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A THEORY OF AMBIGUOUS PROPERTY RIGHTS IN TRANSITIONAL ECONOMIES

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Summary

A widely held belief in economics is that institutions of clearly defined property rights are the pre-conditions for economic prosperity. Based on this conventional wisdom, rapid privatization has been accepted as the main strategy of the post-socialist transition. **The rest of the question is who should be the owner or who should enjoy property rights.**

However, the Chinese experience constitutes a major contradiction to the conventional wisdom of property rights. The surprise comes from the Chinese non-state sector, where property rights arrangements on the whole are far from being clear. The owners of firms in the Chinese non-state sector are often loosely defined. Moreover, the rights of the owners are also ambiguously specified and poorly protected. Surprisingly, the performance of the Chinese non-state sector is miraculous, judged by common standards. During the past decade, it has been enjoying over 20 percent of average annual growth. **As a result, the non-state sector has taken over 50 percent of the nation's output.**

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In this paper, we develop a theory to analyze ambiguous property rights, which are defined as a situation where multiple parties have to fight, ex post, for the actual control right. Conventionally, clearly defined property rights entitle the owner unequivocal control rights in all circumstances, except those specified by an ex ante contract. With ambiguous property rights, the owner's control rights are not guaranteed. The owner(s) has to fight (or bargain) for the actual control after the uncertainty has been resolved. **In other words, before hand, it is uncertain who will obtain control rights ex post.**

Our theory rationalizes ambiguous property rights in some cases. The key is the market environment in which the firm makes transactions. One of such cases is the gray market. In a gray market environment, transactions may be blocked due to remnant government interference. The gray market gets its name due to the uncertainty regarding whether the transaction will be in a white (normal) or black (difficult) state. Facing a gray market, the entrepreneur rationally choose to include seemingly unrelated parties as ambiguous owners, who are not normally involved in the operation of the firm but can step in and turn black states in white ones. Local bureaucrats, who are driven by tax revenue, can play this role. Thus, an otherwise private firm may optimally choose to have ambiguous property rights. The benefit of ambiguous property rights is that when the state is black, the firm can easily get help from some of its ambiguous owners. In other words, the arrangement of ambiguous property rights is a response to the grayness **of the market, which is due to market imperfection.**

The paper has two policy implications. The general implication is that when discussing enterprise reform during the transition, property right arrangements of the enterprise per se may not be the whole issue. In addition, the market environment is also very important. Therefore, narrowly focusing on privatization without helping create market environment is not enough during the transition. The second implication is that until reasonably functioning market environment is established, purely private owner-

ship forms may not be the most efficient. Given market imperfections, at the initial stage of transition, it may be desirable to provide proper incentives to local government officials and to involve them in property rights arrangement of local firms.

A Theory of Ambiguous Property Rights in Transitional Economies¹

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Abstract

Contrary to conventional wisdom, we **ask**: can ambiguous property rights sometimes be efficient? Ambiguous property rights, as defined in this paper, **arises** when owners' rights are not guaranteed before hand. Instead, owners have to fight for the actual control, ex post. As a major example of ambiguous property rights, the highly successful Chinese non-state sector is surveyed. The paper then rationalizes the arrangement of ambiguous property rights. **The key is to relate a firm's optimal property rights arrangement to its market environment.** We finally argue that **the immature market environment in China (the gray market) makes ambiguous property rights often more efficient than unambiguously defined private property rights.**

JEL Classification **Codes:** D23, O12, P21.

Key Words: Reform, Transition, Property Rights, Market Imperfection.

1. Introduction

A widely held belief in economics is that institutions of clearly defined property rights are the pre-conditions for economic prosperity. Based on this conventional wisdom, rapid privatization has been accepted as a necessary step of the post-socialist transition. Meanwhile, most of the current discussions of transition are based on one premise, that is, ownership and property rights are clearly defined. Their concern is who should be the owner or who should enjoy property rights.

However, the Chinese experience constitutes a major contradiction to the conventional wisdom of property rights. The surprise comes from the Chinese non-state sector, which has been the “locomotive” of the Chinese economic growth (Singh, Xiao, and Ratha, 1993). Loosely defined, the non-state sector includes all firms except the traditional state owned enterprises. During a period of 15 years, the performance of the Chinese non-state sector is simply miraculous. Enjoying over 20 percent of average annual growth rate, the non-state sector has taken over 50 percent of the nation's output. However, no one can claim that the Chinese non-state sector enjoys clearly defined property rights. The majority of the non-state firms are collectives and other kinds of non-private firms. The owners of these collective firms are often loosely specified, e.g., all residence in a community. Moreover, in all cases, including private firms, the rights of the owners are ambiguously specified and poorly protected. Most surprisingly, many rigorous econometric analyses reveal that ownership forms do not cause differences in **the firm's productive efficiency (Svejnar, 1990, Weitzman and Xu, 1994).** Thus, ambiguous property rights in the highly prosperous Chinese non-state sector has become a challenge to tradition theories of property rights.

