# *From the Grabbing Hand to the Helping Hand*

*By: Jiahua Che*

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# From the Grabbing Hand to the Helping Hand

Jiahua Che*
Department of Economics
University of Notre Dame

The William Davidson Institute
University of Michigan Business School

Email: che.1@nd.edu

**Abstract**

I present a study of ownership of firms under government rent seeking. Using its control of regulated inputs, a government agency extracts rents from a manager who undertakes an investment. Such a government rent seeking activity leads to a typical hold-up problem. Government ownership is shown to serve as a second best commitment mechanism through which the government agency will restrain itself from the rent seeking activity and even offer the manager support and favor such as tax breaks and subsidies. This mechanism works at a cost as government ownership compromises *ex post* managerial incentives and creates distortion in resource allocation. Nevertheless, under some fairly general conditions, government ownership Pareto dominates private ownership. The analysis corresponds to a host of stylized empirical observations concerning local government-owned firms during China's transition to a market economy. Based on this analysis, I suggest that local government owned firms will be transformed to private ownership as China's input markets become more liberalized.

**Keywords:** Corruption, Bribery, Government Ownership, China's Non-State Sector

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## I. Introduction

For the past two decades, China has registered remarkable economic growth, despite the absence of an adequate checks and balances system to hold governments, especially local government authorities, accountable. Because of lack of institutional mechanisms that will restrain them from rent seeking activities, local governments, using their leverage over public resources and regulatory authorities, have been able to levy arbitrary fees and charges on, and even extort bribes from private enterprises.[1] As a result, private enterprises played only a minor role during the last two decades. By 1993 the private sector accounted for only about 15 percent of national industrial output.

Nevertheless, the remarkable growth in China has been spearheaded by the "non-state" firms (firms not owned by the state government) owned and controlled by local governments. The share of these firms in the national industrial output increased from 22 percent to 42 percent between 1978 and 1993 (*China Statistics Yearbook*, 1994). A striking example of these non-state firms is local government-controlled enterprises in rural areas known as Township-Village Enterprises (TVEs), whose share in the national industrial output increased from 9 percent in 1978 to 27 percent in 1993. More importantly, despite the fact that local governments have sometimes remained predatory towards these firms,[2] they have been in many cases instrumental in making these firms as a driving force behind China's recent economic development. Studies have shown that local governments have been responsible in providing "critical inputs" (such as land), securing loans, and offering political support to these non-state firms.[3] To put it differently, the "grabbing hand" of these local government authorities, using the term of Frye and Shleifer (1997), have turned into the "helping hand" under local government-ownership.

Motivated by this observation, I study in this paper ownership of firms in an environment where there is a lack of institutional frameworks to hold governments accountable. I argue that, in such an environment, government ownership may serve as a second best commitment mechanism to restrain local governments from rent seeking

[1] Indeed, local government agencies collecting illicit fees, charges, and tolls has been one of the major concerns during the recent efforts in reforming government organizations and the tax system in China (see People's Daily (1999) for example).

[2] See Byrd and Gelb (1990)) and Whiting (1995).

[3] For example, Byrd (1990) suggested that the presence of local governments in the ownership of TVEs had been pivotal in securing loans from government-controlled banks (see also Zhang and Ronas (1996)). Nee (1992) maintained that TVEs had benefited from the political connections of local governments in expanding their market reach. Others like Chang and Wang (1994), Naughton (1994, 1996), and Putterman (1997) argued that local governments had contributed "critical inputs", such as land, initial collective assets, and human capital to the development of these enterprises. Local governments were also said to provide political protection for TVEs (Che and Qian (1998b) and Li (1996)). Similar stories apply to other forms of government-owned non-state firms in China as well, most noticeably, joint ventures between foreign investors and domestic government agencies. Indeed, studies have found that one of the most important factors for foreign investors in choosing local partners is the latter's knowledge of local politics and government regulations (Miller *etc* (1996)). And forming joint venture with a government owned partner "has been by far the most common way for western companies to establish a presence in China." (*The Economist* (1997). It has been argued that forming joint venture with a government owned partner allows foreign investors to "steer a path through bureaucracy."

activities. Under government ownership, a government subjects its interest to the performance of firms under its control and hence incentives of private agents managing these firms. To entice better efforts from these private agents and ultimately advance its own interest, the government may become less inclined to extract rents from these private agents and sometimes may even volunteer to offer "help" such as tax break or subsidy to these firms. In contrast, when firms are privately owned, the government will extract rents from private agents as much as possible, as it has little interest in these firms. As a result, government owned firms may suffer less from government rent seeking activities than private firms and therefore will have more room for development.[4]

I use a simple model to formalize my argument. In this model, a private agent, whom I refer to as a manager, undertakes an investment. The manager takes two costly actions, first he initiates the investment and then he implements the investment. Once it is initiated, the investment needs some regulated resources, such as a license, a quota, a piece of public land, and so forth, before it can be implemented by the manager. I refer to these regulated resources as a "slot," using the term of Banerjee (1997). A government agency is responsible for allocating the "slot" at a regulated price of zero. However, the government agency is corrupt. After the investment is initiated, the government agency can hold up the investment and use its control of the "slot" to charge an arbitrary amount of fee. I consider the slot as an "critical input" so that without the slot, the investment will generate no return.

I compare two ownership forms: private ownership and government ownership. In this model, ownership allows the owner (either the manager or the government agency) to control an investment decision that may offer private benefits to the owner at the expense of a lower investment return. To incorporate one of the conventional wisdom regarding government ownership, I model the decision as one about hiring (or firing) excessive workers and the private benefit as the political benefit pertinent only to the government agency.

Under private ownership, the manager hires no excessive workers and has the best *ex post* incentives to implement the investment. However, because the government agency uses the "slot" to extract rents from the manager, the latter's *ex ante* incentive to initiate the investment is compromised. Under government ownership, the government agency hires excessive workers out of political consideration. The hiring of excess workers adversely affects the *ex post* managerial incentives in implementing the investment. Under some natural assumption, the hiring of excessive workers and the *ex post* managerial incentives behave as complements: less over-staffing implies better managerial efforts.

The extent to which the owner-government agency will over-staff the firm depends on the trade-off the government agency perceives between the political benefit and the investment return it shares. Depending on various conditions it faces (which are not modeled), the government agency may either add more weight to the

[4] The focus of this paper is on the comparison between local government owned firms and private firms. I will discuss at the end of section 5 why the essence of this analysis applies better to local government ownership than to state ownership (i.e., ownership by the central government).

political benefit, in which case it is referred to as being pro politics; or vice versa, in which case it is referred to as being pro business. A lesser amount of excessive workers will be hired when the government agency is pro business.

Because it shares the investment return under government ownership, the government agency sees a need to motivate the manager. To motivate the manager, the government agency must convince the manager of its pro business attitude. Since the (*ex post*) managerial effort and hence the investment return is higher when the government agency is pro business, a pro business government agency can credibly reveal its pro business attitude by making a transfer payment to the manager. And such a transfer payment is made when the government agency restrains itself from extorting fees and offers "help" such as tax break or subsidy to the manager.[5]

Therefore, there is a trade-off between government ownership and private ownership. Government ownership compromises the manager's *ex post* incentives in implementing the investment not only because the manager no longer claims all the investment return, but also because the owner-government agency manipulates the control decision to pursue its political agenda. However, government ownership can enhance *ex ante* incentives from the manager in initiating the investment, as the government agency restrains itself from rent seeking activities. Under some fairly general conditions, government ownership Pareto dominates private ownership.

This analysis corresponds to many stylized empirical observations. First, the analysis echoes the notion that local government ownership emerges in China because local governments contribute "critical inputs" (Bryd (1990), Chang and Wang (1994), Naughton (1994, 1996)). It furthers this argument by highlighting the implication of government control of these inputs (or slots) on the ownership of firms under government rent seeking.

Second, this analysis also reflects the asserted linkage between local government ownership and the political favor and support provided by local governments (Nee (1992), Li (1996)). It extends the conventional wisdom in two important ways. On the one hand, it explains why such favor and support are earned through ownership rather than fees or bribes; and on the other hand, it shows how private parties, not just local governments themselves, can gain from these favor and support.

Third, by highlighting the possibility that government ownership Pareto dominates private ownership, the analysis offers a reason for the phenomenon that has been observed time and again, that is, private entrepreneurs in China's non-state sector would often volunteer to invite government authorities (and their affiliates) on board of their ventures.

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[5] This mechanism is to some extent similar to the recent work of Hermalin (1998). Hermalin (1998) shows that a superior may motivate his subordinates by taking actions to signal his private information, to which the subordinate could react on to improve productivity. In this model, the government agency restrain itself from fully exercising its bargaining power to signal its pro business attitude, to which the manager could react on to attain high productivity.

Fourth, the analysis suggests that the government agency restraints itself from rent seeking activities because it claims a share of returns from local government owned firms. This fits well with the fact that the rapid development of local government owned firms did not take place until early 1980's, when fiscal decentralization was introduced in China (Oi (1992, 1994), Qian and Weingast (1996), Wong (1992)). Thus, the analysis furthers the widely received argument that fiscal decentralization has provided local governments incentives to promote local economies by explaining in addition why fiscal decentralization favors local government owned firms in particular.

