SPONTANEOUS (NON) EMERGENCE OF PROPERTY RIGHTS

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Abstract

It is often argued that secured property rights are established in response to grassroots demand of private owners. The paper analyzes preferences of private owners over the degree of protection of property rights. The framework for this analysis is an equilibrium model, which combines production and appropriation activities. It is shown that inequality in resource ownership and/or relative inefficiency of production technologies could make wealthier agents to favor less than full protection of property rights. If such agents decide the outcome of public choice of a property rights regime, then fully secured property rights will not emerge from the grassroots. This conclusion is consistent with the failure to establish an efficient system of property rights regime in Russia.

1. Introduction

Institutions, including property rights, emerge and develop in response to evolving economic and political conditions. Thus, changes in relative prices, technologies of production, appropriation and enforcement, market agent preferences, and allocation of economic and political power could prompt conversion of ownership of resources from common to private (Libecap, 1989).

In this general concept, the transmission mechanism between underlying changes in economic and political fundamentals and the resulting institutional accommodations remains unspecified. However, institutions are normally expected to come to being and evolve in response to grassroots demand, reflecting needs of market agents (Davis, North, 1971). The classical view, which subjects institutional change to the microeconomic principle of efficiency maximization, holds that new institutions appear to enable market agents to capture aggregate efficiency gains that are technically feasible but de facto unavailable under the institutional status quo (Knight, 1992). For example, if private property rights are expected to release net aggregate gains, then potential beneficiaries will seek enactment of such rights (Demsetz, 1967).

While this view is corroborated by a number of well-known case studies (op. cit., Umbeck, 1977; Libecap, 1989; Alston et al., 1995), it does not explain why efficiency-enhancing institutional changes, such as establishing secure property rights, often remain retarded (Clague, 1997). The answer should be sought in the nature of institutions as the "rules of the game" affecting multiple actors. It means that, unlike the standard microeconomic paradigm, institutional changes are not prompted by a single agent, but instead result from collective actions. Such actions are complicated, apart from the standard free-riding concerns, by conflicts over distribution of expected aggregate gains (Libecap, 1989). Potential aggregate efficiency gains do not automatically create an agreement for the new institutional order within a sufficiently broad or otherwise decisive constituency of stakeholders. Distributional stalemates blocking an efficiency-enhancing institutional change are particularly likely in the case of private property rights, which are divisive by their nature. When such stalemates occur, grassroots demand for a *particular regime* of private property rights fails to materialize.

One could hope, however, that if the distributional conflict could be avoided or confined within narrow limits, then demand for property rights would ensue. While it is likely that those who have not secured sufficient ownership of privatized assets could be opposed to the new regime, at least the latter's beneficiaries should be natural agents for change. If a particular allocation of property rights has the property of a "focal point," then the expected winners would uphold and defend such outcome. It thus appears that establishment of private property rights could be ensured by creation of a "winning -be private owners. Such a coalition would use its economic and political clout to see that newly established private property rights are duly codified and protected.

Under such a scenario the formal institution of private ownership is indeed endogenous to grass-roots demand (Libecap, 1989). Put differently, private property rights will emerge spontaneously as a result of concerted actions of designated owners. According to (Eggertsson, 1990, p. 261), under such circumstances

> "the state has a passive role [in a process of establishing property rights] and supplies rules in response to pressure [from the grassroots level]".

2. Russian model of privatization

The above outlined scenario had a considerable appeal for transition economies, where governments were faced with the formidable task of privatization of predominantly state-owned production assets, but lacked the administrative capacity, professional experience and political resources to lead this process. Arguably, instead of leaving privatization in the hands of poorly informed, inexperienced and corruption-prone bureaucracy, efforts should be aimed at creating a constituency of potential beneficiaries of the new institutional order. Such a constituency, once in place, would press the government into enacting and enforcing required legislation.

This reasoning was strongly advocated as guidance for Russian privatization, and in particular for creation of the institutions of property rights and corporate control. According to Shleifer (1995) (see also Boyko et al., 1995),

> "… there is simply no political interest in governance mechanism before privatization. This interest emerges during privatization, as large outside shareholders are created and come to realize their needs ... Pressure from these new owners can then convince the government to adopt regulations that foster corporate governance. Under pressure, the government begins to protect property rights. ... The transfer of control rights from politicians to private parties gives the process of establishing property rights a jump-start by creating the political demand for the protection of property rights."

A. Aslund (1995) is of the same opinion: he argues that once

> "... the fundamental issues [of] the mutual independence of enterprises from one another (as well as from the state) and their profit orientation [have been addressed], under such conditions owners will forcefully try to ascertain their property rights".

The role of the government in this "technology" of creation of property rights is to design and implement a process of transfer of state-owned production assets into private hands. The sole purpose of such a process is to produce an allocation of assets among private owners that would be officially endorsed and thus commonly acceptable as a "focal point." It would then be up to private owners to make sure that newly created private property rights would be protected by the government and put in the necessary legal and regulatory context. Once these requirements are met, trade in property rights would result in their efficient allocation.

This scenario appears to be distributionally neutral, and does not assign particular significance to allocation of assets immediately after privatization. Indeed, economic inefficiency of such an allocation should be corrected by subsequent exchanges of property rights. On the political side, even if the distribution of property rights is highly uneven, the constituency for private ownership, while not particularly numerous, would be nonetheless economically empowered and thus politically influential, which should still ensure the desired outcome. In the Coaseian spirit, initial allocation of property rights is not highly relevant neither economically nor politically, and within broad limits any outcome of privatization is expected to lead to spontaneous emergence of the institution of private property rights[1].

The Russian reality, however, has not corroborated the above scenario. Russia still remains unparalleled among the formerly Communist countries in the scope of its privatization program. The speed of Russian privatization, which was largely completed in less than two years, allowed to avoid a potentially paralyzing distributional conflict and promptly pass, even at the cost of numerous irregularities and ad hoc decisions, most of the nation's production assets into private hands. Still, after seven years since the inception of privatization, property rights in Russia have no adequate protection from the state.

[1] Indeed, Russian privatization downplayed egalitarian motives. Instead the distributional emphasis was placed on placating "stakeholders," i.e. economic and political groups capable of blocking the privatization program (Shleifer, 1995). In other words, the possibility to *implement* privatization was given clear precedence over resultant allocation of property rights.

This is, perhaps, even more surprising given the fact that "big money" indeed wield unprecedented political influence in Russia – so much so that the country's government was often considered as being "privatized" by those having controlling interest in the Russian economy. These parties managed to win numerous concessions from the government, and on occasions displayed a remarkable ability to work in concert for the sake of mutually beneficial collective actions – e.g. when leading economic and financial groups in Russia, "fearing that a Communist victory in the [1996] presidential elections would spell disaster … decided to sink their professional differences and work together for Mr. Yeltsin's re-election" (Survey of Russia, 1997, p. 6).

The conspicuous absence of protection of property rights from the "wish lists" of these "kingmakers" is therefore particularly noteworthy. It is further symptomatic that the main agents for protection of property rights in today's Russia are not the financial-industrial conglomerates, known as the "oligarchs," who were the main winners in the privatization, but instead owners of small and medium-size firms, mostly *de novo* enterprises, who gained little or nothing when state-owned assets were transferred into private hands. It was not until after the 1998 economic and financial crisis, which has drastically diminished the influence of the oligarchs in Russia, that the task of protection of property rights has been brought back to the agenda of the Russian government.

This leads to the conclusion that the Russian privatization, against the expectations of its architects, had failed to create sufficiently strong demand for secured property rights. This phenomenon is not unique to Russia – a survey of twenty transition economies (Hellman, Schankerman, 2000, p. 546)

> "…emphasizes the limitations on how much privatization can improve the [effectiveness of institutional infrastructure] … This conclusion runs contrary to the view that one of the main contributions of large-scale privatization is to jump-start the *demand* for institutional development to support a private market economy".

The rest of the paper shows that under certain conditions, observed in Russia and some other transition economies, the absence of sufficient grassroots pressure upon the government to provide effective protection of property rights is indeed a distinct possibility.

3. Distributional and technological caveats

Why wouldn't private owners be interested in having property rights duly protected by law and effectively enforced by the government? After all, it is natural that a private owner welcomes policies that would ensure public protection of his/her property. However, the seemingly counterintuitive rejection of fully secured property rights by private owners could still be rational, when protection of property right is understood as a *public* institution that protects property of everyone. With this caveat, a self-interested agent is not necessarily in support of having such an institution in place. Indeed, public protection of property rights, while securing private property of a given agent, also makes it harder for this agent to further accumulate his/her assets by appropriating property of others. The overall attitude of the agent to publicly protected property rights therefore hinges upon a cost-benefit analysis,

where gains from secured ownership of the assets that the agent presently controls are weighted against forgone opportunities to augment these assets through appropriation.

Individually held assets obtained as a result of privatization could be used not only for productive purposes, but also invested into rent seeking[2], which in this paper is a synonym for extra-market redistribution (see e.g. Frydman, Rapaczynski, 1994; Polishchuk, 1998). It is conceivable that a wealthy person with a relative surplus of economic assets might find it individually rational to split this resource between production and rent seeking, especially if returns to scale in production steeply decline, and appropriation through rent seeking of economic wealth and resources of others outperforms the production yield. Since public protection of property rights reduces the net cost of production[3], but at the same time elevates the cost of expropriation, the attitude of an economic agent to such an institution would depend on which of these two activities renders a higher return.