The purpose of this paper is two-fold. First, it defines the concept of ambiguous property rights in comparison with clearly defined property rights. As a major example of ambiguous property rights, I will survey the Chinese non-state sector. Second, it aims

to develop a theory of ambiguous property rights. The theory rationalizes ambiguous property rights in transitional economies, by relating the property rights arrangement within a firm to the firm's market environment.

I define the concept of ambiguous property rights from a control rights perspective. Conventionally, clearly defined² property rights entitle the owner unequivocal control rights in all circumstances, except those specified by an ex ante contract. With ambiguous property **rights, the owner's control rights are not guaranteed. The owner(s) has to** fight (or bargain) for the actual control after the uncertainty has been resolved. In other words, before hand, it is uncertain who will obtain control rights ex post.

To rationalize ambiguous property rights, I focus on the market environment in which the firm makes transactions. One of such cases is the gray market. A gray market is one in which socially worthwhile transactions may be blocked due to remnant government **interference.**³ However, a government bureaucrat or a government agency can properly work around the obstacles and make the transaction possible. Thus, the gray market gets its name **due to** the uncertainty regarding whether the transaction will be in a white (normal) or black (difficult) state. I show that facing a gray market, the entrepreneur may want to include the government as an ambiguous owner. Thus, the otherwise private firm is optimally chosen to have ambiguous property rights. The benefit of ambiguous property rights is that when the state is black, the firm can easily get help **from** burcaucrats. **In other words, the arrangement of ambiguous property rights is a** response to the grayness of the market, which is a form of market imperfection.

Ambiguous property rights in the Chinese non-state sector can be explained by the theory. First, due to the **lack of** a proper legal system and due to the remnant bu-reaucratic control, entrepreneurs expect to be in various situations where they will be

²The leading example is purely individual private ownership.

³The concept of gray market was first coined and analyzed by Chinese economists (see Fan, 1988).

bothered by issues which are costly to settle by themselves. These issues include raising additional capital, obtaining production license, securing export permits, and settling contractual disputes. These markets are gray markets. In these cases, local governments can be very productive due to their bureaucratic connection and political power, which are unlikely to fade away in the near run.. Thus, including the local government as a part-owner and leaving the control rights ambiguous can be an entrepreneur's wise **response to their particular market conditions.**

Several previous works are closely linked to this paper. The first **is** Weitzman and Xu (1994), who first raise the issue of ambiguous property rights ("vaguely defined cooperatives" in **their** words) in the context of Chinese rural enterprises (or the Township Village Enterprises — TVE's). In explaining these firm's success, they rely **on the cooperative nature of the traditional Chinese culture. The second one is** Chang and Wang (1994). They explain the success of TVE by the political economy among the central government, local governments, and entrepreneurs in China. This paper attempts to search for rationales of ambiguous property rights that may go beyond the Chinese context. Finally, Murrel and Wang (1993) argue that privatization sometimes should be delayed when the overall infrastructure to support private firms is not fully set up. This paper certainly shares the basic approach and philosophy with theirs.

The next section looks into the details of ambiguous property rights in the Chinese non-state sector. Section 3 describes the nature of the gray market in China and the role of **local government** in the gray market. Section 4 provides a a theory of ambiguous property rights. Finally, section 5 summarizes the arguments, extends the model, and discusses implications of the paper.

2. Ambiguous Property Rights in the Chinese Non-State Sector

In this paper, the concept of ambiguous property rights is based on the issue of control rights. In general, the most important aspect of ownership and property rights is the

right to control. All of the benefits of ownership and property rights can be regarded as the consequences of the right to control (following Grossman and Hart, 1986 and Hart and Moore, 1990). Thus, a set of clearly defined property rights delineates unequivocally who can control what decisions under what conditions. To the contrary, by ambiguous ownership, I mean the lack of such clear institutional configurations. In other words, **under ambiguous property rights, there is no pre-agreed and binding contracts, instead, parties involved have to negotiated or bargain over the actual control right.**

The Chinese non-state sector fits closely to my definition of ambiguous property rights. The non-state sector in China is a loosely defined concept. As a broad definition, it refers to all the enterprises in the economy, excluding the traditional state-owned enterprises. Purely private enterprises only constitute less than 13 percent of the non-**state sector. The biggest component (74 percent) of the Chinese non-state sector is the collective enterprises** (from Jefferson and Rawski, 1994, Table 1).⁴ Most of the rural enterprises, the Township and Village Enterprises (TVE's) fall into the category of collective enterprises.