Finally, by emphasizing the control of critical inputs by the government agency as an important aspect in understanding local government ownership, this analysis sheds light on how ownership of firms would respond to institutional dynamics. For example, when the political climate in China turned hostile towards rural enterprises in 1989, with government regulations being tightened up, many private firms changed ownership into local government owned firms. On the other hand, as input markets become more and more liberalized in recent years, more and more local government owned firms will become privatized.

This study is linked to two strands of literature. First, it contributes to the property rights literature. The conventional view in the property rights literature maintains that ownership rights be allocated to parties whose incentives are more important (Grossman and Hart (1986), Hart and Moore (1990)). Nevertheless the ownership pattern in China's non-state sector often contradicts this conventional wisdom. That is, despite the fact that private incentives are arguably crucial to a firm[6], ownership rights of many newly emerged industrial firms in China are allocated to local governments rather than private parties. This study reconciles this paradox. As shown in this study, ownership is allocated to the government agency despite the fact that the government agency plays no productive role. Such an arrangement induces the government agency to restraint itself from fully exercising its bargaining power and therefore promotes private incentives.

Second, this study also contributes to the corruption literature. Thanks to many of the existing works,[7] I neglect many questions that have been addressed in the literature. For example, I will not discuss why there exist government regulations that encourage government rent seeking and why bribery is considered illegal. Nevertheless, little has been done in the literature linking government ownership with government rent seeking.[8] This study fills the vacuum. It formalizes the idea appearing sometimes in the press that government ownership may help private parties "steer a path through bureaucracy" (*The Economist* (1997)).

[6] This is not to deny the fact that, at least during the early development of China's township and village enterprises, local governments' incentives may also have been important in many cases. However, many of these enterprises remain government owned even after the roles of local governments have gradually faded.

[7] See Bardhan (1997) for a survey of this literature. For some of the recent contribution to this literature, see also Banerjee (1997), Bliss and Di Tella (1997), and Shleifer and Vishny (1993).

[8] With the exception of Shleifer and Vishny (1994), which focuses on the cost of government ownership when rent-seeking politicians distort behaviors of government-owned firms.

The idea that government ownership may help reduce government rent seeking activities is also contained in some recent studies. Che and Qian (1998b), for example, has shown that local government ownership can limit predatory behavior of the state. This study complements the work by Che and Qian by demonstrating that local government ownership can limit rent seeking activities of the local government itself.

The rest of the paper is organized as follows. Section 2 introduces the model. Section 3 offers the benchmark analysis of private ownership. It shows that government rent seeking may completely wipe out the manager's incentives to initiate an investment. I focus my analysis on government ownership in section 4. I show that the manager will have better incentives to initiate the investment as the government agency may restrain itself from rent seeking under government ownership. I extend this analysis to show that, under government ownership, the government agency may even help the firm by offering subsidies. A number of comparative static results are derived in section 5 to link this analysis to a number of stylized empirical observations concerning China's local government owned firms. Section 6 concludes.

## II. The Model

There are two risk neutral players: a manager and a government agency. The manager has know-how about an investment project and is responsible for initiating and managing the project. To initiate an investment, the manager has to spend the first effort, denoted by e. By spending the effort e, the manager incurs a private cost that is denoted as e as well. Once the effort is sunk, the investment takes place with probability $\mu(e)$ where $\mu(.)$ is differentiable, strictly increasing and concave, and satisfies the Inada condition.

After it is initiated, the investment needs an input and the government agency is a body that is in charge of the allocation of this input. One can think of this input as either a license, or a quota, or a piece of land, or access to financial capital. And the government agency can be any government regulatory organization in reality, such as a local community government.[9] Using the term of Banerjee (1997), I will refer to this input as a "slot." The government agency is delegated (by a higher level government, which is not modeled in this model) to allocate the slot to an investment project at a regulated price. For simplicity, I assume that the regulated price is zero.

However, the government agency is not held accountable. While the slot should be allocated to the investment at the regulated price, the government agency will use its authority to illicitly collect a fee for the slot. I

[9] In other words, in this paper I do not consider government as a single body. Instead I view government as a collection of various government agencies with the state government on the top setting regulations and delegating lower level government agencies to carry out these regulations. Of course, my analysis focuses on a government agency that is charge of a particular regulation while leaving the higher level (state) government outside the model.

denote the fee by B. In particular, once the investment is initiated, the agency will make a take-it-or-leave-it offer that demands the manager to pay B and otherwise the slot will not be allocated to the investment.

The fee may be either collected by the government agency to cover its local fiscal expenditures[10] or to put into its own pocket, in which case, this fee may be better described as a bribe. In any case, the Court does not enforce the illicitly charged fee. Instead, I assume that the transaction of fee-slot is enforced either in the form of spot transactions or through some informal enforcement mechanisms such as reputation. Thus once the manager pays the fee to the agency, the agency allocates the slot. If the slot is not allocated, the investment will be cut short and will generate a low return that is normalized to zero. If the slot is allocated, the investment continues and when completed will yield a positive (expected) return R.[11] The return is not contractable.

The amount of the expected return R is determined by two factors. One of the factors is the second managerial effort, denoted by a, in implementing the investment. The manager incurs a private cost, also denoted by a, for this effort. The other factor is an unverifiable control decision $x \in [0, \infty)$, which affects not only the total amount of the investment return, but also the marginal productivity of the managerial effort a.

While there are many ways to model the decision in the context of government-business relation, what I have particularly in mind is the hiring of excessive workers. In other words, x is the number of excessive workers that are hired. One of the major concerns regarding government owned firms is over-staffing (Shleifer and Vishny (1994)). Like their counterparts in other countries, one of the most important objectives of local governments in China is in fact to create employment opportunities for their constituents (Rozelle and Boisvert (1994), Jin and Qian (1998), Putterman (1997), Song and Du (1990)).

Although I interpret the decision x as the hiring of excessive workers, one should keep in mind that the decision can in fact be more generally thought of as any control decision that allows the government agency to interfere with the normal investment operation under government ownership. For example, one can also think of x as an activity that diverts funds used in the investment for public expenditure. However, to focus my analysis, I will interpret the decision as the hiring of excessive workers for the remainder of this paper.

As I model the control decision as the hiring of excessive workers, the government agency in this model does not have any productive role (from the technological point of view) in the investment. This is *not* to say that in reality local governments do not play any positive roles in the development of non-state enterprises. Many times, they do, as some of the existing studies suggest. However, I choose to model the control decision by the

[10] Many local government agencies in China have extra budget that is not closely monitored by higher level governments (Qian and Weingast (1996)) and is disposable by these local government agencies for the local fiscal expenditures.

[11] The expectation is taken conditional on the investment having taken place.

government agency as something unproductive in order to highlight that, even in this extreme case, government ownership may still Pareto dominate private ownership.[12]

More specifically, I assume that $R = f(a, x)$ where $f(., .)$ is differentiable, and concave in $\{a, x\}$. In addition, $f(., .)$ is strictly increasing in a, and satisfies the Inada condition, but is strictly decreasing in x. The hiring of excessive workers reduces the investment return: $\partial f/\partial x < 0$; and it reduces the marginal productivity of the managerial effort as well: $\partial^2 f/(\partial a \partial x) < 0$.[13]

The making of the control decision depends on the ownership form of the investment. I consider two ownership forms: private ownership and government ownership. Under private ownership, the manager controls the hiring of excessive workers and under government ownership, the decision right is allocated to the government agency.

Some private benefits accrue to the owner from the control decision. In the context of hiring of excessive workers, these private benefits can be best thought of as political benefits pertinent only to the government agency. Thus without loss of generality, I assume that the manager derives no political benefits from over-staffing, whereas for the government agency, the political benefits increase in the number of excessive workers. For simplicity, I assume that the political benefits of over-staffing have no (net) social value.

The propensity of the government agency in pursuing the political agenda of employment, however, depends on factors such as the political climate the government agency faces and the local economic condition it sees (see Byrd and Gelb (1990) for example). These factors determine both the pressures as the reward for the government agency in expanding local employment. Instead of modeling these factors explicitly, I choose a simple parameter $\theta$ to represent the propensity in which the government agency will pursue its political agenda.

In particular, the political benefits for the government agency is denoted by $U(x, \theta)$. $U(x, \theta)$ is differentiable, strictly increasing and concave in x, and satisfies the Inada condition, whereas $\theta \in \{\theta_h, \theta_l\}$ such that $\partial U(x, \theta_h)/\partial x < \partial U(x, \theta_l)/\partial x$. In other words, the government agency finds the marginal political gain of hiring additional workers much higher in the state $\theta_l$ than in the state $\theta_h$. Correspondingly, the government agency in the state $\theta_l$ is referred to as being "pro politics" and the government agency in the state $\theta_h$ is referred to as a (relatively) "pro business" government agency.

Naturally, the government agency has better information concerning the working of the factors that will determine its propensity in pursuing the political agenda as compared to the manager. Thus, without loss of

[12] Alternatively, I can model the control decision as some productive activity, which will only strengthen the argument that government ownership may dominate private ownership.

