

# **The Change of Performance of Chinese Large-sized Private Enterprises and Its Determinants (2004-2006)**

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Using the data collected by All China Federation of Industry and Commerce, this paper studies the change of performance of Chinese large-sized private enterprises and its possible determinants. The study finds that the financing difficulty of private firms, due to Chinese government's control policy, is the major factor resulting in the worsening performance of these large private firms.

*Keywords:* Large-sized private enterprises, Technical efficiency, Financing constraint

*JEL Classification:* F16, F12

## **I. Introduction**

Chinese private enterprises have been developing very rapidly in the 1990s and early 21<sup>st</sup> century. From 1989 to 2002, the registered capital and the sales revenue of Chinese private enterprises have been growing at an annual average rate of more than

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50 percent.<sup>1</sup> By 2006, the number of private firms has reached 4.65 million, and private enterprises have contributed more than a half to the GDP of China.<sup>2</sup>

Compared with the fast growth of Chinese private enterprises in the 1990s and beginning of 21<sup>st</sup> century, the growth has been slowing down since 2003. From 1990 to 2002, the sales revenue of Chinese private enterprises grew at an annual average rate of 59.75 percent.<sup>3</sup> From 2003 to 2005, the sales revenue grew at an average annual rate of 28.34 percent, which is much lower than that of 1990s. The growth rate of value-added of Chinese large-sized private firms was also slowing down since 2003, it was 65.21 percent in 2003, but was only 42.43 percent in 2005.<sup>4</sup>

Under this background, our question is: Why has the growth of private firms been slowing down since 2003? And what is the change of performance in terms of technical efficiency and profit margin of Chinese private firms in recent years? It seems that the performance declines, but we need data to confirm (or refute) it.

The next question is: If the efficiency and profitability of private enterprises also decreased, then what are the factors that have resulted in the changes? Is it due to market fluctuations, government policies, or any other factors? This question could best be answered empirically. Fortunately, surveys of All China Federation of Industry and Commerce (ACFIC) provide us with data on Chinese large private firms for several consecutive years. With the firm-level data at hand, we are able to measure the change of performance of Chinese large private firms and figure out factors that may have resulted in the change of their performance.

In 2003 and 2004, the Chinese government launched a round of so-called "macro-control." Under the macro-control policies, commercial banks were asked to cut loans and reclaim loans already released. And many projects in iron and steel, aluminum and cement, *etc.* were halted or canceled. The macro-control policy coincided in time with the downturn of Chinese large-sized private firms. Is there any correlation between these two events? By our conjecture, there should be some connections between the two

<sup>1</sup> Source: ACFIC(All China Federation of Industry and Commerce), 2006.

<sup>2</sup> Source: <http://news1.jrj.com.cn/news/2006-11-10/000001772932.html>.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

events, not just by chance. We hypothesize the macro-control policy, with an emphasis on credit contracting, had an adverse effect on private firms. Based on it, to what extent the large private firms were affected under the policy, and are there any other factors that may have contributed to the change of performance of Chinese large private firms in recent years? For all above, we will try to test and find the reasons for such performance changes.

In recent years, many studies in this area focus on companies listed on the stock market, measuring their performance and analyzing the determinants. Also there are some studies concerning the comparison of performance and efficiency of firms with different ownerships. For Chinese private enterprises, a lot of studies focus on the governance structure of private firms theoretically, such as Zhang (2006). Chen and Cao (2007) studies several cases of Chinese private firms, they point out that the institutional environment determines the development of Chinese private enterprises during the past two decades. But very few scholars do empirical studies on private enterprises.

ACFIC has an annual report on the development of Chinese large-sized private enterprises. But these reports just simply described the general statistical figures, lacked a systematic analysis for several consecutive years, thus failed to measure the changes of performance and to find the underlying determinants. Up to now, there are almost no empirical studies that focus on Chinese private enterprises, perhaps due to the unavailability of data. Our study in the present paper will do such empirical work to fill this void.

The rest of this paper is organized as follows. Part II explains the source of the data and methodology used in this paper, and also gives the econometric models. Part III measures the performance of Chinese large-sized private enterprises, namely the technical efficiency and profit margin, to find the tendency of changes. Part IV provides the regression results and gives corresponding explanations. And Part V concludes the paper.

## **II. Data and Methodology**

The data used in this study come from the annual surveys of ACFIC. ACFIC and its local branches conduct surveys throughout

China on large-sized private enterprises annually. ACFIC first designs questionnaire, and private firms fill in the questionnaire voluntarily. According to the statistical standards of ACFIC, only those private firms with annual sales revenue exceeding or equal to RMB200 million are included in the survey from 2004 to 2006. In 2004, the number of private firms satisfying this standard was 2119, and the number in 2005 and 2006 was 2688 and 3191 respectively. They are the leading and most competitive private firms of China. The dataset contains information on Chinese large private firms' sales revenue, assets, profits, taxes, and employment, and also some information about conditions of firm's financing and investment, marketing and management, and major problems they encounter during their development recently.

We should point out that the dataset could be biased, since the surveys are not conducted on a random sampling or all-inclusive investigation, but on willingness of the respondents. Generally speaking, firms with good performance may be more likely to join in the survey, while those with bad performance may decline to do so. We think the problem should not be serious since the surveys generally cover most Chinese large-sized private enterprises in normal operation. Therefore, the datasets can, to a great extent, represent the population of Chinese large-sized private enterprises.

Another limitation of the dataset is that it is not panel data, but cross-sections, even there are 3 years data. That is to say, not only the number of firms (as mentioned above), but also the firms covered in each year's survey may differ. So what we have at hand are cross-sections of each year. So what we can do with the dataset is to do comparative static analysis, rather than dynamic analysis.<sup>5</sup> Even so, we can still capture the change of performance of Chinese large-sized private firms for several consecutive years and try to figure out the determinants underlying the change. Of course, the underlying assumption is that each year's cross-section can basically represent the population of Chinese large-sized private enterprises. The rationale is the all firms entering the sample must satisfy the RMB200 million threshold — those firms with lower sales revenue than this threshold are excluded from the sample.