The best illustration of the non-state sector's ambiguous property rights is the joint control of entrepreneurs and the local government. Typically a non-state firm is initiated or founded by some entrepreneurs. In principle, the entrepreneurs can choose the organizational form of the firm: collective, private, or other forms. The local government, on the other hand, has access to many necessary factors of production and can provide services to the enterprise. Thus, by choosing to register the firm as a collective one, the entrepreneurs intentionally invite the local government to share **the control** rights. Once the local government is involved in the operation of the firm, it is practically very **difficult** to pre-assign who has what rights. The division of control becomes blurred and **the control rights ambiguous.**

⁴The numbers are calculated by the share in nominal output.

For a collective firm, at the very establishment; its property rights are ambiguous. The initial capital is usually arranged by the local government. **Land is obtain&l the same way.** In most cases, there are no formal financial contracts specifying whether the financial investment is in the form of debt or equity. Even if there are preliminary agreements, the payment schedule is subject to subsequent revision. Equally problematic is the issue of tax allowance, which many firms usually enjoy. Tax allowance often **provides basis for the local government to claim control rights to the enterprise. All of these not only leave wide open the issue of who owns what proportion of the firm, but also give rise to 'disputes over control rights** in later days.

When the collective firm is in operation, the ambiguity of property rights is translated into-contests for actual control rights. It is helpful to break down the control rights into several large categories. These are: decisions in daily operation, decisions of profit distribution, and decisions of investment.

Decisions in daily operations represent the first area of ambiguous property rights. **They are shared between the entrepreneur and the local government. In a sample of 40 enterprises, Lin, He, and Du (1992) found that on average, 60 percent of production decisions of entrepreneurs are subject to local government interference. In their sample, many enterprises are coal mines. These coal mines have to "contend as much as possible for planned freight car quota from local governments" (p253).** This is one of the many **reasons for government intervention. In general, -there are economic rationale for the joint control of daily operation. The entrepreneur has a natural advantage in controlling the daily operation, due to his managerial skills. The local government, on the other hand, is also irreplaceable, since many times, it can step in to facilitate the transactions when market mechanisms fail.**

The decision right of profit is the second aspect of ambiguous rights. First of all, the rules of tax collection is never clear. Instead, bargaining and negotiation are prevalent.

From enterprise interviews and analyzing statistics, Lin, He, and Du (1992) conclude that “there is no stable relationship between an enterprise’s retained profits and its business achievements. Profit retention, subject to unpredictable changes through ad hoc decisions, is finally determined through bargaining after profits have been earned” (p.260). Secondly, the disposal of the after tax profit is also subject to bargaining. For example, all collective firms have to put aside about 15 percent of its profit as “collective accumulation fund” (Whiting, 1994). There is no clear rules as of how this funds should be invested or paid out. Disposal of this fund invokes complicated negotiations among the entrepreneur, the local government, and workers.⁵

Investment decisions constitute another important aspect of ambiguous property rights. Capital markets in Chinese are yet to be fully liberalized. All financial institutions are state-owned and administratively controlled. Thus, the local government enjoys a clear advantage over individual entrepreneurs in the capital market, while entrepreneurs may have better understanding of the intrinsic value of the investment. Thus, local governments are heavily involved in most of the investment decisions.. Lin, He, and Du (1992) find that “investment activities decided by government accounted for 55.6 percent, those decided by enterprise themselves but subject to government approval accounted for 21.2 percent, and those decided solely by enterprises accounted for 23.2 percent” (page 264).

In summary, the majority of firms in the Chinese non-state sector can be characterized by ambiguous property rights. Ambiguous property rights give rise to constant negotiations or bargaining for actual control rights. Indeed, entrepreneurs and local governments negotiate on a wide variety of issues inside the collective enterprises.

3. Local Governments and the Gray Market

⁵For a detailed discussion of the controversy of the accumulation fund, see Cui (1994). It is a report of TVE’s in a prefecture in Zhejiang province.

Chinese local governments have great incentives to promote their local economy. With rapid growth of the local economy, the increased tax **revenue** benefits local bureaucrats, in various ways. With good performance, there is also more chance for the local officials to be promoted to higher ranks⁶. In addition, by being directly involved in business activities, many local bureaucrats are actually preparing their new career as businessmen after retirement from politics. All of these reasons and many more well explain local officials' enthusiasm for business development.