[13] This assumption can be justified easily. For example, imagine a scenario where over-staffing requires more managerial effort in monitoring (say, to prevent theft or embezzlement) leading to lower marginal productivity under diminishing marginal productivity.

generality, I assume that the actual state of nature is revealed to the government agency only. In contrast, the manager has only the *a priori* knowledge that the agency is pro business ($\theta = \theta_h$) with probability p and is pro politics ($\theta = \theta_l$) with probability 1 – p. Nevertheless, the manager may form his posterior belief about the agency's type based upon the way in which the government agency behaves.[14]

In addition to allowing the owner to take control of the decision x and receive the political benefits associated with the decision (if any), the ownership form also determines the redistribution of the investment return. Under private ownership, the investment return accrues to the manager only. I assume that the investment return is divided between the government agency and the manager under government ownership. To avoid the cost of going into details of how these shares are determined endogenously, for the purpose of this paper I simply assume that the government agency receives $\lambda_G$ share of the investment return and the manager receives 1 - $\lambda_G$ share of the investment return.[15]

The government agency's objective is to maximize its political benefits plus the rents that it can extract from the investment project, either through the fee it collects or through the investment return it shares under government ownership. The manager's objective is to maximize the amount of rents he will receive from the investment, net of the cost of his efforts.

The following figure summarizes the sequence of events under private ownership and under government ownership.

[Figure 1 enters here]

The appropriate solution concept for the ensuing analysis is sequential equilibrium. However, this solution concept often allows multiple equilibria to exist. To eliminate "unreasonable" equilibria, I will apply the "intuitive criterion" test (Cho and Kreps (1987)) whenever necessary. Thus an equilibrium in the rest of this paper refers to a sequential equilibrium that survives the "intuitive criterion" test. In the context of this model, the "intuitive criterion" test checks whether the manager has a "reasonable" posterior belief after the government agency deviates from an equilibrium behavior. Loosely speaking, suppose a government agency of a particular type (pro business or pro politics) will *never* choose action A under any posterior belief of the manager, and yet a government agency of the other type might choose action A under some posterior belief of the manager. Then according to the "intuitive

[14] The manager's posterior belief becomes irrelevant if the agency does not allocate the slot, in which the project will be terminated.

[15] The manager shares the investment return perhaps because he is the only one who has the know-how of the investment. It is straightforward to endogenize these shares, using the framework of Grossman, Hart and Moore (Grossman and Hart (1986), Hart and Moore (1990)), for example.

criterion" test, a posterior belief $\rho(A)$ that assigns a positive probability to a government agency of the first type given that A is observed is considered "unreasonable."

Before I begin my analysis, I should make the note that, in the context of this model, private ownership is the efficient arrangement *if* the government agency is held accountable (i.e., prevented from collecting arbitrary fees). This is because, under private ownership, the manager's efforts, both *ex post* in implementing the investment and *ex ante* in initiating the investment, reach the social optimum; and no excessive workers will be hired. With this in mind, I turn next to an environment of government rent seeking.

## III. The Benchmark: Private Ownership

I begin my analysis with the case where the investment is privately owned. I will show as a benchmark that under private ownership the threat of government rent seeking may wipe out *ex ante* incentives of the manager in initiating an investment. I proceed in my analysis using backward induction.

Notice first that, after the fee is paid and the slot is allocated, the manager will hire no excessive workers because he derives no political benefit from this and will choose effort a to maximize $f(a, 0) - a$ since he has the claim for all the investment return. Let $a^p$ denote the manager's optimal (*ex post*) effort under private ownership. The manager's payoff at this stage will be $f(a^p, 0) - a^p$.

Second, consider the stage where the government agency charges a fee for the slot. Since the government agency has all the bargaining power, the government agency will fully exploit its bargaining power and set the fee $B^p = f(a^p, 0) - a^p$. Since, the manager's payoff will be zero without the slot being allocated to the investment, the manager will pay this fee. As a result, once the investment is initiated, the manager will receive a zero payoff $V^p$ from the investment.

Finally, consider the stage where the manager chooses his effort in initiating the investment. Anticipating a zero payoff from his investment, the manager will therefore never choose an effort to initiate the investment. The next proposition summarizes the observation.

Proposition 1:

Under private ownership, there exists a unique equilibrium where the investment is never initiated.
Proof: Omitted.

Proposition 1 highlights a typical hold-up problem faced by the manager in this model. Once the effort of initiating the investment is sunk and the investment gets started up, the government agency will use its control of the slot to extract all surplus from the manager. Anticipating this, the manager will never put forward any effort to initiate the investment. Because the investment is never initiated, both the government agency and the manager will receive a zero payoff.

## IV. Government Ownership as a Commitment Device

In contrast to private ownership, government ownership can serve as a credible commitment device for the government agency to restrain itself from excessive rent seeking. I show in this section that the government agency may become less predatory toward the investment it owns than the investment the manager owns, and as a result, government ownership will encourage the manager to initiate the investment.

I proceed in my analysis in three stages: the *ex post* stage, the interim stage, and the *ex ante* stage. In the *ex post* stage, the government agency chooses the hiring of excessive workers and the manager chooses an effort in implementing the investment. In the interim stage, the government agency collects the fee. In the *ex ante* stage, the manager chooses his effort in initiating the investment.

### *Ex Post*

Consider first the stage after the fee is paid and the slot is allocated. At this stage, the government agency chooses x, the number of excessive workers to be hired, simultaneously with the manager choosing the effort a in implementing the investment. Anticipating the managerial effort a, the government agency chooses x to maximize its payoff:

$$\lambda_G f(a, x) + U(x, \theta)$$

where $\theta \in \{\theta_h, \theta_l\}$. Let $x(a, \theta)$ be the reaction function of the government agency thus generated.

Lemma 1:

The reaction function of the government agency $x(a, \theta)$ is strictly decreasing in the managerial effort a and for any managerial effort a, $x(a, \theta_h) < x(a, \theta_l)$.

Proof: See Appendix

The intuition behind Lemma 1 is as follows. First, I have assumed that the marginal productivity of the managerial effort a decreases as more excessive workers are hired (i.e., $\partial^2 f(a, x)/(\partial a \partial x) < 0$). Given this assumption, the marginal cost of hiring excessive workers increases as the managerial effort a increases (since $\partial^2 f(a, x)/(\partial x \partial a) < 0$ -- notice that $\partial f(a, x)/\partial x < 0$). Therefore $x(a, \theta)$ decreases in the managerial effort a. Second, I have also assumed that the marginal benefit of hiring excessive workers is higher when the government agency is pro politics as compared to when the government agency is pro business (i.e., $\partial U(x, \theta_l)/\partial x > \partial U(x, \theta_h)/\partial x$). Thus the pro business government agency tends to hire fewer excessive workers than the pro politics government agency does.

The manager, on the other hand, chooses the effort a to implement the investment while anticipating the government agency's interference in hiring decisions. Given the anticipated hire of excessive workers x, the effort a maximizes the manager's payoff:

$$(1 - \lambda_G)f(a, x) - a.$$

Let a(x) be the reaction function of the manager thus generated.

<u>Lemma 2</u>:

The reaction function of the manager a(x) is strictly decreasing in x.

Proof: Omitted.

The intuition underlying this result is evident. Since the marginal productivity of the managerial effort decreases when a larger number of excessive workers are hired, the manager will put forward the less effort when he anticipates that a larger number of excessive workers will be hired.

Given the manager's posterior belief ρ, the (subgame) equilibrium choices of a and $x(\theta)$ are determined when the anticipated choice of the managerial effort equals the actual managerial effort and the anticipated hiring of excessive workers equals the average hiring of excessive workers by the pro business and pro politics government agencies. In other words:

$$\rho x(a, \theta_h) + (1 - \rho)x(a, \theta_l) = a^{-1}(x)$$

Since both the manager's reaction function and the government agency's reaction function are downward sloping, a condition is needed to ensure that the equilibrium choices of a and $x(\theta)$ are stable. I assume that:

$$\partial x(a, \theta)/\partial a > (\mathrm{d}a(x)/\mathrm{d}x)^{-1} \qquad [1]$$ [16]

for both $\theta_h$ and $\theta_l$. With this condition, the equilibrium choices of a and x under government ownership, denoted as $a^G$ and $x^G(\theta)$, can be shown in Figure 2. In Figure 2, given the choice of the managerial effort $a^G$, the pro business government agency would choose $x^G(\theta_h)$ and the pro politics government agency would choose $x^G(\theta_l)$. The expected choice of the excessive workers, given the manager's posterior belief$\rho$, is then $\rho x^G(\theta_h) + (1 - \rho)x^G(\theta_l)$. And given this expected choice of the government agency, the manager chooses his effort $a^G$.

[Figure 2 enters here]

Proposition 2:

Suppose that condition [1] holds. Given the manager's posterior belief $\rho$, there exists a unique (subgame) equilibrium, where

(1) the pro business government agency's choice of excessive workers $x^G(\rho, \theta_h)$ is strictly less than that of the pro politics government agency $x^G(\rho, \theta_l)$;

(2) the managerial effort $a^G(\rho)$ increases in the manager's posterior belief $\rho$; and

(3) the hiring of excessive workers decreases in the manager's posterior belief $\rho$.

