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From the Grabbing Hand to the Helping Hand

A Rent Seeking Model of China's Township-Village Enterprises

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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, government ownership may Pareto dominate private ownership under certain conditions. These conditions correspond to a host of stylized empirical observations concerning local government-owned firms (township-village enterprises) during China's transition to a market economy.

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Acknowledgements

I.   Introduction

For the past two decades, China has registered remarkable economic growth, despite the absence of a 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 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 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' through tax break or subsidy. In contrast,

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[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.

[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; Li, 1996).

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. Che and Qian (1998b) delivered the similar idea that government ownership may help reduce government rent seeking activities. In particular, they showed that local government ownership can limit predatory behavior of the state. This study complements their work by demonstrating that local government ownership can limit rent seeking activities of the local government itself.

During (at least the early stage of) China's economic transition, local governments controlled the allocation of various inputs, such as land, electricity, water, license, financial capital, and so forth. Such privilege enjoyed by local governments over private parties such as entrepreneurs and managers is the institutional basis for government rent seeking and is the starting point of this paper. Similar to this paper, Li (1996), Chen and Rozelle (1999), Hsiao et al. (1998), and Tian (2000) emphasized such privilege as well. However, different from this paper, these works derived their analyses from the assumption that (non-corrupt) local governments *themselves* are useful in production. Consequently, the focus of these papers was, in a sense, how to best make use of the local governments' 'efforts'. This paper, on the other hand, recognizes explicitly that (1) institutionally, the local government is not held accountable and hence may be corrupt; and (2) the local government is perhaps as counter-productive in production as it may be technically useful. To deviate from these studies, this paper thus considers an environment where *there is no need to offer the local government incentives in production*. I show that, even in such an environment, ownership may be allocated to the local government. In particular, by recognizing the possibility that the government-controlled input can be 'bought' on the market (through bribery), this paper address the classical question of Coase: whether the transaction of the input should take place on the market, or within the boundary of the firm (i.e., by granting the local government the ownership of the firm).

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. Section 4 analyzes government ownership, where 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 and deliver a number of comparative static results in section 5. Section 5 links this analysis to a number of stylized empirical observations concerning TVEs. Section 7 concludes.

2. 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.[4] 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 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[5] 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.[6] The return is not contractable.

The amount of the expected return R is determined by two factors. One 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

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[4] 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.

[5] 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.

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

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 government agency as something unproductive in order to highlight that, even in this extreme case, government ownership may still Pareto dominate private ownership.[7]

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: $\partial^2 f/(\partial a \partial x) < 0$.[8] 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; 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 θ to represent the propensity in which the government agency will pursue its political agenda.
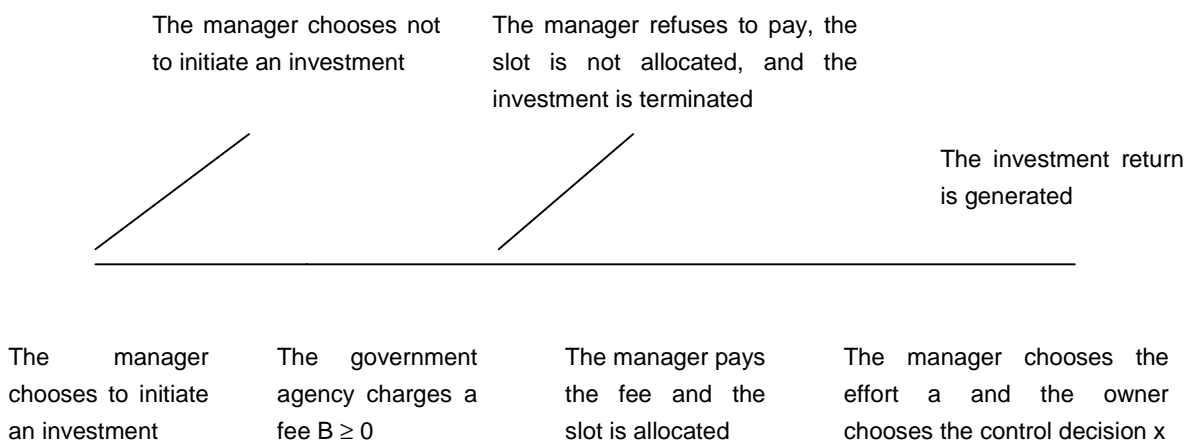
In particular, the political benefits for the government agency is denoted by $U(x, \theta)$. $U(x, \theta)$ is differentiable, strictly increasing and concave in x, and satisfies the Inada condition, whereas $\theta \in \{\theta_h, \theta_l\}$ such that $\partial U(x, \theta_h)/\partial x < \partial U(x, \theta_l)/\partial x$. In other words, the government agency finds the marginal political gain of hiring additional workers much higher in the state θ_l than in the state θ_h. Correspondingly, the government agency in the state θ_l is referred to as being 'pro politics' and the government agency in the state θ_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 generality, I assume that the actual state of nature is revealed to the government agency

