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Journal of COMPARATIVE ECONOMICS
ELSEVIER
Journal of Comparative Economics 31 (2003) 715–731
www.elsevier.com/locate/jce

# Why the rich may favor poor protection of property rights ☆

Konstantin Sonin

*New Economic School, 47 Nakhimovsky prospect, Moscow 117418, Russia*
*CEFIR, Moscow, Russia*

Received 15 March 2003; revised 4 September 2003

**Sonin, Konstantin**—Why the rich may favor poor protection of property rights

In unequal societies, the rich may benefit from shaping economic institutions in their favor. This paper analyzes the dynamics of institutional subversion by focusing on the public protection of property rights. If this institution functions imperfectly, agents have incentives to invest in private protection of property rights. The ability to maintain private protection systems makes the rich natural opponents of public property rights and precludes grass-roots demand to drive the development of the market-friendly institution. The economy becomes stuck in a bad equilibrium with low growth rates, high inequality of income, and wide-spread rent-seeking. The Russian oligarchs of 1990s, who controlled large stakes of newly privatized property, provide motivation for this paper.*Journal of Comparative Economics* **31** (4) (2003) 715–731. New Economic School, 47 Nakhimovsky prospect, Moscow 117418, Russia; CEFIR, Moscow, Russia.


*JEL classification:* O1; P14; P26

## 1. Introduction

If the state does not protect economic agents from unlawful expropriation, these agents may take matter into their own hands. One way to protect one's property is to maintain a private system, e.g., to hire a security firm or to establish corrupt relationship with a public official. An alternative way is to reveal a preference for more public protection of property rights through the political process, e.g., by voting for an appropriate candidate.

☆ An earlier version of this paper has previously circulated as "Inequality, property rights protection, and economic growth in transition economies: theory and Russian evidence," CEPR discussion paper No. 2300.

*E-mail address:* ksonin@nes.ru.

0147-5967/$ – see front matter 
doi:10.1016/j.jce.2003.09.005

In transition and developing economies, the latter option is often unavailable due to the underdevelopment of political institutions. As a result, economic agents are forced to invest in private protection. Economies of scale in private protection provide rich agents with a significant advantage over poor agents in this environment. Furthermore, the rich agents' ability to gain from redistribution due to improper protection of property rights makes them natural opponents of improvements in public protection.

An economy in which the rich support a regime of incomplete protection of property rights is discussed in Glaeser et al. (2003). Rich agents use their wealth and accumulated political power to shape economic institutions in their favor. Inequality encourages institutional subversion by the rich, leading to more inequality.[1] This paper focuses on the dynamics of institutional choice; the political process determines the level of redistribution of wealth in society, which in turn affects the political choices of future generations.

Transition economies provide a policy laboratory in which economists can study rapid institutional change (Djankov and Murrel, 2002). The transition experience has shown that liberalization, macroeconomic stabilization, and de-jure privatization in a former command economy are not sufficient conditions for an upturn in economic activity. Among various explanations of the continued failure of some economies to achieve sustainable growth, the inability of the state to promote the development of good economic institutions and the unexpected stability of bad ones occupies our interest. Our objective is to provide microeconomic and political foundations for an environment that prevents grass-roots demand for the protection of property rights from driving the development of new market-friendly institutions. We demonstrate that, if the rich have enough political power to choose the level of public property rights protection, the economy may be locked in a stable long-run equilibrium with weak public protection of property rights.

The process of public enforcement and regulation of property rights by the state is influenced by social demands. Agents reveal their preferences over government policy through various political mechanisms. Rich agents might be expected to favor full protection of property rights. However, in many countries, rich agents are the main beneficiaries of weak protection of property rights, which allows them to gain from non-productive activities such as rent-seeking or other redistributive activities by maintaining expropriation capabilities. In the absence of adequate public protection of property rights by the state, these rent-oriented agents can take control of a substantial share of the national economy. In Russia, the oligarchs' success at rent-seeking led them to prefer relatively weak protection of property rights and forced other economic agents to invest in private protection from expropriation. Due to the oligarchs' political power, the Russian state has failed to establish and to enforce a system of clearly defined property rights.

An agent who invests in the private protection of property rights does not necessarily seek military capabilities. Rather, an investment in relational capital, e.g., in establishing corrupt relations with state authorities, costly relational contracting, or hiring a lawyer, may be the appropriate strategy to increase efficiency and enhance predictability in business relations.[2] Since private protection capabilities can be used to obtain rents, investment

[1] Limiting the subversion of property rights protection is the fact that the beneficiaries must protect themselves from each other (Murphy et al., 1993).

[2] Hendley et al. (1998) analyze such strategies for Russian enterprises.

in private protection is a particular type of rent-seeking. Tullock (1980) and many other papers devoted to unproductive activities model the decision to participate in rent-seeking as a comparison of costs and benefits. In our analysis, we assume that there business cannot be conducted without investment in the private protection of property rights as Alexeev et al. (1995) describe. Shleifer (1997) stresses that agents with private protection have an incentive to expropriate resources from others. Hence, wide-spread private enforcement of property rights in transition economies is inherently stable.

