SOE preference, government regulation and economic growth: Evidence from China

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Abstract

This study investigates how the privileged position of state-owned enterprises' (SOE) affects China's regional economic growth. A theoretical model is established for analyzing the economic consequences of local government's policies including regulations of entry and credit subsidies towards SOEs. We assume that the local government cares about the aggregated output as well as profits which SOEs obtain, and thus an optimal entry barrier exists and this entry barrier consist is increasing in SOEs' share within the local economy. The model also shows that stronger political power of the group of SOEs actually increase profits obtained by SOEs, but local total output will decrease because the more powerful SOEs are, the more they can prevent the potential entry of private enterprises. The profits of private enterprises which have been present in the market will be negatively associated with SOEs' share, because of banks' credit discrimination towards them. Using the data results of an industrial survey and the numbers in the local statistical yearbook, we find strong empirical evidence supporting our hypotheses.

1 Introduction

It is conventional wisdom in economics today that incumbent producers have strong incentives to erect entry barriers for keeping potential competitors away and that they will enjoy an existing market, where they have monopoly rights.

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Usually, there are two types of man-made entry barriers: one consists of the industrial standards and professional certifications set up and required by a group of current producers, such as a guild; the other consists of government – established entry regulations (Stigler, 1971). Though protecting consumers' welfare is the widely declared purpose of the existence of such entry barriers, Djankov et. al. (2002) does not find any evidence to support this claim. Quite the contrary, they find that stricter regulation of entry within a market is not necessarily associated with higher quality of products, nor is it associated with better pollution records or health outcomes, rather it is associated with a sharper and higher level of corruption as well as a greater size of unofficial, black or gray, economy. Intuitively, high entry barriers may harm long-term economic growth (North and Thomas, 1973), because they do not "grant economic opportunities to a broad cross section of the society" (Acemoglu et al., 2005), on the contrary, it produces equilibrium outcomes which are characterized by the extensive usage of inferior technologies, on one hand, and their use generates lack of efficiency, on the other (Parente and Prescott, 1999).

Nevertheless, strict regulations of entry, which may have growth-damaging potentials, still exist in some countries. One possible explanation is given by the fact that major producers and market agents, who benefit considerably from the existence of these regulations, usually have a stronger political influence than other entrepreneurs. They also manifest this influence. As Acemoglu (2008) argues, entry barrier against new groups may ultimately lead to the occurrence of a dynamic distortion: major producers become richer and have even greater political power, as a result of gains from profits obtained from a monopoly scenario, and also, their grip on the economy as a whole tightens, as potential and existing market entry regulations become even more harsh and bound to their will. Such a dynamic distortion implies that a small difference of SOE share at the beginning of the reform can turn into a significant difference in economic performance on a long term basis.

According to Parente and Presott (1999), monopoly rights can explain a considerable amount of differences in the economic development trend of various countries. Acemoglu (2008) discusses how political regimes determine the historical patterns of long-term growth in both North America and Latin America. In brief, Latin American countries were caught up and then even surpassed by United States in terms of economic development, because economic elites in these oligarchic countries manifested a considerable political influence and were able to establish high entry barriers against new entrepreneurs, which deterred

them from entering the market. Unfortunately, due to the small size of the sample population which was used in the research, it is scientifically irrelevant to conduct empirical tests on Acemoglu's theory; it is possible however to use his descriptions and discussions on historical facts as an incipient point. Moreover, it's also hard to distinguish the long – term effects of political regimes from the potential effects of other factors, such as religion, culture and geography, which are closely related to both economic growth as well as to political institutions. However, China's reform may provide us with an opportunity of conducting a natural experiment, in order to examine Acemoglu's theory with firm-level data for two reasons. First, although there are differences in culture, religion and social norms across the various regions of China, they are much smaller than those across two various other countries. Secondly, the allocation of state-owned firms in planning era was mainly driven by non-economic considerations and thus the initial share of the state-owned economy in one region was somewhat exogenous. Following Acemoglu's (2008) idea, we examine whether or not the state-owned enterprises (SOE) in China, which usually have stronger political power than other firms, have successfully protected their monopoly profits by succeeding in establishing high – level entry barriers. We also analyze whether or not these barriers have, on the other hand, slowed down the local economic development, just like the oligarchs of Latin American countries did a century ago.

Since its reform in 1978, China has enjoyed an unprecedentedly rapid growth for over 30 years. Yao (2009a) identifies the key for this success in the disinterested nature of government in China. According to his definition, a "disinterested government" is a government who doesn't favor any particular sections of an economy and as a result, is more likely to undertake growth-enhancing development strategies. An argument which he uses to support this assumption is given by the end of the dual-track system as an example of China government's disinterestedness. Contrary to western scholars' prediction (Murphy et al, 1992), China's Communist Party (CCP) gave up on its dual-track price system in a gradual manner, even though some CCP insiders, who controlled the quotas, were able to gain significant profits from the system's existence. But, Yao's "disinterested government" theory may only well capture the behavior of the central government. Sometimes, local governments act more like "partial government", a government who prioritizes or favors the interests and well-being of certain groups of people over the interest of the general population. In this study, we find that local governments may actually adopt high regulations of entry, which are not growth-enhancing for the whole region but bring high monopoly - based

profits to current SOEs.

