Encroachment as Redistribution: Optimal Security of Property*

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Abstract

In the existing literature, property right is the key institution for economic growth and underdevelopment is explained as a failure to establish this key institution. This failure is often attributed to rentseeking elites who favor weak property rights for expropriative strategies. In this paper we argue that in developing countries, even the poor benefit from weak property rights as it enables them to encroach as a livelihood strategy. This paper departs from existing literature in showing that weak property right regime is a means of redistribution and therefore even a benevolent social planner may choose a less than fully secure property right regime. We derive insecure property rights as a social planner equilibrium, a voting model outcome and an equilibrium outcome in the presence of a technological shock. Initial inequality in ownership of productive asset turns out to be crucial in society's transition to a more secure property rights regime.

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1 Introduction

Among the stylized facts of development is the observed positive correlation between per capita income and security of property rights. An economy is more likely to be characterized by rent-seeking activities if property rights are not properly defined or weakly protected. Similarly, it has been argued that informality, and hence poverty results from insufficient titling of the productive resources of the poor. The existence of insecure property rights in developing countries is often attributed to rent-seeking elites who favor weak property rights for expropriative strategies. In this paper we argue that in developing countries, even the poor benefit from weak property rights as it enables them to encroach as a livelihood strategy. This paper departs from existing literature in showing that weak property right regime is a means of redistribution and therefore even a benevolent social planner may choose a less than fully secure property right regime. We derive insecure property rights as a social planner equilibrium, a voting model outcome and an equilibrium outcome in the presence of a technological shock. Initial inequality in ownership of productive asset turns out to be crucial in society's transition to a more secure property rights regime.

In the existing literature on transition to a secure property rights regimes, the oft-mentioned problems are collective action problems in achieving the transformation, high transactions cost in the face of uncertainty regarding the distribution of private gains and losses from such a transition, exclusion costs associated with an enforced property rights regime and political bias towards status quo arising from distributional consequences of such transformation on the elite. We consider initial inequality in productive assets as an obstacle to transition to a more secure property rights regime—the resistance coming not only from the rich who seeks to expropriate the poor, but also from the poor who benefits from encroachment.

We first consider a benevolent social planner who chooses the degree of security of property rights for a scarce resource like land to maximize economic surplus in the economy while ensuring subsistence for all. We show that elite resistance–modeled as a cost of redistribution–leads to a optimal choice of less than full security of property rights. We next consider a voting model, where existing inequality in land ownership means that the poor people may vote against a transition to a secure property rights regime. Finally, following a technological shock with differential impact on individuals in an unequal society, we show that the transition to a more secure property rights may be reversed.

The rest of the paper is organized as follows. The next section discusses the lietarure on transition to a more secure property rights regimes in developing economies and discusses the complex processes at work in the Indian context, where the state has to strike a fine balance between growth and redistribution. Section III presents the social planner model, the voting model and the model with a technological shock. The last section concludes.

2 Property Rights and Development

The standard view of evolution of property rights in a developing economy is based on the "Demsetz thesis" (Demsetz (1967) which states that scarcity is a necessary condition for the establishment of enforceable property rights and opportunities for growth result in an increased scarcity of resources leading to a more efficient reorganization of property rights. Clearly defined property rights-more specifically, Western-style private property rights-facilitates development by a) creating incentives for the owner to develop resources for private gain in response to new markets and/or new technologies, b) avoiding dissipation of rent in open-access regimes through internalization of externalities and c) reducing costs involved in market transactions in rights through a reduction in the number of parties involved and elimination of the collective action problem. Empirical work on cross-country differences in economic performance find that institutions, and in particular, private property rights, are significant for economic growth (North 1990; Barro 1991, 1996; Acemoglu et al. (2001, 2002; Engerman and Sokoloff 2000). In the context of developing countries, insufficient titling of productive resources of the poor are often held accountable for the informality (and poverty) trap (de Soto 2000). Secure property rights allow the owner to use them as collateral for credit and hence facilitate productive investment.

