goodness of fit of an estimated statistical model and a model with lowest AIC value is preferred. Results in Table 3 indicate that the interaction of ownership on proportion should be kicked out of the model and a model with only interaction on profit per capita is preferred.

Table 3

Results of Drop Any Single Terms to this Full Model
Model:

Capacity~ Ownership+ Proportion+ Profit+ Ownership× Proportion+ Ownership× Profit	Sum of Square	RSS	AIC	F-value	p-value (>F)
<none>		3381513	688.22		
Ownership× Profit	39135	3420666	686.93	0.6481	0.424
Ownership × Proportion	319526	3701057	691.81	5.2915	0.025 *

* $p \leq 0.05$

I also make an F-test in the Analysis of Variance (Fox, 1997) to compare model without interaction (Model 1) and my selection model (Model 2) with one interaction of ownership on profit per capita in fitting my data set. The assumption is that, the Model 1 in Table 4 fits the date set well and I want to test whether a new Model 2 describes the data set better than Model 1. A p-value of 0.030 supports the improvement of Model 2 performance better in explaining data set better than Model 1 at 95% confidence level.

ANOVA in these two statistical tests support my theoretical analysis on the model selection.

Table 4

F-test in Analysis of Variance

Model 1: Capacity~ Ownership+ Proportion+ Profit

Model 2: Capacity~ Ownership+ Proportion+ Profit+ Ownership× Profit

	Residual D.F.	RSS	D.F.	Sum of Square	F-value	p-value (>F)
Model 1	58	3718802				
Model 2	57	3420666	1	298136	4.968	0.030 *

* $p \leq 0.05$

D. Discussions

Business-government relations are always widely discussed no matter in democracies or in socialist reforms. Although contemporary China's steel industries do not have centralized bureaucratic management of the market with government planners that used to happen in their "planned economy" before 1978, a remaining close relationship between SOEs and the government still exists due to complicated reasons which can be best summarized by North's (1990) path dependence theory. However, in the empirical examination, the direction is opposite to the common view. It is the state-owned enterprises that lose relative bargaining power when they have economic improvements. During my field work, most of managers at SOEs complain about the dual-regulation on them from both local government and local State-owned Assets Supervision and Administration Commission. In most of the cases for SOEs, their real production capacity is approximately same as the reported one on Yearbook. The number is quite different for PEs. Take Sha Steel in Jiangsu Province as an example, its real production is 1050 ten thousand of tons while the one found in Yearbook is only 950 ten thousand of tons. Due to NDRC's monitor on production capacity quota and environmental protection policy, steel enterprises are required to immediately terminate old, low-efficient furnaces and relevant equipments when they are approved to operate new, high-efficient ones with higher production capacity. As China's largest private steel

enterprise and selective taxation contributor in Jiangsu Province, Sha Steel received relative loose supervisor from municipal NDRC de facto. Being a private enterprise gives Sha Steel the flexibility in operating both old and new furnaces at the same time and seizes more production capacities. PEs also take the advantage of blind spot in their supervision with the trick⁷ like reporting a lagged schedule of new furnaces and equipments. A manager at Ma Steel, a large SOE in Anhui Province, told me that, for large SOEs others than three of them directly supervised from the SASAC of the State Council (which is Bao Steel, An Steel and Wu Steel), NDRC, SASAC and government in each level like mother in-laws that you need to pay exceptional attention to.

The core spirit of “well managing large enterprises while adopting a flexible policy toward small ones” in the beginning of SOE reforms treats the large SOEs and small-medium-sized SOEs separately. While CCP prefers to establish large SOEs into highly competitive large enterprises groups with trans-regional, inter-trade, cross-ownership and trans-national operations, they also quicken the pace in relaxing the control over small-medium-sized enterprises and invigorating them by way of reorganization, association, merger, leasing, contract operation, joint stock partnership or sell-off. CCP became more liberal in privatization of the state-owned sectors and also was conscious with the forthcoming aftermaths of bankruptcy, laid-off workers and merger in the small-medium-sized SOEs, which brought problems of mass unemployment at the first three years after 1997. The number of establishment fell rapidly since 1998, mirroring the reduction in the number of state-owned industrial establishments, the share of gross industrial output accounted for by SOEs was falling. China’s old system of state ownership was receding rapidly (Yusuf, Nabeshima, and