Allowing a property rights regime to emerge spontaneously from the grassroots, the government in fact makes the level of protection of property rights a decision variable that will ultimately be established by a political process. In this case the quality of protection of property rights becomes a matter of public choice, and is decided by an aggregation of individual preferences over this public decision variable. Individual preferences, in their turn, could be derived from an agent's optimal allocation of resources between production and appropriation for any *given* level of protection of property rights, and the ensuing total returns that accrue to the agent. Variation of such returns over a range of strength of public protection of property rights characterizes the agent's preference profile, and in particular his/her most preferred level of property rights protection.

It could be expected that while nobody would want a complete anarchy with no public protection of property rights whatsoever, at least some of the agents might opt for imperfectly protected property rights, which would maintain a desired balance between production and appropriation. If these agents are successful in advocating their preferences, and can influence the political process, grassroots pressure will produce a regime with less than fully secured property rights.

Such eventuality means that the above outlined scenario of "spontaneous" emergence of property rights is not assured, but is instead contingent upon certain assumptions about, inter alia, technologies for production and appropriation, and distribution of economic assets across the society. The intuition behind the technological qualification was outlined above, while the distributional caveat is justified as follows. In a sufficiently egalitarian society aggregate efficiency gains make everyone better off, and therefore public policy measures that would improve overall efficiency are likely to meet broad support. Protection of property rights is undoubtedly among such measures, as it prevents twofold losses – due to diversion of economic resources from production to appropriation, and due to weakened incentives to produce out of the fear of subsequent appropriation. When property rights are contestable, the society at large is worse off, and if all individuals are in roughly similar social and economic positions, there will be no winners in the fight over property. The perception of such an outcome makes everyone to support full protection of property rights,

[2] The assumption that production inputs can also be invested into rent seeking is now standard (see among others Tullock, 1980; Umbeck, 1981; Murphy et al., 1991, 1993; Acemoglu, 1995; Polishchuk, 1996; Skaperdas, 1996).

[3] By ensuring secured ownership of production inputs and outputs and making unnecessary individual protection efforts.

and democratic political institutions would indeed transform such support into necessary legislative and policy measures[4].

But if economic wealth is distributed across a society unevenly, the above arguments do not hold, and it is conceivable that some of the agents might in fact prefer poorly protected property rights which allow for extra-market redistribution. Contest for property rights is a negative sum game, and thus there will always be some losers – not only in the sense of being deprived of previously held assets, but also in comparison with their well-being under fully protected property rights. However, because players will be in unequal positions, one cannot conclude that *everybody* will be on the losing side, and there is a possibility that there will be winners as well. The question is whether potential winners (if there are any) will be sufficiently influential politically to impose their preferences upon the society.

The answer depends on political institutions. For a society under democratic rule, it would take a majority to benefit from poorly protected property rights (by preying on the minority) to prevent the government from providing full protection of private property. In case of a plutocracy the matter will be decided by the wealth of potential beneficiaries.

Conventional wisdom suggests that property rights are more likely to be vulnerable under democracy, with a majority of have-nots being first in the line to seek reallocation of property (Eaton, White, 1991, Grossman, 1994). This danger is the main rational for wealth-based restrictions of voting rights. While indeed there are numerous empirical and theoretical evidences supporting such apprehensions, property rights might need protection not only from the poor, but from the rich as well[5]. This is, of course, conditional on the second of the aforementioned qualifications, i.e. on the superiority of appropriation over production in terms of returns they yield.

The impact of wealth on the propensity to seek protection of property rights is predicated upon *relative (dis)economies of scale* in production and appropriation. *Ceteris paribus*, gross returns to both of these activities are positively related to each other, because the more efficient a production technology is, the richer is the society, and thus appropriation appears to be more lucrative (Umbeck, 1981, Barzel, 1997)[6]. However, if the technology for appropriation features increasing returns to scale *in relation* to the production technology (Murphy et al., 1993), then wealthier agents could benefit from the economy of scale in rent seeking, and thus are less likely to seek full protection of property rights than those who are poorer.

An analytical framework presented in the next section takes into account all of the above considerations, and allows exploration of the preferences of private owners who have a choice between production and rent seeking. The subsequent analysis confirms that inefficient production technologies and profound inequality could indeed produce an environment where wealthy resource owners would oppose full public protection of property rights, and their preferences shape the outcome of public choice.

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[4] Libecap's analysis (1978) suggests that homogeneity of claimants facilitates reaching an agreement on property rights.

[5] "In the redistribution of property, there are no satisfied people. Everyone is unhappy. Those who got a lot aren't happy, because they think they could have gotten even more, and those who lost aren't happy". (Boris Berezovsky, a Russian economic magnate, quoted by *Washington Post* of January 10, 1997.

[6] According to earlier held views, an increase in value of a resource strengthens the incentive to subject it to private ownership (Posner, Ehrlich, 1974). In light of above qualifications, this is a hypothesis, subject to empirical testing (Libecap, 1989).

4. The model

The following model incorporates production and appropriation (or, synonymously, rent seeking). It is assumed that every agent has access to both types of these activities, and optimally allocates between them the resources that he/she controls. The purpose of the model is to characterize the equilibria which obtain in such situations.[7] In every such equilibria, the quality of protection of property rights is given exogenously and determines payoffs which accrue to participating agents. The subsequent comparative statics analysis allows describing agents' preferences over the degree of public protection of property rights.

Consider an economy which consists of a unit continuum of agents $x \in [0,1]$. The stock $\overline{w}$ of a multi-purpose economic resource which could be used either for production or, alternatively, appropriation, is distributed across the agents with density $w(\cdot)$:

$$\int_0^1 w(z)\, dz = \overline{w}.$$

Without loss of generality, function $w(x)$ is assumed monotonically non-decreasing.

Every agent has access to a production technology with production function $f(w)$, which meets the following standard conditions:

$$f'(w) > 0,\ f''(w) < 0,\ \lim_{w \to 0} f'(w) = \infty,\ \lim_{w \to \infty} f'(w) = 0.$$

Technology for appropriation is described as follows. Let $\kappa \in [0,1]$ be the portion of the economy's GDP Y, which is available for re-distribution through appropriation activities. Parameter κ – for the time being, exogenous, characterizes (inversely) the quality of public protection of property rights: the smaller is κ, the stronger is such protection. The extreme cases of $\kappa = 0$ and $\kappa = 1$ correspond, respectively, to fully protected property rights and to complete anarchy.

The take of an agent involved in appropriation activities is proportional to the amount h of this agent's resource invested in appropriation – an assumption commonly used since the pioneer paper of Tullock (1980). If H is the total amount of resources spent for rent seeking throughout the economy, then the agent's payoff is $\kappa hY/H$. While such description of appropriation technology is standard, it should be emphasized that it sheds no light on particular means of redistribution. The latter could be either so-called *influence activities*, also known as *state capture* (Hellman, Schankerman, 2000), such as lobbying and bribery, where redistribution involves the government, or *conflict technologies*, whereby the parties directly confront each other (see e.g. Hirschleifer, 1991, Nitzan, 1994). The above model of rent seeking captures some general features of these activities, such as their contesting nature (participants' payoffs positively depend on their own efforts and negatively on counter-efforts of other parties), and the fact that payoffs from appropriation are, *ceteris paribus*, higher in richer societies with poorly protected property rights.

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[7] For other examples of general equilibrium analysis that combines productive and non-productive economic activities see Murphy, Shleifer, Vishny, 1991,1993, Grossman, 1994, Acemoglu, 1995, Polishchuk, 1995, 1996).

The linearity of an agent's payoff as a function of resources he/she spent on rent seeking could also be interpreted as an indication that the market for rent seeking is perfectly competitive, and pays a fixed rate of return to every unit of invested resource. Finally, the functional form of rent seeking technology adopted in this paper allows various axiomatic justifications.[8]

We now turn to descriptions of equilibria where individual choices of agents on allocation of their resources between production and re-distribution are mutually consistent, and none of the agents has an incentive to change her action, given the choices of others.

5. Equilibrium with appropriation

When agent x makes a decision on how to split her stock of resource $w(x)$ between production and appropriation, she maximizes aggregate returns to both of these activities by solving the problem

$$\max_{h\in[0,w(x)]} \{(1-\boldsymbol{k})\, f\,(w(x)-h) \quad + \quad \boldsymbol{k}\, hY / H\,\}. \tag{1}$$

In solving problem (1) agent x behaves "competitively", i.e. takes the values of Y and H as given, assuming that her actions will not affect these aggregates (this will always be the case if the distribution $w(\cdot)$ has no "atoms"). Denote $h(x)$ the optimal choice of the agent; this is the amount of resource that agent x spends for rent seeking. Function $h(\cdot)$ forms an *equilibrium with appropriation*, if $h(x)$ solves problem (1) for every $x \in [0,1]$ with some Y and H, and the following balance equations hold:

$$Y = \int_0^1 f\,(w(z) - h(z))\, dz, \quad H = \int_0^1 h(z)\, dz. \tag{2}$$

PROPOSITION 1. For every $\boldsymbol{k} \in [0,1]$ and $w(\cdot)$ an equilibrium exists, is unique, and allows the following description: for some $t > 0$,

$$h(x) \quad = \quad \begin{cases} 0, & w(x) \le t \\ w(x) - t, & w(x) > t. \end{cases} \tag{3}$$

The value of t is uniquely determined by $\boldsymbol{k}$ and $w(\cdot)$, and could be found from the following equation:

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[8] See e.g. Skaperdas, 1996. An axiomatic description which belongs to the authors of this paper is as follows. Let a pie of fixed size A is contested by n agents, and the amount of resource that agent i spends in the contest is x_i. Suppose that the share of the pie that the agent wins in the contest is a. function of two variables, one of which is the amount x_i of resource that the agent spends individually, and another – the total expenditures of all the agents participating in the contest, i.e. $\sum_{j=1}^{n} x_j$. In this case one can easily verify that under mild regularity assumptions such function is necessarily the ratio $\dfrac{x_i}{\sum_{j=1}^{n} x_j}$.

$$\frac{1-\kappa}{\kappa} f'(t) = \frac{\int_0^1 f(\min\{w(z), t\})dz}{\int_0^1 (w(z)-t)_+ dz}. \qquad (4)$$

Proofs of this and other propositions are omitted here and available from the author upon request.