There are three basic negative consequences for economic growth as a result of weak protection of property rights. First, private protection wastes resources because it is an unproductive activity. Second, the threat of expropriation distorts the economic environment and leads to suboptimal paths of capital accumulation and production. Third, extensive rent-seeking and improper public protection of property rights are associated with substantial income inequality. The impacts of inequality and redistribution policies on economic growth are well-studied. Alesina and Rodrik (1994), Persson and Tabellini (1994), and Benabou (1996) show that inequality is harmful for growth. However, in these papers and in Perotti (1993), the poor agents are the beneficiaries of redistribution through progressive taxation of capital income, direct social transfers, extensive regulation, or trade and capital restrictions. Based on a proportional tax on income, Persson and Tabellini (1994) also assume that incomplete protection of property rights leads to a redistribution of wealth from rich to poor agents. Our paper departs from this literature by assuming that rich agents are the beneficiaries of redistribution.[3]

The negative impact of weak protection of property rights on economic growth has been stressed at first by Smith (1776) and later by North (1981). The spontaneous emergence of property rights has been studied recently. Gelb et al. (1996) note that ambiguous property rights generate rent-seeking contests in Russia. Polishchuk and Savvateev (1997) model a one-period rent-seeking game in which rich agents are favored at the expense of poor agents and explore the static general equilibria properties of the model. They argue that scale inefficiency in production is a major cause of rent-seeking in Russia. Hellman (1998) discusses the political economy of partial reforms in transition economies with an emphasis on the role that powerful rent-seekers play in keeping the economy in an inefficient state.

This paper contributes to this literature by studying the relationship of inequality and institutional dynamics. The rich redistribute wealth away from the poor, which leads to increased inequality, and thus more possibilities for the rich to gain from redistribution. Increased inequality may generate a heightened political demand for better institutions, e.g. a higher level of public property rights protection. However, if there is a significant wealth bias in the political system, the economy may be stuck in a long-run equilibrium in which increasing inequality due to redistribution and decreasing level of redistribution due to increased inequality offset each other.

The rest of the paper is organized as follows. Section 2 contains a brief analysis of Russian oligarchs, who are the main motivation for this paper, and presents evidence from non-transition economies. In Section 3, an endogenous growth model is introduced to investigate the relationship between the private protection of property rights, inequality,

[3] In Acemoglu and Robinson (2001) the rich agents benefit from redistribution but face a threat of revolution.

and growth. Section 4 analyzes the political economy of property rights protection. Section 5 concludes.

## 2. The oligarchs as an example

Aristotle used the term oligarchy to describe a political environment, in which the rich rule for their own interests rather than for those of the society. In modern times, this term has been applied to the ruling elite in Imperial Japan by Ramseyer and Rosenbluth (1995) and to families possessing significant economic power in Latin America by Dosal (1995) and in East Asia by Claessens et al. (2000).

Claessens et al. (2000) report that the largest ten families in Indonesia and the Philippines control more than half of all corporate assets at 57.7% and 52.5%, respectively. The concentration of control in the hands of large families is also high in Thailand at 46.2%, Hong Kong at 32.1%, Korea, Malaysia, and Singapore at 25%.[4] The authors conclude that the concentration of corporate control in the hands of a few families creates powerful abilities to lobby government agencies and public officials for preferential treatment, whether through trade barriers, non-market-based financing, public contracts, or other means. They assert that concentration of control might also have been a detriment to the evolution of the countries' legal systems.

The rule of oligarchy is often associated with weak protection of property rights. Johnson et al. (2000) argue that the Asian financial crisis had more severe effects in countries with weaker investor protection as measured by La Porta et al. (1997, 1998). One means of redistributing wealth toward politically valuable agents is capital controls as Rajan and Zingales (1998) discuss. Johnson and Mitton (2002) support strongly this point by analyzing data on Malaysian firms before and after the imposition of capital controls. In particular, these authors find that the stock price performance of firms in Malaysia is broadly consistent with the view that capital controls create a screen for cronyism.

The experiences in transition countries provide further examples of oligarchs. Glaeser et al. (2003) use the Russian oligarchs as an illustration of their subversion-of-institutions theory. At the beginning of the Russian transition, institutional change was expected to be driven by grass-roots demand.[5] Usually, it is the rich who favor full protection of property rights, because they have the most to lose in any redistribution process. However, reality in Russia was quite different. The Russian oligarchs, who are a small group of politically influential people, have taken command of a major share of Russia's productive assets. Having accumulated enormous wealth and political power, they have blocked various attempts of the government to improve property rights protection (Polishchuk and Savvateev, 1997).

[4] By contrast, in Japan, the 15 largest families control only 2.1% of GDP in 1996; in the US this figure was 2.9% of GDP in 1998.

[5] Aslund (1995) argued 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, owners will try to ascertain their property rights forcefully.

Freeland (2000) and Hoffman (2002) combine a detailed description of the oligarchs' lives with political analysis. In the early years of transition, rents for redistribution arose from various arbitrage opportunities, e.g., foreign trade liberalization with incomplete price liberalization and privatization in the absence of credit markets (Barnes, 2002 and Hellman, 1998). The oligarchs rarely confronted each other; each had own branch of the economy, e.g., mass-media for *Most-bank*, natural gas for *Gazprom*, and international weapon trade for *Rossiiskii Kredit* (Freeland, 2000). However, by 1997 all of them started to acquire businesses in unrelated fields, especially mass-media. Newspapers and broadcasting programs are an effective means of political influence. Accumulation of media-related assets by an oligarch led to increasing political influence and thus more redistributive power. As Stiglitz (2002) notes, demands for the rule of law have come from the oligarchs only as they have seen their influence on Russia's government weaken in recent years.

## 3. Private enforcement of property rights

A standard model of endogenous growth is used to analyze the impact of incomplete property rights on growth. In an overlapping-generations framework, agents choose the amount to invest in production and in private protection. There is a continuum $[0, 1]$ of heterogeneous overlapping-generations families. Each member $i$ born at the period $t$ has the following utility function:

$$u_{it} = \ln c_{it} + \rho \ln d_{it},$$

where $c_{it}$ is consumption when young, $d_{it}$ is consumption when old, and $\rho$ is the common discount factor. Agent $i$ is born endowed with an individual-specific basic level of skills, denoted $w_{it}$. To simplify the subsequent analysis, we assume that skills are distributed across agents log-normally according to

$$\ln w_{it} \sim N\left(m, \sigma^2\right).$$

Let $w_t$ denote the mean, and the aggregate, level of basic skills so that $w_t = E w_{it}$. Intergenerational linkages are given as

$$w_{it+1} = \varepsilon_{it+1} y_{it},$$

where $\varepsilon_{it+1}$ are independent identically distributed shocks with mean equal to 1 and $\mathrm{Var}[\ln \varepsilon_{it+1}] = \delta^2$, and $y_{it}$ is the second-period income of the member of family $i$.[6] Henceforth, time indices are suppressed to focus the analysis on members of one generation.