Market imperfections form the basis for the local governments to actively intervene in local firms. The gray market phenomenon is prevalent. Transactions in these markets carry heavy costs. Factor markets are leading examples of the gray market. So far, most banks are still owned and controlled by the government. Lending activities are under great government intervention. Provision of credit for purely private firms has been difficult .⁷

In addition to factor markets, some product markets also fit the definition of gray market. Prices of electricity, transportation services, and some hotly pursued raw materials are not fully freed. A common reason for the delayed liberalization is to buy time for vested interest groups to adjust to higher prices. With shortage in the market, bureaucratic connections become valuable. Thus, local governments become much more effective than private entrepreneurs in organizing production in the local firms.

The gray market phenomenon also extends to inter-temporal transaction relations, i.e., transactions through contracts. The signing and implementation of contracts are the basis of market economies. However, during the transition from a bureaucratic economy

⁶See Byrd and Gelb (1990) for a detailed study of the incentive of local government officials in economic development.

⁷In a sample of 100 rural firms, Wang (1990) found that collective **firms** have about 27 percent of their capital being-financed by banks. The same statistic for private banks is only 17 percent (page 224). The difference is due to local government's active involvement in collectives firms.

to a market one, the infrastructure to support a contract system takes time to establish. Meanwhile, bureaucratic intervention into the execution of contracts is natural. Thus, in the Chinese context, a private firm cannot always get good treatment when it is involved in a contract dispute with a state-owned enterprise. Protection from the local bureaucrats thus becomes very helpful.

Given the prevalence of the gray market, which in essence is due to- remnant influence of bureaucratic coordination (Kornai, 1992), an emerging non-state firm may find it highly beneficial to include the local government as part of the firm. This is a fundamental reason for the rise of ambiguous property rights. When the gray market becomes black, i.e, when the firm runs into trouble, the local government can step in and intervene on behalf of the non-state firm. Thus, because of imperfections in the financial market, the firm needs the local government to help secure its funding; because of the difficulty of obtaining transportation services through the market, local coal mines needs the local government to step in their daily operations (like the many firms in the **sample of Lin, He, and Du, 1992**).

For the founding entrepreneur of a local firm, there is a choice of forms of property rights: ambiguous property rights or private property rights. In the case of creating a private enterprise, the private firm can buy services from the local government in the spot market. That is, when the private firm is in trouble, it approaches the local bureaucrats and offer bribes for their services. However, such spot market transactions can be very costly. The first source of cost is information asymmetry. Local government may not have perfect knowledge of the firm and thus the negotiation for such a deal may not always be possible. To the contrary, for a collective firm, in which the local government is directly involved, this problem disappears. The second source of cost lies in the limited scope of payment from the private firm to the local government. Many times, the payment for the service of the government should be in the form of future flow

of taxes. However, the local government has much harder time taxing a private firm than a collective firm. As Song and Du (1990) concludes from a World Bank study of Chinese TVE's: "the township government can safeguard public finances only by participating directly in the management of firms . . ." (page 348).

The inclusion of the government in the firm is not costless. Once the local bureaucrats obtain direct control rights of the firm, they cannot resist the temptation to distort the operation of the firm to their own benefit. In particular, they can easily exercise their control rights to divert resources .of the' firm to their own use. Wang (1990) surveyed both township leaders and collective firm directors. He found that "the objectives of the TVCE (i.e. collective firms) differ sharply from those set by these governments." (page 225). On the other hand, a private firm can easily avoid this intrusions by not sharing its information with the local government. In reality, this translates into lower ability for the government to tax private business.

In summary, given the gray market, the local government can become productive for the local firms. The benefit of ambiguous property rights is better protection for the enterprise. However, the cost is the potential excessive intervention of the local government. The entrepreneur has to balance the cost and benefit in choosing the optimal property rights forms. The next section is a formal theory based on this intuition.

4. A Theory of Ambiguous Property Rights

To best illustrate and rationalize ambiguous property rights in the Chinese non-state sector, I will construct ad analyze a simple model. The purpose is to catch the very essence of the story. To this purpose, the model abstracts away from many details.

The model concerns a private entrepreneur (E or she) and the local government (G or he). E can also be a group of investors such as a foreign company-. The private entrepreneur E has spotted a good investment project which clearly has a positive net present value. At time 1, E establishes the firm by choosing the organizational form.

Specifically, she can either set up the firm as a purely private business or a collective firm with G (or a state owned enterprise) being a **part-owner**⁸. In a purely private company, E enjoys unambiguous control rights, while with G as a part-owner, the control right allocation is ambiguous, ex ante. In other words, E and G have to fight for the control right when a particular state is realized.

Assume that E and G can negotiate over the form of property rights of the new **firm**. **Therefore, according to the argument of Coase (1960), the end result is the arrangement of property rights that is most efficient ex ante when taking both parties' welfare into account.**

At time 1, E makes an investment k_E after choosing the form of property rights. k_E can be either physical or human capital investment. As standard assumptions, the cost function is convex. That is,

Assumption 1: $C'(k_E) > 0$, and $C''(k_E) > 0$.