According to Proposition 1, in every equilibrium there is a threshold level of resource endowment t such that only agents with stocks of resource in excess of t participate in rent seeking, and their expenditures for rent seeking are equal to surpluses of resource endowments over the threshold.

Threshold t is a function of κ and $w(\cdot)$. According to the following proposition, for a given distribution $w(\cdot)$ t is an indicator of quality of property rights protection (in that t is a monotonically decreasing function of κ, which characterizes vulnerability of property rights to appropriation), whereas for any given κ this threshold is a measure of inequality of resource distribution. Inequality is understood here in the sense of Dalton majorization (Marshall, Olkin, 1979): distribution $w_1(\cdot)$ is more unequal than $w_2(\cdot)$, if both add up to the same total of $\overline{w}$, and the latter could be obtained from the former by transfers of resource from richer to poorer individuals.

PROPOSITION 2. The threshold $t(\kappa, w(\cdot))$ monotonically decreases in κ. For given κ and $\overline{w}$ the threshold t goes up (non-strictly) when distribution $w(\cdot)$ becomes more unequal. The minimal value t_o of this threshold, which attains when resource is distributed uniformly among the agents, satisfies the equation

$$(1-\kappa)(\overline{w} - t_o)\, f'(t_o) \;=\; \kappa\, f(t_o). \qquad (5)$$

Consider as an illustration a Cobb-Douglas technology $f(w) = w^{\alpha}$, with $0 < \alpha \le 1$. In this case $t_o = \overline{w}(\alpha - \alpha\kappa)/(\alpha + \kappa - \alpha\kappa)$. Notice that in agreement with Proposition 1, t_0 and κ are in inverse relations with each other.

Agents' equilibrium payoffs are as follows:

$$(1-\kappa)\, f(w(x)), \text{ if } w(x) < t; \qquad (6)$$

$$(1-\kappa)(f(t) + (w(x)-t) f'(t)) \text{ otherwise.}$$

6. Market equilibrium

A natural reference point for assessment of equilibria with rent seeking should be the market equilibrium, where property rights are completely secure ($\kappa = 0$) and fully tradable. In this case agents with relative surpluses of resource would sell their surpluses to those who can use them more efficiently. Market trade in the model is the only alternative to production – not necessarily because trade outperforms expropriation (as we will see, for some agents that might not be the case), but simply because expropriation is precluded institutionally by effective enforcement of property rights.

If p is the price at which the resource is traded, then every agent maximizes his/her profit:

$$\max_h \{ f(w(x) - h) + ph \}.$$

In equilibrium, agents' net sales of resource h should all add up to zero, which immediately leads to the following standard description of the *market equilibrium*.

PROPOSITION 3. In the market equilibrium, the resource is traded at price $p = f'(\overline{w})$, and after trade every agent uses in production the same amount of resource $\overline{w}$ and earns total pay-off equal to $f(\overline{w}) + (w(x) - \overline{w}) f'(\overline{w})$.

Of course, this equilibrium is Pareto-efficient and yields the highest possible level of the economy's GDP Y. However, this does not guarantee that *every* agent would prefer this equilibrium to another one involving appropriation. If every equilibrium with appropriation were Pareto-inferior to the market one, then indeed grass-roots pressure for fully secured property rights would be assured. Otherwise there would be gainers and losers, and grassroots forces that prompt institutional changes become more complicated.

7. Hybrid equilibrium

The two institutional setups considered previously could be combined by assuming that property rights, while being tradable, are not fully secured, so that trade and appropriation coexist with each other. It might be useful to interpret such situation as an incomplete set of property rights. Full-fledged property rights include the rights of (residual) control – the possibility to use production assets at the owner's discretion, rights for (residual) returns, i.e. for profit generated by owned assets, and the rights to transfer the above set of rights to another owner (see e.g. Milgrom, Roberts, 1992). In the situation considered in this section, the first and third components of the full bundle of property rights are present, whereas the second one is not fully enforced and could be challenged[9]. Such incompleteness, which is

[9]This assumption corroborates with some of Russia's economic realities. "In the course of [Russian] privatization it was soon realized that property relations are … for the rime being too abstract. In the modern

typical for Russia and some other transition economies, leads to hybrid equilibria, which comprise market trade and extra-market re-distribution.

In a hybrid equilibrium market income, which can partly be appropriated, is earned through production and trade. If an agent uses r units of resource for production, and trades s units on the market at price p, her market income is $f(r) + ps$. The agent securely holds portion $1-\kappa$ of this income, whereas the balance is subject to re-distribution. The agent maximizes aggregate return from all three of these activities by solving the following problem:

$$\max_{h,r;\, h\geq 0,\, h+r\leq w(x)} \{(1-\kappa)[f(w(x)-h-r)+pr]+\kappa hY/H\}, \qquad (7)$$

where as before, Y is the total income of the economy, and H – the aggregate amount of resources invested in appropriation.

Triplet $\{h(\cdot), r(\cdot), p\}$ forms a *hybrid equilibrium,* if $h(x)$ and $r(x)$ solve problem (7) for every $x \in [0,1]$, and the following balance equations hold:

$$Y = \int_0^1 f(w(z) - h(z) - r(z))\, dz, \quad H = \int_0^1 h(z)\, dz, \quad 0 = \int_0^1 r(z)\, dz. \quad (8)$$

To characterize a hybrid equilibrium, notice first that with $\kappa > 0$ at least some of the agents participate in appropriation ($h > 0$). Observe next that freedom to buy and sell implies that $f'(w(x) - h(x) - r(x)) = p$ for all $x \in [0,1]$, so that every agent uses in production the same amount of resource $t < \overline{w}$, no matter what was this agent's initial endowment. It means that $Y = f(t)$ and $H = \overline{w} - t$. Finally, market trade takes place if and only if it yields the same returns as does appropriation, i.e. if $t = t_o$, where t_o is defined by equation (5). These observations summarize as follows.

PROPOSITION 4. A triplet $\{h(\cdot), r(\cdot), p\}$ forms a hybrid equilibrium if and only if the following statements hold:

(i) $h(x) \geq 0$, $w(x) - h(x) - r(x) = t_o$, for all $x \in [0,1]$;

(ii) $\int_0^1 r(z)\, dz = 0$;

(iii) $p = f'(t_o)$.

In a hybrid equilibrium agent x receives a total payoff equal to

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Russian life *control over financial flows* has proven to be more important than ownership". (*Ekspert*, n 1, 1997, p. 6).

$$(1-\kappa)(f(t_o)+(w(x)-t_o)\,f'(t_o))\,. \qquad (9)$$

Notice that there is a multiplicity of hybrid equilibria, and that an agent is indifferent between investing his/her resource in market trade or in appropriation, as long as the budget constraints (i) are met. The common production level t_o is, however, the same for all such equilibria, and according to (4) does not depend on how the gross stock of resource $\overline{w}$ is distributed among the agents.

8. Comparing equilibria: the impact of trade

Comparisons of the equilibria introduced above shed light on the incentives that underlie institutional changes. When reforms involve public choice, preferences of the affected parties over policy alternatives and their outcomes are critically important. A possible discrepancy between individual interests and aggregate efficiency gains could block implementation of efficiency-enhancing policies. Two such policies are considered in the paper – first, creation of a market for the production input, and in the next section – securing the right for returns. In their combination these policies would result in establishment of the complete set of property rights and the market equilibrium. As it was already noticed, such equilibrium, being a first-best Pareto optimum, attains the highest aggregate income and in this sense is superior to impaired institutional frameworks which lead to equilibria with appropriation – with or without trade.

The impact of trade for aggregate income when property rights remain insecure, being threatened by appropriation, a priory is less obvious, since there are two counteracting effects in play. On the one hand, trade releases efficiency gains by moving resources to where they can yield higher returns. On the other hand, as the economy gets richer, appropriation becomes more attractive, prompting agents to invest more of their resources into rent seeking and leaving less for production. Such eventuality is clear from Propositions 1, 2 and 4, according to which the cut-off level t at which production stops in the equilibrium with appropriation and without trade is higher (non-strictly) then the similar threshold t_o in the hybrid equilibrium. Therefore market development, if it is not paralleled by improved protection of property rights, could increase the scope of appropriation and leave less of resources for production (this phenomenon was earlier demonstrated in a slightly different analytical framework in (Polishchuk, 1996)).

While being an eventuality, such adverse impact is not inevitable: it is also possible that trade would not only improve *allocation* of resources contributed to production, but would as well increase the *aggregate supply* of such resources. Indeed, although $t_o \le t$, in a hybrid equilibrium everyone ends up using t_o units of resource for production, whereas in the equilibrium without trade agents whose resource endowments *w(x)* are small, are constrained by these endowments and do not reach level t.