Proof: Omitted.

The first part of Proposition 2 follows directly from Lemma 1. The second part of Proposition 2 is derived from the first part in conjunction with Lemma 2. Because the government agency hires a smaller number of excessive workers when it is pro business than when it is pro politics, the managerial effort increases if the manager believes that the government agency is more likely to be pro business. The third part of Proposition 2 follows from the second part of this proposition and Lemma 1.

Proposition 2 has two important implications. First, the government agency may solicit efforts from the manager by affecting the latter's posterior belief. In particular, the government agency may motivate the manager by convincing him that it will not extensively interfere with the investment operation (through the hiring of excessive workers). Second, the pro business government agency derives a larger marginal value from increased managerial effort than the pro politics government agency. This is because, according to Proposition 2, the government agency hires fewer excessive workers when it is pro business, and the marginal productivity of the

[16] This condition holds if $\lambda_G f_{xa}{}^2 > \lambda_G f_{xx}faa + U_{xx}f_{aa}$ holds for both $\theta_h$ and $\theta_l$, where $f_{aa}$ is the second derivative of f(.,.) with respect to a, $f_{xx}$ is the second derivative of f(.,.) with respect to x, $f_{xa}$ is the cross derivative of f(.,.) with respect to x and a, and $U_{xx}$ is the second derivative of U(.,.) with respect to x.

managerial effort is higher when there are fewer excessive workers. This observation is summarized in the following Lemma.

Lemma 3:

The marginal value of the (*ex post*) managerial effort is larger for the pro business government agency than for the pro politics government agency.

Proof: See Appendix.

*Interim*

I now turn my analysis to the stage where the government agency charges the fee for the slot. At this stage, the manager forms the posterior belief regarding whether the government agency is pro business or pro politics, based on how the government agency sets the fee. For simplicity, I will focus only on pure strategy adopted by the government agency, which is defined as the fee charged by the government agency given the state of nature $\theta$.

There can be two kinds of (pure strategy) sequential equilibrium: separating equilibrium and pooling equilibrium. In a separating equilibrium, the pro business government agency and the pro politics government agency charge a different amount of fee. Let $B_h$ denote the fee charged by the pro business government agency and $B_l$ be that by the pro politics government agency, $B_h \neq B_l$. In such an equilibrium, the manager has the posterior belief such that $\rho(B = B_h) = 1$ and $\rho(B = B_l) = 0$. In a pooling equilibrium, the pro business government agency and the pro politics government agency charge the same amount of fee. Let $B_{hl}$ denote the fee thus charged. The manager's posterior belief will then be $\rho(B = B_{hl}) = p$.

According to Lemma 3, the marginal value of the managerial effort is greater for the pro business government agency. Thus in a separating equilibrium the pro business government agency can charge a smaller amount of fee than what the pro politics government agency is willing to so as to convince the manager that it is pro business. Once the manager is convinced that the government agency is pro business, and therefore will not put a large number of excessive workers on the staff, he will exert better efforts in implementing the investment, as Proposition 2 suggests. In other words, the pro business government can motivate the manager by restraining itself from rent seeking activities.

Nevertheless, however small it is, the fee must be non-negative. To articulate this non-negativity constraint, I define condition [2] as:

$$f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) + U(x^G(\rho = 0, \theta_l), \theta_l) - a(\rho = 0)$$

$$\geq \lambda_G f(a^G(\rho = 1), x^G(\rho = 1, \theta_l)) + U(x^G(\rho = 1, \theta_l), \theta_l). \quad [2]$$

Furthermore, define $v^G(\rho = 0)$ (and $v^G(\rho = 1)$) as the payoff received by the manager in a separating equilibrium *after* he pays the fee charged by the pro politics (and pro business) government agency. These payoffs determine the maximum amount of fee that the pro politics (and pro business) government agency can extract in a separating equilibrium.

Lemma 4:

Under government ownership, the maximum amount of fee that the government agency *can* extract in a separating equilibrium is higher when the government agency is pro business, i.e., $v^G(\rho = 1) > v^G(\rho = 0)$.
Proof: See Appendix.

Proposition 3:

Suppose that condition [1] and [2] hold. Then, under government ownership there exists a unique equilibrium where

(1) the amount of fee charged by the pro business government agency is strictly less than that charged by the pro politics government agency, i.e., $B_h < B_l$; and
(2) the pro politics government agency extracts all the rents from the manager, i.e., $B_l = v^G(\rho = 0)$; whereas the pro business government agency does not, i.e., $B_h < v^G(\rho = 1)$.

Proof: see Appendix.

The intuition for these results is as follows. First, in order to separate itself from the pro politics government agency, the pro business government agency must charge a fee that is less than the fee that the pro politics government agency charges. Otherwise, the pro politics government agency could charge the same amount of fee as the pro business government agency does and at the same time receive better managerial efforts from the deceived manager.

Second, when the pro business government agency charges a smaller amount of fee than the pro politics government agency does, the pro politics government agency faces a trade-off. It can either receive better managerial efforts with the smaller fee that the pro business government agency charges, or it can receive reduced managerial efforts with the larger fee it charges in equilibrium. Since the marginal value of the managerial efforts is smaller for the pro politics government agency, the pro politics government agency will opt for the second choice when the fee charged by the pro business government agency is sufficiently small.

Third, given that the pro politics government agency trades off managerial efforts for a larger amount of fee, the pro politics government agency will fully exploit its bargaining power and extract all the rents from the manager. Thus $B_l = v^G(\rho = 0)$. Furthermore, the payoff received by the manager after the fee is paid is higher when the government agency is known to be pro business in equilibrium, i.e., $v^G(\rho = 1) > v^G(\rho = 0)$, because the managerial efforts are higher and fewer excessive workers are hired in this case. Given that the pro business government agency charges a smaller amount of fee than the pro politics government agency, it follows that $B_h < v^G(\rho = 1)$.

*Ex Ante*

Proposition 3 reveals a central observation of this paper. That is, government ownership can serve as a credible commitment mechanism through which the government agency may restrain itself from fully exercising its bargaining power and therefore alleviate the hold-up problem. As a result, the manager may receive a positive amount of payoff from the investment under government ownership. Indeed, the *ex ante* payoff for the manager, denoted by $V^G$, will be $V^G = p(v^G(\rho = 1) - B_h) > 0$. The manager chooses e to maximize $\mu(e)V^G - e$.

Corollary 1:

Suppose that condition [1] and [2] hold. Then

(1) the manager has a positive incentive to initiate the investment under government ownership; and

(2) government ownership Pareto dominates private ownership.

The analysis presented above offers a new insight as to why local government owned firms, instead of private firms, have become a driving force behind China's rapid economic growth. When input markets are not liberalized so that inputs (or "slots"), especially those crucial to business activities, are under government control, private incentives will suffer from government rent seeking activities in an environment where there are lacking institutional mechanisms to hold governments accountable. Government ownership, on the other hand, induces governments to restrain themselves from fully exercising their bargaining power, thus protects private incentives that are pivotal to economic development. When other conditions are right (such as the presence of cheap labor and market opportunities) as in the case of China, government ownership allows the non-state sector to take off.

This analysis also unravels a puzzling issue regarding China's local government owned firms. Despite the fact that these enterprises have contributed significantly to China's remarkable economic growth, empirical studies have found local governments to use their enterprises to pursue their political agenda, leading to the possible inefficiency of local government owned enterprises. This analysis suggests that the possible inefficiency in government ownership (government intervention in investment operation and the need to solicit managerial incentives) actually prompts the government agency to restrain itself from abusing its government authority.

Nevertheless, because the amount of fee collected by the government agency is non-negative, there is a limit to the extent that the pro business government agency can effectively motivate the manager only through restraining itself from rent seeking activities. In particular, when condition [2] does not hold, the pro business government agency will no longer be able to motivate the manager by charging a smaller amount of fee, unless something can be done in addition. This is because, when condition [2] does not hold, the pro politics government agency will always find it better off to mimic the fee charged by the pro business government agency so as to induce better efforts from the manager.

In other words, when condition [2] does not hold, there will no longer exist a separating equilibrium if the action of the government agency (during the interim stage) is restricted to collecting a fee for the slot. On the contrary, there may indeed exist a pooling equilibrium where the managerial incentives in initiating the investment are completely compromised under government ownership. Let $v^G(\rho = p)$ denote the (expected) payoff the manager receives after he pays the fee $B_{hl}$ in a pooling equilibrium,

$$v^G(\rho = p) = (1 - \lambda_G)[pf(a^G(\rho = p), x^G(\rho = p, \theta_h)) + (1 - p)f(a^G(\rho = p), x^G(\rho = p, \theta_l))].$$

This payoff defines the maximum amount of rents the government agency can extract from the manager in a pooling equilibrium.