A number of theories have been established, in order to explain why local governments in China pay more attention on state-owned firms' profits and interests than on the interests of private firms'. First, some local governments treat SOEs as cash cows and extort SOEs' revenues for financing public infrastructure and services (Jefferson, 1998). As a result, local government can be regarded as an implicit shareholder and beneficiary of SOEs, because it receives informal dividends from SOEs, other than taxes. Secondly, within a transitional economy such as China, local governments usually have to bail out a SOE, if that it undergoes financial woes and this phenomenon is also known as "soft budget constraints" (Kornai, 1986). Moreover, local government and an SOE also may be linked through other channels, such as personnel relations. For example, several years ago, a former manager from First Auto Work, the largest state-owned firm of Jilin province, was appointed as deputy secretary of the Jilin province's Communist Party. However, this doesn't mean that local governments don't care about economic growth at all. Chen et al (2005) have found that provincial political leaders are strongly motivated to pursue better economic performance, in order for them to obtain a higher likelihood of promotion. Thus, it is reasonable to assume that local government's utility function is a weighted aggregation of total output (or GDP) and local SOEs' profits.

As aforementioned, high entry barriers against new entrepreneurs will hamper economic growth. Thus, protecting SOEs by various regulations of entry is not costless. Local governments have to make a trade-off and choose an optimal established level of entry barriers. Here, the costs of entry include both official costs and unofficial costs. Djankov et al (2002) show that the official cost of entry in China is modest compared with other transitional countries. According to their estimates, the official startup costs of a new enterprise in China are roughly estimated at 14.17% of GDP per capita and the process takes roughly 92 days. However, in transitional economies, new entrepreneurs often need to bear extra unofficial payments besides these. For instance, in a survey conducted on Russian private firms, more than 90 percent of managers answered that they had to pay "extralegal" amounts in order to receive government services or a business license when they established their manufacturing firms (Johnson et al, 2002). Moreover, the way in which market-supporting institutions developed within a region also affects startup costs in a considerable manner. For instance, during the incipient stage of the reform, meaning the late 1970s, China's financial system was far from being well-developed (Allen et al, 2005). In some areas,

banks served state-owned firms exclusively. When heavy credit discrimination exists and thrives, a logical consequence is the establishment of a number of informal institutions and market arrangements. They have been developed to loosen credit constraints that private enterprises faced. Long and Zhang (2011) found that industrial cluster work as a market arrangement which lowers the barriers to entry, in terms of capital. The current research borrows Long and Zhang's (2005) indicator of entry barriers, minimum firm size, as one of the key variables in our regressions. This indicator is also consistent with our proposed model, in which entry barrier is modeled as a fixed lump-sum payment needed for entering a market. Klapper et al (2006) found that entry regulations force new entrants to be larger – in terms of size, and this finding also supports our use of such a measure.

In this paper, we investigate how SOEs' relative size affects China's regional differences in economic growth. A theoretical model is built up for demonstrating our idea. The government sets an entry barrier for potential entrepreneurs to maximize its utility, which is jointly determined by weighted GDP and SOE profits. The model shows that as the relative size of SOEs increases, the optimal entry barrier increases as well, and then the profits of state-owned firms increase; however, the regional total output decreases as well. The effect of SOEs' share on the current private firms is a little more complicated to analyze. On one hand, a high SOE share will induce a high entry barrier level. High entry barrier does not only create monopoly profits for current producers, but also makes the entry process highly selective and only highly productive new entrepreneurs can enter the market. On the other hand, when credit subsidies to SOEs are present, a higher SOEs' share also means there are more firms which are running businesses with cheap capital. If a higher share of producers within a designated market receives credits with a low interest rate, the market price as a whole will be lower. And then, as a result, private firms, which find it hard to access bank loans, will see a drop in their market shares and as a result, will earn less. For existing private firms, our model shows that the negative effect which results from credit discrimination may dominate positive effect which results from entry barrier. Using the data from National Economic Census and the Local Statistical Yearbooks, we find strong evidence supporting our hypotheses.