Overall, according to the following proposition, even if property rights are insecure, the improvement in allocation of production resources accomplished through market trade outweighs the possible decrease of the aggregate supply of such resources for productive purposes, and as a result trade always yields (non-negative) aggregate efficiency gains – with

or without fully established rights for residual returns. Moreover, making production assets tradable constitutes *a Pareto improvement* that would leave every agent, rich and poor alike, better off (again, in general non-strictly). Without appropriation this conclusion holds trivially due to simple revealed preferences arguments. An inspection of payoffs (6) and (9) shows that this is also true in the presence of appropriation.

PROPOSITION 5. For any given level of property rights protection k and resource distribution $w(\cdot)$, every agent's payoff in a hybrid equilibrium is at least as high as in the appropriation equilibrium without trade.

Note, however, that vulnerability of property rights suppresses the incentive to trade in the resource even when such trade is institutionally feasible and would have been desirable if property rights were fully secured. In extreme cases trade could be completely "crowded out" by appropriation activities. To illustrate such possibility, suppose that initially the resource market didn't exist, and in the equilibrium with appropriation *every agent* participated in rent seeking. In this case for all x initial endowments $w(x)$ are above the production threshold t determined by (4) – which means that equations (4) and (5) are identical, and that in fact t is at its lowest level t_o. Then, according to Proposition 5, such equilibrium will also be a hybrid equilibrium, and therefore will remain unchanged even if trade was made institutionally feasible. In this case a newly opened resource market will have no impact on the previous no-trade equilibrium. Only if an initial distribution of resource is highly inefficient (which in our case, when production technologies are identical for all agents, means – highly uneven), and for some agents their endowments $w(x)$ are below t_o, trade would occur out of the appropriation equilibrium attained when trade was impossible.

This leads to the conclusion that economic liberalization, which opens up markets for production inputs, could be expected to meet a broad endorsement by resource owners, or at the very least won't raise much of grass-roots resistance. Another conclusion, however, is that such markets would remain thin, unless all other components of property rights are firmly established.

The attitudes of resource owners to a reform that would fully establish property rights, including the right for returns, are more complex and, as at will be shown, conditional upon the initial distribution of resource and available production technology.

9. Comparing equilibria: the impact of right for returns

Attitude of agents to improved protection of property rights could be inferred from parametric analysis of payoffs (6) and (9) with respect to k. If the status quo is characterized by absence of trade and incomplete right for returns, then one has to compare payoffs (6) with those available to the same agent in the market equilibrium. If trade is possible from the outset, then payoffs (9) have to be inspected, and the main question is if these payoffs attain their maximal values when the right for returns are fully protected, i.e. $k = 0$.

Notice first that in the chosen model only those who are relatively rich could prefer incomplete protection of property rights. This could be seen, first, from the fact that if for a

given k_0 an agent doesn't participate in appropriation because of low initial endowment ($w(x) < t$), then such an agent is clearly a victim of appropriation, and therefore would always prefer full protection of property rights to the status quo. Next, it could be easily deduced from (6), (9) and definitions of equilibria that both with and without trade sets of agents x which prefer incomplete rights for returns ($k_0 > 0$) to full protection are either empty, or of the form $(a, 1]$, with some $a < 1$. In other words, adverse attitude to full protection of property rights, if at all, should be expected from the upper range of distribution of economic wealth.[10]

It was conjectured earlier in the paper that preferences against fully protected property rights are rooted in inefficient technologies for production and/or in highly unequal distribution of economic resources. Naturally, inefficiency of production technology should be interpreted in relation to the returns available in appropriation. As it was already noticed earlier in the paper, the yield of the latter, in its turn, is limited by the aggregate output, and eventually by the same efficiency of production that appropriation is supposed to outperform. This contradiction, however, is resolved if production inefficiency is interpreted as steeply declining marginal product $f'(w)$ when the amount of resource w used in production increases.[11] We will refer to this property as *scale inefficiency*. With such understanding, the first of the aforementioned conjectures could be supported formally as follows.

PROPOSITION 6.

a) Let the gross stock of resource $\overline{w}$ be given. Then the following statements are equivalent:

(i) for any distribution of resource $w(\cdot)$ such that $\int_0^1 w(z)\,dz = \overline{w}$, no agent would prefer a status quo with no trade and incomplete protection of the right for returns (i.e. with some $k \in (0,1]$) to full protection of property rights;

(ii) for any distribution of resource $w(\cdot)$ such that $\int_0^1 w(z)\,dz = \overline{w}$, no agent would prefer a status quo with trade and incomplete protection of the right for returns (i.e. with some $k \in (0,1]$) to full protection of property rights;

(iii) for all $t \in (0, \overline{w})$ the following inequality holds:

$$\frac{1}{f'(\overline{w})} - \frac{1}{f'(t)} \leq \frac{\overline{w} - t}{f(t)}. \qquad (10)$$

b) Let the gross stock of resource $\overline{w}$ be a variable as well. Then the following statements are equivalent:

[10] As it was already mentioned in the Introduction, threat to property rights is usually expected from the poor. The purpose of the analysis presented in this paper is not so much to refute such expectations, but rather to point out that under certain circumstances rich could be opposed to full protection of property rights as well.

[11] Recall that marginal product in appropriation is assumed to be flat as a function of resources expended by an individual agent, although this flat rate itself is endogenous in an equilibrium and negatively related to the total amount of resources invested in appropriation economy-wide.

(iv) for any distribution of resource $w(\cdot)$ no agent would prefer a status quo with no trade and incomplete protection of the right for returns (i.e. with some $\kappa \in (0,1]$) to full protection of property rights;

(v) for any distribution of resource $w(\cdot)$, no agent would prefer a status quo with trade and incomplete protection of the right for returns (i.e. with some $\kappa \in (0,1]$) to full protection of property rights;

(vi) function $f^2(w)$ is convex in $w > 0$.

Conditions (iii) and (vi) both convey the same message: to exclude aversion of richer agents to full protection of property rights, marginal product $f'(w)$ should not diminish too rapidly when the scale of production goes up. These conditions can also be re-stated in terms of the cost function $c(\cdot) = f^{-1}$ associated with production function f. Namely, the equivalent formulation of (iii) establishes an upper limit to the increment of marginal cost: $c'(\overline{q}) - c'(s) \le (c(\overline{q}) - c(s))/s$ (here $\overline{q} = f(\overline{w})$, $s = f(t)$), whereas condition (vi)'s re-formulation is that the elasticity of marginal cost $\varepsilon_{mc}(q) \equiv qc''(q)/c'(q)$ is not greater than unity [12].

Under the above conditions, no matter how broad are the opportunities for appropriation and how much of resource an agent has, he/she would always prefer full protection of property rights, which would secure all of the earnings and will not make him/her to divert some of the resources from highly efficient production and trade. It is interesting that conditions (iii) and (vi) do not depend on whether trade was possible a priory or is a part of a reform package, which also includes the fully secured right for returns.

Vice versa, if condition (iii) is violated, there is a distribution of the given aggregate stock of resource $\overline{w}$ such that some agents will be against full protection of property rights (it will be clear from the subsequent analysis that such distribution should be highly uneven). In case of violation of stronger condition (vi) there is an aggregate stock of resource $\overline{w}$ and its allocation across the agents such that those who own sufficiently large chunks or aggregate resource would opt for imperfect protection of property rights.

Consider again as an illustration the Cobb-Douglas technology with $f(w) = w^{\alpha}$, $0 < \alpha \le 1$. In this case condition (vi) (which, of course, implies (iii)) is satisfied for all $\alpha \in [1/2, 1]$, so that if the output's elasticity is at least as high as .5, then under no circumstances will anyone be opposed to an establishment of fully secured property rights. If $\alpha < .5$, then there are combinations of resource distribution $w(\cdot)$ and imperfect property rights protection κ such that some of the richest agents would prefer status quo to the full bundle of property rights.

Suppose now that condition (vi) is violated for some w, or, what is the same, that (iii) is violated for some t and $\overline{w}$. In other words, assume that the technology exhibits, at least locally, relative scale inefficiency, so that adverse attitude to full protection of property rights is a possibility. We will now show, in support of the second of the aforementioned conjectures, that such possibility becomes a reality only if the initial allocation of resource

[12] We owe this result to V. Polterovich.

among the agents is sufficiently uneven, so that some agents' resource endowments are well $\overline{w}$.

PROPOSITION 7. For a given production technology *f*, agent *x* prefers imperfect protection of the right for returns, with or without trade, to full protection of property rights only if

$$\frac{w(x)}{\overline{w}} \geq \frac{\mathrm{E}}{\mathrm{E}-1,} \tag{11}$$

where $\mathrm{E} \equiv \sup_{q>0} \boldsymbol{e}_{mc}(q)$.

Proposition 7 supports the second conjecture about the sources of opposition to full protection of property rights, which puts blame on inequality in resource ownership. Indeed, it immediately follows from Proposition 7 that if the total stock of resource $\overline{w}$ is uniformly distributed among the agents, then no matter what production technology is used in the economy, all agents unanimously support full protection of property rights. Furthermore, if inequality is modest in that no agent's resource endowment exceeds the per capita level by more than $\frac{\mathrm{E}}{\mathrm{E}-1}$ times, then economy-wide consensus in favor of full protection of property rights still holds.

Propositions 6 and 7 show that scale efficiency in production and relatively egalitarian distribution of production assets are each sufficient to prevent opposition to fully protected property rights. Perverse preferences over protection of property rights are only possible if *both* of these conditions are violated. In this case, there is a certain trade-off between scale inefficiency and inequality of ownership.