To capture an important aspect of the ownership of the firm, assume that after the initial investment k_E is made and after establish of the firm, at time 2, the profitability of the firm is revealed — only to the insiders or owners of the firm. Let this be measured by θ . In other words, only owners can have access to θ . In reality, this corresponds to the true marketability of the firm's product. Without having direct control over the operation of the firm, outsiders have difficulties to find out. For simplicity, assume that at time 1, before θ is realized, it is common knowledge that θ follows a uniform distribution. To summarize:

Assumption 2: At time 1, it is common knowledge that $\theta \sim \text{Uniform } [0, 1]$.

In addition, at time 2, the whole market environment can break down. Either a white state or a black state will arise at time 2, when the firm is in operation. Thus,

⁸A collective firm can also be a community firm, in which the local government represents the interest of all residents of the community. This is the case of Chinese TVE's.

from time 1's perspective, the prospective state is grayish. The white state is one where the market functions perfectly and there is no productive role for G to play. The black state arises when the market mechanism fails and the firm runs into trouble. G's services are needed. The black state can arise due to events such as legal disputes with another firm, obstacles resulted from interventions from another government, and difficulties in obtaining extra capital.

At time 1, the common knowledge is that the white state has probability p and the black state has probability of $1 - p$. Furthermore, this distribution of states is independent of the distribution of θ .

In the white state, the profit π_W depends on E's effort level a_E , the initial investment level k_E , and the overall profitability θ . No effort from G is productive at all. Assume that the disutility of effort of E is $U(a_E)$. Furthermore, assume that

Assumption 3: $\pi_W = \theta q_E a_E^\alpha k_E^\beta$, $0 < \alpha, \beta < 1$.

Of course, q_E measures the productivity of E in the white state. This assumption is useful **later for the purpose of comparative statics**.

Assumption 4: $U'(a_E) > 0$, and $U''(a_E) < 0$.

In the black state, the firm's profitability is in jeopardy and the firm has to be rescued by the local government G, who will negotiate with E regarding the payment for the rescuing effort. To simplify without losing generality, assume that in that black state, E is totally unproductive. In addition, assume that G's effort comes in the form of additional capital k_G , which is a fixed amount and can easily be re-interpreted as other kinds of bureaucratic services. k_G can only be obtained via the government. The opportunity cost of k_G to the government is $r_0 K_G$.

Suppose that with the help of K_G , the profit in the black state π_B depends on the investment k_E and a return rate of investment θ . Of course, the implicit assumption that E is not product at all in the black state is extreme and is meant to high light the

effect of black states. It is a simplification for the ease of modelling.

In other words,

Assumption 5: $\pi_B = \theta k_E$.

The firm's property right arrangement determines the control right structure at time 2. In the private firm, E as the sole owner enjoys uncontested control. In the firm with ambiguous property rights, E has to bargain for control with G in each possible realization of the state.

4.1. Private Property Rights

Suppose that at time 1, E chooses to set up the firm as a private one. That is, she becomes the sole owner. In this system, she enjoys uncontested control rights of the firm at time 2. In the white state, as the sole owner of the firm, she obtains all the profits from the operation. She chooses the optimal a_E to maximize her payoff. Thus, the payoff to her is

$$y_W = \text{MAX}_{a_E} \theta q_E a_E^\alpha k_E^\beta - U(a_E). \quad (1)$$

The first order condition for her optimal choice of a_E is

$$\theta \alpha q_E a_E^{\alpha-1} k_E^\beta - U'(a_E) = 0.$$

From the Envelope Theorem, we have

$$\frac{dy_W}{dk_E} = \theta \beta q_E a_E^\alpha k_E^{\beta-1}. \quad (2)$$

In the black state, E will end up with nothing unless she asks the help from G. The issue is how much E pays for G for the service k_G . Not knowing the realization of θ , G bargains with E under asymmetric information. Assume that there are many private firms in this situations. G will set an optimal charge rate r in order to maximize G's

own payoff. With rate r , which E can still afford the service? It must be that

$$e : \theta k_E - r k_G \geq 0, \text{ or}$$

$$\theta : \theta \geq r \frac{k_G}{k_E}. \quad (3)$$

Therefore the expected payoff of G must be

$$E [r k_G - r_0 k_G \mid (3)] = (r k_G - r_0 k_G) \left(1 - r \frac{k_G}{k_E}\right)$$

and the optimal r must be

$$r = \frac{k_E + k_G r_0}{2 k_G}.$$

Thus, in the black state, E expects to get a payoff

$$\begin{aligned} E[\theta k_E - r k_G \mid (3)] &= \frac{1}{2} \left(1 + \frac{k_E + k_G r_0}{2 k_E}\right) \left(1 - r \frac{k_G}{k_E}\right) k_E - \left(1 - r \frac{k_G}{k_E}\right) \frac{k_E + k_G r_0}{2 k_G} k_G \\ &= \left(1 - \frac{k_E + r_0 k_G}{2 k_E}\right) \frac{K_E - r_0 K_G}{4}. \end{aligned} \quad (4)$$