7 From the interviews with a manger at Yong Steel, a township private enterprise in Jiangsu Province.

Perkins, 2006). For China's steel industry, most of large SOEs listed as the top ten steel industries by the China Metallurgical Enterprises Management Association⁸ were forced to separate with their affiliated collective economy factories that produce low-end steel products to improve their own strength in the market. Those small-medium sized SOEs in China's steel industry that used to get subsidy from large SOEs and the local government,⁹ were vulnerable in the market-oriented competition with a competitive mechanism selecting the superior and eliminating the inferior when government relaxed the control on them. Many were forced to quit the market or soon privatization. Situations are much better for PEs in the commanding heights domain. Some PEs emerge in the market through management buy-outs (MBO) and some are the township village enterprises (TVEs). Let me take Sha Steel I mentioned before for another example. Sha Steel was an iron and steel enterprise incorporated with self-financing in 1975 and grew as a regional PE. The SOE reform gives it an opportunity to absorb international capitals, build the joint stock partnership with a foreign enterprise. Sha Steel developed dramatically and soon became a national key enterprise in 1999. Meanwhile, due its remarkable growth in its size (in terms of number of employees and production capacity) and high profits compared to other regional enterprises, Sha Steel grows to be more and more influential in regional economy: its former leader once selected to be one of heads in the local municipal government. And the proposal for increasing to 1050 millions of ton production furnaces and equipment was approved at that time.

8 The former professional association of China Iron & Steel Association. It is a weak professional association and are financially supported by both its member and the government.

9 Xinhua She (News Agency), Wo Guo Guoyou Qiye Sannian Gaige Yu Tuopin de Licheng (Three Years of China's SOEs Reform and Poverty Elimination), Dec. 12, 2000, <http://www.china.com.cn/chinese/2000/Dec/13585.htm>

There are many standards to evaluate the efficiency of an enterprise and this thesis concentrates on the separation of enterprise from administration (Zhang, 1997). State-owned enterprises (guoyou qiye) used to be state-run enterprises (guoying qiye) in China under the old pattern of the “planned economy” and the state held a dual-status of both the owner and administrator of the SOEs (Yang, 2004). Accordingly, SOEs also should take parts of the government’s responsibilities for the welfare of the whole societies, that nearly all of them had affiliated public service units in health care and education (usually from kindergarten, elementary schools, middle schools to technician vocational schools). The SOE reform started since CCP’s 15th National Congress, especially the requirement on “separation of enterprise and administration” helps SOEs negotiate with their local government and separate their sectors like hospital and schools from the enterprises in 1998. While SOEs sometimes are eager to fully concentrate on the corporation governance, local governments are reluctant to receive these public service units. As a return of taking care of the public sectors like hospitals and schools, SOEs also earn relative bargaining powers on distributional benefits, as an agent for local government, local NDRC sometimes turn a blind eye to the environmental protection problems and do political lobbying at provincial even state level for favored asymmetric resources like production capacity or low-rate loans. On the contrary, most of PEs in the steel industry were more independent and flexible, and don’t meet with this kind of burden on their way to become modern enterprises in the market competition.

Early case studies made by Steinfeld (1998) criticized ambiguous property rights of SOEs and the absence of the final authorized proxy in China’s steel industry reform. Aimed to solve this problem and build a clear principal-agent relation, the State-owned Assets Supervision and Administration Commission of the State Council was set up in 2003 on the principle of separating government administration from

enterprise management and separating ownership from management power, remaking Chinese Leviathan. SASAC performs the responsibility as the investor on behalf of the state; supervises and manages the state-owned assets of enterprises according to law; guides and pushes forward the reform and restructuring of SOEs. SASAC also directs and supervises the management work of local state-owned assets. All others SOEs are administrated by provincial state-owned assets management authorities. This restructuring arrangement solves the problem in Steinfeld's fieldwork to some extent but phenomenon of the lack of final authorized proxy of the state-owned assets still exists. Nevertheless, the group of formal institutions that separates administration from enterprises improves the enterprises efficiency and force SOEs to be more market-oriented and independent to survive in the competition with PEs, no longer playing a mixed role of both the policy-maker (government) and policy-implementers (enterprises).