Subsequent work on the Demsetz thesis dealt with the problem of transition in property rights-in particular, the costs involved in transforming the property rights system. The problem of transition is usually theorized in the context of emergence of property rights from a commons-type system-either in terms of the collective action problem in enforcing the change or in terms of information costs in assessing the future value of the resource and the distribution of private benefits and losses consequent upon the re-organization of the property rights (Banner (2002), Libecap (2004), Barzel (1989), North (1990)). The latter makes calculation of compensation difficult and drives up the transaction costs for parties negotiating for the change in property-rights (Libecap (2004)). Apart from informational costs, the transition to a "secure" and "enforced" property rights regime faces "exclusion costs"-the costs of fencing, policing and punishing (Field (1989), Smith (2002). The same process-rising resource values-that provides incentives for securing property rights also provides incentives for encroachment.

Exclusion costs are not just economic in nature-quite often there are political costs. If the excluded population constitutes a large political constituency, then the political costs of enforcing a secure property rights regime may include subsequent electoral defeat or irrelevance in a democracy. Moreover, the informational costs in ascertaining the future value of the resource in question and the distribution of private gains and losses makes political consensus often difficult to achieve. Fernandez and Rodrik (1991) uses a voting model to show that in a decentralized set-up, there might be a bias towards status quo if there is uncertainty regarding the distribution of gains and losses across individuals, even if there is no uncertainty regarding the aggregate outcome. In democracies in the developing world, electoral compulsions often force political parties in opposition to take up the cause of those excluded from strict enforcement of property rights against the "government" (read, the incumbent political party) which seeks to maximize growth through protection of private property rights. The political parties reverse their roles as electoral fortunes favour one or the other, but this game of opposition constitutes a constant element of the politics in poor democracies. Even in developed countries, political calculations often explain the persistence of inefficient property rights systems. Libecap (2004) argues that the persistence of inefficient small-sized family farms in the American Great Plains is often attributed to the political objective of the respective state politicians to maintain their number of seats in the House of Representatives. Seats per state are proportional to the population of the state and large-scale consolidation of farms in the American Great Plains would have reduced the population density of the concerned states and hence, the numerical strength, i.e. political power, of the concerned state politicians in the Congress.

Developing countries are characterized by a very large informal sector. Informality not only thrives outside the regulatory framework of the state, but also sustains by encroachment on public or private property. This is typical of informal squatter-colonies alongside railway tracks and of illegal slums that arise through "quiet encroachment of the ordinary" (Bayat (1997). Unused public and private land in urban areas or in their periphery are often encroached by rural migrants through acts of "colonization" and defended against enforcement of the owners' property rights through episodic political mobilizations and prolonged collective action. Chatterjee (2004) argues that such informal squatters constitute population groups who animate a "political society" with moral and politically articulated claims on resources and who are different from participants in the civil society with legal rights to resources. In Chatterjee's analysis, the state is often forced to enter into negotiated settlements with such population groups outside the "rule of property" on grounds of exception. Thus uniquitous encroachment and moral right to livelihood often means exclusion can be very costly.

The flip side of exclusion costs is the cost of redistribution, if we assume that the government acts as a benevolent social planner who optimizes property rights by compensating the excluded. In an unequal society, higher the degree of security of property rights, the greater the pressure of redistribution on the propertied and consequently higher their resistance. In this paper, we consider an economy with a legally defined private property rights system without institutional enforcement, i.e. an economy with a distribution of *de jure* private property rights which is subverted by encroachment. Hence, a *de facto* commons-type regime exists. The transition considered here is that from a lower to a higher degree of security of property rights, which in effect, means a transition from commons to a private property regime. When the *de jure* property rights is unequally distributed, such a transition automatically increases inequality, resulting in an increased pressure on redistribution. In presence of a cost of redistribution, a less than full security oof property rights may be optimal. It has been argued that the state may strategically choose weak governance to support incomes in the informal economy as a redistributive policy alternative to the traditional tax-transfer program (Marjit et al (2006). In our model we do require the social planner to compensate for the loss of those negatively affected by the transition to higher property rights regime, but unlike (Marjit et al 2006) the social planer maximizes total social surplus and not the poor people's income. In our case, lower security of property rights is an optimal choice in the presence of a cost of redistribution. Our model chimes well with the problem of compensation explored in collective action-based analyses of transition to higher propertry rights regime, even though there is no uncertainty in our model regarding the distribution of private gains and benefits following the transition.Instead we bring in political power as a determinant of economic institutions, where political power itself is determined by previous period's distribution of resources (Acemoglu et al 2005, Weitzman 1974).