Lemma 5:

Suppose that condition [2] does not hold and the government agency is restricted in charging a non-negative fee. Then, there exists a pooling equilibrium under government ownership where the manager has no incentive to initiate the investment, provided that

$$\lambda_G f(a^G(\rho = p), x^G(\rho = p, \theta_l)) + U(x^G(\rho = p, \theta_l), \theta_l) + v^G(\rho = p)$$
$$> \lambda_G f(\theta_l, a(\rho = 1)) + U(x^G(\rho = 1, \theta_l), \theta_l). \qquad [3]$$

Proof: See Appendix.

Lemma 5 motivates the following extension of the previous analysis. What I will do next is to relax the implicit assumption that the government agency can only charge a non-negative amount of fee for the slot. Instead, I assume that the government agency can help the manager by granting the slot along with a subsidy instead of a fee.

In other words, let $B \in (-\infty, \infty)$.[17] I assume that the subsidy becomes a part of the investment return and is shared between the owner and the manager.

It is evident that, when the investment is privately owned, the government agency will not offer any subsidy. When the investment is government owned, however, the pro business government agency may use a subsidy to motivate the manager. It does so when a reduced amount of fee is not sufficient to convince the manager that it will not excessively intervene with the investment operation (i.e., condition [2] does not hold).

Proposition 4:

Suppose that $B \in (-\infty, \infty)$ and that condition [1] holds. Then under government ownership there exists a unique equilibrium where

(1) the pro business government agency collects a smaller amount of fee than the pro politics government agency does when condition [2] holds;

(2) the pro business government agency offers a subsidy while the pro politics government agency collects a fee when condition [2] does not hold;

(3) the manager has a positive incentive to initiate the investment; and

(4) government ownership Pareto dominates private ownership.

Proof: Omitted.

However, the government agency is delegated by a higher level government to regulate the allocation of the slot and the regulated price of the slot is zero. Hence the subsidy can also be interpreted as the government agency hiding fiscal revenues at the firm it owns. This interpretation sheds light on a phenomenon that has often been observed in China. That is, local governments often offer tax rebates and concessions to the local government owned enterprises without the state approval (see Berkowitz and Li (1999)). Such a practice, known as "hiding fortune at your constituents" or *cang fu yu min* is in fact opposed by the state out of concern that this will result in a loss of the state's fiscal revenues. This practice is in sharp contrast with the behavior of local governments collecting arbitrary fees and taxes *vis a vis* private enterprises. Nevertheless, according to this analysis, by neglecting the revenue collection for the state, the local governments can actually motivate managers to take better efforts and thus increase revenues (investment returns) that accrue to the local governments directly.

[17] Implicitly, I am assuming that the government agency is not constrained by the fiscal budget that is available to it. More realistically, the amount of subsidy the government agency can offer depends on its fiscal budget. A richer government agency will, therefore, be more capable of motivating the manager. This is consistent with the observation of Byrd and Gelb (1990) and that of Jin and Qian (1998).

## V. From Government Ownership to Private Ownership

The previous section has demonstrated an unequivocal case where government ownership Pareto dominates private ownership. The case is made with the assumption that, when the manager is denied of the slot, the investment cannot take place and therefore yields zero return. In this section, I assume instead that, when the manager is denied of the slot, the investment can still take place but will yield a smaller amount of return. I assume for simplicity that the amount, denoted by r, is fixed. This amount r measures how critical the slot is to the investment. I adopt this alternative assumption to offer a more balanced comparison between private ownership and government ownership.

Evidently, this alternative assumption does not change the qualitative analysis concerning private ownership; except that the *ex ante* payoff the manager receives, denoted as $V^P$, will be $V^P = r$ as the government agency is only able to charge a fee $B^p = f(a^p, 0) - a^p - r$, and the manager will therefore choose e to maximize$\mu(e)r - e$. Neither does the alternative assumption change the qualitative analysis concerning government ownership. Under government ownership, there exists a unique equilibrium where the pro politics government agency will charge $B_l$ such that $B_l = v^G(\rho = 0) - (1 - \lambda_G)r$, where $v^G(\rho = 0)$ as defined before is the payoff the manager receives after he pays $B_l$; and the pro business government agency will choose a fee/subsidy $B_h < B_l$. Accordingly, the *ex ante* payoff of the manager will be:

$$V^G = p\{(1 - \lambda_G)f(a(\rho = 1), x(\rho = 1, \theta_h)) - a(\rho = 1) - B_h\} + (1 - p)(1 - \lambda_G)r .$$

where p is the probability that the government agency is pro business. And the manager will therefore choose e to maximize $\mu(e)V^G - e$.

<u>Lemma 6</u>:

$\partial V^P/\partial r > \partial V^G/\partial r > 0.$

Proof: See Appendix.

According to Lemma 6, the less critical the slot is to the investment (i.e., r is larger), the larger an amount of *ex ante* payoff the manager receives from the investment. Furthermore, the manager's *ex ante* payoff increases faster in r under private ownership than under government ownership. This is because, under private ownership, the manager is the only one that has the claim over r, whereas under government ownership, r is shared between the government agency and the manager. Since the manager's *ex ante* payoff is larger under government ownership than under private ownership when $r = 0$, Lemma 6 implies that there exists $\underline{r} > 0$ such that all $r \leq \underline{r}$ government ownership promotes the *ex ante* managerial incentives.

On the other hand, Private ownership always promotes the *ex post* efficiency. That is, once the investment takes place, it is always more efficiently implemented under private ownership than under government ownership. This is both because the manager has the claim over all the investment return under private ownership, and because the manager has the control decision and as a result excessive workers will not be employed.

Whether government ownership or private ownership should be adopted therefore depends on the trade-off between the *ex ante* managerial incentives and the *ex post* efficiency. Given the assumption that the political benefits the government agency received through hiring excessive workers does not contribute to the social surplus, the social surplus under private ownership is:

$$SS^P = \mu(e^P)[f(a^P, x^P = 0) - a^P] - e^P;$$

and the social surplus under government ownership is:

$$SS^G = \mu(e^G)\{p[f(a^G(\rho = 1), x^G(\rho = 1, \theta_h) - a^G(\rho = 1)] + (1 - p)[f(a^G(\rho = 0), x^G(\rho = 0, \theta_l) - a^G(\rho = 0)] - e^G.$$

Government ownership is more efficient than private ownership if and only if $SS^G > SS^P$. The next proposition highlights the conditions under which government ownership, as a second best solution to the problem of government rent seeking, may turn out to be more efficient than private ownership.

<u>Proposition 5</u>:

Government ownership is more efficient than private ownership only if

(1) the slot is “critical” to the investment, i.e., r is sufficiently small;

(2) the government agency is likely to be pro business, i.e., p is sufficiently large; and

(3) both the government agency and the manager has an adequate share of the investment return, i.e., $\lambda_G$ is neither sufficiently small nor sufficiently large.

Proof: Omitted.

According to Proposition 5, a number of conditions must hold in order for government ownership to dominate private ownership. Following this proposition, the rest of this section discusses two issues: how these conditions affect the trade-off between government ownership and private ownership, and how these conditions are related to the development of local government owned firms in China.

The Input Markets

The first condition claims that, in the context of this analysis, government ownership becomes more efficient than private ownership when the government agency regulates an input that is critical to the investment. The reason is that, under this circumstance, the government agency extracts a large amount of rents from the manager under private ownership. Accordingly, the government agency's self restraint on rent seeking activities under government ownership allows the manager to preserve these rents, thus leading to a considerable increment in the *ex ante* managerial incentives.

This observation formalizes the conventional argument that the rise of local government owned enterprises in China is closely related to the underdevelopment of input markets and that local governments have contributed "critical inputs" to the growth of these enterprises (Chang and Wang (1994), Naughton (1994, 1996), and Putterman (1997)). In particular, Naughton (1994) suggested the control of "critical inputs," such as land, by local governments as an important factor explaining the emergence of China's township and village enterprises.[18]

However, the government control of "critical inputs" itself could not have led to the dominance of local government ownership. According to the property rights literature, ownership rights of an investment should be allocated to parties whose *incentives* that are the most important to the investment. In this model, and arguably in the case of China, incentives of private parties rather than local governments are perhaps the most important for many local government owned enterprises. In this respect, the "critical input" argument does not fully address the emergence and the relative success of these local government owned enterprises.

The analysis complements the "critical input" argument by highlighting two important factors. First, it emphasizes the lack of institutional mechanisms in China that will hold local governments accountable. In such an environment, local governments can abuse their control of those "critical inputs", extract surplus from private parties, and compromise their incentives as a result. Second, in contrast to the conventional view in the property rights literature, it suggests that allocating ownership rights of an investment to local governments can induce the local governments to restrain themselves from abusing their authorities and ultimately promote private incentives.

According to this analysis, the significance of local government owned enterprises in the Chinese economy is likely to diminish with the development of the input markets.[19] As input markets become liberalized, an

[18] Indeed, local governments in rural China control not only land, but also water, electricity, business licenses, access to financial capital and so on.
[19] In a recent empirical study, Jin and Qian (1998) show that the role of the local government owned enterprises become less

increasing number of inputs will be allocated through market mechanisms, free of bureaucratic discretion. Consequently, formal contracts can be introduced to help alleviate the hold-up problem that results from government rent seeking. Furthermore, as an increasing number of inputs are allocated on the market, it creates competition with government regulated inputs. This helps reduce government agencies' bargaining power over the regulated inputs and in turn reduces their ability in extracting rents from private parties. Finally, the development of input markets also implies more mobility of local enterprises, perhaps because of the build-up of their reputation and experience. This induces competition among local governments as well, reducing further their ability in rent seeking activities. In any event, the development of input markets will make enterprises less dependent on favors from local governments and less vulnerable to government rent seeking. Consequently, the concern for improving the *ex post* efficiency will dominate the choice of ownership forms, and many of the local government owned firms may be transformed to private owned firms.