<sup>5</sup> One referee suggests that we should use only those firms that survived throughout the period to do dynamic analysis, but that would result in a too small sample size to do reliable analysis.

Therefore, even if certain sample selection bias exists, the sample can still represent most of the large-sized private enterprises. In addition, it is unnecessary to do deflations for the cross-sections since the effect of price fluctuations on all firms is the same.

According to the dataset, Chinese large-sized private enterprises are operating in most manufacturing industries, and also wholesale and retailing sectors. Most of them are operating in labor-intensive industries, such as electrical machinery, textile and chemical fiber, clothing, shoes, and leather production, black metal and non-ferrous metal rolling and processing, general and special equipment manufacturing, *etc.* And there are also a lot of large-sized private enterprises lie in real estate and architecture industry. Very few of them are operating in finance and insurance, tobacco, culture, sports and entertainment industries.

In order to examine the change of performance of Chinese large private firms, we choose some indicators to represent performance. In general, efficiency and profitability of the firms are good measurements for enterprise's performance. The two indicators are widely used to demonstrate a firm's competitiveness and comprehensive strength.

To measure efficiency of the private firms, we use the *Farrell Input-Saving Measure of Technical Efficiency*. By using Data Envelope Analysis (DEA), we can calculate the Farrell technical efficiency. The software we used is called *OnFront*. Efficiency measurement tells us about how well a firm is doing relative to some benchmark. By using input-saving measure of technical efficiency, we define the benchmark firms as those that produce a given level of goods or services with the fewest resources or lowest cost. Given our data, we calculate the technical efficiency for each industry from 2004 to 2006.

We use profit margin, defined by net profit over sales revenue, to measure profitability of large private enterprises. We also calculate profit margin for each industry from 2004 to 2006. Apart from this definition of profit margin by net profit over sales revenue, ROA is another alternative. When we use ROA as the dependent variable, the *R* squared of the regression is lower than former one. That is because the statistics of net profits over sales revenue is more reliable, and it is determined by the firms' competitiveness or characteristics of industries. But the statistics of total assets seems not good measurement in private firms, because the fluid assets

are very hard to compare with each other in distorted financial or capital market, and also there are no same rules for depreciation rates of assets between the firms and industries. Even in the same industry, due to the different sources of capital and statistical caliber, the balances of fluid assets are also incomparable. ROE (Rate of Return on Common Stockholders' Equity) is also an alternative to measure profit margin, but it is not available from our data.

Multiple linear regression models are used to test the possible factors that have resulted in the change of performance of Chinese large-sized private firms. Specifically, we use two models. The first one is a Cobb-Douglas production function regression model. In this model, sales revenue is treated as the dependent (explained) variable, which measures the output of firms, and fixed asset measures capital input, and number of employees in a firm measures labor input. In the second model, profit margin is used as the dependent variable.

The Cobb-Douglas production function regression model is constructed as follows:

$$Y = AK^\alpha L^\beta \text{EXP} \left( \sum_i d_i X_i \right) \quad (1)$$

By taking natural logarithm at both sides of Equation (1), we get

$$\ln Y = c + \alpha \ln K + \beta \ln L + \sum_i d_i X_i \quad (2)$$

where  $Y$  is sales revenue,<sup>6</sup> measuring output, and  $K$  and  $L$  are fixed assets and number of employees measuring capital and labor inputs respectively.  $\alpha$  and  $\beta$  measure the output elasticity of capital and labor.  $X_i$  measure all other variables that may affect output of a firm.

The profit margin regression model is constructed as follows:<sup>7</sup>

<sup>6</sup> Output is better measured by value-added of a firm, but due to the limitation of our data, we use sales revenue as a proxy.

<sup>7</sup> We did not include scale variable into the regression model. When we add such variable into models, the  $R$  squared only increased by one percentage point in one year, or no change in other years. The scale

$$\frac{\pi}{Y} = c + \sum_i d_i X_i \quad (3)$$

where  $\pi$  is net profit of a firm,  $Y$  is sales revenue, and  $X_i$  measure all other variables that may affect the profit margin of a firm. The  $X_i$  variables meaning in each regression are as follows:

- Human resource represented by **RLZY**: proportion of employees with at least a bachelor's degree in a firm
- Financing difficulty represented by **Financing**: for firms that believe financing difficulty is a major problem hindering their development, let the variable be 1, otherwise, 0
- Industry dummies represented by **hy1-hy25**: industry 1-25 are 25 industry dummies, if a firm belongs to an industry, let the industry dummy be 1, otherwise, 0
- Source of capital for investment:
  - **Source 1**: for firms whose capital for investment come from self deposit, let the variable be 1, otherwise, 0
  - **Source 2**: for firms whose capital for investment come from borrowing from private channels, let the variable be 1, otherwise, 0
  - **Source 3**: for firms whose capital for investment come from bank loans, let the variable be 1, otherwise, 0
  - **Source 4**: for firms whose capital for investment come from capital market (direct financing), let the variable be 1, otherwise, 0
  - **Source 5**: for firms whose capital for investment come from other channels (except the above four), let the variable be 1, otherwise, 0

variable does not make much difference for the whole of the model, and after including the scale variable, the effect on financing is weakened, which implies that financing is to a great extent affected by scales. That is, larger firms are easier to obtain bank loans, and also easier to get opportunities to finance from the stock market. All this is consistent with our intuition. Since the effect of firm size on performance is not our main focus in this study, we omitted the scale variable, and focused on the effects of difference financing sources on firm performance.