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

[8] 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.

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.[9]

Figure 1
Sequence of events

The manager chooses not to initiate an investment

The manager refuses to pay, the slot is not allocated, and the investment is terminated

The investment return is generated

The manager chooses to initiate an investment

The government agency charges a fee B ≥ 0

The manager pays the fee and the slot is allocated

The manager chooses the effort a and the owner chooses the control decision x

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 λ_G share of the investment return and the manager receives $1 - \lambda_G$ share of the investment return.[10] 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. Figure 1 summarizes the sequence of events under private ownership and under government ownership.

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,

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

[10] 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.

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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 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.

3.   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.

<u>Proposition 1:</u> 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.

4. From grabbing hand to helping hand

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.

Lemma 2: 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(θ) 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(θ) are stable. I assume that:

$$\partial x(a, \theta)/\partial a > (da(x)/dx)^{-1} \qquad\qquad [1]^{11}$$

for both θ_h and θ_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 ρ, 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. For the rest of my analysis, I assume that condition [1] always holds.

Figure 2
The equilibrium choice of a and x under government ownership

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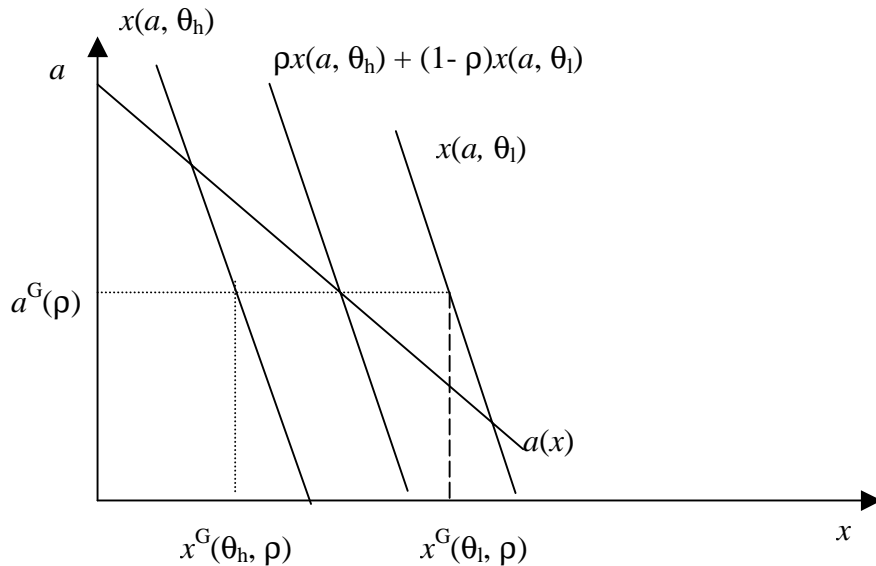
[11] This condition holds if $\lambda_G f_{xa}^2 > \lambda_G f_{xx}f_{aa} + U_{xx}f_{aa}$ holds for both θ_h and θ_l, where f_{aa} is the second derivative of f(.,.) with respect to a, f_{xx} is the second derivative of f(.,.) with respect to x, f_{xa} is the cross derivative of f(.,.) with respect to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

Proposition 2: Given the manager's posterior belief ρ, there exists a unique equilibrium for the continuation game, 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 ρ; and

3. the hiring of excessive workers decreases in the manager's posterior belief ρ.
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 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 θ. 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 $\rho(B = B_{hl}) = p$. Under the pooling equilibrium, the government agency's type is not revealed. This section focuses mainly on the separate equilibrium whereas the next section will focus on the pooling equilibrium.