Pro Business Government Agency

The second condition maintains that government ownership will dominate private ownership only when the government agency is likely to be pro business. This is because, only when the government agency is pro business, will it have the incentive to motivate the manager by restraining itself from rent seeking activities. In contrast, when the government agency is pro politics, it will not stop extracting rents from the manager even under government ownership.

In this model, I have described a pro business government agency as one less interested in hiring excessive workers to advance its political agenda. More generally, a pro business government agency is one that is more interested in undertaking an activity that will complement the efforts of the private parties involved in the investment.

Whether a government agency is pro politics or pro business often depends on the political climate, the administrative pressure the government agency faces, and perhaps most importantly the local political and economic environment the government agency inhabits. Studies have shown that local governments promote local government owned enterprises for various motives, such as fiscal revenue generation and employment creation. And these motives can sometimes promote the development of government owned non-state enterprises and hamper it at other times (see Byrd and Gelb (1990), Rozelle and Boisvert (1994), Song and Du (1990) for example).

For example, in their studies of China's local government owned enterprises, Byrd and Gelb (1990) found that "(i)n relatively prosperous areas the relationship between community governments and their enterprises tends to

prominent in areas with better-developed product markets.

be mutually beneficial." They also noted, "(b)ut in poorer areas governments are forced to exploit their enterprises, to the long-term detriment of both firms and community." According to their argument, the fiscal linkages between community governments and their enterprises "reinforce the incentives of community government leaders to promote the development of community enterprises." However, with the same linkages, "the difficult financial situation of community governments (in backward areas) impels them to draw funds from community enterprises for public expenditure." [20]

Observations like this fit well with this analysis. According to this analysis, the role of local governments is neither uniformly benevolent nor uniformly hostile to the development of local economy. Instead, the institutional environment, organizational forms as well as local political and economic conditions all determine the way in which local governments will behave.

Of course, as local government ownership promotes private incentives, their development also changes the local political and economic conditions. Take the employment creation for example, the growth of local government owned enterprises helps ease employment pressure faced by the local governments. In this regard, one can think of some interesting extension of this analysis. For instance, suppose that there are two regions, each has an equal number of firms. In one region, only a small percentage of firms are government owned. In this region, the government agency will tend to be pro politics. This is because most of firms are private owned which are less likely to invest due to government rent seeking and as a result, the employment pressure will be high. But given that the government agency is likely to be pro politics, private ownership will dominate government ownership. In the end, the local economy of this region may be trapped into low development. In contrast, suppose that most of firms in the other region are government owned. In that region, investments will take place in these firms if the government agency is pro business. On the other hand, if investments take place in these firms, the employment pressure will be relieved and the government agency will become pro business. Accordingly, multiple equilibria are possible in the second region.

## Fiscal Decentralization

The third condition states that both the government agency and the manager must have sufficient stakes in the government owned firm. When the manager has little stake in the government owned firm, its *ex post* incentives will be low anyway and will not respond to the control decision made by the government agency. As a result, government ownership will not prompt the pro business government agency to soften its bargaining power in

[20] Jin and Qian (1998) showed that township and village enterprises are more likely to be adopted and generate more revenues in regions where local governments are more capable of resisting political pressures from the central government

allocating the slot.[21] Similarly, when the government agency has little share in the investment return, the government agency will always trade off fiscal revenues for its political agenda such as higher employment. Consequently, the *ex post* managerial efforts are likely to remain low, and government ownership will not induce the government agency to concede its bargaining power.

This condition implies that, as a part of the government organization, the local government must be able to maintain the fiscal revenues generated from its enterprises without having to hand over to higher level governments. Furthermore, this condition implies that the local government must retain the authorities to dispose these fiscal revenues for local expenses. These requirements happen to be met in China since 1980's. Indeed, the rapid development of local government owned firms did not take place until early 1980's when fiscal decentralization started to be introduced in China. Fiscal decentralization has devolved fiscal authorities from the central to local governments, has allows local governments to maintain a large share of fiscal revenues generated from the local economy, and has created various mechanisms[22] to credibly commit the central government to hands off local economic affairs. Many have argued that fiscal decentralization encourages local governments to promote economic development.[23] Complementary to this conventional argument, which focuses on the incentives of local governments, this study points out that fiscal decentralization helps the development of local government owned enterprises in particular, because it prompts local governments to nurture the private incentives.

Along this line of argument, I shall discuss briefly the difference between state-owned enterprises and local government owned enterprises. In contrast to local government owned enterprises, which have been the driving force of China's recent economic development, many state-owned enterprises have had deteriorating financial performances despite the on-going enterprise reforms. In 1994, more than 40 percent of state-owned enterprises incurred losses, which amounted to 6.1 percent of total industrial value added and one percent of China's GDP.

There are many factors attributable to the lack-luster performance of state-owned enterprises. It is not the purpose of this paper to exhaust all those factors. Instead, I shall simply suggest one perspective of government ownership within the context of this particular analysis. Like local government owned enterprises, state-owned enterprises from time to time rely on government agencies at local level to provide inputs under regulation. However, unlike local government owned enterprises, state-owned enterprises hand over a large share of their returns to the central government, which either directly controls these enterprises or delegates the control to local governments. Because government agencies at local level do not have a significant share of revenues from state-owned enterprises, they have less incentive to help these enterprises overcome bureaucratic barriers when allocating

[21] Evidence has shown that, unlike their counterparts in the state sector, the compensation of manager/workers in local government owned enterprises are closely linked to the profitability of these enterprises (see Dong (1998), Gelb (1990)).

[22] Such as allowing local governments to maintain "extra-budget" accounts.

[23] See Berkowitz and Li (1999), Oi (1992, 1994), Qian and Weingast (1996), and Wong (1992).

inputs under their control. For the same reason, when these local government agencies exercise the control of state-owned enterprises on behalf of the usually pro politics central government, they will, according to this analysis, be pro politics as well, adding troubles to the embattled state-owned enterprises.

## VI Conclusion

I begin this paper with the observation that private enterprises in China have often suffered from encroachment of local governments whereas firms with local government ownership have flourished under the support of local governments. Inspired by this observation, I present a study of ownership of firms when there are short of institutional mechanisms to prevent government rent seeking activities. The purposes of this study are two folds. First, I show how certain ownership arrangement, especially, government ownership, can serve as a commitment mechanism through which government agencies will restrain themselves from rent seeking activities. Such commitment is shown to promote private incentives and ultimately benefits government agencies themselves. Second, I use this analysis to interpret a host of empirical observations observed during the development of local government owned enterprises in China, and to shed light on the relative success of these enterprises as well as the possible dynamics of their future.

The model I present in this paper is interesting in its own right. It is stylized and can be easily linked to the Grossman-Hart-Moore framework.[24] Thus the analysis coming out of this model holds the promise of being more generally applied to settings other than government rent seeking. In particular, it may be applied to situations where transaction of certain input that is critical to an investment activity (such as the slot in this paper) cannot take place prior to the investment. A particular example is the case of venture capital where financial capital is typically allocated to an entrepreneur only after he/she initiates the investment. Nevertheless, the central point of this analysis sets this model apart from the conventional wisdom in the property rights literature. It suggests that ownership of the investment may be more efficiently allocated to the party who controls the input (such as the government agency in this case or the venture capitalist in the venture capital example), even though the incentives of that party are *not* the most important.

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[24] For example, one can reinterpret this model as if the investment requires two assets to operate. The first asset is the slot. Its ownership is fixed at party A before the investment takes place. The second asset is formed after the investment takes place. Its ownership will determine the share of the investment return as in the Grossman-Hart-Moore framework. Following the conventional assumption in the Grossman-Hart-Moore framework, one can further interpret x as an activity always undertaken by party A, who has the private information concerning the cost of undertaking action x. Assume that party B takes action e and a sequentially and the incentives for these two actions are most important to the investment. According to the Grossman-Hart-Moore framework, the ownership of both assets should be allocated to party B. However, given that the ownership of the first asset is fixed at party A before the investment takes place, this analysis suggests that it will be more efficient to allocate the ownership of the second asset to party A, despite the fact that party B's incentives are most important.

The current study is limited to a partial equilibrium analysis. In future research, one may bring the analysis to a macro level by considering the relations between institutional dynamics (the liberalized input markets for example) and the evolution of ownership forms. One particular point of interest is the relationship between the development of local government ownership and the "dual track" system in China, where resources are allocated both through plans and on the emerging markets. Another interesting extension is to study how the organization of government institution affects the ownership of a firm. The organization of the government institution can be characterized as the allocation of many different slots among various government agencies. Such a study may help us understand why the relative success of local government ownership remains a phenomenon peculiar to China, but not elsewhere like Russia.