**TABLE 1**  
CHANGE OF TECHNICAL EFFICIENCY OF CHINESE LARGE-SIZED  
PRIVATE ENTERPRISES: 2004-2006

Industry	Industry mean efficiency		
	2004	2005	2006
Food processing, food and beverage production	0.798	0.593	0.799
Textiles and chemical fiber manufacturing	0.719	0.678	0.792
Apparel, shoes, hat, and leather production	0.762	0.628	0.798
Timber processing, wood, bamboo, vine, and furniture	0.803	0.589	0.730
Paper making, printing, and office products	0.815	0.539	0.711
Non-metal mineral products (incl. cement, glass, etc.)	0.818	0.713	0.568
Black metal, non-ferrous metal melting and rolling processing	0.673	0.611	0.512
Metal products	0.581	0.343	0.657
Oil processing, coking processing	0.681	0.519	0.379
Chemical materials and chemical products making	0.708	0.544	0.389
Pharmaceutical industry	0.805	0.718	0.820
Rubber and plastic products	0.558	0.654	0.813
General and special equipment manufacturing	0.694	0.399	0.738
Transportation equipment manufacturing	0.698	0.393	0.726
Electrical machinery, equipment and cable production	0.801	0.545	0.584
Telecom equipment, computer and other electrical equipment	0.617	0.565	0.547
Instrument and metering manufacturing	0.582	0.623	0.528
Architecture industry	0.754	0.510	0.428
Wholesale and retailing	0.359	0.374	0.429
Comprehensive (including investment)	0.722	0.629	0.406

### III. Measuring Performance of Chinese Large-sized Private Enterprises

#### A. Change of Technical Efficiency: 2004-2006

Table 1 shows that compared with 2004, in 2005, technical efficiency of Chinese large-sized private firms decreased in almost all industries, except rubber and plastic products and instrument and metering manufacturing industry. Technical efficiency declined very significantly in 2005 for industries like transportation equipment manufacturing, general and special equipment manu-



facturing, paper making, printing and office products making, electrical machinery, equipment and cable production, architecture industry and metal production industry.

Compared with 2005, technical efficiency of large private firms rose in more than a half industries covered in Table 1, while decreased in less than a half industries in 2006. Technical efficiency rose dramatically in industries like metal production, transportation equipment manufacturing, general and special equipment manufacturing, while declined in industries like comprehensive (including investment), chemical materials and chemical products making, and non-metal mineral products. If 2004 is treated as the benchmark, the technical efficiency in 2006 decreased a little bit in about half industries.

#### *B. Change of Profit Margin: 2004-2006*

Table 2 shows that, from 2004 to 2005, the profit margin of Chinese large-sized private enterprises decreased, and from 2005 to 2006, it rose a little bit, but the profit margin in 2006 was still lower than that of 2004. Compared with 2004, the profit margin in 2005 decreased dramatically in industries like non-metal mineral products, oil processing and coking, telecommunication equipment, computer and other electrical products and instrument and metering production. While profit margin rose in industries like ore mining, leasing and business services, lodging and restaurant, information transmission, computer service and software. Not many private firms are operating in these industries.

Compared with 2005, profit margin dropped significantly in 2006 in industries like ore mining, lodging and restaurant, food processing, and food and beverage production, architecture and paper making and printing. While the profit margin rose a little bit in 2006 in industries like oil processing and coking, rubber and plastic products, general and special equipment manufacturing and non-metal mineral products.

It could be found that the number of industries covered in Table 1 is fewer than that of Table 2. This is because DEA is a non-parametric method, which requires each industry contain a certain number of observations. Thus those industries with too few enterprises were omitted in the calculation of technical efficiency.

**TABLE 2**  
CHANGE OF PROFIT MARGIN OF CHINESE LARGE-SIZED  
PRIVATE ENTERPRISES: 2004-2006

Industry	Profit margin		
	2004	2005	2006
Ore mining	9.19%	15.97%	10.96%
Production and supply of power, gas and water	6.83%	8.60%	6.92%
Electric machinery and cable, and cable manufacturing	6.02%	4.86%	5.15%
Real estate	8.67%	9.28%	8.18%
Textiles, and chemical fiber making	3.71%	3.66%	3.77%
Non-metal mineral products (incl. cement, glass, etc.)	11.24%	4.64%	5.88%
Clothing, shoes, caps, and leather	6.01%	5.81%	5.39%
Workmanship and other manufacturing products	4.30%	4.90%	3.96%
Black and non-ferrous metal melting, rolling and processing	5.20%	4.01%	4.52%
Chemical materials and chemical products making	4.87%	5.99%	5.45%
Architecture industry	3.94%	2.79%	0.58%
Transportation, warehousing and post	3.14%	2.84%	1.99%
Transportation equipment manufacturing	3.49%	3.67%	4.54%
Metal products	4.76%	3.51%	4.36%
Timber processing, and wood, bamboo, vine and furniture	4.61%	5.12%	5.25%
Agriculture, forestry, animal husbandry and fishery	5.45%	4.63%	3.73%
Wholesale and retailing	1.51%	1.47%	1.58%
Oil processing, and coking	7.81%	3.89%	6.19%
Food processing, and food and beverage production	4.79%	4.79%	1.90%
Telecom equipment, computer and other electronic products	3.98%	1.36%	1.44%
General and special equipment manufacturing	5.42%	5.05%	6.37%
Rubble and plastic products	5.17%	5.26%	6.80%
Information transmission, computer service and software	4.43%	7.15%	6.27%
Pharmaceutical industry	6.66%	7.58%	5.92%
Instrument and metering production	6.72%	4.43%	4.42%
Paper making and printing, office products	5.36%	6.45%	4.44%
Lodging and restaurant	10.55%	13.28%	8.45%
Comprehensive (including investment)	5.10%	5.47%	5.14%
Leasing and business service	0.95%	4.97%	3.01%
Total	4.83%	4.22%	4.45%

Table 1 and 2 all show that the performance of Chinese large-sized private firms, measured by technical efficiency and profit

margin, dropped in 2005 and was improved a little bit in 2006, but still lower than that of 2004. That is to say, a declining trend is obvious of the performance of Chinese large private firms, in terms of efficiency and profitability.