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.

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: 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

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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:

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. More importantly, the analysis reveals a possibility that a rent seeking government agency may turn its grabbing hand *vis-à-vis* private firms to a helping hand towards government-owned firms. To see this, notice that B_h is set in such a way that the incentive compatibility constraint for the pro politics government agency is binding. That is:

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

Since $B_l = (1 - \lambda_G)f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) - a(\rho = 0)$, I have:

$$B_h = f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) + U(x^G(\rho = 0, \theta_l), \theta_l) - a(\rho = 0)$$
$$- [\lambda_G f(a^G(\rho = 1), x^G(\rho = 1, \theta_l)) + U(x^G(\rho = 1, \theta_l), \theta_l)].$$

In other words, $B_h \geq 0$ if and only if:

$$f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) + U(x^G(\rho = 0, \theta_l), \theta_l) - a(\rho = 0)$$
$$\geq \lambda_G f(a^G(\rho = 1), x^G(\rho = 1, \theta_l)) + U(x^G(\rho = 1, \theta_l), \theta_l). \qquad [2]$$

Corollary 2: Under government ownership, the pro business government agency will charge a fee to the firm if [2] holds, but will offer a subsidy otherwise.

To summarize this section, I present the next proposition, which should be straightforward following the discussion above.

Proposition 4: Suppose that $B \in (-\infty, \infty)$. 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.

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-à-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.

5.   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 two assumptions that turn out to be quite restrictive. First, when the manager is denied of the slot, the investment cannot take place and therefore yields zero return. Second, when necessary to induce the managerial effort, the government agency can offer an unlimited amount of subsidy. In this

section, I drop these two restrictive assumptions and assume instead that, (1) when the manager is denied of the slot, the investment can still take place but will yield a smaller amount of return, for simplicity, this amount is assumed to be fixed and is denoted by r; and (2) the government agency faces a fiscal budget constraint $\underline{B}$ such that $B \in [- \underline{B}, \infty)$. I adopt these two alternative assumptions to offer a more balanced comparison between private ownership and government ownership. These two alternative assumptions do 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 able to charge a fee $B^p = f(a^P, 0) - a^P - r$ only.

Neither do the alternative assumptions change the qualitative analysis concerning government ownership, provided that $B_h > - \underline{B}$. Suppose this is the case. Then under government ownership, 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 such that

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

And the separating equilibrium exists if

$$f(a^G(\rho = 0), x^G(\rho = 0, \theta_l)) + U(x^G(\rho = 0, \theta_l), \theta_l) - a(\rho = 0)$$
$$- [\lambda_G f(a^G(\rho = 1), x^G(\rho = 1, \theta_l)) + U(x^G(\rho = 1, \theta_l), \theta_l)] \geq - \underline{B} + (1 - \lambda_G)r \qquad [2']$$

In such an equilibrium, the ex ante payoff of the manager will be:

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

<u>Lemma 5</u>: $\partial V^P/\partial r > \partial V^G/\partial r > 0$. Proof: see Appendix.

According to Lemma 5, 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 5 implies that there exists a threshold of r beyond which private ownership instead of government ownership better promotes the ex ante managerial incentives.

When the condition [2'] does not hold, there will no longer exist a separating equilibrium under government ownership. Instead, a pooling equilibrium will emerge. In such an equilibrium, the government agency's type is not revealed. Accordingly, the government agency will have no incentive to restraint itself from rent seeking, regardless whether it is pro business or pro politics. I therefore focus on the pooling equilibrium where both types of the government agency set the fee to extract as much as possible from the manager. That is:

$$B_{hl} = (1 - \lambda_G)[pf(a^G(\rho = p), x^G(\rho = p, \theta_h)) + (1 - p)f(a^G(\rho = p), x^G(\rho = p, \theta_l))] - a^G(\rho = p) - (1 - \lambda_G)r.$$

In such an equilibrium, the ex ante payoff of the manager will be:

$$V^G = (1 - \lambda_G)r.$$

Whether government ownership or private ownership should be adopted 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:

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

Since private ownership is always ex post efficient, government ownership may be more efficient than private ownership only if it improves the ex ante managerial incentive. Whether government ownership does so or not depends on if $V^G > V^P$. I therefore conclude:

Proposition 5: 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 close and yet not equal to one; and

3. the government agency has a sufficiently large fiscal budget if condition [2] does not hold.