[6] Technically, this is a familiar growth model similar to those in Persson and Tabellini (1994), Verdier (1994), and Benabou (1996). That elicits closed-form solutions for maximization problems to simplify greatly exposition. At the same time, most of our qualitative results remain the same in a broader framework having an arbitrary non-degenerate distribution of wealth, different intra-generational linkages, and a redistribution mechanism that need not be multiplicative.

Each agent $i$ has access to a Cobb–Douglas technology so that second-period income is given by $y_i = A\tilde{k}_i^{\beta} w^{1-\beta}$, where $\tilde{k}_i$ is the productive capital after redistribution, $A$ is an exogenously given technological parameter, and $w$ is the economy-wide endowment of basic skills. The variable $\tilde{k}_i$ depends not only on the capital investment $k_i$ of agent $i$, but also on investment of agent $i$ in private protection of property rights and on both types of investment of the other agents. There are no credit markets so that agents cannot borrow or lend to optimize consumption intertemporarily.

In addition to investment in production, each agent may invest in private protection of property rights. If $k_i$ is the capital expenditures of agent $i$ and $h_i$ is the amount invested in protection, agent's $i$ productive capital is $\tilde{k}_i = k_i h_i^{\theta} g$ after redistribution. Hence, for each individual agent, production and private protection are strategic complements. The factor $g$ is defined by the balance condition

$$\int_0^1 \tilde{k}_i \,\mathrm{d}i = \int_0^1 k_i h_i^{\theta} g \,\mathrm{d}i = \int_0^1 k_i \,\mathrm{d}i.$$

The non-negative parameter $\theta$ measures the effectiveness of protection. If $\theta = 0$, public protection of property rights is complete so that $h_i = 0$ and $g = 1$, i.e. no redistribution takes place. If $\theta > 0$, each agent invests some positive amount of capital in protection given the redistribution technology. The balance condition indicates that such investment is totally wasted in this negative sum game Tullock (1980).

The capital of agent $i$ after redistribution is given by

$$\tilde{k}_i = \frac{k_i h_i^{\theta}}{\int_0^1 k_i h_i^{\theta} \,\mathrm{d}i} \int_0^1 k_i \,\mathrm{d}i.$$

Our model exhibits Tullock-type rent-seeking competition in which inputs $h_i$ are weighted by the amount of capital invested and the entire amount of capital invested in production becomes the rent-seeking prize. This type of redistribution possesses the basic feature of rent-seeking, namely, relative success is a function of each agents' respective resource commitments. Specifically, an agent's proportionate share of the prize depends positively on his own input and negatively on the contest inputs of the others. The value of the prize, $\int_0^1 k_i \,\mathrm{d}i$, is an endogenous variable because productive and expropriative capital are rival uses of resources. Departing from the initial Tullock framework, we assume that each agent takes $\int_0^1 k_i h_i^{\theta} \,\mathrm{d}i$ as given.

Agent $i$ has the following maximization problem:

$$\max_{k_i, h_i} \left\{ \ln(w_i - k_i - h_i) + \rho \ln\left(A\left(\tilde{k}_i\right)^{\beta} w^{1-\beta}\right) \right\}.$$

The solution can be written as:

$$k_i = p(\theta, \beta) w_i \quad \text{and} \quad h_i = r(\theta, \beta) w_i,$$

where $p(\theta, \beta)$ and $r(\theta, \beta)$ are the shares of wealth that agent $i$ invests in production and protection, respectively. Investment in productive capital rises with improvement

of property rights protection, i.e., as $\theta$ decreases, and productivity, $\beta$, so that we have $(\partial/\partial\theta)p(\theta,\beta) < 0$ and $(\partial/\partial\beta)p(\theta,\beta) > 0$. Investment in expropriation, and thus welfare losses, increases with $\theta$, i.e., $(\partial/\partial\theta)r(\theta,\beta) > 0$. If property rights are secured fully so that $\theta = 0$, $h_i = 0$ and each agent divides his endowment between consumption and production.

Those agents who lose in redistribution overconsume in the first period, while those who gain underconsume compared to the benchmark case of $\theta = 0$. Hence, in addition to dead-weight losses, rent-seeking distorts the consumption of agent $i$. The second-period income of the agent $i$ is given by

$$y_i = Ap(\theta,\beta)^{\beta} w_i^{(1+\theta)\beta} \frac{w}{(E w_i^{1+\theta})^{\beta}}.$$

Summing over all agents, the growth rate of the aggregate income is expressed by

$$\gamma(\theta) = \ln(y/w) = \ln A + \beta \ln p(\theta,\beta) - \beta(1-\beta)(1+\theta)^2 \frac{\sigma^2}{2}.$$

With a low level of property rights protection, i.e. a high $\theta$, agents divert more resources from production to the private protection of property rights and growth is affected adversely. Proposition 1 summarizes these points; the proofs of all propositions are relegated to Appendix A.

**Proposition 1.** *The equilibrium consumption and investment in production choices of any agent increase with the level of property rights protection, but the equilibrium investment in private protection decreases. The growth rate of the economy increases with the level of property rights protection*; *it is maximized if property rights are fully secured, i.e.,* $\theta = 0$.