#### **IV. Regression Analysis and Explanation**

By constructing regression models, we tested all possible factors that may affect the performance of Chinese large-sized private firms and listed several variables in the tables that were statistically significant. According to the regressions, financing difficulty stands out as one of the most important factors that have resulted in the decline of technical efficiency and profit margin of Chinese large-sized private enterprises since 2003.

Table 3 presents the regression result of the Cobb-Douglas production function model. By controlling industry variables, financing difficulty has a negative effect on efficiency of firms. This effect was not very statistically significant in 2004, but very significant in 2005 and 2006, especially in 2005.

The variables of sources of capital for investment demonstrate varied effects. Capital from private borrowing has a statistically significant negative effect on efficiency. This implies that firms that cannot get bank loans and thus have to rely on private borrowings will be adversely affected. Capital directed financed from capital market has a statistically significant positive effect on firm's efficiency. Capital from banks shows different effects. In 2005, bank loans have no effect on firm efficiency, but in 2006, the effect is positive and statistically significant. This implies that it was hard for firms to get loans in 2005 and thus their reliance on banks was very weak, but in 2006 the situation was improved, and thus bank loans have a statistically significant positive effect on firm efficiency.

Financing difficulty is a common problem for Chinese private enterprises, but this problem is more severe for small and medium-sized private firms than for large ones. However, during the 2004-2006 macro control period, the financing situation of large private firms also worsened. Even large private firms faced severe liquidity constraint.

**TABLE 3**  
FACTORS AFFECTING OUTPUT OF CHINESE LARGE-SIZED  
PRIVATE ENTERPRISES: 2004-2006

Dependent variable:	2004		2005		2006	
	Coefficient	T value	Coefficient	T value	Coefficient	T value
LNK	0.246	15.03	0.296	20.39	0.307	23.17
LNL	0.269	13.88	0.219	13.08	0.209	13.73
HY1	-0.066	-0.91	0.107	1.82	0.122	2.16
HY2	-0.0116	-0.12	0.223	2.67	0.302	4.05
HY3	-0.0003	-0.00	0.087	0.59	-0.012	-0.10
HY4	-0.0659	-0.51	-0.077	-0.66	-0.147	-1.26
HY5	0.347	4.42	0.525	8.13	0.665	11.15
HY6	0.479	0.81	0.261	3.15	0.417	5.79
HY7	0.083	0.41	0.162	0.12	0.166	1.61
HY8	0.034	0.39	0.079	1.14	0.127	2.01
HY9	-0.323	-2.84	-0.064	-0.67	-0.028	-0.31
HY10	-0.032	-0.24	0.081	0.75	0.065	0.60
HY11	-0.152	-1.74	0.057	0.78	0.032	0.47
HY12	-0.020	-0.19	0.152	1.70	0.095	1.11
HY13	0.194	2.33	0.288	4.26	0.366	6.01
HY14	0.002	0.01	0.353	1.98	0.008	0.04
HY15	-0.054	-0.34	0.093	0.70	0.167	1.11
HY16	-0.504	-2.69	0.335	2.21	-0.060	-0.49
HY17	-0.264	-1.02	-0.099	-0.73	-0.159	-0.86
HY18	0.008	0.09	-0.153	-0.74	0.534	7.84
HY19	0.080	0.31	0.443	6.23	0.051	0.33
HY20	0.399	1.53	0.098	0.46	0.491	1.83
HY21	0.814	9.67	0.584	2.77	1.000	15.16
HY22	-0.141	-0.87	1.136	15.94	0.227	1.76
HY23	-0.700	-2.50	0.162	0.53	0.277	1.10
HY24	0.193	2.00	0.474	5.72	0.381	1.55
HY25	0.115	1.08	0.221	2.32	0.349	4.42
RLZY	0.010	11.01	0.007	8.55	0.008	10.98
Financing	-0.051	-1.53	-0.097	-3.23	-0.085	-3.04
Source 1	-	-	0.098	3.02	0.016	0.55
Source 2	-	-	-0.201	-2.39	-0.204	-2.04
Source 3	-	-	-0.005	-0.15	0.061	2.13
Source 4	-	-	0.215	3.91	0.210	5.07
Source 5	-	-	-0.014	-0.24	-0.022	-0.39
Adj. R-sq.	0.4530		0.4951		0.5080	
F value	47.19		63.12		85.69	
Observations	1674		2218		2790	

Notes: LNY stands for the logarithm of sales revenue, LNK stands for the logarithm of fixed asset, LNL stands for the logarithm of number of employees;

RLZY stands for proportion of employees with at least a bachelor's degree. Financing stands for those firms who answer that financing is a big problem in their development. Source 1, 2, 3, 4, and 5 stand for firm's capital for investment coming from self deposit, borrowing from private persons, banks, capital market and, and others. HY0 stands for food and beverage, which is the benchmark industry. HY1 stands for textile and chemical fiber industry, HY2 stands for clothing, shoes and hat industry, HY3 stands for timber processing, wood, bamboo, vine, palm fiber, and grass processing, and furniture making, HY4 stands for paper making and printing industry, HY5 stands for black and non-ferrous metal processing, HY6 stands for metal products industry, HY7 stands for oil processing industry, HY8 stands for chemical materials and chemical products making, HY9 stands for pharmaceutical industry, HY10 stands for rubber and plastic industry, HY11 stands for general and special equipment industry, HY12 stands for transportation equipment manufacturing, HY13 stands for electrical machinery and equipment industry, HY14 stands for instrument and metering industry, HY15 stands for workmanship and other manufacturing industry, HY16 stands for ore mining industry, HY17 stands for production and supply of power, gas, heat and water, HY18 stands for architecture industry, HY19 stands for transportation, warehousing and post industry, HY20 stands for Information transmission, computer and other electronic products industry, HY21 stands for wholesale and retail, HY22 stands for agriculture, forestry, animal husbandry, and fishery industry, HY23 stands for lodging and restaurant industry, HY24 stands for real estate, HY25 stands for comprehensive industries, including investment-oriented firms.