A crucial factor in the emergence of political power in our model is the initial inequality in ownership rights over productive resources. Glaezer et al (2003) argues that inequality is detrimental to the security of property rights because it enables the rich to subvert the "rule of property" to its own advantage through corruption. Sonin (2003) argues that the rich may resist public protection of private property, because in the absence of the former, agents have an incentive in investing in private protection of property. With economies of scale in private protection of property with lower private protection. However, in our model, the rich favor higher security of property rights, but resist any redistribution of income to compensate for the loss of the poor. On the other hand, the poor, knowing that, will resist any tranistion to the higher property rights regime. Thus, in the absence of initial inequality, the transition to a more secure property rights is smoother. Thus, our result is similar to Engermand and Sokoloff (2000).

3 The Model

We consider an economy of individuals distributed with respect to their land holding $x \in [0, \overline{x}]$, according to the distribution function $\phi(x)$ and a cumulative distribution function $\Phi(x)$. A section of the society, $\Phi(\underline{x})$, is landless. Total population is $\Phi(\overline{x}) = N$. Total land is $X = \int_x^{\overline{x}} x \cdot \phi(x) dx$. Let $\overline{X} = \frac{X}{N}$.

There is only one good (Y) in the economy, that can either be produced with land only (low technology informal production) or with capital (high technology formal production).

$$y_F = f(K) \tag{1}$$

We assume that in the presence of imperfect capital markets, one has to use land as collateral to borrow capital. The demand for capital is constrained by the fraction of land that can be used as collateral and the degree of collateralization depends on the degree of security for property rights given by α . Assume one unit of capital can be secured against one unit of collateralized land. Hence, formal production is given by

$$y_F = f(\alpha x) \tag{2}$$

 αx is *de facto* ownership of land, which is different from *de jure* ownership in the presence of encroachment.

The informal land-owning individual produces Y using unencroached part (α fraction) of her private plot of land and encroached part of others' private plots. Each individual encroaches, by competing equally with everyone on the total encroachable land (i.e. total unsecured private land) in the economy.Individuals who engage in formal production using capital simultaneously carry on informal production using land. Thus, with or without formal production, everybody is an encroacher on land. There is no role for "productive" labor in either formal or informal production. Labor, in so far as it exists, does so only in its "appropriative" role, i.e. as labor engaged in encroachment. We assume all individuals are equally efficent in encroachment and has the same technology of encroachment. The following is the informal production for land-owning population, where x is the individual's owned land.

$$y_I = g(\alpha x + (1 - \alpha)\overline{X}); g' > 0 \tag{3}$$

The production function for landless individuals is obtained by putting x = 0 in (3) Y.The landless individuals produce using only encroached land.

$$\underline{y}_I = g((1-\alpha)\overline{X}) \tag{4}$$

Every one requires subsistence level of consumption, <u>s</u>. When there is no security of property rights, $\alpha=0$, everybody uses informal technology to produce subsistence.

$$y_I = g(X) = \underline{s} \tag{5}$$

In this state of affairs, there is no investment and therefore no growth. Growth is only possible if a shift to formal production is possible–so that a surplus above subsistence emerges–which requires security of property rights (a positive value of α). With a positive protection for *de jure* property rights, total production and consumption for the landless people is now

$$\underline{y}_I = g((1-\alpha)\overline{X}) < \underline{s} \tag{6}$$

for all $\alpha > 0$.

For land-owning producers, private output falls below subsistence if private land is less than average per capita land.

$$\alpha x + ((1 - \alpha)\overline{X}) < \overline{X} \Rightarrow x < \overline{X}$$
(7)

We assume that a tax-transfer mechanism exists to ensure each individual"s subsistence. All landowners pay an average lump-sum tax τ .

3.1 The Social Planner Problem

Consider a social planner who wants to maximize the economic surplus – defined as excess of aggregate output over aggregate consumption-net of the cost of redistribution, by choosing α . Think of it as a two stage game. In the first stage the social planner announces α and in the second stage land-owning individuals decide whether or not to enter into formal production. We solve this game through backward induction. In stage 2, land-owning individuals decide whether to collaterize the secure part of their land, given α , and enter into formal production along with informal production, or continue to produce solely in the informal sectorn. In stage 1, given the distribution of individuals between formal or informal production, the social planner chooses the value of α that maximizes economic surplus.