Once a private protection system is maintained, it can be used to contest many rents simultaneously, e.g. a supportive politician may help to establish import tariffs in one industry and shape regulation in another. As demonstrated in Claessens et al. (2000), oligarchs tend to have diversified businesses. We show that if investment in private protection can be used to contest other rents in addition to amending production, agents have stronger incentives to invest in private protection. The bigger is the rent-seeking prize, the worse is the situation. Murphy et al. (1993) emphasize that rent-seeking may become self-generating. For example, when foreign aid or a loan is obtained, large rent-seekers may maintain their expropriative capabilities to strive the prize, but also use these weapons to appropriate resources from others. Furthermore, if rent-seeking is allowed because public protection of property rights is weak, rents from natural resources constitute an attractive prize. *Gazprom*, which is a natural gas monopoly, pays roughly a quarter of all the taxes collected by Russian government. In a developing country, rents from natural resources may be an even greater as share of the country's GDP.

To model the effect of an exogenous flow of rents to the economy, we assume that an agent gains from pure rent-seeking in addition to benefits from production and expropriation. Agent's $i$ share of the prize depends positively on her own investment in private protection, i.e., expropriation, $h_i$, and negatively on the investment of the other agents. Specifically, we assume that agent's $i$ productive capital after redistribution is $\tilde{k}_i = k_i h_i^{\theta} g + \Delta(h_i^{\theta} w_i / H)$, where $\Delta$ is an additional exogenous rent-seeking prize,

the multiplier $g$ is again defined by the balance condition on the capital market, and $H = \int_0^1 h_i^\theta \, \mathrm{d}i$. The rent-seeking technology continues to favor rich agents as indicated by the agent-specific constant $w_i$.[7] For the sake of simplicity, we assumed that $\beta = 1$, and therefore inequality do not play any role in the subsequent analysis. We also assume that $\rho = 1$.[8] Thus, agent's $i$ problem can be written as

$$\max_{k_i, h_i \geqslant 0, k_i + h_i \leqslant w_i} \left\{ \ln(w_i - k_i - h_i) + \ln A\tilde{k}_i \right\}.$$

Solving this problem yields optimal investment both in production and expropriation as a function of the exogenous rent:

$$k_i = p(\theta, \Delta) w_i, \qquad h_i = r(\theta, \Delta) w_i.$$

If the additional prize, $\Delta$, is large enough, the endowment, $w_i$, is split between consumption in the first period and investment in expropriation. In what follows, we assume interior solutions only. First, we observe that $(\partial/\partial\Delta)p(\theta, \Delta) < 0$ and $(\partial/\partial\Delta)r(\theta, \Delta) > 0$, i.e., the larger is the rent-seeking prize, the smaller is investment in production and the larger is investment in private protection, which increase the agent's proceeds from rent-seeking. We state this effect in the following proposition.

**Proposition 2.** *The larger is the additional rent-seeking prize, $\Delta$, the lower is the growth rate $\gamma = \gamma(\theta, \Delta)$ of the economy.*

When investing in private protection or contesting rents, agents do not internalize the impact of their actions on other agents' decisions. This behavior increases the incentives for other agents to invest into private protection and diminishes their incentives to invest in production. The negative effect on growth of weak protection of property rights has two components. First, the lower is the level of property rights protection by the state, i.e., the higher is $\theta$, the more resources are devoted to private protection, which is an unproductive activity. Second, an increase in $\theta$ makes budget constraints tighten; this effect appears in the third term of the growth equation. In the absence of asset markets, poor agents underinvest compared to the socially efficient level. Since rich agents are the main beneficiaries of redistributive activity, inequality measured by $\sigma$ hampers productive investment, and thus growth, given any incomplete level of property rights protection $\theta$, i.e., $\theta > 0$. Alternatively, if the capital market were perfect so that the interest rate equals the marginal product of productive capital, the growth rate would be $\gamma(\theta) = \ln A + \beta \ln p(\theta)$; hence, no second effect of incomplete protection of property rights arises because all the agents will invest the same amount of capital in production. In this case, inequality does not affect the growth rate. However, perfect capital markets are unlikely without full protection of property rights so that we do not consider this case any further. Moreover, if loans and debts are subject to expropriation, the above results will be essentially unchanged.

[7] The qualitative results hold without such an assumption; however, this particular assumption allows a closed-form solution and simplifies greatly comparative statics.

[8] The main results hold in a more general setup, e.g., if both $\beta$ and $\rho$ are not equal to one.

## 4. The political economy of redistribution

Weak protection of property rights has been considered an impediment to economic growth by many economists, e.g., Smith (1776) or North (1981). The example of the Russian oligarchs demonstrates that the rich agents may provide political support to the bad institution. Our next objective is to determine the level of property rights protection preferred by agent $i$. Agent $i$ has the following maximization problem:

$$\max_{\theta \geqslant 0} \left\{ u_i(\theta) = \ln\bigl(1-(p+r)\bigr) w_i + \rho \ln A p^{\beta} w_i^{(1+\theta)\beta} \frac{w}{(E w_i^{1+\theta})^{\beta}} \right\}.$$

In Appendix A, we show that any agent $i$ has single-peaked preferences over $\theta \geqslant 0$ so that agent's $i$ problem has a unique solution, $\theta_i^*$. The poorer is the agent, the higher is the level of preferred property rights protection.[9] Proposition 3 presents the results.

**Proposition 3.** (i) *If* $w_i \geqslant w_j$, $\theta_i^* \geqslant \theta_j^*$; *that is, the richer is the agent, the weaker are preferred property rights.*

(ii) *There exists a unique threshold, denoted* $\overline{w}$, *such that any agent* $i$ *with* $w_i \leqslant \overline{w}$ *prefers complete protection of property rights, i.e.,* $\theta_i^* = 0$, *while any agent* $i$ *with* $w_i > \overline{w}$ *prefers incomplete protection of property rights, i.e.,* $\theta_i^* > 0$.