The variable of human resource, measured by the proportion of employees with at least a bachelor's degree in a firm, showed a statistically significant positive effect on firm efficiency, and this effect was very stable in three consecutive years, 2004-2006. This shows that human resource is of critical importance for the development of Chinese large private firms; and the logic also holds conversely — lack of human resource must be detrimental to firm's further development. According to the annual surveys of ACFIC, lack of human resources is universally considered as one of the top three biggest problems faced by Chinese large-sized private firms. See Table 5.

Table 4 shows the result of regression with profit margin as the explained variable. As in Table 3, financing difficulty has a statistically significant negative effect on the profit margin of firms in 2005 and 2006, although the effect is not very significant in 2004. Table 3 and 4 both show that capital for investment from self-deposit has a statistically significant positive effect on firm's performance in 2005, but not significant in 2006. This may be related to the macro control effect in 2005. Since most firms were not able to get bank loans, only those firms with relatively

**TABLE 4**  
FACTORS AFFECTING PROFIT MARGIN OF CHINESE LARGE-SIZED  
PRIVATE ENTERPRISES: 2004-2006<sup>8</sup>

Dependent variable: Profit margin	2004		2005		2006	
	Coefficient	T value	Coefficient	T value	Coefficient	T value
Intercept	5.117	8.64	6.027	13.74	6.016	15.89
HY1	-0.915	-1.32	-0.975	-2.12	-2.147	-4.83
HY2	0.831	0.94	0.305	0.47	-0.441	-0.76
HY3	0.925	0.61	2.349	2.00	-1.156	-1.21
HY4	-0.335	-0.27	1.759	1.90	-0.968	-1.06
HY5	-0.515	-0.68	-1.223	-2.41	-0.917	-1.96
HY6	-0.649	-0.73	-1.038	-1.60	-2.075	-3.67
HY7	2.95	1.52	-0.082	-0.08	0.087	0.11
HY8	0.360	0.43	1.079	1.99	-0.476	-0.96
HY9	2.983	2.72	3.813	5.11	-0.412	-0.57
HY10	2.307	1.83	-0.780	-0.92	-0.737	-0.88
HY11	0.520	0.62	0.612	1.07	1.279	2.41
HY12	-1.682	-1.55	-0.569	-0.81	-1.047	-1.56
HY13	0.314	0.39	0.656	1.24	-0.744	-1.55
HY14	6.736	2.51	1.297	0.92	0.580	0.40
HY15	-0.816	-0.53	0.569	0.54	-2.729	-2.30
HY16	4.762	2.64	12.571	11.77	5.713	5.91
HY17	3.740	1.50	3.579	2.21	-0.874	-0.60
HY18	-1.004	-0.12	-1.960	-3.71	-0.044	-0.28
HY19	-1.276	-0.51	-0.565	-0.33	-2.292	-1.90
HY20	-1.885	-0.75	1.065	0.65	-1.764	-0.84
HY21	-4.044	-5.12	-3.646	-6.68	-4.837	-9.56
HY22	2.226	1.42	1.233	1.03	-1.883	-1.85
HY23	5.010	1.87	9.658	4.07	1.914	0.98
HY24	3.923	4.27	4.066	6.30	2.178	3.32
HY25	1.688	1.65	0.959	1.29	-0.559	-0.90
RLZY	0.023	2.65	0.016	2.60	0.010	1.75
Financing	-0.506	-1.58	-0.830	-3.52	-0.829	-3.76
Source 1	-	-	0.464	1.85	0.186	0.81
Source 2	-	-	-0.101	-0.15	-1.550	-1.96
Source 3	-	-	-0.199	-0.84	-0.165	-0.74
Source 4	-	-	1.108	2.61	1.766	5.55
Source 5	-	-	0.126	0.27	0.333	0.76
Adj. R-sq.	0.0737		0.163		0.096	
F value	5.76		14.55		10.30	
Observations	1677		2228		2791	

Note: The same with Table 3.

abundant self-deposit can have good performance. Then in 2006, when the bank credit was loosened, the effect of self-deposit was weaker.

Table 3 and 4 also both show that capital directly financed from capital market has a statistically significant positive effect on both efficiency and profit margin of firms. This implies that listed-firms are less liquidity constrained by the government's macro-control policy. However, capital from banks has a varied effect on firm performance, but bank loans have a stronger effect on firm's efficiency than on profit margin.

All above regressions show that financing difficulty is one of the most important determinants of the performance of Chinese large-sized private firms. It leads to, directly or indirectly, the decline of performance of Chinese large private firms since 2003.

The regressions also explain the minor increase of technical efficiency in 2006 and a little bit increase in profit margin in 2006. If we compare the regression results of 2005 and 2006, the variable of capital for investment coming from bank loans demonstrates statistically insignificant negative effect on performance in 2005, while the effect is statistically significant in 2006. Moreover, the coefficient on financing difficulty variable is smaller in 2006 than that of 2005, although both are statistically significant negative effect. These facts show that the banks loosened credit constraint in 2006, which to some degree improved the financing conditions of Chinese large-sized private firms.

As is known to all, Chinese banks are dominated by four state-owned commercial banks. Traditionally they only serve SOEs. These state banks are generally reluctant to grant loans to private firms, especially small and medium-sized private firms. With the commercialization and governance structure reform of the banks, since the late 1990s, large private firms can get loans from state-owned commercial banks, since they have assets (say, land) as mortgages. And banks also want to earn interest from those large private firms with good performance.