In stage 2, apart from the lump-sum tax, each individual deciding to join formal sector has to pay an additional cost-a fixed cost of collaterization (κ).Note individuals entering formal production continue to engage in informal production. Hence, a landowner joins formal sector if

$$f(\alpha x) + g(\alpha x + (1 - \alpha)\overline{X}) - \kappa - \tau \ge g(\alpha x + (1 - \alpha)\overline{X}) - \tau \Rightarrow f(\alpha x) - \kappa \ge 0$$
(8)

Hence, people prefer formal activity if

$$x \ge x^*(\alpha) \tag{9}$$

where x^* is derived by solving the equation $f(\alpha x) - \kappa = 0$.

Insert Fig 1 here

Proposition 1. As the social planner increases the security of property right more people will choose to produce in the formal sector.

In stage 1, the social planner decides α so that the level of social surplus is maximized. The level of social surplus is defined as sum of income from three sections (formal, informal, and landless) minus the cost of redistribution and aggregate subsistence.

$$W = g((1-\alpha)\overline{X})\Phi(\underline{x}) + \int_{\underline{x}}^{\overline{x}} g(\alpha x + (1-\alpha)\overline{X})\phi(x)dx + \int_{x^*}^{\overline{x}} f(\alpha x)\phi(x)dx - N.\underline{s} - \Psi(\alpha)(10)$$

 $\Psi(\alpha)$ ($\Psi' > 0$) is the administrative and/or the political cost of redistributive policy, which is increasing in α because higher the security of property right, greater is the political power of the the relatively more propertied section of the society and hence higher the resistance against redistributive taxes. Morover, higher the security of property right, larger is the shortfall of subsistence for landless and small landowners, requiring greater per capita tax. Hence, with more secure property rights in an unequal society it is more difficult politically to tax and redistribute. The social planner would choose α such that

$$\frac{\partial W}{\partial \alpha} = 0 \tag{11}$$

Now the first order condition of the social planner can be written as (see Appendix)

$$\frac{\partial W}{\partial \alpha} = -g'((1-\alpha)\overline{X}).\overline{X}.\Phi(\underline{x}) + \int_{\underline{x}}^{\overline{x}} g'(\alpha x + (1-\alpha)\overline{X}).(x-\overline{X}).\phi(x)dx$$

$$+ \int_{x^*}^{\overline{x}} f'(\alpha x) \cdot \phi(x) \cdot x dx - f((x^*(\alpha), \alpha) \cdot x^{*'}(\alpha) - \Psi'(\alpha)$$
(12)

Increasing α affects the output of different classes of producers differently. A higher α lowers the output of the landless and raises that of the bigger lanowners (with land holdings greater than x^*) both in formal production and, when their private land is more than mean land, in informal production. The effect of higher α is ambiguous on small landowners engaged only in informal production. Small landowners with land-holdings less than the mean land size suffer a decline in output, while the opposite is true for those with above-mean land holdings.

The marginal cost of redistribution decreases the welfare effect of higher α . The marginal cost is higher, higher the initial inequality of *de jure* land ownership. With no security of property rights, there is *de facto* equality. Security of property rights increases inequality in both wealth and income dimensions. The wealth effect occurs because higher security of property rights makes the latent inequality in *de jure* land ownership operative. The income effect occurs because with secure property rights, a section of the propertied class can supplement their income from informal production with income from more productive formal enterprises. Big landowners, in fact, gain from a positive income effect in both formal and informal production due to higher α .

Proposition

Proposition 2. In presence of the cost of redistribution absolute property right ($\alpha = 1$) is not socially optimal

3.2 The Voting Outcome

In this section, we endogenize the property rights regime as a voting outcome. We begin by disaggregating the welfare effect of more secure property rights, we get the following differential effects of higher α on the population. Consider condition (12). a)All landless producers experience a decline in their income.

b) When $x^* < \overline{X}$, informal producers with land size $x < x^*$ experience a drop in their income, those with $x \in [x^*, \overline{X}]$ experience a decline in their informal income and a rise in their formal income and those with $x > \overline{X}$ experience a rise in both their formal and informal income. Since formal production uses more advanced technology, we assume that a fall in informal income is more than compensated by a rise in formal income for the second group with land size $x \in [x^*, \overline{X}]$.

c) When $x^* > \overline{X}$, landowners with land size $x < \overline{X}$ experience a decline in income, those with land $x \in [\overline{X}, x^*]$ experience a rise in their informal income, and those with $x > x^*$ experience a rise in both informal and formal income.