In the recent rent-seeking literature, the level of property rights protection is often taken to be endogenous (Grossman and Kim, 1995). However, these rent-seeking models cannot be used to study growth issues. Perotti (1993), Alesina and Rodrik (1994), Persson and Tabellini (1994), and Benabou (1996) do endogenize tax policy in the political equilibrium of endogenous-growth models. In this section, we follow this procedure and endogenize the level of property rights protection, as parametrized by $\theta$, in an analogous way. We assume that the old generation does not participate in the political process. Although the obvious approach is to use the median-voter model (Grandmont, 1978), countries do not often conform to democratic ideals. Rather, anecdotal evidence suggests that the level of property rights protection is determined by a relatively small group of powerful agents. Assume that the pivotal voter is located at the $\pi$th percentile of the wealth distribution rather than the 50th. This agent's wealth $w_\pi$ is characterized by $F((\ln w_\pi - m)/\sigma)) = \pi$, where $F$ is the cumulative density function of a standard normal distribution. Hence, we can write $\ln w_\pi = m + \lambda\sigma$, where $\lambda = F^{-1}(\pi)$. If $\lambda > 0$, that is $\pi > 1/2$, the political system is biased toward rich agents. This bias may be due to their lobbying power or to imperfect political information.

To investigate the effects of this wealth bias in the political system, substitute $\ln w_\pi = m + \lambda\sigma$ into $u_i'(\theta) = 0$ for $w_p \geqslant \overline{w}$ if $\lambda \geqslant \tilde{\lambda} = \sigma + 1/\sigma$ and note that $\theta^* = 0$ if $\lambda \leqslant \tilde{\lambda}$. The following proposition summarizes the result.

[9] Polishchuk and Savvateev (1997) and Savvateev (1998) derive results similar to Proposition 3 for a static model, in which production and rent-seeking are strategic substitutes. The basic intuition is that the production process exhibits diminishing marginal returns, while returns to rent-seeking are constant (cf. Murphy et al., 1993).

**Proposition 4.** (i) *The more democratic is the society, i.e., the lower is the degree of wealth bias of the pivotal voter, the more secure are property rights in the political equilibrium, i.e. the lower is* $\theta^*$. *If* $\lambda$ *exceeds a threshold value of* $\tilde{\lambda}$ *then* $\theta^*$ *is strictly increasing in* $\lambda$.

(ii) *For any pivotal voter, the higher is the productivity of production,* $\beta$, *or the more valuable is the future,* $\rho$, *the more protection of property rights is preferred by the pivotal voter.*

A straightforward corollary to the first part of the proposition is that the political equilibrium involves complete protection of property rights, i.e., $\theta = 0$, if and only if $\lambda$ does not exceed some threshold value. For a wide range of parameters, increased inequality reduces the expropriation gains of rich agents, and thus makes incomplete protection less attractive. This effect complicates our analysis of the impact of inequality on growth. Although the direct effect of inequality on growth is negative, an increase in inequality leads the pivotal voter, who, all other things being equal, becomes poorer than before, to prefer more secure property rights and favor more growth. Therefore, the effect of a change in inequality on growth can be written as

$$\frac{\mathrm{d}\gamma}{\mathrm{d}\sigma} = \frac{\partial\gamma}{\partial\sigma} + \left.\frac{\partial\gamma}{\partial\theta}\right|_{\theta=\theta^*} \times \frac{\partial\theta^*}{\partial\sigma},$$

where the first term on the right-hand side represents the direct effect of inequality on growth, holding $\theta$ constant, and the second term represents the indirect effect. If property rights are protected fully, then inequality affects growth exclusively through the binding wealth constraints. In the above analysis, we assume that the protection of property rights is provided by the state at zero cost, which is obviously not true. If agents bear the costs of public protection, they prefer even less such protection and the above results are strengthened.

Combining the solution to the maximization problem with intragenerational dynamics of income within a family provides the law of motion for the family's income:

$$\begin{aligned}\ln w_{it+1} = {} & \ln\varepsilon_{it+1} + \ln A + \beta\ln p + (1+\theta_t)\beta\ln w_i + \ln w \\ & - \beta\big(m(1+\theta_t) + (1+\theta_t)^2\big(\sigma_t^2/2\big)\big),\end{aligned}$$

where $\theta_t$ is the level of property rights protection chosen in period $t$. Recall that $\theta_t$ is chosen by agents born in period $t$. Assuming that $\mathrm{Var}[\ln\varepsilon_{it+1}] = \delta^2$, the autoregressive process for inequality is given by

$$\sigma_{t+1}^2 = \delta^2 + \beta^2(1+\theta_t)^2\sigma_t^2.$$

Hence, a reduction in the level of property rights protection, i.e., a higher $\theta$, increases not only current inequality, but also inequality in all future periods. The results are presented in the following proposition.

**Proposition 5.** *If* $\sigma^2 > 1$, *an increase in inequality leads weakly to a higher level of protection of property rights by the state. If the political system exhibits a strong wealth bias, multiple steady-states exist, including a bad equilibrium characterized by high inequality and a low level of property rights protection.*

In Russia, income inequality has increased dramatically during the transition (Kolenikov and Shorrocks, 2000). Although the demand for public protection of property rights may have increased, the economy need not eventually have complete protection. If a political system has significant wealth bias, a long-run equilibrium may involve both a low level protection of public protection of property rights and a low growth rate. Hellman (1998) notes that the winners in the reform process may have implicit veto power over separate components of the reforms, especially those that affect their existing rent streams. In our model, a negative general equilibrium feedback of inequality on the level of property rights protection worsens budget constraints; this effect produces multiple long-run steady states.

Our model has implications for foreign direct investment in transition economies, which is an important determinant of successful economic development. Brock (1998) finds that foreign direct investment in Russia, and other FSU countries, is significantly lower than in the East European transition economies. Our analysis sheds some light on this observation: First, investment in private protection wastes resources of a foreign investor. Second, overall investment must be very large to generate redistribution gains. Finally, such an investment, e.g., a bribe to a public official, may be considered illegal in the domestic country of the investor.