Proof: omitted.

I make the final note to highlight the importance of information asymmetry, or the uncertainty of the manager regarding the government agency's type, in determining the possible dominance of government ownership.

<u>Corollary 3</u>: Private ownership weakly dominates government ownership when p = 1 or p = 0. Proof: omitted.

6.   Interpreting China's TVEs

The foregoing analysis corresponds to a number of stylized observations of China's TVEs. The conventional wisdom has argued 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; see Chang and Wang (1994), Naughton (1994, 1996), Putterman (1997), and more recently Chen and Rozelle (1999) and Tian (2000). Naughton (1994), for example, 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.[12] This analysis reflects such wisdom nicely. Indeed, it shows that government ownership dominates private ownership *only when* the input that the government agency controls is 'critical'. Nevertheless, this analysis also pushes the argument one step further. It explains why the 'critical input' needs to be acquired within the boundary of the firm instead of via market transactions.

According to the property rights literature, ownership rights enhance the bargaining power to the party that the rights are allocated to. In an environment where incentives of private parties are important and local governments are as often counter-productive as they are useful (in bringing the 'critical inputs', for example), ownership rights should be allocated to private parties such as managers or entrepreneurs and the acquisition of 'critical inputs' should take place through market transactions (as Corollary 3 demonstrates). In other words, 'critical inputs' argument itself does not rationalize the ownership arrangement.

This analysis adds a twist to the existing property rights literature. It captures two salient features in the government-management relation in China's TVEs. First, by having the control of the firm, the local government is likely to interfere with the management and such interference can be *counterproductive* (instead of productive as many studies typically assume). Second, the manager of a township-village enterprise can never be absolutely sure about how (and whether) the local government will interfere with the management. As this analysis shows, these two features help account for the nature of government ownership of TVEs. In particular, when allocating the input it controls, the local government may behave softly (does not charge a bribe as much as possible) if it owns the firm, but will behave aggressively otherwise. Accordingly, government ownership emerges when the input is 'critical', since in this case the 'leniency' is especially valuable (without the 'leniency', a large amount of rents will be appropriated by the local government).

Instead of restricting the attention to physical input, one may interpret the government-regulated input in more broad sense. In particular, one may think of the input as representing the political favor and support provided by local governments. In the early stage of China's economic transition, the political environment was hostile not only towards private enterprises, but also towards TVEs as well. As they penetrated the

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[12] Indeed, local governments in rural China control not only land, but also water, electricity, business licenses, access to financial capital and so on.

transitional turf of state-owned enterprises, TVEs were once considered as a threat to the state sector. Despite this, TVEs were able to flourish thanks to the political favor and support granted by the local governments (Nee, 1992; Li, 1996).

It is interesting to note that some of the TVEs were first created by private entrepreneurs as private firms and were later registered as TVEs. Even for those enterprises that were established by local governments, it is often private entrepreneurs that were hired into the management of these enterprises. These entrepreneurs chose to forego outside opportunities such as creating their own firms despite their career success. In both cases, it is evident that both entrepreneurs and local governments find it in their own interests to team up together instead of having private firms, as this analysis has suggested.

One important implication of this analysis is that the ownership form of TVEs will evolve in response to the dynamics of the institutional environment. Following the discussion above, at least two institutional changes have significant impacts on the ownership arrangement. One is the liberalization in ideology and hence political climate under which the development of non-state sector and private firms in particular is regarded as legitimate and an integral part of China's economic transition. Such a change in ideology as well as government policies towards private firms will inevitably induce a large-scale transformation of TVEs from government ownership to private ownership. Another is the development of the input markets. As input markets become liberalized, an increasing number of inputs will be allocated through market mechanisms, free of bureaucratic discretion. An increasing number of inputs allocated on the market helps cut into the local government's bargaining power *vis-à-vis* private enterprises as government-regulated inputs become increasingly less relevant. The development of input markets also implies more mobility of local enterprises. This induces competition among local governments as well, reducing their bargaining power even further. In a recent empirical study, Jin and Qian (1998) show that the role of the local government owned enterprises become less prominent in areas with better-developed product markets; see also Chen and Rozelle (1999) and Tian (2000).