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**Appendix**

Proof of Lemma 1:

To show that the reaction function of the government agency x(a, θ) is strictly decreasing in a, notice that the reaction function satisfies the first order condition:

$$\partial U(x(a, \theta), \theta)/\partial x + \lambda_G \partial f(a, x(a, \theta))/\partial x \equiv 0$$

Differentiating the first order condition with respect to a, I have:

$$[\partial^2 U(x(a, \theta), \theta)/\partial x^2](\partial x/\partial a) + \lambda_G \partial^2 f(a, x(a, \theta))/(\partial x \partial a) + [\lambda_G \partial^2 f(a, x(a, \theta))/\partial x^2](\partial x/\partial a) = 0$$

Given the assumptions that $\partial^2 f(a, x(a, \theta))/(\partial x \partial a) < 0$ and that both U(x, θ) and f(a, x) are concave in x, I therefore conclude that $\partial x/\partial a < 0$.

To show that $x(a, \theta_h) < x(a, \theta_l)$ for any managerial effort a, notice again that the optimal choice of x given a and θ satisfies the first order condition:

$$\partial U(x, \theta)/\partial x + \lambda_G \partial f(a, x)/\partial x = 0$$

Since $\partial U(x, \theta_h)/\partial x < \partial U(x, \theta_h)/\partial x$ and both U(x, θ) and f(a, x) are concave in x, it follows that $x(a, \theta_h) < x(a, \theta_l)$.

Proof of Lemma 3:

I denote the payoff of the government agency at this stage as:

$$w(\theta; a(\rho)) = \lambda_G f(a^G(\rho), x^G(\rho, \theta)) + U(x^G(\rho, \theta), \theta)$$

where $\theta \in \{\theta_h, \theta_l\}$. I differentiate $w(\theta; a(\rho))$ with respect to ρ. Using the envelope theorem, I have:

$$\partial w(\theta; a(\rho))/\partial \rho = \lambda_G[\partial f(a^G(\rho), x^G(\rho, \theta))/\partial a](\partial a/\partial \rho).$$

Since $x^G(\rho, \theta_h) < x^G(\rho, \theta_l)$ according to Proposition 2, and since $\partial^2 f/(\partial a \partial x) < 0$,

$$\partial f(a^G(\rho), x^G(\rho, \theta_h))/\partial a > \partial f(a^G(\rho), x^G(\rho, \theta_l))/\partial a.$$

In other words,

$$\partial w(\theta_h; a(\rho))/\partial \rho > \partial w(\theta_l; a(\rho))/\partial \rho.$$

Proof of Lemma 4:

By definition,

$$v^G(\rho = 0) = (1 - \lambda_G)f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) - a(\rho = 0),$$

$$v^G(\rho = 1) = (1 - \lambda_G)f(a^G(\rho = 1), x^G(\rho = 1, \theta_h)) - a(\rho = 1).$$

Since $x^G(\rho = 1, \theta_h) < x^G(\rho = 0, \theta_h)$ (according to the third part of Proposition 2) and $x^G(\rho = 0, \theta_h) < x^G(\rho = 0, \theta_l)$ (according to the first part of Proposition 2), the result is thus obtained using the envelope theorem.

Proof of Proposition 3:

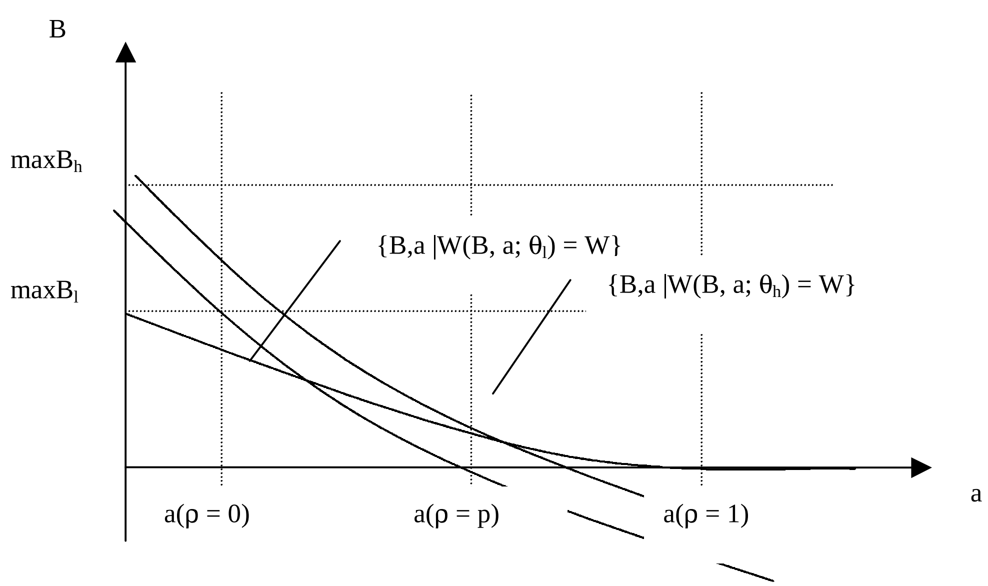
Let $W(B, a; \theta)$ denote the government agency's payoff at this stage,

$$W(B, a; \theta) = \lambda_G f(a, x) + U(x, \theta) + B,$$

where $\theta \in \{\theta_h, \theta_l\}$. According to Lemma 3, $W(B, a; \theta)$ has the single crossing property. That is, for any (B, a),

$$W_a/W_B(\theta = \theta_h) > W_a/W_B(\theta = \theta_l),$$

where $W_a = \partial W/\partial a$ and $W_B = \partial W/\partial B$. Accordingly, I can draw indifference curves for the high type agency and the low type agency on the space of (B, a) as shown in the following figure.




Notice that, in Figure 2, the indifference curves for the pro business government agency are everywhere steeper than the indifference curves for the pro politics government agency because of the single-crossing property.

With this in mind, I proceed to prove the proposition. First, I notice that the government agency can do no worse than charging a fee so that the manager forms the "worst" belief of the government agency. That is, the pro politics government agency's payoff is bounded below by

$$W(B = v^G(\rho = 0), a^G(\rho = 0); \theta_l) = f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) + U(x^G(\rho = 0, \theta_l); \theta_l) - a^G(\rho = 0).$$

And the pro business government agency's payoff is bounded below by

$$W(B = v^G(\rho = 0), a^G(\rho = 0); \theta_h) = \lambda_G f(a^G(\rho = 0), x^G(\rho = 0, \theta_h)) + U(x^G(\rho = 0, \theta_h); \theta_h)$$
$$+ (1 - \lambda_G) f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) - a^G(\rho = 0).$$

Second, I notice that if condition [2] holds, there does not exist a pooling equilibrium that survives the "intuitive criterion" test. This is because, when condition [2] holds, for any pooling equilibrium the pro business government agency can deviate by choosing a fee $B \geq 0$ such that

$$\lambda_G f(a^G(\rho = 1), x^G(\rho = 1, \theta_h)) + U(x^G(\rho = 1, \theta_h); \theta_h) + B >$$
$$\lambda_G f(a^G(\rho = p), x^G(\rho = p, \theta_h)) + U(x^G(\rho = p, \theta_h); \theta_h) + B_{hl}$$

and at the same time

$$\lambda_G f(a^G(\rho = 1), x^G(\rho = 1, \theta_l)) + U(x^G(\rho = 1, \theta_l); \theta_h) + B <$$

$$\lambda_G f(a^G(\rho = p), x^G(\rho = p, \theta_l)) + U(x^G(\rho = p, \theta_l); \theta_l) + B_{hl}.$$

In other words, there exists a fee that only the pro business agency will (profitably) deviate to under some posterior beliefs of the manger.

Third, since the pro politics agency can do no worse that having the payoff:

$$W(B = v^G(\rho = 0), a^G(\rho = 0); \theta_l) = f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) + U(x^G(\rho = 0, \theta_l); \theta_l) – a^G(\rho = 0).$$

therefore in a separating equilibrium (that survives the “intuitive criterion” test), the pro politics agency will charge the fee

$$B_l = (1 - \lambda_G)f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) – a^G(\rho = 0).$$

Thus a separating equilibrium exists if there exists $B_h$ such that (1) the pro politics government agency does no worse than $W(B = v^G(\rho = 0), a^G(\rho = 0); \theta_h)$:

$$\lambda_G f(a^G(\rho = 1), x^G(\rho = 1, \theta_h)) + U(x^G(\rho = 1, \theta_h); \theta_h) + B_h \geq$$
$$\lambda_G f(a^G(\rho = 0), x^G(\rho = 0, \theta_h)) + U(x^G(\rho = 0, \theta_h); \theta_h)$$
$$+ (1 - \lambda_G)f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) – a^G(\rho = 0);$$

and (2) the pro politics government agency will not deviate to choose $B_h$:

$$\lambda_G f(a^G(\rho = 1), x^G(\rho = 1, \theta_l)) + U(x^G(\rho = 1, \theta_l); \theta_l) + B_h \leq$$
$$f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) + U(x^G(\rho = 0, \theta_l); \theta_l) – a^G(\rho = 0).$$

Obviously, only one of these two conditions will be binding in equilibrium. It is also evident that for a sequential equilibrium that survives the “intuitive criterion” test, it must be the second condition that binds (otherwise the pro business government agency can increase $B_h$). When the second condition is binding, the first condition is reduced:

$$\lambda_G f(a^G(\rho = 1), x^G(\rho = 1, \theta_h)) + U(x^G(\rho = 1, \theta_h); \theta_h) - \lambda_G f(a^G(\rho = 0), x^G(\rho = 0, \theta_h)) - U(x^G(\rho = 0, \theta_h); \theta_h) \geq$$
$$\lambda_G f(a^G(\rho = 1), x^G(\rho = 1, \theta_l)) + U(x^G(\rho = 1, \theta_l); \theta_l) - \lambda_G f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) - U(x^G(\rho = 0, \theta_l); \theta_l).$$

And the condition holds according to Lemma 3. Hence, if condition [2] holds, there exists a separating equilibrium where the pro politics government agency will charge $B_l = (1 - \lambda_G)f(a^G(\rho = 0)) – a^G(\rho = 0)$ and the pro business government agency will charge $B_h \geq 0$ such that the incentive compatibility condition for the pro politics government agency (the second condition) binds.