But in 2003, the Chinese government believed that the economy

<sup>8</sup> Limited by the data, most of the explanatory variables are dummies. Under this circumstance, the *R* squared is generally not very high. Moreover, our main objective is to examine the effect of some special variables on profit margin, rather to examine the total effect of whole equation.

was "over-heated" and inflation was around the corner. In order to cool down the economy, the government launched a new round of so-called "macro-control." On August 23, 2003, the People's Bank of China, the central bank, raised the reserve requirement of commercial banks from 6 percent to 7 percent with a view of contracting bank loans. On April 11, 2004, the central bank further raised the reserve requirement by 0.5 percentage point. In April 2004, the private iron and steel plant under construction in east China's Jiangsu Province was shut down by the central government forcefully. And the macro-control policy was then implemented with administrative means. Under the control policy, all commercial banks, which are still state-owned or state-controlled, were asked to cut loans, although implicitly, and reclaimed loans already released.

But why were large-sized private firms most severely affected in the macro-control with an emphasis of credit contracting and loan reclaiming? First, large-sized SOEs generally have strong governmental background, so commercial banks cannot force them to repay the loans. Second, for small and medium-sized SOEs, reclaiming loans will bring about bankruptcy of them, which is now allowed by the governments. Third, for medium and small-sized private firms, they generally have little loans from commercial banks. Therefore, large-sized private firms became the major target of credit contracting of banks. After enjoying some time of relaxed credit policy, when forced to repay loans and faced with credit cut, these large private firms' cash chain was abrupt, and the performance was seriously hurt.

It is beyond doubt that the credit contracting policy worsened the financing condition of Chinese large-sized private enterprises. As a response to the government's policy, commercial banks contracted credit, cut loans to firms, which resulted in a rupture of many large private firms' cash chain, and in 2004 and 2005, some large-sized private enterprises went bankrupt due to the rupture of cash chain, and the performance of many other private enterprises deteriorated, which are direct results of government's macro control policy. Under the macro-control policy, the credit contracting of commercial banks focused on bank loans, which brought about a more severe adverse effect on private firms than on SOEs. The cutting down loans reduced directly the cash flow of private firms and hampered the normal operation of products, which resulted in the un-sustainability of private firms.



Under the macro-control policy, the bank loan cutting was very sudden and was implemented by administrative means, which interrupted the normal production plan of firms and decreased their output. Lack of working capital resulted in the interruption of planned production quota, and the fixed asset cannot be apportioned to more output, which brought about higher fixed costs. Moreover, the bank credit cutting increased the cost of using fluid capital, so firms had to resort to short-term inter-firm loans to alleviate the shortage of long-term loans, which pushed up the cost of using capital. In addition, cutting down loans resulted in many delay payment, and increased the cost of production. In short, the high costs are caused by expensive financial cost and increased fixed capital cost, which are due to discrimination of government policy, instead of uncertainty of market.

Moreover, under the government's macro-control policy, private enterprises' investment projects in iron and steel, cement, aluminum and automobile were also restrained by the government. Many undergoing projects in these industries were halted. In the macro control period, many small coal mines and power generating plants were eradicated. This industry control policy worsened the investment environment for large-sized private firms in these industries. Of course, the performance in these industries must have been harmed.<sup>9</sup>

Lack of human resource and rising price of raw materials are also two factors that may have resulted in the decline of performance of Chinese large-sized private enterprises. From the surveys, we can see that these two factors, together with financing difficulty, constitute the top three obstacles to the development of Chinese large-sized private firms.

Limited by data, we are not able to test the effect of rising price of raw materials on firm performance. The effect of lack of human resources on firm performance was also tested indirectly. However, a lot of observations and cases show that these factors must have very important effect on firm performance. This point needs further explanation.

<sup>9</sup> One referee claimed that it is hard to understand the quantity restrictions like loans cut can cause a decrease in profit margin. This is partly because loan cut made it impossible for private firms to invest in profitable projects.

**TABLE 5**  
 MAJOR DIFFICULTIES FACED BY CHINESE LARGE-SIZED PRIVATE ENTERPRISES:  
 2003-2006

No.	2003	2004	2005	2006
No. 1	Lack of human resource (24.4%)	Financing difficulty (38.6%)	Rising price of raw materials (41.3%)	Rising price of raw materials (45.8%)
No. 2	Financing difficulty (23.2%)	Lack of human resource (30.3%)	Financing difficulty (36.0%)	Lack of human resource (41.0%)
No. 3	Taxes and fees (18.4%)	Taxes and fees (25.8%)	Lack of human resource (30.9%)	Financing difficulty (36.2%)
No. 4	Market expansion (14.4%)	Land use (23.1%)	Taxes and fees (24.5%)	Taxes and fees (30.5%)
No. 5	Land policy (14.4%)	Technical innovation (19.4%)	Market expansion (17.9%)	Market expansion (20.6%)

Source: Arranged from the datasets of ACFIC.

Why did the price of raw materials rise so dramatically in recent two years? We have pointed out that although not confirmed directly from the regressions, the rising price of raw materials may be another factor that have resulted in the decline of private firm's performance, especially the decline of profit margin in recent years. By 2002, most SOEs in competitive industries, especially small and medium-sized ones, have been privatized. And now SOEs are mainly operating in "upstream industries," such as coal, oil, ore mining, and iron and steel, while private firms are mainly operating in "downstream industries," which are generally labor-intensive manufacturing industries. Those upstream industries in which large SOEs are operating are generally monopolized. And it is very difficult, if not impossible, for private firms to enter these industries.