Glaeser et al. (2003) designate redistribution from poor to rich agents as King John redistribution and redistribution from rich to poor agents, e.g., progressive taxation or social security programs, as Robin Hood redistribution. Our model provides interesting insights for both types of redistribution. In particular, having a rich pivotal voter helps to offset the efficiency losses from excessive taxation. Formally, suppose that the tax on capital is progressive at some rate $\tau$. Following Benabou (1996), we assume that redistribution is as follows. If pre-tax capital is $k_i$, after-tax capital is $\tilde{k}_i = k_i^{1-\tau} m^{\tau}$, where the multiplier $m$ is defined by the following balance condition:

$$\int_0^1 \hat{k}_i \, \mathrm{d}i = \int_0^1 k_i^{1-\tau} m^{\tau} \, \mathrm{d}i = \int_0^1 k_i \, \mathrm{d}i.$$

Incomplete protection of property rights leads again to some redistribution. As a result, agent $i$'s capital stock is given by $\tilde{k}_i$ satisfying:

$$\int_0^1 \tilde{k}_i \, \mathrm{d}i = \int_0^1 \hat{k}_i^{1-\tau} h_i^{\theta} g \, \mathrm{d}i = \int_0^1 \hat{k}_i \, \mathrm{d}i = \int_0^1 k_i \, \mathrm{d}i.$$

For any $\theta$, the growth rate function exhibits the usual properties; it is hill-shaped with respect to the tax rate $\tau$ as Benabou (1996) demonstrates.

**Proposition 6.** *For any tax rate $\tau > \tau'$, there exists $\bar{\lambda}$ such that, for any pivotal voter with $\lambda > \bar{\lambda}$, the preferred levels of protection of property rights satisfy $\theta^*(\tau) > \theta^*(\tau')$.*

In words, if the tax rate is too high, the pivotal voter, who must be rich enough to loose from taxation, tries to offset these losses by lowering the level of public protection of property rights. Polterovich (2001) obtains a similar result by assuming that a fixed portion of the government's tax revenue is contested by economic agents.

The proposition illustrates a potential difficulty for the government if the tax rate is below the growth-maximizing one. Now if the pivotal voter determining the level of property rights protection is rich enough, an increase of taxes would not lead to the desired increase of the growth rate, because, following an increase in taxes, the level of property rights protection diminishes. The impact through inequality would be fully offset and the only remaining negative effect of increased taxes would be on incentives to invest in production. Vice-versa, if the tax rate is above the growth-maximizing rate, decreasing the tax rate would bring additional benefits of more secure property rights.

In most countries, the level of taxation and, more generally, redistribution policies toward the poor are determined by the legislative power, e.g., a chamber of representatives. However, the level of property rights protection or the degree of subversion of the institution is determined endogenously by various political actors. If the level of taxation, i.e., redistribution of toward the poor, and the level of property rights protection (i.e., redistribution toward the rich) are determined non-cooperatively by different pivotal voters, both of groups fail to internalize the resulting losses. Intuitively, this situation is similar to the case of two authorities competing over one tax base by independently setting tax rates, which results in a tragedy of commons.

Our next objective is to show that the political base for economic reforms, defined broadly as measures to increase the effectiveness tomorrow at a cost of today's consumption, narrows when the protection of property rights is incomplete. Intuitively, with incomplete protection of property rights, an agent is not sure whether he can transfer successfully a part of his endowment to the second period. An agent who losses due to redistribution is less willing to sacrifice consumption today for an increase in efficiency tomorrow. Formally, we illustrate this idea by representing economic reform as a trade-off between today's consumption and enhanced production tomorrow. Suppose that, in the first-period, agents consider paying a fixed share $\alpha$ of their first-period consumption for an increase in production efficiency, i.e., an increase in $\beta$, in the next period. Such a reform will be supported by agents whose life-time utility increases. The following proposition states the main result.

**Proposition 7.** *For large $\theta$s, the share of agents supporting reform decreases with the level of property rights protection. The larger is inequality, the fewer voters support a reform.*

This proposition shows formally that privatization and any other economic reforms aimed to improve efficiency are less vulnerable to political opposition if they follow institutional reforms, such as increasing protection of property rights by the state (Shleifer, 1997 and Stiglitz, 2000). Countries that started transition with more inequality, or in which early privatization increased inequality dramatically as in Russia, faced more political resistance to economic reforms.

## 5. Conclusion

This paper combines the analysis of inequality and institutions by considering directly unproductive, rent-seeking activities. We identify both the influences favoring weak

protection of property rights and the political obstacles to full enforcement of property rights. Agents with no political power to appropriate privately the fruits of their efforts must devote substantial resources to the protection of their productive capital, which reduces the attractiveness of production. In other words, contestability of property rights diminishes incentives to invest and accumulate capital. In theory, improvements in property rights protection, both in its level and its effectiveness, and a reduction in rent-seeking activity are preconditions for economic growth. In reality, improvements will occur only if they are in the self-interest of the majority of those who determine policy.

Our model provides insights into a broader issue than property rights protection; namely, the theory of institutional choice. Suppose that a social planner can choose freely an institutional parameter, denoted $\theta$ in our model, at a cost $c(\theta)$, where $c(\theta)$ is decreasing and convex. The parameter $\theta$ could be interpreted as the rigidity of the law so that civil law would correspond to a low $\theta$ with a corresponding high cost, while common law would correspond to higher levels of $\theta$. The model predicts that, with high levels of inequality, lower levels of $\theta$ are optimal, while the cost of maintaining these levels are higher. This modification emphasizes the trade-off between cost-effectiveness of public protection, which requires high levels of $\theta$, and subversion (which is mitigated when $\theta$ is low). Such an extension provides a theory of institutional choice consistent with Glaeser and Shleifer (2002, 2003), Glaeser et al. (2003), and Djankov et al. (2003).