Notice that I have abstracted away the issue of commitment in the payment from E to G. I have assumed that E can promise to pay G any amount deemed appropriate. The lack of commitment can be another source of cost for the private owner E to seek protection of G.

Overall, the expected payoff to E at time 1 becomes

$$Y_E = p E_\theta [\theta q_E a_E^\alpha k_E^\beta - U(a_E)] + (1 - p) \left(1 - \frac{k_E + k_G r_0}{2 k_E}\right) \frac{K_E - r_0 K_G}{4}. \quad (5)$$

Consequently, the investment k_E is based on the the solution to the following problem:

$$MAX_{k_E} p E_\theta [\theta q_E a_E^\alpha k_E^\beta - U(a_E)] + (1 - p) \left(1 - \frac{k_E + k_G r_0}{2 k_E}\right) \frac{K_E - r_0 K_G}{4} - C(k_E). \quad (6)$$

4.2. Ambiguous Property Rights

With ambiguous property rights, G is included in the firm. However, there is no clearly defined rules as of who makes what decisions, even though they share the information about the firm's profitability.⁹ E and G will have to contest or bargain for the actual control in each of the possible states. In other words, the actual control can belong to different parties in different states. It is in this sense that the property rights are ambiguous ex ante.

In the white state, E is the only productive party. However, G has to agree to giving up his control right in order for E to be productive. The issue is how much payment G gets in return for relegating all control to E. If G does not cooperate, the total profit is 0. If G gives up all of his rights, E has full incentive to produce:

$$y_W = \text{MAX}_{a_E} \theta q_E a_E^\alpha k_E^\beta - U(a_E). \quad (7)$$

Without losing generality, assume that E and G equally divide the welfare gain between full cooperation and no cooperation. The payoff to G becomes

$$T = \frac{1}{2}[\theta q_E a_E^\alpha k_E^\beta - U(a_E)],$$

where a_E is the solution to problem in equation (7). T in essence is a lump sum tax on E and it enables E to "lease" the enterprise and to fully exercise her control rights.

Thus, the payoff to E is

$$y_E = \frac{1}{2}[\theta q_E a_E^\alpha k_E^\beta - U(a_E)]. \quad (8)$$

In the black state, E is useless and G becomes productive. In addition, both E and G can observe the actual return rate θ . With full cooperation, E gives up all of her

⁹This is a main difference between our model and that of Grossman and Hart (1986), who abstract away the issue of information.

rights and lets G take over. G maximizes his payoff:

$$\theta k_E - r_0 k_G.$$

The simple optimal solution is that invest k_G *only* if

$$\theta > r_0 \frac{k_G}{k_E}. \quad (9)$$

Of course, without the cooperation of E, G cannot serve k_G and both E and G get 0 payoff. Thus, again without losing generality, the payoff to E is

$$\frac{1}{2}(\theta k_E - r_0 k_G),$$

if (9) is satisfied; otherwise 0. Thus, in the black state, E's expected payoff becomes:

$$\begin{aligned} y_E &= E\left[\frac{1}{2}(\theta k_E - r_0 k_G) \mid (9)\right] = \frac{1}{4}\left(1 + r_0 \frac{k_G}{k_E}\right)\left(1 - \gamma_0 \frac{k_G}{k_E}\right)k_E - \frac{1}{2}\left(1 - \gamma_0 \frac{k_G}{k_E}\right)r_0 k_G \\ &= \frac{1}{4}\left(1 - \gamma_0 \frac{k_G}{k_E}\right)(k_E - \gamma_0 k_G). \end{aligned} \quad (10)$$

$$Y_E = p \frac{1}{2} E_\theta [\theta q_E a_E^\alpha k_E^\beta - U(a_E)] + (1 - p) \frac{1}{4} \left(1 - \gamma_0 \frac{k_G}{k_E}\right) (k_E - \gamma_0 k_G) - C(k_E). \quad (11)$$