Our work contributes to analyzing inequality in China. As Gustafsson and Li (2002) shows, inter-county inequality accounted for more than 40 % of total inequality in the country, and this percentage kept rising in 1990s. Our

research reveals that SOE's share within the economy is an important factor, which explains why some counties are rich while others are poor. Based on our regression function, a decrease of 1 % of SOE's share in employment will induce 0.228 % increase of total output in that county. The standard deviation of SOE's proportion in employment is 25 percent, then it implies that a standard-deviation reduction of SOE's share in employment will increase total output in that county by 5.7 percent. Yao (2009b) discusses the political economy of China's regional inequalities, but he focuses more on the consequences of the central government's policies.

Another area of literature which is related to our paper is "Middle income trap". Recently, some scholars have manifested concern about whether or not China can keep its rapid growth in the long run. For instance, Woo et al (2012) worry that China will be caught in the middle-income trap and will thus be unable to become a modern country, unless it overcomes the difficulties which arise from undertaking further reforms within next ten years. Another question arises: why do some countries, which have splendid histories of economic growth, come to stagnate at a given point? Acemoglu et al (2003) may provide an answer this question. In their theory, protecting large firms may be beneficial at early stages of development because it relaxes potential credit constraints for the economy as a whole. As the economy approaches a developed status from a technological perspective, selecting right entrepreneurs becomes more and more important. However, in our model, new entrepreneurs are blocked out by entry barriers which are established in order to protect existing large firms. Due to the fact that SOEs have stronger influences on government's decision making process and actual resulting decisions, these entry barriers are not easy to remove. As McMillan and Woodruff (2002) show, entrepreneurship plays a central role in the economic performances of transitional countries but even wisest reformers may overlook its potential sphere of influence.

The following paper also helped to expand our understanding on China's economic reform. Lau et al (2000) praise China's dual track approach to transition as a "reform without losers". Nevertheless, Naughton (2007, chapter 4) argues that further reforms, such as the ownership reform, will not be "without losers" any more and will be much more difficult to implement than reforms that have already been done. As he shows, the process of privatization faces great obstacles and moves quite slowly because it hurts the interests of some politically influential groups. Our study provides supporting evidence for these statements. We find that counties with relatively more SOEs have higher entry

barriers against new private entrepreneurs and less aggregated output. It also tells us that the ownership reform is definitely not separated from the market reform. If a sufficient number of politically privileged firms exist in a market, any market reform benefitting the whole economy but hurting these firms can't be put into practice.

The paper is structured as follows: The next section introduces the economic model. Section 3 describes the data and empirical results. Section 4 concludes.

2 The Model

2.1 Demand

Similar with Melitz and Ottaviano (2008), a representative consumer with income I maximizes utility function:

$$U = m + \alpha c - \frac{1}{2}\gamma c^2$$

under budget constraint $m + pc = I$, where p is the price, m is the consumption level of numeraire good. By optimization, we can get linear demand function:

$$c(p) = \frac{\alpha - p}{\gamma} \tag{1}$$

2.2 Production

There are two types of firms: State-Owned Enterprises (SOEs) with proportion μ and private firms (or non-SOEs) with proportion $1 - \mu$. Both types of firms have the same production function :

$$q = a^{\eta} \left(k^{\alpha} l^{1-\alpha}\right)^{1-\eta}$$

where a, drawn from a distribution function $g(a)$ over $[0, +\infty)$, is the productivity level of the firm. After the productivity level realize, firms have to pay an entry cost f before production.

SOEs ($t = s$) and non-SOEs ($t = n$) share the same wage rate w, but different interest rates. SOEs enjoy a subsidy rate τ from the government, thus they have to pay less rent than priavte firms $r_s = (1 - \tau) r_n$. We fix $r_s = r$ to capture that the government wants to maintain a low interest rate for SOEs, and thus $r_n = \frac{r}{1-\tau}$. With these factor prices, we can write down the profit of

firms:

$$\pi_t = a^\eta \left(k^\alpha l^{1-\alpha}\right)^{1-\eta} - r_t k - wl$$

By maximization we can get the optimal production and profit level for both types of firms:

$$q_t(a) = Aa\left(\frac{p}{r_t^\alpha}\right)^{\frac{1-\eta}{\eta}} \tag{2}$$

$$\pi(a) = r_t^\alpha \eta A a \left(\frac{p}{r_t^\alpha}\right)^{\frac{1}{\eta}} \tag{3}$$

where $A \triangleq (1-\eta)^{\frac{1-\eta}{\eta}} \alpha^{\frac{\alpha(1-\eta)}{\eta}} \left(\frac{1-\alpha}{w}\right)^{\frac{(1-\alpha)(1-\eta)}{\eta}}$.