Proof of Lemma 5:

To establish a pooling equilibrium, notice first that in a pooling equilibrium as in a separating equilibrium, the government agency must receive a payoff greater than $W(B = v^G(\rho = 0), a^G(\rho = 0); \theta_l)$ if it is pro politics and greater than $W(B = v^G(\rho = 0), a^G(\rho = 0); \theta_h)$ if it is pro business.

Let $v^G(\rho = p)$ denote the (expected) payoff the manager receives after he pays the fee $B_{hl}$ in a pooling equilibrium. In a pooling equilibrium where the manager’s incentives to initiate the investment is completely, $B_{hl} = v^G(\rho = p)$. In this equilibrium, the pro politics government agency receives a payoff:

$$\lambda_G f(a^G(\rho = p), x^G(\rho = p, \theta_l)) + U(x^G(\rho = p, \theta_l), \theta_l) + v^G(\rho = p);$$

and the pro business government agency receives a payoff:

$$\lambda_G f(a^G(\rho = p), x^G(\rho = p, \theta_h)) + U(x^G(\rho = p, \theta_h), \theta_h) + v^G(\rho = p).$$

It is straightforward to show that both payoffs exceed their lower bounds.

Furthermore, for this equilibrium to survive the "intuitive criterion" test, the pro business government agency must not be able to separate itself from the pro politics government agency by choosing a smaller amount of fee that the latter will never choose. In other words, there does not exists a $B > 0$ such that:

$$\lambda_G f(a^G(\rho = p), x^G(\rho = p, \theta_l)) + U(x^G(\rho = p, \theta_l), \theta_l) + v^G(\rho = p)$$
$$\leq \lambda_G f(\theta_l, a(\rho = 1)) + U(x^G(\rho = 1, \theta_l), \theta_l) + B.$$

In other words,

$$\lambda_G f(a^G(\rho = p), x^G(\rho = p, \theta_l)) + U(x^G(\rho = p, \theta_l), \theta_l) + v^G(\rho = p)$$
$$> \lambda_G f(\theta_l, a(\rho = 1)) + U(x^G(\rho = 1, \theta_l), \theta_l).$$

Proof of Lemma 6:

Under private ownership, $\partial V^P/\partial r = 1$. Under government ownership, $\partial V^G/\partial r = - p\partial B_h/\partial r + (1 – p)(1 - \lambda_G)$.

To evaluate $\partial B_h/\partial r$, notice that in a separating equilibrium (that survives the "intuitive criterion" test), the pro politics government agency collects a fee $B_l = v^G(\rho = 0) – r$ and the pro business government agency chooses a fee $B_h$ such that the pro politics government agency does not want to mimic.

Accordingly, the pro politics government agency has the payoff:

$$\lambda_G f(a(\rho = 0), x(\rho = 0, \theta_l)) + U(x(\rho = 0, \theta_l), \theta_l) + v^G(\rho = 0) – (1 - \lambda_G)r.$$

and when $B_h \geq 0$, the pro business government agency must choose $B_h$ in equilibrium such that:

$$\lambda_G f(a(\rho = 0), x(\rho = 0, \theta_l)) + U(x(\rho = 0, \theta_l), \theta_l) + v^G(\rho = 0) – (1 - \lambda_G)r =$$
$$\lambda_G f(a(\rho = 1), x(\rho = 1, \theta_l)) + U(x(\rho = 1, \theta_l), \theta_l) + B_h,$$

in which case $\partial B_h/\partial r = - (1 - \lambda_G)$. This holds of course when $B_h$ satisfies the non-negativity condition, which now is

$$f(a(\rho = 0), x(\rho = 0, \theta_l)) + U(x(\rho = 0, \theta_l), \theta_l) - a(\rho = 0) – (1 - \lambda_G)r$$
$$>\lambda_G f(a(\rho = 1), x(\rho = 1, \theta_l)) + U(x(\rho = 1, \theta_l), \theta_l). \qquad [2']$$

When condition [2'] does not hold, the pro business government agency must charge a subsidy $B_h < 0$ such that the pro politics government agency does not want to mimic:

$$\lambda_G f(a(\rho = 0), x(\rho = 0, \theta_l)) + U(x(\rho = 0, \theta_l), \theta_l) + v^G(\rho = 0) – (1 - \lambda_G)r =$$
$$\lambda_G f(a(\rho = 1), x(\rho = 1, \theta_l)) + U(x(\rho = 1, \theta_l), \theta_l) + (1 - \lambda_G)B_h,$$

in which case, $\partial B_h/\partial r = - 1$.

In either case, $\partial V^G/\partial r > 0$ and $\partial V^G/\partial r < 1$. Hence $\partial V^P/\partial r > \partial V^G/\partial r > 0$.

Figure 1

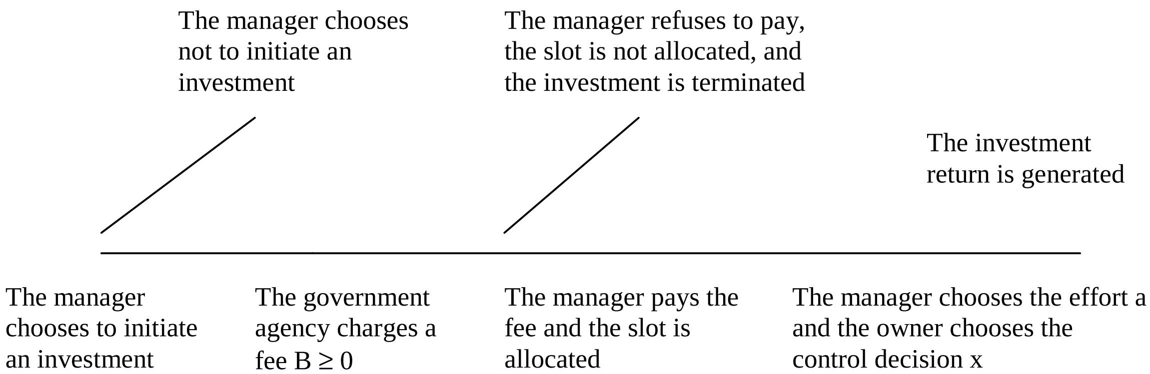
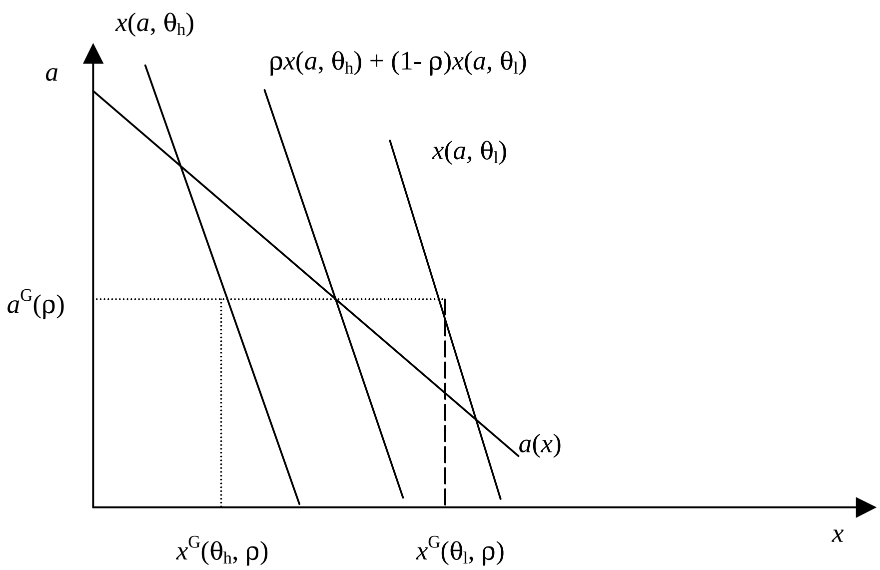



Figure 2



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