Consequently, the ex ante investment level of k_E is based on the the solution to the following problem:

$$\begin{aligned} \text{MAX}_{k_E} Y_E &= p \frac{1}{2} E_\theta [\theta q_E a_E^\alpha k_E^\beta - U(a_E)] \\ &+ (1 - p) \frac{1}{4} \left(1 - \gamma_0 \frac{k_G}{k_E}\right) (k_E - \gamma_0 k_G) - C(k_E). \end{aligned} \quad (12)$$

4.3. Property Rights and the Market Environment

Given that E and G negotiate for the organizational form, the end outcome must be that E will choose the most socially efficient property arrangement. Before making predictions about which form of property rights arrangement E will choose, a useful

exercise is to compare both cases with a bench-mark case, i.e. the first-best arrangement. The first-best arrangement is obtained when a social planner controls everything. In the model, the social planner will decide on k_E . Then, in the white state, he gives complete the control right to E. In the black state, he chooses the optimal financing policy k_G and gives all of the surplus profit to E. The reason is simple: only E makes initial investment. To summarize:

Lemma 1 *The first-best outcome can be achieved when E obtain unambiguous control rights all the time and when E can have access to capital k_G at the interest rate of r_0 .*

Given this characterization of the best-best outcome, the following result is not surprising.

Lemma 2 *So long as $p < 1$, both private and ambiguous property rights arrangements give rise to too little investment k_E , relative to the first-best property right arrangement.*

The reason why this may not be totally surprising is the following. When $p = 1$, the market is always white. Thus, G cannot be productive. Thus, the private property rights case is first-best: E gets 100 percent of the return to its initial investment k_E . However, when $p < 1$, there is always a possibility of the black state. The market is genuinely grayish from the time l's perspective. Private property rights cannot be first-best, since in the black state, E's investment is not fully protected, plus that G gets some rents from E's investment k_E . Thus, E under-invests. The ambiguous property rights are inefficient, too. Since in the white state, E cannot get 100 percent of the return to her investment.

Proposition 1 *Given q_E, r_0 , and k_G , there exists a $\bar{p} > 0$ such that, when $p < \bar{p}$, a firm with ambiguous property rights is' more efficient than a pure privately owned firm.*

(All proofs of the propositions are in Appendix)

The next result analyzes the **effect of r_0 and k_0 on the relative efficiency of the** two property rights arrangements. Notice that $r_0 k_G$ can be regarded as a measurement of the opportunity cost of the government in rescuing the firm **in** the black state. A decrease in this opportunity cost indicates that the government is more productive inside a relationship with the firm. Intuition seems to be that when the government is more **productive then involving the government as an ambiguous owner is efficient. Indeed,** when the cost of rescuing the firm is small, then under ambiguous property rights, all firms in the black state will be financed. However, G's still wants to charge a high r to private firms, due to the lack of perfect information and monopoly power.

Proposition 2 *Ceteris paribus, the lower the $r_0 k_G$, the more likely that a firm with ambiguous property rights is more efficient than a privately owned firm.*

Very similar to the above result, when E is more efficient, then it is better to involve more the input of E . A pure private firm by E is better in this regard, since E can keep all its marginal product in the white state. The following proposition verifies this intuition.

Proposition 3 *Ceteris paribus, the higher the productivity of E, q_E , the more likely that a private firm solely owned by E is more efficient than an ambiguously owned firm between E and G.*

A simple implication of ambiguous property rights is that such firms have more chance to get protection from the local government and survive black states. This corresponds well to empirical observations. For example, after studying financial status of 100 rural enterprises, Wang (1990) finds that “(M)oney-losing TVCEs (i.e. collective firm — author) typically stay **in business**, despite their inability to repay debts...” (page 225).

Corollary 1 *Ceteris paribus, under ambiguous property rights, firms are less likely to be liquidated than under private property rights.*

Lastly, the model also sheds light on the efficiency comparison between ambiguously owned firms and private firms. Given that the choice of property rights forms is endogenous, it is easy to see that the firm's expected efficiency should be independent of the property rights forms. This is exactly the finding of many econometrics work. For example, Svejnar (1990) concludes that "after differences in inputs and other variables are controlled, productive efficiency does not vary systematically with the four types of ownership examined (i.e., township, village, partnership or individual, and joint venture — author)". The same conclusion is echoed by Weitzman and Xu (1994) and Zhao (1994). As is clear from the model, these findings are not proofs of the *universal* efficiency of ambiguous property rights (for example Weitzman and Xu, 1994). If the market is always white, private firms should always be the most efficient.

5. Conclusions and Further Discussions

The paper develops a theory of ambiguous property rights, by which it is meant that property owners have to fight for the actual control rights. A major example is the highly successful Chinese non-state sector. This constitutes a challenge to conventional theories of property rights. My theory is that ambiguous property rights can be an efficient response to market imperfections. An example is the gray market, in which many transactions are potentially illegitimate and/or subject to enormous transaction costs.