The "division of industry" between SOEs and private firms in China implies that the outputs of SOEs are inputs of private firms. After 2004, the monopoly power of SOEs in these resource-oriented industries has been increased.<sup>10</sup> It should be noted that the

<sup>10</sup> Private firms are discriminated against under the government's policy. Cases abound. *Tieben*, a large private iron and steel factory was closed down when it was under construction, but at the same time, *Baogang*, a state-owned iron and steel factory, was approved to issue shares worth RMB 28 billion. *Jigang* and *Wugang*, another two state-owned iron and steel

monopoly position of SOEs is not the result of fair competition, but coming from government protection. The increasing monopoly power of SOEs can be illustrated by the extremely rapid growth of their profits. In 1998, the profit of all Chinese SOEs was RMB 52.5 billion, while in 2004, the profit of all state industrial firms reached RMB 531.2 billion, with central firms' profit reached RMB 478.5 billion increasing by 60 percent compared with that of 2003.<sup>11</sup> And in 2006, the profit of SOEs reached RMB 1219.3 billion, after tax profit was RMB 625.2 billion.<sup>12</sup>

With rich capital at hand and the implicit support of the government, Chinese large SOEs expanded their sphere in many industries, especially iron and steel, coal and oil, in recent years. SOEs merged and acquired many private firms in these industries, which made SOE's monopoly power in these industries increase dramatically. It is beyond doubt that they will charge a higher price for their products. And private firms are not allowed to enter into these upper-stream industries. Of course, the soaring price of raw materials for private firms have other reasons, such as the rising of international oil price, the rising of land price also due to macro control policy of the government, the rising coal and power price due to the shutting-down a lot of small coal mines and power-generating plants in the macro control. And of course, the labor price also increases significantly in recent years, and this is also bad news for private enterprises, which are generally operating in labor-intensive industries. This explains why rising price of raw materials was listed as the No. 1 difficulty faced by Chinese large-sized private enterprises in 2005 and 2006. See Table 5.

Why were private firms so constrained by human resource in recent years? In the 1990s, human resources of Chinese private firms mainly came from their state-owned counterparts. At that time, SOEs covered almost all industries, both competitive and monopolized. Then the income of private firms, which were determined by the market, was much higher than that of SOEs. One important reason was that under fierce market competition, private firms outperformed SOEs under the same industries. There

factories, were approved to be listed on the stock market. It was very hard, if not impossible, for new private iron and steel factories to be approved.

<sup>11</sup> Data source: <http://opinion.people.com.cn/GB/1034/3341137.html>.

<sup>12</sup> Data source: <http://finance.sina.com.cn/g/20070914/18213980500.shtml>.

is small wonder that many talents, especially technicians and engineers, resigned from SOEs and joined private firms.

Then beginning from the mid of 1990s to the beginning of the 21 century, almost all small and medium-sized SOEs in competitive industries were privatized. SOEs are more and more concentrated in monopoly industries. The income and benefits of employees in SOEs now are much better than that of private firms, and it is no longer easy to absorb talents from SOEs. Moreover, Chinese private firms, which are generally family-owned, have not established a mature and standardized governance structure and corporate culture, which makes it less competitive for many people than foreign firms. Many private firms, especially in less-developed regions, cannot attract high-caliber people easily.

## V. Conclusion

In this paper, we did a research based on 2000-3000 Chinese large-sized private enterprises surveyed by ACFIC from 2004 to 2006, and measured the change of performance in terms of technical efficiency and profit margin of them. We find that from 2004 to 2006, there was an obvious decreasing trend of performance for these large private firms. The trough occurred in 2005, and it recovered a little bit in 2006, but still worse than that of 2004.

With a view of figuring out the underlying determinants for the decreasing of performance, we constructed two multiple regression models, and tested factors that might have resulted in the change of performance of Chinese large private firms. The regression results showed that the most important determinant is financing difficulty faced by these enterprises. Financing difficulty had a statistically significant negative effect on performance of firms. Such effects were very stable in three consecutive years, and especially in 2005 there were most obvious and significant negative ones. Meanwhile, different sources of capital for investment also had important effects on firm performance. Firms that can obtain bank loans or finance from the capital market generally had good performance. However, the positive effect of bank loans did not exist in 2005, which implied that it was hard for firms, regardless of their performance, to get bank loans then.

Therefore, the decrease of performance of Chinese large-sized private firms is by no means an accident, nor is it the result of business cycle fluctuation, but is closely related to the macro-control policy of the government with an emphasis of credit contracting started in 2003. In order to meet the target of contracting credit, commercial banks forcefully reclaim bank loans released to large-sized private firms, no matter whether the loans were due or undue, and no matter how firms performed. This discrimination policy against private firms resulted in the rupture of cash chain of many private firms. Under these circumstances, the decline of performance is unavoidable. The empirical analysis in this paper confirmed this hypothesis.

The Chinese government can, to a great extent, determine the cycle of the Chinese economy, due to its powerful control over finance and the capital market. Economic fluctuations due to government policies (non-economic factors) have occurred several times during the economic development of China since the reform and opening up in late 1970s. These economic fluctuations do not result from market forces, but from government intervention, which tend to have some harmful effect on the healthy development of market economy. Private firms are major players of market economy, whose healthy development not only relates to benefits of themselves, but more importantly, relates to the foundation of the national economy. And the healthy development of private enterprises also has some bearing with the successful transition of economic growth pattern of China, namely, from an extensive pattern to an intensive one, and with the employment of most people and social welfare. The healthy development of Chinese private enterprises affects the healthy operation and development of the entire Chinese economy. If private capital is seriously curbed in the production area, the adverse effect will be transmit to other markets, such as real estate and financial market, and if so, economic bubble will be inevitable, and which will affect the stable development and equilibrium of the Chinese economy.

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**References**

- All China Federation of Industry and Commerce (ACFIC). *The Development Report of Non-State-Owned Economy in China 2005-2006*. Social Sciences Academic Press, 2006 (in Chinese).
- Chen, Ling, and Cao, Zhenghan, *Institutions and Capability: 20 Years of Growth Analysis of Chinese Private Enterprises*. Shanghai: Shanghai People's Press, 2007.
- Zhang, Weiyong. *Core Competence and Growth of the Firm*. Beijing: Peking University Press, 2006.