The welfare effect of a rise in α is unambiguously negative for landless and positive for formal sector. Its effect on informal production is ambiguous.

In a voting model, we will consider two cases as shown in Figure 2. In the first case (Fig. 2a), the voting outcome will be in favor of higher α , if $\tilde{x} \ge x^*$, where $\Phi(\tilde{x}) = 0.5$, i.e. if the median voter has land holding greater than or equal to x^* . In the second case (Fig 2b), people will vote for higher α , if $\tilde{x} \ge \overline{X}$, where $\Phi(\tilde{x}) = 0.5$, i.e. if the median voter has more than the mean landholding size. In both cases, the society is likely to vote for greater security of property rights if $\tilde{x} \ge \overline{X}$.

Insert Fig 2 here

Now, $\tilde{x} > \overline{X}$ (i.e. median land size is less than mean land size) means that the income distribution is such that there are less people towards the tail, which implies a more equal society. Therefore, a more equal society with respect initial land distribution, is likely to vote for greater security of property rights than a more unequal society. This is immediately seen if we consider a radical land reform that distributes total land equally among the population so that each individual gets exactly per capita land. There will be no encroachment and hence no insecurity of property rights. On the other hand, consider a highly unequal society where $\tilde{x} = \underline{x}$. This society will always vote for low security of property rights.

Proposition

Proposition 3. A society with a more unequal distribution of land may choose lower protection of property right as a voting outcome.

3.3 Techological Shocks and the Voting Outcome

The pivotal thing in the choice of more or less secure property rights regime is the loss of income from my land that is encroached by others vis a vis gain in income from land that I encroach from others, as long one gets as much land from others as he loses to others. However, results will be different if we add one more dimension to the land-its quality. In that case, quality of my encroached land may be different from the quality of land that I encroach from others. Such quality difference matters in agriculture, for example, when the opening up of international markets prompts farmers to switch to those crops that command higher prices in the international markets and which require particular soli qualities to grow. The openning up of international markets acts like a technology shock that positively affects only those with access to certain qualities of land. In non-agricultural activities, building of a highway or a new township may play the same role. Land located closer to the highways generates more income. In this case, individuals experiencing the positive shocks have an incentive to go for more secure property rights and conversely for those unaffected by the shock.

Based on the experience of the shock, the population can be divided into those experiencing the shock and those unaffected by the shoock. The following analysis is conducted with respect to those who are enaged soley in informal production, because that is the only group that votes ambiguously, depending on individual's *de jure* landownership. The landless as well the landowners engaged in formal production will unambiguously vote for lower and higher security of property rights respectively. Suppose, *n* fraction of the "pure" informal producers experience the shock while 1 - n fraction remains unaffected. The distribution of shocks is orthogonal to the diistribution of land holding. We want to know how individual's choice of property rights regimes get modified by the incidence of shocks.

Let us first take the case of those individuals who receive shocks. The argument for their production function is given by,

$$\alpha(x+\gamma) + (1-\alpha)(n.\gamma + \overline{X}) \tag{13}$$

which is equal to

$$\alpha[(x - \overline{X}) + \gamma(1 - n)] + (n \cdot \gamma + \overline{X})$$
(14)

The above mentioned expression is rising in α only if $x > \overline{X} - \gamma(1-n) = x^1$

Note that $x^1 < \overline{X}$ which means under this productivity shock some people who earlier had voted against higher α would now vote for it. The reason is very straightforward. Lower protection of property right and subsequent encroachment works as public good. People support it as long as she gets more from society than she has to share. In this model, technological shock appears to have a land-augmenting effect for those experiencing it. Thus, an individual experiencing the shock has more of her private land to share relative to others' lands following the shock. This land-augmenting effect of technology pushes more people across the threshold limit beyond which higher security of property rights is privately beneficial.