Several issues need to be further addressed. The first is to generalize the forms of market imperfections under which ambiguous property rights are efficient. This is particularly important for transitional economies, in which market mechanisms need time to mature. The second is to elaborate the process of bargaining for control within

a firm with ambiguous property rights. It **is** important to understand the detailed institutional arrangement of ambiguous property rights.

There are several implications of the theory. First, it helps re-focus our attention of enterprise reform from the enterprise per se to the surrounding market environment. That is, property rights cannot be clarified without establishing a properly functioning market. This is congruous with the **Coase** (1937) approach to the theory of the firm. Second, the theory implies **that an unconditional call for “clarifying the ownership and property rights of the enterprise”** (a popular slogan in China) may not be appropriate for transitional economies. Given the grayness and imperfections of the market, a proper degree of ambiguity of property rights is highly necessary. Thirdly, an immediate and outright privatization of state firms may not be effective in the short-run, since properly operating markets need time to develop itself. **This** echoes the views **of some** authors, such as Murrel and Wang (1993) and Kornai (1990). Scattered empirical work seems to support this general view. For example; effective restructuring of the privatized **SOE’s** has been scarce in Russia (Boycko, Shleifer and Vishny, 1993). Thus, in this sense, perhaps, lessons of the Chinese non-state sector may bear some relevance to Eastern Europe and the Former Soviet Union.

Appendix

All the propositions and corollary follow a comparison of first order conditions for k_E of the first best, the private ownership, and the ambiguous ownership cases.

I. The First Best Case

In the first best case, the social welfare in the white state is

$$\theta q_E a_E^\alpha k_E^\beta - U(a_E).$$

In the black state, only when $\theta k_E > r_0 k_G$, will the firm be rescued. Thus the expected social welfare, given k_E , in the black state is

$$E(\theta k_E - r_0 k_G \mid \theta k_E > r_0 k_G) = \frac{1}{2} \left(1 - \gamma_0 \frac{k_G}{k_E}\right) (k_E - \gamma_0 k_G).$$

Therefore, the total expected social welfare is

$$p E_\theta [\theta q_E a_E^\alpha k_E^\beta - U(a_E)] + (1 - p) \frac{1}{2} \left(1 - \gamma_0 \frac{k_G}{k_E}\right) (k_E - \gamma_0 k_G) - C(k_E)$$

and the first order condition for the first best k_E becomes

$$p E_\theta [\theta q_E \beta a_E^\alpha k_E^{\beta-1}] + (1 - p) \frac{1}{2} \left(1 - \frac{r_0^2 k_G^2}{k_E^2}\right) = C'(k_E). \quad (a1)$$

Notice that we have used the Envelope theorem in obtaining the first term. Also important is that if the size of $C(\cdot)$ is well-bounded, then the optimal k_E is never so small so that the second term is negative. We will work under this general case.

II. Private ownership by E

From maximizing expression (6), we get the first order condition

$$p E_\theta [\theta q_E \beta a_E^\alpha k_E^{\beta-1}] + (1 - p) \frac{1}{8} \left(1 - \frac{r_0^2 k_G^2}{k_E^2}\right) = C'(k_E). \quad (a2)$$

Notice that from our set-up, a_E in the first order conditions is an increasing function of k_E .

Comparing (a1) with (a2), we can see the right-hand-sides are an increasing function of k_E (by assumption). The curve of the left-hand-side of (a2) is moved downward relative to that of (a1), unless $p = 1$. Therefore, k_E defined by (a2) should be less than that in (a1).

III. Ambiguous Ownership Between E and G

From maximizing expression (12), we can get the first order condition

$$p \frac{1}{2} E_\theta [\theta q_E \beta a_E^\alpha k_E^{\beta-1}] + (1 - p) \frac{1}{4} \left(1 - \frac{r_0^2 k_G^2}{k_E^2}\right) = C'(k_E). \quad (a3)$$

Notice that from our set-up, a_E in the first order conditions is an increasing function of k_E .

Very similar to the proof in II, we can get the the other half of Lemma 2 (Lemma 1 is obvious).

N. Propositions 1, 2, and 3

These can be easily obtained by comparing the left-hand-sides of (a2) and (a3). From the above discussion, we know that the one with the higher left-hand-side should yield a larger k_E . Obviously, when p or q_E is high, then the first term of the left-hand-side is more important and thus (a2) has a higher left-hand-side curve than (a3).

Consider the case of $r_0 k_G$. When it is lower, than the second term of (a3) is even larger than the second term of (a2) and therefore it is more likely for (a3)'s whole left-hand-side to dominate that of (a2). This implies the conclusion of proposition 2.

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