## Comments and Discussion

### *Comments by Byung-Yeon Kim\**

This paper has two main purposes. It aims at explaining the extent to which technical efficiency and profit margin of Chinese enterprises have decreased and identifying factors that determine such changes, with having the latter as a main focus. It uses data from surveys of All China Federation of Industry and Commerce that include firm level data from 2004 to 2006. Firms' performance was measured using data envelope analysis (Farrell technical efficiency) and profit margin. In addition, standard regression method was used to identify determinants of firms' performance having sales revenue or profit margin as a dependent variable.

The key findings of this paper can be summarized as follows: Firms' performance has decreased substantially in 2005 compared to 2004; Such a decrease is affected by macro control policies that intensified financial constraints of firms; Firms financed from capital market performed best, followed by bank-financed or self-financed firms.

This paper is interesting and has potential for extension. It appears to be possible to add some contribution to the literature not only on Chinese firms but also on financial hierarchy.

Having said that, I have some concerns about econometric or data problems, namely, sample selection bias and some problems in interpretation. As regards sample selection bias, the number of samples varies across years, making meaningful comparisons difficult (2199, 2688, and 3191 in 2004, 2005, and 2006, respectively). The paper suggests that annual sales revenue exceeding RMB200 million was used as a threshold. If this threshold is not inflation adjusted, smaller firms, possibly less

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efficient, began to be included over time, which may result in biases in estimates. The authors should consider using only firms that survived throughout the period in order to eliminate such a bias.

This paper explains macro control policies that cut loans and reclaimed loans already released. Yet, it is hard to understand that such quantity restrictions caused a decrease in profit margin (quantity restrictions will decrease sales revenue as well as costs simultaneously). The authors need to give a more detailed explanation on such policies. (If macro control policies involved raising interest rates on loans, profit margin would have decreased for firms with financial constraints).

The authors need to think about their main findings from the perspective on 'financial hierarchy' literature (eg. Fazzari, S., Hubbard, G., and Petersen, B., "Financing Constraints and Corporate Investment," *Brookings Papers on Economic Activity*, vol. 1, 1988, pp. 141-195; Hubbard, G., "Capital-Market Imperfections and Investment," *Journal of Economic literature*, vol. 34, 1998, pp. 193-225). This literature has been advocated where: internal funds, new debt, and new equity represent progressively higher cost of financing. However, the findings do not square with such literature. Given financial constraints, one would expect that the order of performance is source 1 (self deposits) > source 3 (borrowing from banks) > source 4 (capital markets) ... Yet the order this paper suggests is source 4 > source 1 > ... source 2 (borrowing from private persons). It would be worth explaining why the findings of this paper are not in line with those suggested by 'financial hierarchy' literature. In fact, linking this paper with literature on financial hierarchy will be an interesting avenue to explore.



**Comments by Donghoon Hahn\***

1. This paper analyzes the reason why Chinese large-sized enterprises have recently been suffering from poor performances. I think this topic subject is very timely, and reminds me of the massive bankruptcy of the Township-and-Village collective enterprises around the time of Tiananmen Incident in the late 1980s. Moreover, it seems that this subject is closely related with the so called 'revival of the Chinese SOEs' debate. The engine of growth for Chinese economy has been being changed from collective enterprises to private enterprises. But in these years, the performance of Chinese private enterprises have deteriorated, which is a rather unexpected matter. And at the same time, as the SOEs have been showing superior performances, people began to think of the SOEs as a viable form of ownership under the condition of the market economy, the so called 'revival of the SOEs'. This paper shows us that the revival of the SOEs is closely related with the downfall of the private enterprises. That is to say, a big part of the good performances of the SOEs has been attained by the sacrifice of the private enterprises.

2. This paper did empirical works on Chinese private enterprises. As the authors say, there are many papers on Chinese private enterprises but there are few papers that did empirical works. Although the data of this paper is confined to recent 3 years, but when we consider the low availability of the firm-level data, I think that it is not an easy job to do. It may be said to be one of the contributions of this paper.

3. Talking on data and methodology, I wonder why the authors used the ratio of net profit divided by sales revenue to measure the profitability. I think that it is not a very good measure of profitability because this indicator does not contain the information on firm size, and moreover I think if you conduct empirical work using this indicator, it is very likely to arouse industry bias problem because this indicator reflects the profitability of the

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industry that a certain firm belongs to. I suggest the authors to use the indicator ROE or ROA instead. ROE is better than ROA, if you don't have the firm equity data, ROE would be the second-best.

4. In table 4, the adjusted *R*-square values are too small for all the three years, so I think you should find some more explanatory variables, for example input material price indicators. According to the firm survey result you used, the rise of raw material prices became the No. 1 difficulty that private firms face. But the authors did not include this variable in the regression.

5. For the empirical works that you did in Tables 3 and 4, I wonder if you dealt with the listed firms and non-listed firms separately. The authors used the variable 'direct financing from the stock market' as one of the explanatory variables, but the non-listed firms can not have access to the direct financing. So, I think you have to take this factor into account.

6. The authors suggested the macro-control and the resulting weak accessibility to financial resources as one of the most important factors to explain the poor performance of the private enterprises. However, I think that there are not presented sufficient evidences about how strong the macro-control measures were. The authors just wrote that the central bank raised the reserve requirement of commercial banks two times. Could you please give provide more evidences?

7. The authors suggested the rise of raw material prices as one of the factors to explain sudden deterioration of private firms' performances. The authors explain the rise of raw material prices by the strengthening of monopoly power of the upstream industry SOEs. But there are not provided enough evidences. The authors wrote that Chinese large SOEs merged many private firms in the industries producing raw materials, and that many small private coal mines and power-generating plants were shut down by the government. However, I wonder how much influence these measures could have on the sudden rise of overall raw material prices.

8. Finally, I would like to ask the author to add some prospects

on the future development of the large private enterprises, especially prospects of the variables the author included in the regression.