The development of TVEs was not uniform across different regions of China even during the early stage of economic reform. This analysis suggests that TVEs are likely to emerge when the local government is more likely to be pro business and is well endowed in terms of its fiscal budget. 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 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'.

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)). Fiscal decentralization devolved fiscal authorities from the central to local governments and allowed local governments to maintain a large share of fiscal revenues generated from the local economy, thus creating incentives for local governments to promote local economies.[13] Indeed, as this analysis suggests, the dominance of TVEs requires that the local government is able to maintain the fiscal

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

revenues generated from these enterprises for its own expense, without having to hand over to higher level governments.

But, why did TVEs instead of private enterprises benefit particularly from fiscal decentralization? By alluding to corruption, this analysis reveals a possible reason. That is, fiscal incentives will not stop local governments from behaving predatory against private firms,[14] but will induce them to restraint themselves from rent seeking activities when dealing with TVEs.

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 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.

7. 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 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

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[14] Indeed, it is straightforward to show that the government agency will try to extract as much rent as possible from a private firm even when it generates tax revenues from the firm.

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 $x(a, \theta)$ 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 $U(x, \theta)$ 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 $U(x, \theta)$ 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.

Figure 3
Indifference curves of the two type agencies
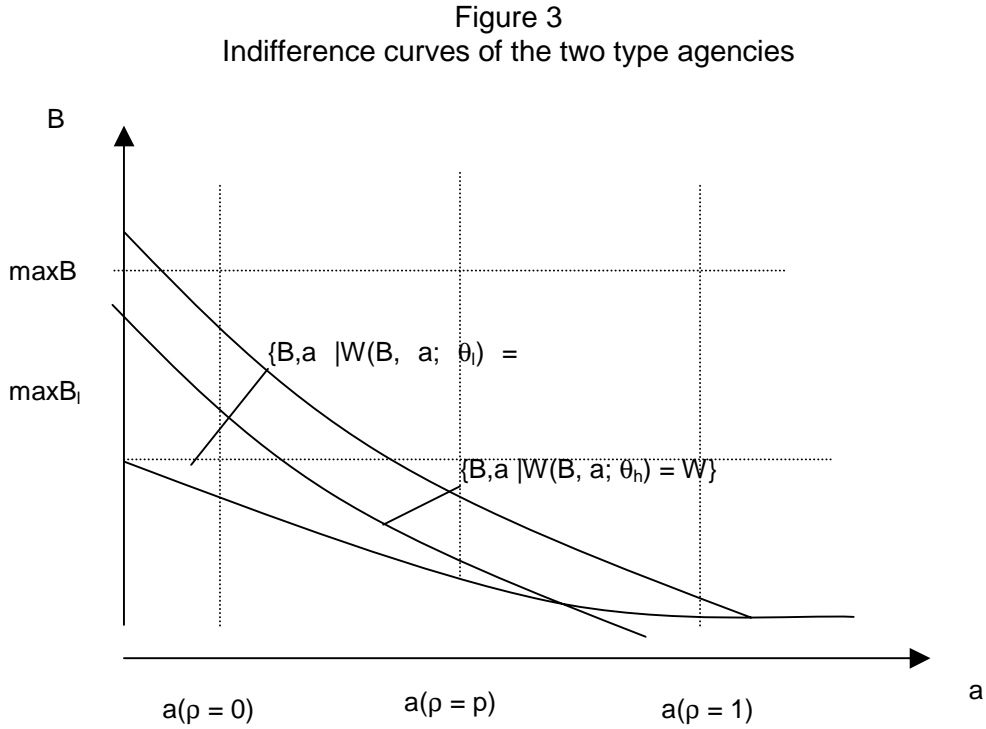
Notice that, in Figure 2, the indifference curves for the pro business government agency are everywhere steeper than the indifference curves for the pro politics government agency because of the single-crossing property. With this in mind, I proceed to prove the proposition. First, I notice that the 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: 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 $\partial V^P/\partial r > \partial V^G/\partial r > 0$.