To make this trade-off explicit, notice first that, in full agreement with Proposition 6, sufficiently wealthy agents could be against full protection of property rights only if $\mathrm{E}>1$, which means that $\boldsymbol{e}_{mc}(q)>1$ for some q and thus constitutes a violation of condition (vi). The more pronounced such a violation is, the lesser the relative wealth threshold (11) above which adverse attitude to fully protected property rights becomes a possibility. The difference $\mathrm{E}-1$ can be interpreted as a measure of scale inefficiency in production. According to Proposition 7, if the scale inefficiency is relatively low, then preferences in favor of imperfect protection of property rights could occur only under high concentration of wealth, i.e. in cases of profound inequality of resource allocation. If, however, the technology features high scale inefficiency, then even a relatively modest inequality of resource ownership will be sufficient to generate among wealthier agents aversion to full protection of property rights. In general, if inequality of resource ownership is measured by $\Delta-1$, where $\Delta \equiv \sup_{x\in[0,1]} w(x)/\overline{w}$, then the aforementioned trade-off could be described as follows: some agents could be opposed to full protection of property rights only if

$$(\mathrm{E}-1)(\Delta-1)>1. \tag{12}$$

Therefore, resistance to full protection of property rights can only be expected if the product of just introduced measures of scale inefficiency and inequality is greater than unity.

These conclusions can be illustrated by the Cobb-Douglas technology $f(w) = w^{\alpha}$. In this case condition (11) takes the form $\frac{w(x)}{\overline{w}} \geq \frac{1-\alpha}{[1-2\alpha]_+}$. This is the lower bound for the inequality level sufficient to generate adverse attitude to full protection of property rights. Direct calculations show that for this technology resistance to fully secured property rights actually occurs as soon as $\frac{w(x)}{\overline{w}} \geq \frac{2(1-\alpha)}{[1-2\alpha]_+}$.

Figure 1 illustrates dependence of agents' payoffs on the level of protection of property rights for various combinations of α and $\frac{w(x)}{\overline{w}}$. Inequality (11) holds for all cases considered, which opens the possibility that an agent's preferred choice will be partial protection of property rights with $\kappa \in (0,1)$. The sufficient condition for adverse attitude to fully protected property rights $\frac{w(x)}{\overline{w}} \geq \frac{2(1-\alpha)}{[1-2\alpha]_+}$ is violated for combination (a), and holds for all other combinations. And indeed, according to preference profiles presented in Fig. 1, values of κ which are optimal for agent x are positive in cases (b)-(e), which means that in these cases an agent will opt for incomplete protection of property rights.

10. Political Economy of Establishing Property Rights

The above analysis leads to a few important conclusions about possible outcomes of public choice of a property rights regime. Such outcomes depend on public choice rules and procedures, and we start by assuming that the society has a democratic regime, where public decision-making is based on a majority will. In this case full protection of property rights requires a constituency of agents, for each of whom such outcome is superior to the range of alternatives where property rights protected imperfectly; furthermore, such a constituency should comprise a majority of agents. Of course, secured property rights will be fully established if such is the preferred outcome of every agent.

According to Propositions 6 and 7, the latter will be the case if either the production technology doesn't exhibit scale inefficiency and/or the distribution of resource across the agents is sufficiently egalitarian. In such cases full protection of property rights will be in everyone's best interest, and the public choice outcome is straightforward.

If the aforementioned preconditions are not met, then some agents would favor less than perfect protection. While there will always be a constituency of agents who are net victims of rent seeking and therefore would opt for fully secured property rights, these agents don't necessarily form a majority, and the public choice outcome becomes unclear. According to the following proposition, full protection of property rights will still be upheld by a majority of agents when scale inefficiency of production is modest. Under a pronounced scale inefficiency this is not necessarily the case, and grassroots emergence of secured property rights under democratic political regime is not guaranteed.

PROPOSITION 8.

a) If $E < 2$ (i.e. scale inefficiency of production is less than unity), then there always will be a majority of agents in favor of full protection of property rights.

b) If $\varepsilon_{mc}(\bar{q}) > \varepsilon_c(\bar{q}) + 1$, where $\varepsilon_c(q) \equiv q\,c'(q)/c(q)$ is cost elasticity of the production technology at point $\bar{q} = f(\bar{w})$, then there is an allocation of the resource stock $\bar{w}$ among the agents such that in a hybrid equilibrium a majority of agents will be opposed to full protection of property rights.

The possibility of a wealthier majority which is against secured property rights runs against the intuition that richer predators are almost by definition a minority in the society, and they prefer appropriation only as long as there is a community of victims sufficiently large and wealthy to plunder on. In fact, predatory behavior could still be a preferred choice of a majority occupying the upper range of wealth distribution.

If preferences of agents over the degree of protection of property rights are single-peaked[13], then the median agent will decide democratic public choice of a property rights regime. When those in favor of full protection of property rights constitute a majority (the latter will then comprise agents $x \in [0, a]$ with $a > 1/2$), the median agent $x = 1/2$ will be a member of this majority, and full protection of property rights will thus ensue. Vice versa, if a majority (of the form $(a,1]$ with $a < 1/2$) prefers some rent seeking, so will the median agent $x = 1/2$, and democratic public choice will leave property rights vulnerable.

An alternative to democracy could be a plutocratic regime, when the choice is underpinned by the will of a "majority of wealth" (to be more exact, of those holding a controlling majority of economic assets). This regime is a proxy to situations where wealthier agents wield disproportionally large political influence. Again, the question is whether it is conceivable to have a situation where there is a majority of wealth in favor of imperfect protection of property rights. The answer, as before, depends on production technology. In the absence of scale inefficiency no one prefers poorly protected property rights, and democracy and plutocracy alike will result in fully protected property rights. However, under scale inefficiency the outcomes of these political regimes could be quite different. Recall that with modest scale inefficiency a majority of agents still favor fully protected property rights. And yet even slight scale inefficiency could already be sufficient for a "majority of wealth" to opt for imperfect protection.

PROPOSITION 9. Let condition (10) be violated, i.e. $\frac{1}{f'(\bar{w})} - \frac{1}{f'(t)} > \frac{\bar{w}-t}{f(t)}$ for some $t, \bar{w},\ 0 < t < \bar{w}$.[14] Then there exist $\kappa > 0$ and an allocation $w(x)$ of the total stock of resource $\bar{w}$ such that in the corresponding hybrid equilibrium with imperfect protection of property rights owners of a majority of the resource are better off than they would be in the market equilibrium will fully secured property rights.

[13] Direct calculations show that this is the case for the Cobb-Douglas production technology (see also Fig. 1).

[14] It can be shown analogously to the proof of Proposition 7 that in this case scale inefficiency of production $E - 1$ is positive.

According to Proposition 9 in the presence of any scale inefficiency of production high concentration of wealth makes the owner of the "median dollar" worth of assets to prefer imperfect protection of property rights. In this case a plutocratic regime will not produce political demand for secured property rights.

Finally, consider the impact of economic liberalization for the attitude to property rights protection. It was often argued in the debates about the sequence of transition that liberalization should precede privatization and establishment of system of private property rights. While there are indeed some sound arguments in support of this claim (see e.g. Aslund, 1995), there is another factor that was missed in the earlier literature, namely, how liberalization would affect "demand" for secured property rights. To answer this question, one has to compare all three equilibria introduced earlier in the paper – an equilibrium with appropriation, i.e. with unsecured property rights and without trade; the corresponding hybrid equilibrium, which obtains after liberalization but prior to the reform that would establish secured property rights, and the market equilibrium where such a reform is implemented.

In the presence of scale inefficiency some wealthier agents could prefer the hybrid equilibrium to the market one, and thus would resist secured property rights. On the other hand, liberalization that has lead to the hybrid equilibrium, being a Pareto-improvement (Proposition 5), makes agents better-off in comparison with the initial equilibrium without trade. This means that if the reform were implemented simultaneously, i.e. economic liberalization were concurrent with establishment of secured property rights, agents would have used the Pareto-inferior equilibrium with appropriation as a reference point. As a result, a larger number of agents suffer losses if secured property rights are established out of the hybrid equilibrium (with trade), than when the status quo is the equilibrium with appropriation (without trade). By the same token, if an agent is opposed to secured property rights both in the equilibrium with appropriation and in the hybrid equilibrium, he would lose more if property rights are made secure in the latter case. These observations (see also Figure 2) summarize as follows: economic liberalization implemented prior to establishment of secured property rights could broaden and strengthen the opposition to public protection of property rights.

11. Conclusions

The paper shows that production inefficiency and economic inequality in their combination create an environment where wealthier agents are averse to full public protection of the property rights. Both of these features were observed in Russia, and the difficulties in establishing property rights in the country are therefore fully consistent with the paper's conclusions.

More generally, the paper shows that if the government simply *distributes* economic assets between private parties, but does not supplement this distribution by an efficient system of *enforcement* of private property rights, expecting that such system will emerge subsequently in response to grassroots pressure of private owners, such expectations could be frustrated. Officially sanctioned possibility of private ownership and transfer of property titles from the state to individuals are not sufficient conditions for establishing the institution of private property rights. When the government assumes a passive role in the matters of

enforcement, it de facto admits and tolerates extra-market redistribution of privatized assets. This option might have stronger appeal than the use of resources for productive purposes, and as a result economically and politically vocal constituencies could be opposed to public protection of private ownership. Under such conditions the scenario of spontaneous emergence of property rights is an example of "betting" on institutional outcomes.

A *laissez faire* approach to privatization not only does not guarantee the desired outcome of such betting, but in fact could precipitate a failure to establish secured property rights. Indeed, a chaotic privatization, which is not subjected to strict and enforceable rules, is likely to produce a highly skewed distribution of ownership, which might lead to subsequent resistance to public protection of property rights.