IV. Conclusion

The primary goal of this thesis is to understand status quo of competitions in on the steel industry after China's SOE reform. More specifically, examine the effect of the SOE reform for a commanding heights industry on the distributional benefits within actors, does private enterprises gain relatively bargain power due to their role of honest seekers of profit maximization. And a simple answer is yes based on my analysis.

To dissect this puzzle, I choose appropriate theories on institutions, operationalize concepts based on theories and literatures, conduction statistical regression for a fitted model and do post-test examination. This work treats the role of ownership equally to other fundamental explanatory variables. SOEs and PEs are combined to be a whole group for study. Within the theoretical frame of relative bargaining power theory, both political logic of decreasing transaction costs when

reforming formal “planned economy”, keeping social stability, as well as the economic logic of seeking profit maximization are discussed in one model. I use quantitative data collected from field work and research with statistical inference while qualitative analysis from interviews for amendment of the model. Different from previous work focus on business-government relations, NDRC is viewed as an external agent for the government; and the business actors of enterprises are examined from three perspectives at the same time. The whole works can be viewed as a case study for analysis on the procedure of remaking “Chinese Leviathan” in decentralizing government and making economic transition under authoritarian regimes.

Results of the model are somehow different from my original prediction. Ownership matters when interactive with the economic performance of enterprises in this heavy industry. However, the director is the opposite. It is the state-owned enterprises that lose relative bargaining power when they have economic improvements. Private enterprises usually become more flexible at provincial and municipal level and receive loose monitor due to the blind spot in their supervision. Strong PEs grow to seek for a solid positions in the business-government relations, especially at the local level where regional government paid more attention to short-run interests instead of the label on the enterprises as state-owned ones or private ones. Empirical results of the social stability reveal the nature of authoritarian communism regime in prevention from turmoil brought by mass unemployment. Regardless of ownership, enterprises do contributions on employment issue obviously gain relative more distributional benefits in seeking for bargaining power.

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Appendix

Table 5

Determinants of Production Capacity without Interaction.

	Estimate	Standard Error	p-value
(Intercept)	143.052	(77.676)	0.071
Ownership: SOE	-18.489	(87.361)	0.833
Laborforce Proportion	4462.933	(1139.847)	0.000*
Profit (per capita)	527.142	(103.545)	0.000*
N	62		
Residual Standard Error	253.214		
R^2	0.434		

* $p \leq 0.05$

Table 6

Determinants of Production Capacity with Two Interactions: Ownership interactive with both Labor force Proportion and Profit per capita.

	Estimate	Standard Error	p-value
(Intercept)	-57.222	123.401	0.645
Ownership: SOE	191.333	133.276	0.157
Laborforce Proportion	10348.133	7326.814	0.163
Profit (per capita)	2047.563	668.039	0.003*
Ownership: SOE \times Proportion	-5966.856	7411.814	0.424
Ownership: SOE \times Profit	-1554.405	675.731	0.025*
N	62		
Residual Standard Error	245.733		
R^2	0.485		

* $p \leq 0.05$

Table 7

List of All Steel Enterprises Recorded by Yearbook Compiled by China Iron and Steel Association in 2004.

No.	Ownership	Capacity	Employee	Labor	Portion	Profit*	Per Capita
1	SOE	1514	132057	4170000	0.03166835	219430	1.66163096
2	SOE	1190	144400	1460000	0.09890411	108380	0.75055402
3	SOE	1036	86604	5740000	0.0150878	10700	0.12355088
4	SOE	1000	120000	10850000	0.01105991	36200	0.30166667
5	SOE	903	62487	580000	0.10773621	6093	0.09750828
6	SOE	850	48765	4320000	0.01128819	18730	0.38408695
7	PE	1050	9500	860000	0.01104651	3746.8	0.3944
8	SOE	710	46000	1970000	0.02335025	2330	0.05065217
9	SOE	590	40458	3350000	0.01207701	783	0.0193534
10	SOE	425	36613	1380000	0.02653116	29540	0.80681725

