CAPITAL AND GROWTH WITH OLIGARCHIC PROPERTY RIGHTS

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http://home.uchicago.edu/~rmyerson/research/oligarch.pdf

The assumption of oligarchic property rights

- The adverse effects of political risk & private protection on investment & capital flight are widely recognized as forces that affect the wealth and poverty of nations; but they often seem peripheral in economic analysis.
- Goal: introduce these effects as central elements of an economic growth model, to better understand capital flows from poor to rich nations, unanticipated decline in post-Soviet Russia.
- Protection of property is a service provided by local political leaders, and it may be viewed as a scarce resource to be rationally allocated by political leaders.
- Leaders need active supporters to maintain their position, and so they may rationally offer such scarce protection as a reward to their active supporters.
- Promises to exchange economic protection for political support are likely to be credible only among individuals who have reputations for honoring such agreements.
- Such reputational equilibria depend on status distinctions: people with good reputations (local oligarchs) enjoy privileges that are denied to otherwise-identical people without such reputations.

Anyone who appears to have violated terms of trust must lose his good status.

With imperfect monitoring, appearances of such violations may occur with positive probability,

- even in an equilibrium where nobody actually violates agreements.
- So people with good reputational status must always consider it to be at risk.
- Thus, fundamental problems of agency in transactions of protection and political support can naturally lead to a political-economic equilibrium where some kinds of property are protected only for an elite who have privileged relationships with local political leaders.

We call this oligarchic property rights.

The investment problem of an insecure oligarch

Local assets, which can be owned only by members of a local oligarchy, will yield profits at rate $\pi(t)$, at any time t.

Membership in the oligarchy is not secure; purged oligarchs lose their local assets. $\tilde{}$

Let \tilde{T} be an oligarch's time of being purged, an exponential random variable, mean $1/\lambda$, so P(not expropriated before time t) = P(\tilde{T} >t) = $e^{-\lambda t}$ where λ = [political risk rate]. Individuals have logarithmic utility for consumption flow *LN*(c), discounted at rate ρ . The rate of return on assets held abroad, safe from political risk, is r. ($r \le \rho$, $r + \lambda < \pi(t)$) At any time t, given wealth $\theta(t)$, an oligarch chooses c = [consumption], x = [safe assets].

The oligarch's problem is to choose functions
$$(\theta, x, c, \overline{c})$$
 so as to

maximize EU = E(
$$\int_0^T e^{-\rho t} LN(c(t)) dt + \int_{\tilde{T}^{\infty}} e^{-\rho t} LN(\bar{c}(x(t)) dt)$$

subject to $\theta(0) = \theta_0$,(initial wealth) $\theta'(t) = \pi(t)(\theta(t) - x(t)) + r x(t) - c(t), \forall t < \tilde{T},$ (growth while oligarch) $0 \le x(t) \le \theta(t), \forall t < \tilde{T},$ (nonnegative investments) $x'(t) = rx(t) - \bar{c}(x(t)), \forall t \ge \tilde{T}.$ (growth when not oligarch)

<u>Lemma.</u> In an optimal consumption/investment plan, an oligarch chooses $c(t) = \rho \theta(t)$ for $t < \tilde{T}$, $\bar{c}(x(t)) = \rho x(t)$ for $t \ge \tilde{T}$, $(\pi(t)-r)/\theta(t) = \lambda/x(t)$ and so $x(t) = \theta(t) \lambda/(\pi(t)-r)$ for $t < \tilde{T}$, $\theta'(t) = \pi(t)\theta(t) - (\pi(t)-r)x(t) - c(t) = (\pi(t) - \lambda - \rho)\theta(t)$ for $t < \tilde{T}$.

Aggregates and general equilibrium in a dynamic economy.

Given labor L and production parameters A and α , local output Y depends on the local capital stock K(t) by Y(t) = A L^{α} K(t)^(1- α).

The workers' wage rate is $w(t) = \partial Y / \partial L = \alpha A [K(t)/L]^{1-\alpha}$.