## Acknowledgments

The author is grateful to John Bonin and Simeon Djankov, the Editors, and to Do Quy-Toan, Richard Ericson, Jim Leitzel, Leonid Polishchuk, Victor Polterovich, Gerard Roland, Jacek Rostowski, Andrei Shleifer, and Judith Thornton for various helpful comments. Financial support of EERC-Russia is gratefully acknowledged.

## Appendix A

**Proof of Proposition 1.** The growth rate of aggregate income is given by

$$\gamma(\theta) = \ln(y/w) = \ln A + \beta \ln p - \beta(1-\beta)(1+\theta)^2 \frac{\sigma^2}{2}.$$

If the level of property rights protection increases, i.e., $\theta$ decreases,

$$p(\theta, \beta) = \frac{\rho\beta}{1+\rho\beta(1+\theta)},$$

which is the share of capital devoted to production, increases and the term $\beta(1-\beta) \times (1+\theta)^2 \frac{\sigma^2}{2}$, which represents the losses due to redistribution and inefficient resource allocation, decreases. Thus, the growth rate $\gamma(\theta)$ decreases with $\theta$. If $\theta = 0$, no redistribution occurs, and the growth rate is maximized at

$$\gamma(0) = \ln A + \beta \ln \frac{\rho\beta}{1+\rho\beta} - \beta(1-\beta)\frac{\sigma^2}{2}.$$

Inequality enters the last term of the growth rate expression only. If $\sigma^2$ is larger, the losses increase, because the budget constraints of agents become more binding in the absence of complete financial markets. □

**Proof of Proposition 2.** Interior solutions are guaranteed if

$$\Delta \leqslant Ae^{\theta\sigma^2} \min\left\{\frac{1}{1+\theta}, \frac{2}{\theta}, 1+\theta\right\}.$$

The first-order conditions are

$$\frac{1}{w_i - k_i - h_i} = \frac{A}{Ak_i + \Delta w_i/H} \quad \text{and} \quad h_i = \theta(w_i - k_i - h_i).$$

Then

$$k_i = \frac{1}{2+\theta}\left(1 - \frac{\Delta(1+\theta)}{Ae^{\theta\sigma^2}}\right)w_i = p(\theta, \Delta)w_i,$$
$$h_i = \frac{\theta}{2+\theta}\left(1 + \frac{\Delta}{Ae^{\theta\sigma^2}}\right)w_i = r(\theta, \Delta)w_i,$$

where the balance condition gives $gH = e^{\theta\sigma^2}$. Then the growth rate is given by

$$\gamma = \ln(y/w) = \ln A + \ln\frac{1}{2+\theta} + \ln\left(1 - \frac{\Delta(1+\theta)}{Ae^{\theta\sigma^2}}\right).$$

Clearly, the growth rate decreases with $\Delta$ and is maximized when $\Delta = 0$. □

**Proof of Proposition 3.** First, we prove that the function

$$u_i(\theta) = \ln\big(1 - (p+r)\big)w_i + \rho \ln A p^{\beta} w_i^{(1+\theta)\beta} \frac{w}{(E w_i^{1+\theta})^{\beta}}$$

is single-peaked for each $i$. For the maximization problem $\max_{\theta \geqslant 0} u_i(\theta)$, the first-order condition is

$$\frac{1+\rho\beta}{1+\rho\beta(1+\theta)} + \sigma^2(1+\theta) = \ln w_i - m.$$

Define

$$\psi(\theta) = \frac{1+\rho\beta}{1+\rho\beta(1+\theta)} + \sigma^2(1+\theta)$$

and note that $\psi(0) = 1 + \sigma^2 > 0$. Taking the derivative,

$$\psi'(\theta) = \sigma^2 - \frac{(1+\rho\beta)\rho\beta}{(1+\rho\beta(1+\theta))^2}.$$

Clearly, $\psi''(\theta) > 0$ when $\theta \geqslant 0$ and, by the assumption that $\sigma^2 > \rho\beta/(1+\rho\beta)$, $\psi'(0) = \sigma^2 - \rho\beta/(1+\rho\beta) > 0$. Hence, $\psi'(\theta) > 0$ for all $\theta \geqslant 0$ so that $\psi(\theta)$ is an increasing function of $\theta \geqslant 0$. Therefore, the first-order condition $\psi(\theta) = \ln w_i - m$ has at most one non-negative root $\overline{\theta} \geqslant 0$; in which case $u_i'(\theta) > 0$, if $0 \leqslant \theta < \overline{\theta}$, and $u_i'(\theta) < 0$, if $\overline{\theta} < \theta$.

If $\psi(\theta)$ has non-negative roots, i.e, $\psi(0) \geqslant \ln w_i - m$, then $u_i'(\theta) < 0$ for all $\theta \geqslant 0$, and therefore, $\theta_i^* = 0$.

Now define $\overline{w}$ such that $\ln \overline{w} = \ln w + 1 + \sigma^2/2$, where $w = Ew_i = e^{m+\sigma^2/2}$. To demonstrate the first part of the proposition, we note that $\theta_i^* = \theta_j^* = 0$ for $w_j \leqslant w_i \leqslant \overline{w}$. To show that $\theta_i^*$ strictly increases with $w_i$ if $w_i > \overline{w}$, suppose that $w_j < w_i$, and note that $\theta_j^*$ and $\theta_i^*$ are roots of the equations $\psi(\theta) = \ln w_j - m$ and $\psi(\theta) = \ln w_i - m$, respectively. Then $\psi(\theta_j^*) < \psi(\theta_i^*)$, because $\psi$ is strictly increasing in $\theta$, so that $\theta_j^* < \theta_i^*$ follows.