11	SOE	680	36800	1240000	0.02967742	273	0.00741848
12	SOE	620	68908	970000	0.07103918	28400	0.41214373
13	SOE	507	71415	1420000	0.05029225	29530	0.41349856
14	SOE	567	103345	670000	0.15424627	3110	0.03009338
15	SOE	449	37913	1000000	0.037913	1699	0.04481312
16	SOE	110	6368	7660000	0.00083133	883	0.13866206
17	SOE	200	4807	4780000	0.00100565	735	0.15290202
18	SOE	230	7083	560000	0.01264821	940	0.13271213
19	SOE	72	61038	2710000	0.02252325	42870	0.70234936
20	SOE	50	NA	5590000	NA	285	NA
21	SOE	310	33712	1310000	0.02573435	15030	0.44583531
22	SOE	70	10575	850000	0.01244118	3270	0.30921986
23	SOE	600	16594	4880000	0.00340041	25140	1.51500542
24	PE	94	3345	1170000	0.00285897	744	0.22242152
25	SOE	99	10976	2760000	0.00397681	1738	0.15834548
26	SOE	93	11265	280000	0.04023214	1254	0.11131824
27	SOE	160	28751	780000	0.03686026	1025	0.03565093
28	SOE	70	11261	2480000	0.00454073	1130	0.10034633
29	SOE	50	10574	310000	0.03410968	650	0.06147153
30	SOE	140	18667	1850000	0.01009027	1560	0.08356994
31	SOE	35	6100	930000	0.00655914	324	0.05311475
32	SOE	100	14787	4280000	0.00345491	685	0.04632447
33	SOE	178.6	15887	890000	0.01785056	2136	0.13444955
34	SOE	160	13865	960000	0.01444271	1273	0.09181392
35	SOE	250	24790	10110000	0.00245203	1450	0.05849133
36	SOE	260	24300	420000	0.05785714	113	0.00465021
37	SOE	400	23053	270000	0.08538148	2052	0.08901228
38	SOE	500	6284	160000	0.039275	1936	0.30808402
39	SOE	135	18521	1720000	0.01076802	1599	0.08633443
40	SOE	95	12374	7660000	0.0016154	802	0.06481332
41	SOE	350	25000	380000	0.06578947	580	0.0232
42	PE	300	18000	NA	NA	2291	0.12727778
43	SOE	300	33787	1150000	0.02938	1001	0.02962678
44	PE	300	17742	450000	0.03942667	249	0.01403449
45	PE	170	8000	2960000	0.0027027	263	0.032875
46	PE	60	2000	380000	0.00526316	37	0.0185
47	SOE	121	13666	1290000	0.0105938	750	0.05488073
48	SOE	600	40000	970000	0.04123711	1001	0.025025
49	SOE	185	11000	650000	0.01692308	1000	0.09090909
50	SOE	229	4026	850000	0.00473647	2060	0.51167412
51	SOE	200	6882	1770000	0.00388814	620	0.09009009
52	PE	200	4600	860000	0.00534884	649	0.14108696
53	PE	200	5600	860000	0.00651163	397	0.07089286
54	PE	60	4881	1680000	0.00290536	138	0.02827289

55	SOE	70	13455	1560000	0.008625	-191	-0.0141955
56	PE	350	11642	810000	0.01437284	650	0.05583233
57	SOE	180	10460	1800000	0.00581111	425	0.04063098
58	PE	60	7900	960000	0.00822917	306	0.03873418
59	SOE	160	5144	1240000	0.00414839	267	0.05190513
60	PE	40	2542	810000	0.00313827	96.2	0.03784422
61	SOE	300	19672	700000	0.02810286	1784	0.09068727
62	SOE	120	18666	4520000	0.00412965	465	0.0249116
63	SOE	65	17357	1990000	0.00872211	5	0.00028807
64	SOE	45	6805	780000	0.00872436	195	0.0286554

Note: 1. * Profit is recorded in currency unit by every million of Chinese RMB. Portion and Per Capita in the table are calculated by Labor and Profit over Employee respectively. 2. Out of 64 observations, there are two observations (obs #20, #42) have missing data.

Source: 1. 2005 Nian Zhongguo Gangtie Gongye Nianjian. 2. Zhonghua Renming Gongheguo Xingzheng Quhua Jiance 2005. 3. Fieldwork of data collection and interviews in An Steel (Liaoning), Bao Steel (Shanghai), Sha Steel (Jiangsu) and Ma Steel (Anhui) in 2008.