Capital depreciates at rate δ . So the profit rate per unit capital is

 $\pi(t) = [Y - w(t)L]/K(t) - \delta = (1-\alpha)A[L/K(t)]^{\alpha} - \delta.$

Oligarchs lose their status at rate λ . Expropriated oligarchs' local assets are taken by local government officials, whose offices also are assets that only local oligarchs can own. Let G(t) denote the total value of government offices, which as investments look to oligarchs like perfect substitutes for local capital, so $\pi(t)G(t) = \lambda(K(t) + G(t)) + G'(t)$.

Let X(t) denote the local oligarchs' total safe assets held abroad, and Let $\Theta(t)$ denote the local oligarchs' total wealth: $\Theta(t) = K(t) + G(t) + X(t)$. Oligarchs all hold the same fraction in safe bank accounts: $X(t) = \Theta(t) \lambda / (\pi(t) - r)$. An individual oligarch's wealth satisfies $\theta'(t) = (\pi(t) - \lambda - \rho)\theta(t)$ until purged, but $\lambda\theta(t)$ is

the probabilistic rate at which an oligarch's wealth is removed from the aggregate. So growth of total oligarchic wealth is $\Theta'(t) = (\pi(t) - 2\lambda - \rho)\Theta(t)$. Equivalently, counting purged oligarchs' local assets as officials' income, we have: $\Theta'(t) = K'(t)+G'(t)+X'(t) = \pi(t)K(t) + (\pi(t)G(t)-\lambda(G(t)+K(t))) + (r-\lambda)X(t) - \rho\Theta(t)$ $= (\pi(t)-\lambda-\rho)\Theta(t) - (\pi(t)-r)X(t) = (\pi(t) - 2\lambda - \rho)\Theta(t).$ At time 0, oligarchs' initial globally-marketable wealth is some given $H_0 = K(0)+X(0)$. Then the dynamic motion of the economy is characterized by:

$$\begin{split} &K(0)+X(0)=H_o,\\ &\pi(t)=(1-\alpha)A(L/K(t))^\alpha-\delta,\\ &X(t)=\Theta(t)\;\lambda/(\pi(t)-r),\\ &\Theta(t)=G(t)+K(t)+X(t),\\ &G'(t)=\pi(t)G(t)-\lambda(K(t)+G(t)),\\ &\Theta'(t)=(\pi(t)-2\lambda-\rho)\Theta(t). \end{split}$$

If we guess K(0) then we can compute X(0), $\pi(0)$, $\Theta(0)$, G(0) from the first 4 equations. The right K(0) is identified by a condition that G(t) must stay bounded & nonnegative in the long run. [*If K(0) is too low then G* $\rightarrow +\infty$. *If K(0) is too high then G* $\rightarrow -\infty$.]

With L fixed (no long-run growth), a steady state must have $\pi^* = \rho + 2\lambda$, $K^* = L[(1-\alpha)A/(\rho+2\lambda+\delta)]^{1/\alpha}$, $w^* = \alpha A(K^*/L)^{1-\alpha}$, $G^* = \lambda K^*/(\pi^*-\lambda)$, $X^* = \lambda (K^*+G^*)/(\pi^*-r-\lambda)$.

Given the parameters (A, α, L, δ, ρ, r, λ, H₀), this model can be solved numerically in a spreadsheet at http://home.uchicago.edu/~rmyerson/research/oligarchs2025.xls
See also http://home.uchicago.edu/~rmyerson/research/oligarch.xls

Example. Given parameters: A=1, α =2/3, L=1, δ =0.04, ρ =0.05, λ =0.02, r=0.03. We get steady state profit rate π^* =0.09, capital K^{*}=4.106, wage rate w^{*}= 1.068,

local value of government offices $G^*=1.173$, and oligarchs' foreign assets $X^*=2.639$.

[With political risk $\lambda = 0$, we would get $\pi^* = 0.05$, $K^* = 7.128$, $w^* = 1.283$, $G^* = 0$, $X^* = 0$.]

Consider a dynamic starting from an steady state for these parameters except $r=-\infty$, which corresponds to a closed oligarchic economy (oligarchs cannot leave the country).

So oligarchs start with only their old steady-state capital $H_0 = 4.106$.

The shock of opening the economy makes them want to immediately sell some capital, to get politically-safe foreign assets $X(0) = H_0 - K(0) > 0$.

We get a stable rational-expectations dynamic with K(0)=3.012, which yields initial conditions X(0)=1.094, G(0)=0.805, and w(0)=0.963.