For people who did not get the shock, i.e. (1-n) fraction of the pure informal producers, the argument of their production function looks as follows

$$\alpha x + (1 - \alpha)(n \cdot \gamma + \overline{X}) \tag{15}$$

which is same as,

$$\alpha[(x - \overline{X}) - n.\gamma] + (n.\gamma + \overline{X})$$
(16)

Hence people who did not receive a shock would prefer high α only if $x \geq \overline{X} + n.\gamma = x^2$. Note that $x^2 > \overline{X}$. This means that some people who earlier voted for high α would switch to low following the shock. So there are some new people who want to switch to high property right protection because they received a shock but their neighbors have not(n) and some people who want to switch to low property right regime because they did not receive a shock but their neighbors have (1 - n).

Hence, the necessary condition for the technological shock to alter the property rights regime as a voting outcome is that it has differential impact across the group of "pure" informal producers. Note that if everyone gets the shock then no body has any incentive to change their votes. The sufficient condition for a change in property rights regime as a voting outcome depends on the distribution of shocks in relation to the distribution of land, the magnitude of the shock and the fraction of the "pure" informal producers experiencing the shock.

Proposition

Proposition 4. In the presence of a technological shock with differential outcome, the transition to higher security of property rights might be reversed.

4 Conclusion

In this paper, we have argued initial initial inequality in land ownetrship may pose problems for transition from a common-stype regime to an "effective" private property regime. We have abstracted from the properties of production function to emphasize other implications of inequality-namely costs of collateralization and redistribution. The cost of collateralization creates heterogeneity among landowners in their choice to enter formmal production and hence in their expected benefits from a higher security of property rights. In the absence of costs of collateralization, and assuming that formal production is much more productive than informal production, all landowners experiencing a fall in their informal output, due to higher security of property, would be more than compensated by the gain in formal output. Thus, the society would have collapsed into a two-class model-the landless and the landowning–with clear implications for their voting behavior. The cost of collateralization prevents the model from collapsing into such a two-class society by injecting a certain ambiguity in the voting behavior of "pure" informal producers and thus making the result indeterminate. Of course, the cost of collateralization would cease to matter in the absence of inequality. With perfect equality of land distribution, either all landowners go for formal production or they don't, depending on whether the per capita land of the economy is greater than that required to cover the cost of collateralization. Similarly, the cost of redistribution follows from asymptric power that comes from asset inequality, which becomes effective with security of property, and which in turn generates income inequality.

We have so far assumed that encroachment is costless. But encroachment establishes *de facto* access to productive resources. Reaching an encroachment equilibrium may be a costly business, requiring negotiations sanctioned by social locations of informal authority.the present work needs to be extended to include a cost encroachment in a commons-type regime just as there is a cost of redistribution in a private-property regime. Costs of encroachment will affect the voting outcome and the not the social planner equilibrium and in this sense, would be different from the costs of redistribution which affect the social planner problem but not the voting outcome.

We have, in this model, assumed away productive labor. Including labor would have an impact on the voting outcome if the landless are employed in formal production. It will be intersting to see to what extent the effect of initial inequality on the transition to more secure property rights regiem is modified in the presence of productive labor.

Appendix: Derivation of Eq 12

Let us define

$$V_F = \int_{x^*}^{\overline{x}} f(\alpha x)\phi(x)dx$$

Using Leibniz rule, we find,

$$\frac{\partial V_F}{\partial \alpha} = \int_{x^*}^{\overline{x}} f'(\alpha x) . \phi(x) . x dx - f((x^*(\alpha), \alpha) . x^{*'}(\alpha))$$

Next define,

$$V_I = \int_{\underline{x}}^{\overline{x}} g(\alpha x + (1 - \alpha)\overline{X})\phi(x)dx$$

Following the same rule we find,

$$\frac{\partial V_I}{\partial \alpha} = \int_{\underline{x}}^{\overline{x}} g'(\alpha x + (1 - \alpha)\overline{X}).(x - \overline{X}).\phi(x)dx$$

Finally, let, $V_L = g((1 - \alpha)\overline{X})\Phi(\underline{x})$

$$\frac{\partial V_L}{\partial \alpha} = -g'((1-\alpha)\overline{X}).\overline{X}.\Phi(\underline{x})$$

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Figure 1: Choice of formal production



Fig.2 Land size and Choice of higher security of property rights