2.3 Equilibrium

In an rational expectation equilibrium, only firms with profit higher than the entry cost will produce: $\pi_t(a) \geqslant f$. Denote a_t^* as the cutoff point satisfying $\pi_t(a^*) = f$, then

$$a_t^* = \frac{r_t^{\frac{\alpha(1-\eta)}{\eta}} f}{\eta A p^{\frac{1}{\eta}}} \tag{4}$$

Thus we have the total production level:

$$Q(p) = MAr^{\frac{\alpha(1-\eta)}{\eta}} p^{\frac{1-\eta}{\eta}} \left[\mu \int_{a_s^*}^{+\infty} ag(a)da + (1-\mu)(1-\tau)^{\frac{\alpha(1-\eta)}{\eta}} \int_{a_n^*}^{+\infty} ag(a)da\right] \tag{5}$$

where M is relative measure of firms to consumers.

From demand function (1) and supply function (5), we can get the market clearing condition for the good:

$$Q(p) = \frac{\alpha - p}{\gamma} \tag{6}$$

From equation (6), we know that given the proportion of SOEs μ and government's subsidy to SOEs τ, there is a unique equiblirium price $p(\mu, \tau)$ in $(0, a)$, , and apparently $p_\mu(\mu, \tau) < 0$, $p_\tau(\mu, \tau) > 0$.

2.4 The government's problem

The government cares about two aspects of the economy: The first is the GDP:

$$Y = pQ(p) = \frac{p(\alpha - p)}{\gamma} \tag{7}$$

The second is the profit of SOEs:

$$\Pi = MA\eta\mu r^{\frac{\alpha(1-\eta)}{\eta}} p^{\frac{1}{\eta}} \int_0^{+\infty} ag(a)da \tag{8}$$

The objective function of the government is to maximize weighted GDP and profit of SOEs:

$$W = \Pi^{\mu} Y^{1-\mu} = Bp^{\frac{\mu}{\eta}+1-\mu}(\alpha - p)^{1-\mu}$$

where $B \triangleq \gamma \left(\frac{MA\eta\mu r^{\frac{\alpha(1-\eta)}{\eta}}}{\gamma} \int_0^{+\infty} ag(a)da \right)^{\mu}$. To maximize W, the government can choose the subsidiary rate τ to adjust the production of different firms. Note that in equilibrium the subsidiary rate get into the expression of W only by price $p(\mu, \tau)$, thus the obejective of government can be rewritten as:

$$p(\mu, \tau) \left[\alpha - p(\mu, \tau)\right]^{\varphi} \tag{9}$$

where $\varphi \triangleq \frac{1-\mu}{\frac{\mu}{\eta}+1-\mu}$. From (9) we can slove the government's optimal subsidiary rate.

Proposition 1*: There is unique optimal subsidiary rate $\tau^*(\mu)$ for the government, where τ^* satisfies $\alpha = (1 + \varphi(\mu))p(\mu, \tau^*)$ and is increasing in μ.*

Trade-off between the profit of SOEs and GDP leads to an optimal entry barrier, and as the proportion of SOEs μ increases, the government cares more about SOEs, and will increase the subsidiary rate τ. Note that although $p_{\mu}(\mu, \tau) < 0$, $\tau^*(\mu)$ is increasing in μ, and this effect outweighs the former effect, thus $\frac{dp}{d\mu} > 0$. As the realtive size of SOEs increases, the price also increases. Based on this observation, we can get some properties of the optimal τ^* that lead to empirical predictions. .

Prediction 1*: The entrance cutoff a_n^* for private firms is increasing in the proportion of SOEs μ.*

Prediction 2*: The production level of SOEs $q_s(a)$ is increasing in the proportion of SOEs μ.*

Prediction 3*: The production level of private firms $q_n(a)$ is decreasing in the proportion of SOEs μ.*

Prediction 4*: Total output Q is decreasing in the proportion of SOEs μ.*

3 Data and Empirical Results

The data used for our research purpose is coming from two sources: National Economic Census and Local Statistical Yearbook. According to *the Guidelines of National Economic Census*, SOEs are divided into two groups: absolutely-controlled SOEs and relatively-controlled SOEs. The former are firms whose more than half equity were owned by state. If the share of state-owned equity doesn't exceed 50% but the state-owned shareholders have the de facto controlling power on the firm, then this firm is a relatively-controlled SOE.

Local SOE's share is mainly determined by allocations made by the central governments during the planning era. China experienced at least two significant waves of allocation and reallocation of industry (Yao, 2009b). The first wave happened during the first 5-year plan period, when many of the major projects, notably the 156 projects aided by Soviet Union, were relocated in Northeast China and inland provinces. The other wave was in the 1960s, when Cold War was intense. Many factories were reallocated from coastal provinces to inland provinces for security considerations (Bo, 1991). Thus, the distribution of SOEs across regions is exogenous to some degree.