Participation of market agents in establishing and enforcing economic rules of the game is a powerful resource and driving force of economic development and institutional change. Private enforcement of rules that advance and protect interests of involved individuals complements public enforcement and raises the effectiveness of official laws (Cooter, 1997). However, private enforcement and initiative cannot fully supplant the government. The latter's role, according to Madison's *Federalist*, is to facilitate productive economic exchanges, and at the same time rise the cost of transactions where narrow interests benefit at the expense of the society. Without such safeguards and checks in place, spontaneous emergence of economic institutions is not guaranteed to produce efficient outcomes.

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References

Acemoglu, D., 1995. Reward structure and the allocation of talent. European Economic Review 39, 17-33.

Alston, L., G. Libecap, and B. Mueller, 1995. Titles, Conflict, and Land Use. The Development of Property Rights and Land Reform on the Brazilian Amazon Frontier. The University of Michigan Press, Ann Arbor.

Aslund, A., 1995. How Russia Became a Market Economy. Brookings Institution, Washington, D.C.

Barzel, Y., 1997. Economic Analysis of Property Rights. Cambridge Univ. Press, Cambridge.

Boycko, M., A. Shleifer, and R. Vishny, 1995. Privatizing Russia. MIT Press, Cambridge.

Clague, C., 1997. The new institutional economics and economic development. In: Ch.

Clague (Ed.), Institutions and Economic Development. John Hopkins Univ. Press, Baltimore and London, pp. 13-36.

Cooter, R.D., 1997. The rule of state law versus the rule-of-law state: Economic analysis of the legal foundations of development. In: Annual World Bank Conference on Development Economics, 1996. The World Bank, Washington D.C., pp. 191-218.

Davis, L.E., and D. C. North, 1971. Institutional Change and American Economic Growth. Cambridge University Press, Cambridge.

Demsetz, H., 1967. Toward a theory of property rights. American Economic Review 57, 47-359.

Eaton, B.C. and W.D.White, 1991. The distribution of wealth and the efficiency of institutions. Economic Inquiry 29, 336-350.

Eggertsson, Th., 1990. Economic Behavior and Institutions. Cambridge Univ. Press, Cambridge.

Frydman, R. and A. Rapaczynski, 1994. Privatization in Eastern Europe: Is the State Withering Away? Central European University Press, London.

Grossman, H.I, 1994. Production, appropriation, and land reform. American Economic Review 84, 705-712.

Hellman, J., and M. Schankerman, 2000. Intervention, corruption and capture. The nexus between enterprises and the state. Economics of Transition, 8, 545-576.

Hirshleifer, J., 1991. The technology of conflict as an economic activity. American Economic Review, 81, 130-34.

Knight, J., 1992. Institutions and Social Conflict. Cambridge Univ. Press, Cambridge.

Libecap, G., 1978. Economic variables and the development of the law: the case of western mineral rights. Journal of Economic History, 38, 338-362.

Libecap, G., 1989. Contracting for Property Rights. Cambridge Univ. Press, Cambridge.

Marshall, A.W. and I. Olkin, 1979. Inequalities: Theory of Majorization and Its Applications. Academic Press, New York.

Milgrom, P. and J. Roberts, 1992. Economics, Organization, and Management. Prentice Hall, Englewood Cliffs.

Murphy, K.M., A.Shleifer and R.W.Vishny, 1991. The allocation of talent: implication for growth. Quarterly Journal of Economics, 113, 503-531.

Murphy, K.M., A.Shleifer and R.W.Vishny, 1993. Why rent-seeking is so costly to growth? American Economic Review, 83, 409-414.

Nitzan, S., 1994. Modeling rent-seeking contests. European Journal of Political Economy, 10, 41-60.

North, D., 1990. Institutions, Institutional Change, and Economic Performance. Cambridge Univ. Press, Cambridge.

Polishchuk, L., 1996. Rent seeking as a means of allocation: the case of spontaneous privatization. (In Russian). Ekonomika i Matematicheskie Metody, 32.

Polishchuk, L., 1996. Inputs market development, property rights, and extra-market re-distribution. California Institute of Technology, Social Science Working Paper n. 967.

Polishchuk, L., 1998. Missed markets: implications for economic behavior and institutional change. In: J. M. Nelson, Ch. Tilley, and L. Walker (Eds.) Transforming Post-Communist Political Economies, National Academy Press, Washington, D.C., pp. 80-101.

Polishchuk, L., and A. Savvateev, 1997. Spontaneous emergence of property rights: a critical analysis. Mimeo, New Economic School.

Posner, R., and I. Ehrlich, 1974. An economic analysis of legal rule making. Journal of Legal Studies, 3, 257-286.

Shleifer, A., 1995. Establishing Property Rights. In: Proceedings of the World Bank Annual Conference on Development Economics, 1994. World Bank, Washington D.C., pp. 93-116.

Skaperdas, S., 1996. Contest success functions. Economic Theory, 7, 283-290.

Survey of Russia, 1997. Economist, July 12, pp. 3-18.

Tullock, G., 1980. Efficient rent seeking. In: J.M. Buchanan, P.D. Tollison, and G.Tullock (Eds.), Towards a Theory for Rent-Seeking Society, Texas A&M University Press, College Station, pp. 97-112.

Umbeck, J., 1977. Might makes rights: a theory of the formation and initial distribution of property rights. Economic Inquiry, 19, 38-59.

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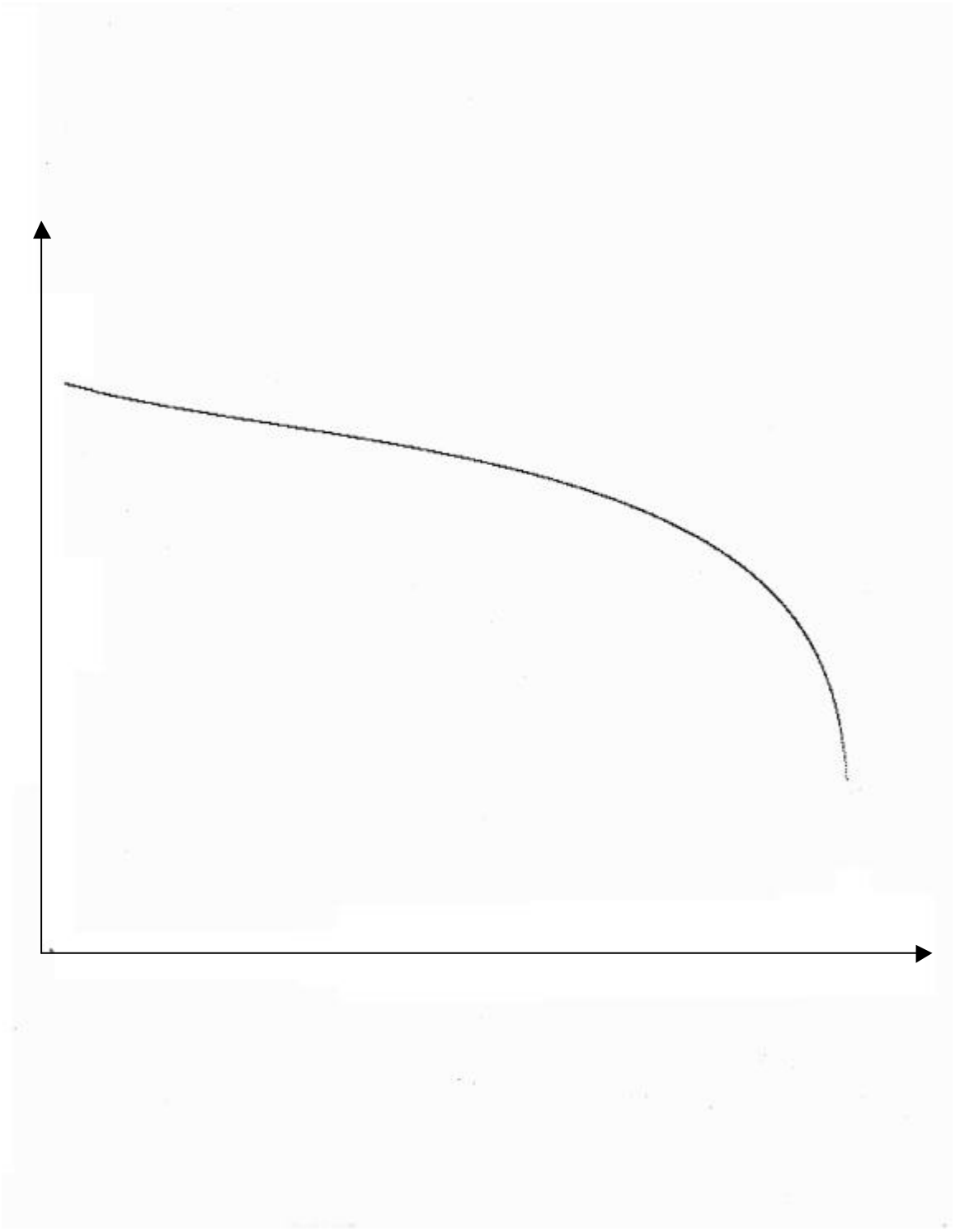


Fig. 1a ($\alpha = .25, w = 2$)