To demonstrate the second part of the proposition, suppose that $w_i \leqslant \overline{w} = e^{1+m+\sigma^2}$. Then $\psi(0) = 1 + \sigma^2 \geqslant \ln w_i - m$. Since $\psi'(\theta) > 0$ for all $\theta \geqslant 0$, $\theta_i^* = 0$ as shown above. If $w_i > \overline{w}$, the equation $\psi(\theta) = \ln w_i - m$ has a positive root, $\theta_i^*$. □

**Proof of Proposition 4.** The level of property rights protection by the state is determined by the pivotal agent $\pi$ with $w_\pi$ such that $\ln w_\pi = m + \lambda\sigma$. Thus, the equilibrium level of protection, $\theta^* = \theta_\pi^*$, satisfies $\psi(\theta^*) = \ln w_\pi - m = \lambda\sigma$. Since $\psi$ is strictly increasing in $\theta$, the lower is $\lambda$, i.e., the wealth bias, the lower is $\theta^*$, i.e., the higher is the equilibrium level of protection. A lower $\theta^*$ corresponds to more protection. From Proposition 3, if $\lambda\sigma > 1 + \sigma^2$, then $\theta^* > 0$. On the other hand, if $\lambda\sigma \leqslant 1 + \sigma^2$, then $\theta^* = 0$. Therefore, an agent with $\lambda = \sigma + \frac{1}{\sigma}$ is the wealthiest agent voting for complete public protection of property rights. □

**Proof of Proposition 5.** If $\theta^* = 0$, there is nothing to prove, so assume that $\theta^* = \theta^*(\sigma) > 0$. The first-order condition for the level-of-protection maximization problem $(\max_{\theta \geqslant 0} u_i(\theta))$ is

$$\frac{1 + \rho\beta}{1 + \rho\beta(1 + \theta^*)} = \lambda\sigma - \sigma^2(1 + \theta^*).$$

Hence, $1 + \theta^* > (\lambda\sigma - 1)/\sigma^2$.

Since $\sigma > 1$, either $\sigma \geqslant \lambda/2$, or $\sigma \geqslant 2/\lambda$. First, assume that $\sigma \geqslant \lambda/2$. Suppose that $\sigma$ is increased by $\Delta\sigma \geqslant 0$. Note that $\theta^*(\sigma + \Delta\sigma) \leqslant \theta^*(\sigma)$ if and only if

$$\frac{1 + \rho\beta}{1 + \rho\beta(1 + \theta^*)} + (\sigma + \Delta\sigma)^2(1 + \theta^*) \geqslant \lambda(\sigma + \Delta\sigma),$$

or, equivalently, $(2\sigma\Delta\sigma + \Delta\sigma^2)(1 + \theta^*) \geqslant \lambda\Delta\sigma$. Dividing by $\Delta\sigma$, we get $(2\sigma + \Delta\sigma) \times (1 + \theta^*) \geqslant \lambda$. The latter inequality follows from our assumption that $\sigma \geqslant \lambda/2$. Now assume that $\sigma > 2/\lambda$. Hence, $2\sigma(\lambda\sigma - 1)/\sigma^2 > \lambda$. Since $1 + \theta^* > (\lambda\sigma - 1)/\sigma^2$, $2\sigma(1 + \theta^*) \geqslant \lambda$, and the rest of the proof is as above.

To demonstrate the existence of multiply steady states, observe that the following two equations determine the steady-states of the model:

$$\sigma^2 = \delta^2 + \beta^2(1 + \theta^*)^2\sigma^2, \qquad \frac{1 + \rho\beta}{1 + \rho\beta(1 + \theta^*)} = \lambda\sigma - \sigma^2(1 + \theta^*).$$

Solving the first equation for $(1+\theta^*)=\sqrt{\sigma^2-\delta^2}/(\beta\sigma)$, we substitute the result into the second equation to get

$$\frac{1+\rho\beta}{1+\frac{\rho}{\sigma}\sqrt{\sigma^2-\delta^2}}=\lambda\sigma-\frac{\sigma}{\beta}\sqrt{\sigma^2-\delta^2},$$

an equation in one variable. Rewrite it as

$$\frac{1+\rho\beta}{1+\frac{\rho}{\sigma}\sqrt{\sigma^2-\delta^2}}+\frac{\sigma}{\beta}\sqrt{\sigma^2-\delta^2}=\lambda\sigma.$$

It is straightforward to show that the left-hand side of the equation is an increasing concave function. Hence, there exists some $\bar{\lambda}$ such that for any $\lambda\geqslant\bar{\lambda}$, there are at least two steady-states. □

**Proof of Proposition 6.** In fact, Proposition 5 holds for all $\theta\geqslant 0$. The higher is the tax rate, the more equal is the after-tax distribution of wealth. Then Proposition 5 can be applied to show that a higher tax rate leads to a lower level of property rights protection. □

**Proof of Proposition 7.** Suppose that the reform requires each agent $i$ to pay a share of $\alpha$ for the increase in productivity from $\beta$ to $\beta'$. Then, agent $i$ supports the reform as long as

$$\beta'\ln p(\theta,\beta')-\beta\ln p(\theta,\beta)+(1+\theta)(\beta'-\beta)\ln\frac{w_i^{1+\theta}}{Ew_i^{1+\theta}}-\geqslant\ln(1-\alpha),$$

or equivalently

$$\frac{\beta'\ln p(\theta,\beta')-\beta\ln p(\theta,\beta)}{(\beta'-\beta)(1+\theta)^2}+\ln w_i-\left(m+(1+\theta)\frac{\sigma^2}{2}\right)\geqslant\frac{\ln(1-\alpha)}{(\beta'-\beta)(1+\theta)^2}.$$

From the above equation, the threshold $\widetilde{w}=\widetilde{w}(\theta)$can be determined so that any agent $i$ with $w_i\geqslant\widetilde{w}$ supports the reform. For large $\theta$, $\widetilde{w}(\theta)$ is strictly increasing in $\theta$. □

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