According to 2004 National Economic Census, out of the 1.373 million manufacturing firms in the survey, 40.905 firms are absolutely state-owned and 6.899 firms are relatively state-owned. Though the number of SOEs is relatively small, SOEs have significant positions in China's economy. SOEs account for 24% of total output, 41% total fixed asset and 22% of total employment of all manufacturing firms in the survey. To make the results more robust, we used the SOE proportion of output, SOE proportion of fixed asset and SOE proportion of employment into our regressions separately, as our measure of SOE's share in a county's economy. Table 1 presents the descriptive statistics of our sample, 1995 industrial survey and 2004 national economic census.

[Insert Table 1]

Based on our model, the first hypothesis we introduce is that the level of entry barriers increases as county-level SOE's share increases. The rationale behind this hypothesis is given by the fact that the political power and influence of SOEs, as a group, within a county is increasing in its share in the total country's economy. It is easier for SOEs to influence governments and persuading them to establish high entry barriers when this group of special interests is

more powerful from a political perspective.

The indicator of entry barrier is the minimum firm size in a county, and we borrow this measure from Zhang and Long (2011). This measure is also empirically supported by Klapper et al (2006). In that paper, they found that regulations of entry force new entrants within a market to be larger. Our model implies that entry barriers can be regarded as a lump-sum tax, a tax that entrepreneurs have to pay when they start a business. And, when the entry barrier is high, it is only profitable for entrants of large size to enter the designated market. Table 2 shows the results of our simple reduced-form estimation. Panel A gives results of regressions on log asset of minimum-sized firm. For more robustness, we also perform regressions on log assets of firms at 5 percentile level and 10 percentile separately and results are shown in Panel B and Panel C. To alleviate potential effects due to causality problem, SOE share is calculated by using data taken from 1995 Industrial Survey, while entry barrier is measured on the basis of 2004 National Economic Census. All regressions in the three panels support our hypothesis that counties with a higher share of SOEs are more likely to erect high entry barriers against small enterprises.

[Insert Table 2]

Next, we examine whether or not potential competitors, especially small private firms, are more likely to be blocked out in regions which present a higher SOE presence. We performed regressions on number of firms in 2004. This somehow can be interpreted as number of new entrants during 1995-2004 because the number of firm in 1995 is included in the regression. The results show that the number of firms increases more rapidly in counties of lower SOE share. We also analyzed the subsample of small firms separately and found even stronger effects of entry barriers. These findings are consistent and in accordance with our theoretical predictions.

[Insert Table 3]

The second hypothesis of our model is that a higher SOE share will increase SOEs' output but decrease private firms' output. As discussed within the model, a high SOE share will result in high entry barriers against private entrepreneurs but also high monopoly profits for SOEs. For private firms which are already

present in the market, the overall effects of a high SOE share can be negative if positive selection effects are dominated by negative effects resulting from credit discrimination. Following Long and Zhang (2011), we estimate the following reduced-form regressions:

$$\ln Y_{i,c,t} = \alpha_c + \mu_t + \beta_1 \ln K_{i,c,t} + \beta_2 \ln L_{i,c,t} + \beta_3 SOE_{c,t} + \gamma Z + \epsilon$$

Here, a subscript i indicates firm i, a subscript c indicates county c and a subscript t indicates year t. The dependent variable is log of firm's output and the key independent variable that we are most concerned about is the county-level SOE share $SOE_{c,t}$, which is constructed in three ways: proportion of output, proportion of fixed assets and proportion of employment. and represent a firm's physical capital $K_{i,c,t}$ (indicated by fixed assets) and employment $L_{i,c,t}$. Z represents a vector of the firm-level control variables likely to be related with firm performance. These include ownership, firm's age, debt-asset ratio and ratio of fixed assets compared to total assets. Considering the changes within the firm's production function during 1995-2004, we also add interactions of dummy variable for year 2004 with $K_{i,c,t}$ and $L_{i,c,t}$. Table 4 presents the results of regressions estimated using the whole sample. The coefficients of three different measures for SOE share are all negative and significant at 1% level. The coefficient of ownership is also significantly negative and it implies that SOEs are less efficient than private firms when production inputs are controlled.

[Insert Table 4]

Then, we explore the differential effects of the SOE share on firms of different ownership. We expect that SOEs in counties with higher SOE share will have more output because of the political power of the group of SOEs would be higher in such counties. And, as a result, based on our theoretical model, we expect that the coefficient of SOE share is negative for non-state-owned firms. The results of regressions which were estimated using subsamples of SOEs and non-state-owned firms are shown in Table 5. As expected, county-level SOE share has considerable effects on firm performance but the effects on SOEs manifest themselves in a contrary direction with regard to non-state-owned firms. Based on the results of regressions using proportion of output as dependent variable, we find that one percent increase in county-level SOE share would result in

0.426 percent increase of SOE's output but 0.485 percent decrease in non-state owned firms.