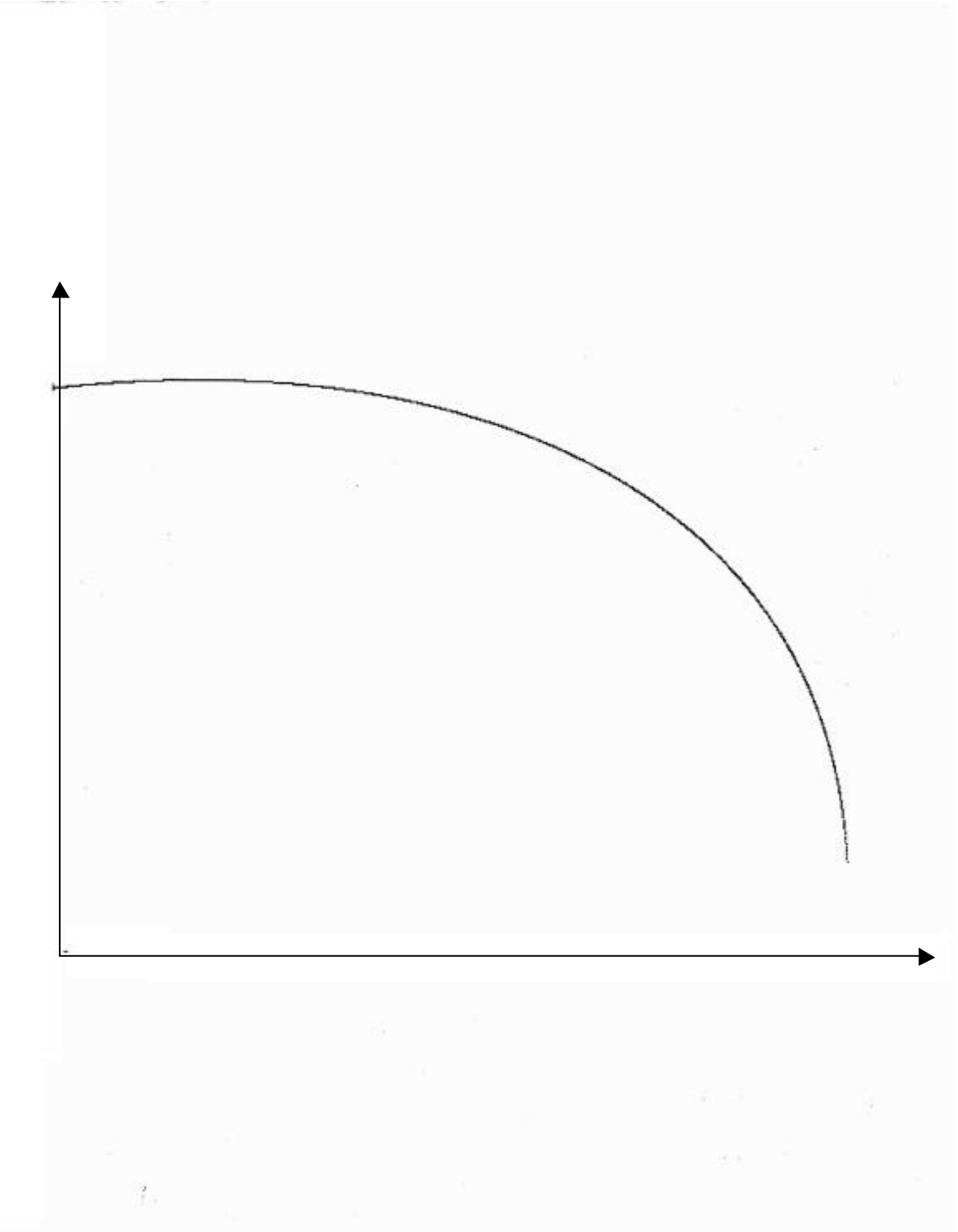


Fig. 1b ($\alpha = .4, w = 10$)

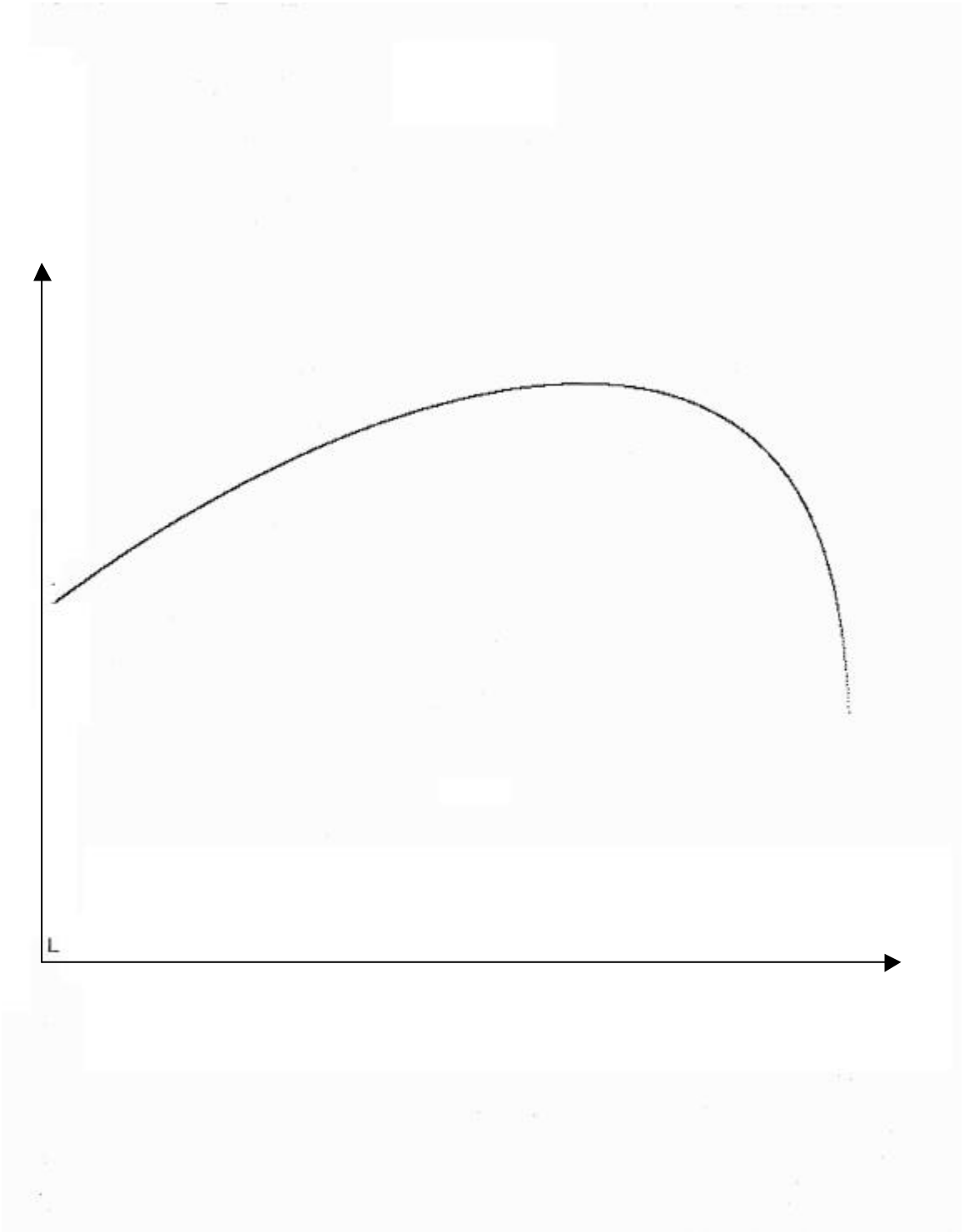


Fig. 1c ($\alpha = .25, w = 100$)

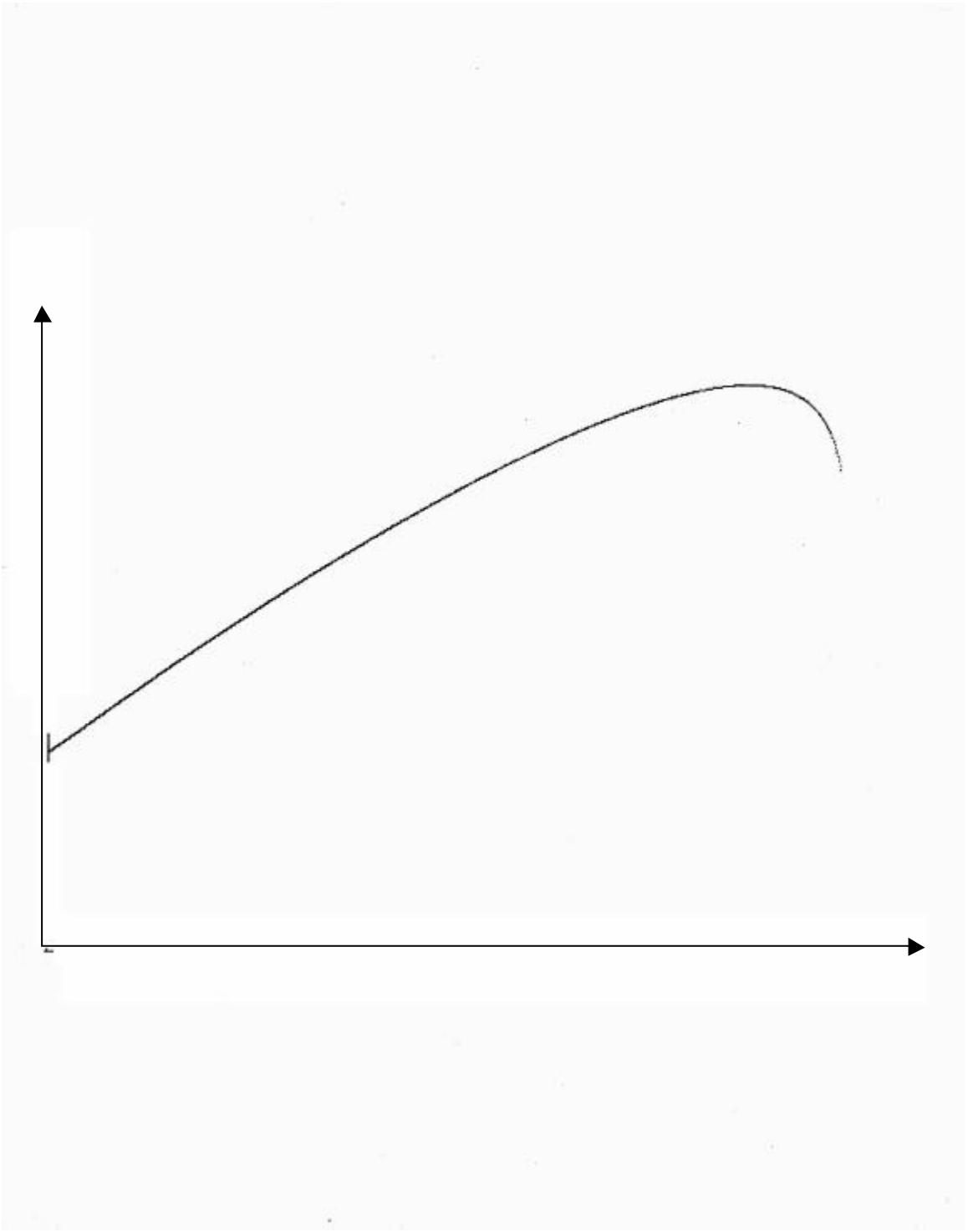


Fig 1d ($\alpha = .1, w = 10$)

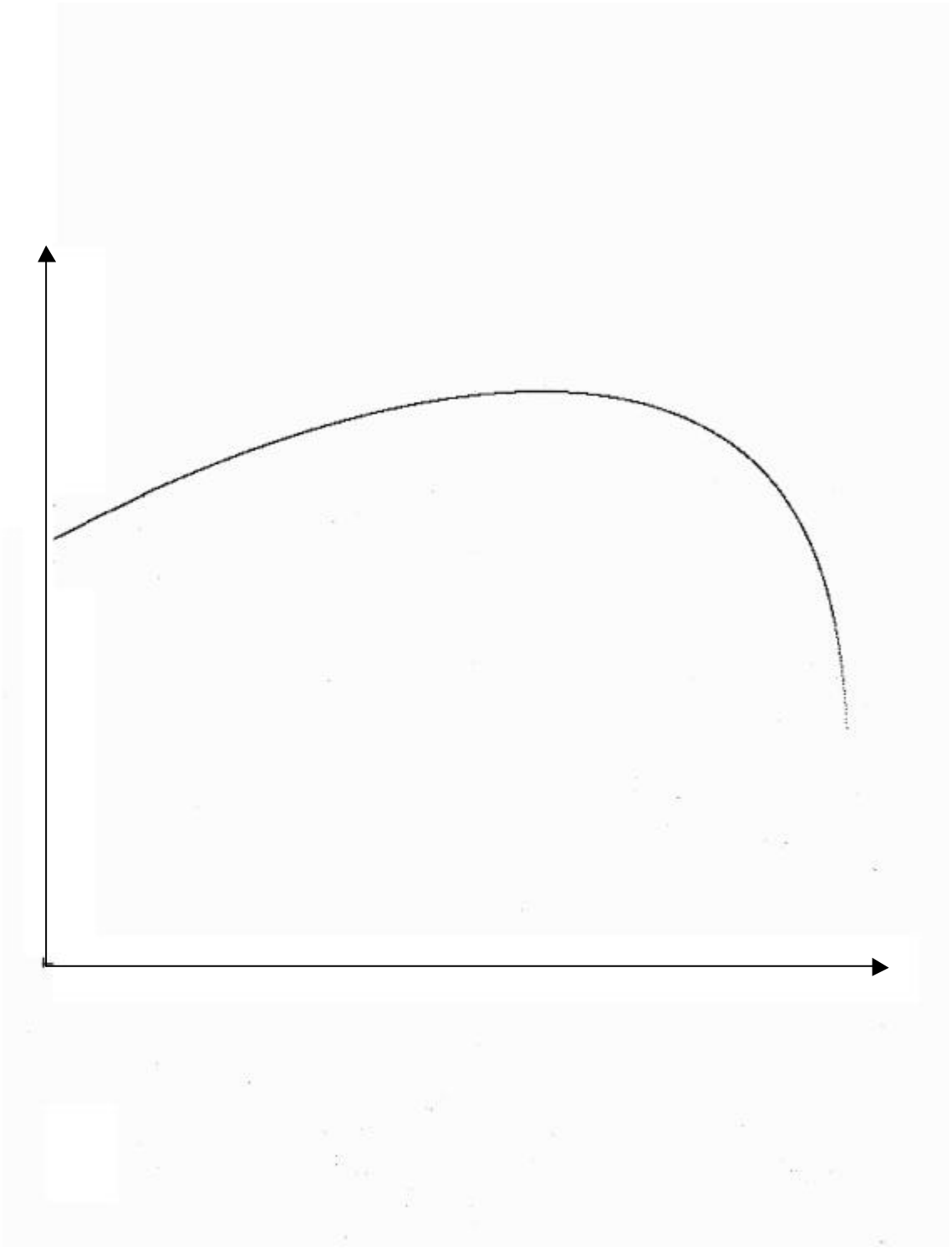
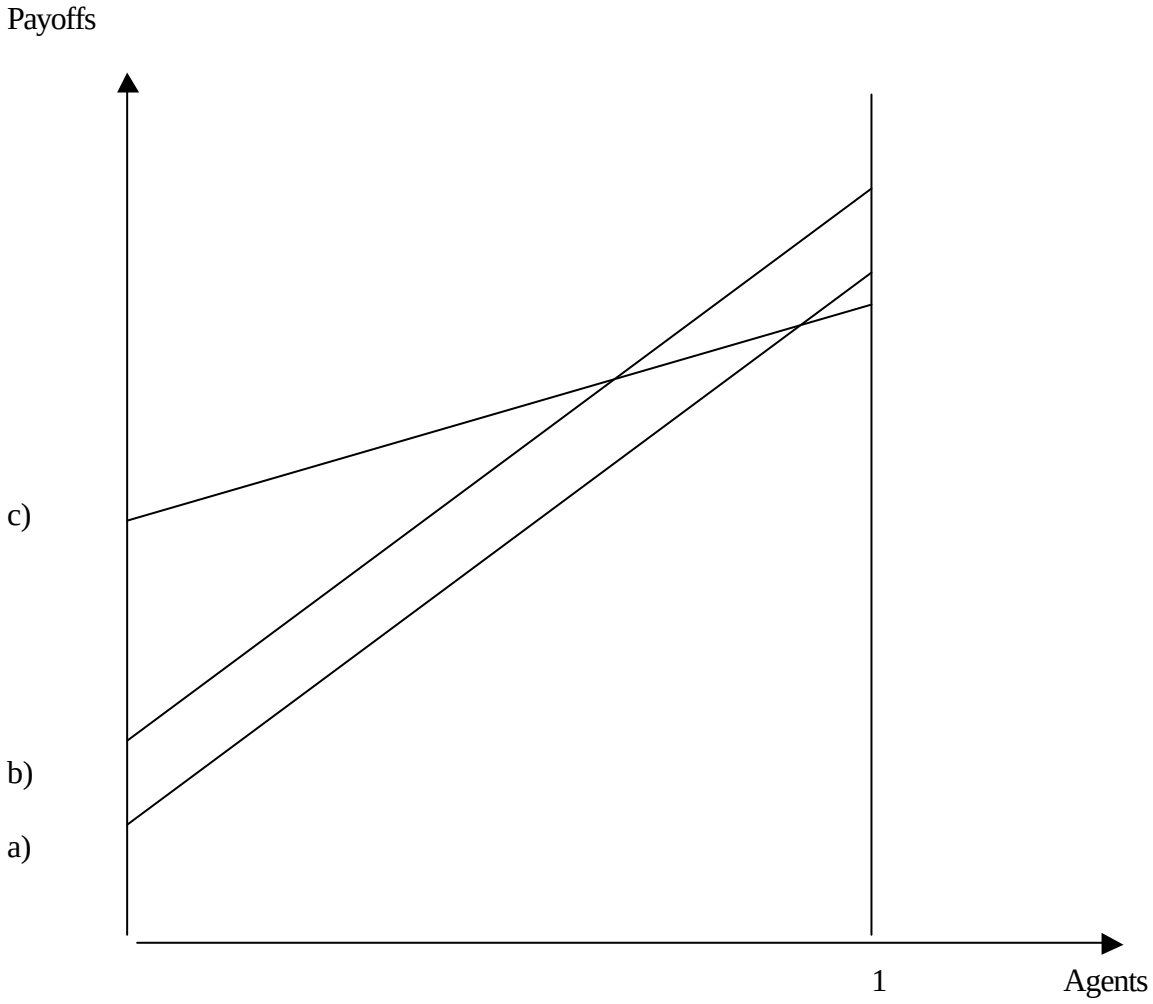


Fig. 1e ($\alpha = .25, w = 10$)



a) – equilibrium with appropriation
b) – hybrid equilibrium
c) – market equilibrium

Fig.2