[Insert Table 5]

As the previous empirical results show, a high SOE share is positively related to the level of SOE output, but negatively related to the number of firms and also, negatively linked to private firm's output. Then the question that arises is: how is the combined effect of SOE share on whole economy? Our model predicts that SOE share has a negative influence on county-level total output. To test this prediction, we perform following regression:

$$\ln Y_{c,t} = \mu_t + \beta_1 \ln K_{c,t} + \beta_2 \ln L_{c,t} + \beta_3 SOE_{c,t} + \epsilon$$

Here, $Y_{c,t}$ indicates county-level total output, $K_{c,t}$ indicates county-level total fixed asset, and $L_{c,t}$ indicates county-level total employment. $SOE_{c,t}$ is SOE share, the key variable that we most concern. Table 6 presents results from the above estimations. All three measures of SOE share are found to have negative effects on the county-level aggregated output. A 1 percentile standard deviation reduction in SOE's proportion in total employment will increase county-level total output by 5.4 percent. Thus, SOE share is shown to be an important determinant of local economic performance. This result is consistent with findings by Chen and Feng (2000).

[Insert Table 6]

4 Conclusion and Discussion

The current paper discusses the manner in which the ownership structure of local manufacturing industries affects economic performance. Both our model and empirical results show that state ownership not only results in incentive problems (Qian 1996; Lin et al, 1998) as previous studies have revealed as well, but also has a negative external effect on the economy, as a whole. Here, we

focus on one dimension of the external effects of state ownership, namely SOEs' political influence on local government's decisions concerning market liberalization, which include: lowering entry costs and making the banking system more equitable. One limitation of our study is failing to exclude other potential effects which are related to both entry barrier and economic development. For example, in terms of traditional planning economies or some transitional economies, aside from financial services, it is also difficult for private firms to gain access to other productivity-related services. And, regulations of entry are more likely to occur in regions with rent-seeking government, because they give officials the power to collect bribes in return for providing permits (Svensson, 2005). Both a lack of productivity-related services as well as a high level of corruption may be positively related to entry barrier and considerably harm economic growth. Moreover, entry barriers do not only keep potential competitors out but can also prevent Schumpeter's "creative destruction", because incumbent producers and suppliers tend to insist on the current work practice unless the market is sufficiently competitive.

Though we find that a positive relation exists between the share of SOEs in an economy and entry barriers, it doesn't mean that such entry barriers will be eliminated once privatization takes place. In fact, regulations of entry within the market will exist if local governments forge a coalition with new economic elites. The economic elites also can be private entrepreneurs, just as the case of Latin American countries (Acemoglu, 2008) shows. The ultimate solution to counter heavy regulations which are hampering growth is to reduce unnecessary government interference and weaken its connection with some groups of special interests which can harm economic growth as a whole. Another indirect solution is given by the enhancing of cross-regional competition. Li et al (2000) find that product market competition induces local institutional changes towards capitalism, and Chen et al (2005) show that promotion tournaments work as an incentive system for motivating local officials to promote economic growth.

Appendix

Proof of prediction 1. We can write the market clearing condition as:

$$\mu F(\mu) + (1-\mu)H(a_n^*) = I(\mu) \tag{10}$$

where $F(\mu) = p(\mu,\tau(\mu))^{\frac{1}{\eta}} \int_{a_s^*(\mu)}^{+\infty} ag(a)da$, $H(a_n^*) = \frac{r^{\frac{\alpha(1-\eta)}{\eta}} f}{\eta A} \frac{1}{a_n^*} \int_{a_n^*}^{+\infty} ag(a)da$ and $I(\mu) = \frac{p(\mu,\tau^*(\mu))(\alpha - p(\mu,\tau^*(\mu)))}{\gamma MAr^{\frac{\alpha(1-\eta)}{\eta}}}$. It is obvious that $F(\mu) > H(a_n^*)$, $H'(a_n^*) < 0$; $a_s^*(\mu) = \frac{r^{\frac{\alpha(1-\eta)}{\eta}} f}{\eta A p(\mu,\tau^*(\mu))^{\frac{1}{\eta}}}$ is decreasing in μ and thus $F'(\mu) > 0$; $\varphi(\mu) < 1$, so $I'(\mu) = \frac{\alpha - 2p(\mu,\tau^*(\mu))}{\gamma MAr^{\frac{\alpha(1-\eta)}{\eta}}} \frac{dp}{d\mu} < 0$. Take derivative of μ on both sides of condition (10), we have

$$\frac{da_n^*}{d\mu} = \frac{I'(\mu) - \mu\left(F(\mu) - H(a_n^*)\right) - \mu F'(\mu)}{(1-\mu)H'(a_n^*)} > 0$$

Proof of prediction 3. From prediction 1,

$$a_n^*(\mu) = \frac{r^{\frac{\alpha(1-\eta)}{\eta}} f}{\eta A p(\mu,\tau^*(\mu))^{\frac{1}{\eta}} (1-\tau^*(\mu))^{\frac{\alpha(1-\eta)}{\eta}}}$$

is increasing in μ, which means $p(\mu,\tau^*(\mu))^{\frac{1}{\eta}}(1-\tau^*(\mu))^{\frac{\alpha(1-\eta)}{\eta}}$ is decreasing in μ, so

$$q_n(a) = \frac{\eta A}{r^{\frac{\alpha(1-\eta)}{\eta}}} a p(\mu,\tau^*(\mu))^{\frac{1}{\eta}-1} (1-\tau^*(\mu))^{\frac{\alpha(1-\eta)}{\eta}}$$

is also decreasing in μ.

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Table 1. Summary Statistics

Variable	Year 1995			Year 2004		
	Mean	SD	N	Mean	SD	N
SOE Proportion_Output	0.444	0.246	471113	0.190	0.213	1266258
SOE Proportion_Fixed Asset	0.589	0.250	471111	0.296	0.262	1266258
SOE Proportion_Employment	0.379	0.247	471064	0.159	0.189	1266258
Ln(Output)	7.357	1.869	471113	7.604	1.764	1261743
ln(Fixed Asset)	6.571	2.057	462751	6.510	1.860	1246268
ln(Employment)	3.657	1.891	331790	3.189	1.239	1265370
Ownership (1=SOE,0="Non-SOE")	0.171	0.377	471113	0.032	0.176	1266258
Firm Age	12.410	16.011	471034	6.402	7.883	1266258
Debt Asset Ratio	0.650	0.522	466576	0.449	3.262	1266033
Ratio of Fixed Asset to Total Asset	0.508	0.661	466576	0.579	5.628	1266023

Table 2. Regression Results SOE share vs. Entry Barrier

	(1)	(2)	(3)	(4)
Panel A:	Dependent Variable: Ln(Minimum Asset in 2004) in a county			
SOE Proportion_Output	0.398***			
	(0.114)			
SOE Proportion_Fixed Asset		0.349***		
		(0.122)		
SOE Proportion_Employment			0.334***	
			(0.109)	
Ln(Minimum Asset in 1995)	0.041***	0.045***	0.032**	0.044***
	(0.014)	(0.014)	(0.014)	(0.014)
Constant	2.971***	2.939***	3.042***	3.168***
	(0.074)	(0.093)	(0.067)	(0.048)
Observations	2,070	2,069	2,044	2,070
R-squared	0.011	0.009	0.008	0.005
	(5)	(6)	(7)	(8)
Panel B:	Dependent Variable: Ln(5 Percentilr Level of Asset in 2004) in a county			
SOE Proportion_Output	0.142**			
	(0.071)			
SOE Proportion_Fixed Asset		0.143*		
		(0.077)		
SOE Proportion_Employment			0.102	
			(0.068)	
Ln(5 Percentile Asset in 1995)	-0.009	-0.007	-0.012	-0.010
	(0.012)	(0.012)	(0.013)	(0.012)
Constant	4.909***	4.882***	4.946***	4.985***
	(0.071)	(0.081)	(0.069)	(0.059)
Observations	2,075	2,074	2,049	2,075
R-squared	0.002	0.002	0.002	0.000
	(9)	(10)	(11)	(12)
Panel C:	Dependent Variable: Ln(10 Percentilr Level of Asset in 2004) in a county			
SOE Proportion_Output	0.163**			
	(0.065)			
SOE Proportion_Fixed Asset		0.155**		
		(0.070)		
SOE Proportion_Employment			0.123**	
			(0.062)	
Ln(10 Percentile Asset in 1995)	-0.002	0.001	-0.005	-0.003
	(0.013)	(0.013)	(0.013)	(0.013)
Constant	5.393***	5.360***	5.431***	5.482***
	(0.076)	(0.085)	(0.075)	(0.067)
Observations	2,075	2,074	2,049	2,075
R-squared	0.003	0.002	0.002	0.000

Table 3. Regression Results: SOE share vs. Number of firms

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)
Ln(Number of Firms in 2004)	All Firms			Small Firms		
SOE Proportion_Output	-0.294**			-1.184***		
	(0.120)			(0.080)		
SOE Proportion_Fixed Asset		-0.257**			-1.262***	
		(0.125)			(0.084)	
SOE Proportion_Employment			-0.258**			-0.951***
			(0.115)			(0.076)
Ln(Number of Firms in 1995)	0.222***	0.228***	0.237***			
	(0.025)	(0.024)	(0.027)			
Ln(Number of Small Firms in 1995)				0.921***	0.942***	0.936***
				(0.019)	(0.019)	(0.020)
Constant	4.386***	4.372***	4.276***	1.621***	1.742***	1.377***
	(0.147)	(0.153)	(0.153)	(0.108)	(0.113)	(0.109)
Observations	2,075	2,074	2,049	1,970	1,969	1,960
R-squared	0.050	0.049	0.049	0.633	0.632	0.604

Table 4. Regression Results: SOE share vs. Firm output

	(1)	(2)	(3)
	Dependent Variable: Ln(Output)		
SOE Proportion_Output	-0.374***		
	(0.011)		
SOE Proportion_Fixed Asset		-0.231***	
		(0.010)	
SOE Proportion_Employment			-0.170***
			(0.011)
ln(Fixed Asset)	0.469***	0.469***	0.469***
	(0.001)	(0.001)	(0.001)
ln(Employment)	0.371***	0.372***	0.372***
	(0.001)	(0.001)	(0.001)
ln(Fixed Asset)xYear 2004	-0.185***	-0.184***	-0.185***
	(0.001)	(0.001)	(0.001)
ln(Employment)xYear 2004	0.440***	0.439***	0.439***
	(0.002)	(0.002)	(0.002)
Ownership (1=SOE,0="Non-SOE")	-0.045***	-0.049***	-0.050***
	(0.004)	(0.004)	(0.004)
Firm Age	-0.007***	-0.007***	-0.007***
	(0.000)	(0.000)	(0.000)
Debt Asset Ratio	0.005***	0.005***	0.005***
	(0.000)	(0.000)	(0.000)
Ratio of Fixed Asset to Total Asset	-0.006***	-0.006***	-0.006***
	(0.000)	(0.000)	(0.000)
Year 2004	-0.164***	-0.144***	-0.119***
	(0.008)	(0.008)	(0.008)
Constant	3.449***	3.424***	3.356***
	(0.008)	(0.009)	(0.008)
Observations	1,569,189	1,569,189	1,569,189
R-squared	0.689	0.689	0.689

Table 5. Regression Results: SOE share vs. Firm Output (By ownership)

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)
Log(Output)	State Owned Enterprises			Non-State Owned Enterprises		
SOE Proportion_Output	0.426***			-0.485***		
	(0.036)			(0.012)		
SOE Proportion_Fixed Asset		0.207***			-0.260***	
		(0.036)			(0.011)	
SOE Proportion_Employment			0.144***			-0.212***
			(0.034)			(0.012)
ln(Capital)	0.590***	0.590***	0.590***	0.438***	0.438***	0.439***
	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
ln(Employment)	0.311***	0.311***	0.310***	0.380***	0.382***	0.382***
	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
ln(Capital)xYear 2004	-0.287***	-0.288***	-0.287***	-0.153***	-0.154***	-0.154***
	(0.005)	(0.005)	(0.005)	(0.001)	(0.001)	(0.001)
ln(Employment)xYear2004	0.490***	0.491***	0.491***	0.431***	0.430***	0.430***
	(0.006)	(0.006)	(0.006)	(0.002)	(0.002)	(0.002)
Firm Age	-0.006***	-0.006***	-0.006***	-0.007***	-0.007***	-0.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Debt Asset Ratio	0.005***	0.005***	0.005***	0.011***	0.011***	0.011***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ratio of Fixed Asset to Total Asset	-0.010***	-0.010***	-0.010***	-0.006***	-0.006***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Year 2004	0.510***	0.474***	0.453***	-0.348***	-0.310***	-0.284***
	(0.030)	(0.030)	(0.030)	(0.009)	(0.009)	(0.009)
Constant	2.138***	2.229***	2.302***	3.660***	3.605***	3.536***
	(0.028)	(0.032)	(0.026)	(0.009)	(0.010)	(0.008)
Observations	96,959	96,959	96,959	1,472,230	1,472,230	1,472,230
R-squared	0.766	0.765	0.765	0.674	0.674	0.674

Table 6. Regression Results: SOE share vs. County-Level Total Output

	(1)	(2)	(3)
	Dependent Variable: ln(Total Output in a County)		
SOE Proportion_Output	-0.144***		
	(0.046)		
SOE Proportion_Fixed Asset		-0.362***	
		(0.045)	
SOE Proportion_Employment			-0.228***
			(0.042)
ln(Total Fixed Asset)	0.677***	0.686***	0.669***
	(0.017)	(0.016)	(0.016)
ln(Total Employment)	0.252***	0.250***	0.259***
	(0.014)	(0.014)	(0.014)
ln(Total Fixed Asset)*Year2004	-0.140***	-0.107***	-0.131***
	(0.019)	(0.020)	(0.019)
ln(Total Employment)*Year2004	0.242***	0.211***	0.237***
	(0.019)	(0.019)	(0.019)
Year2004	0.079	-0.155	0.000
	(0.126)	(0.126)	(0.125)
Constant	2.116***	2.179***	2.181***
	(0.180)	(0.177)	(0.179)
Observations	5,781	5,781	5,781
R-squared	0.990	0.990	0.990