

An informal version of the Acemoglu/Robinson (2000) model

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1 Model set up

There are two types of citizens, Elites (R) and the Poor (P). The share of poor citizens is $\lambda > 1/2$. The two groups have initial (and subsequent) wealth $h_0^R > h_0^P \geq 0$.

Production has a constant productivity A so aggregate production is $Y_t = AH_t$. Everybody pays a flat tax τ_t . There is a potential “home production” technology with productivity B which is not taxed, so taxes are capped at $\tau \leq \frac{A-B}{A}$.

Under elite rule (E), elites determine the tax rate in every period and can choose to democratize. If democracy (D) is introduced, power to determine τ is transferred to the poor (as $\lambda > 1/2$), and it is impossible to go back to elite rule.

Under elite rule the poor can initiate a revolution (Rev). Revolution always succeeds, and the poor capture all capital in the economy. However, a fraction $1 - \mu_t$ is destroyed during the revolution, leaving income $\mu_t \frac{AH}{\lambda}$ for each poor. The parameter μ_t is drawn at random each period, and equals 0 with probability $1 - q$ and $\mu > 0$ with probability q .

2 Solving the model

A part of the game tree for the game can be seen in Figure 1. Let $V^i(S)$ denote the life time utility of group $i \in \{R, P\}$ in state S . The discount factor is β .

2.1 Branch **[Y]**: Revolution

When $\mu_t = 0$ the revolution is not undertaken as everything is destroyed. If $\mu_t = \mu$, we have

$$V^P(Rev) = \mu \frac{1}{1-\beta} \frac{AH}{\lambda} \quad (1)$$

$$V^R(Rev) = 0 \quad (2)$$

2.2 Branch **[Z]**: Democracy

The poor choose a tax rate $\tau = \frac{A-B}{A}$. Then we get

$$V^P(D) = \frac{1}{1-\beta} (Bh^P + (A-B)H) \quad (3)$$

$$V^R(D) = \frac{1}{1-\beta} (Bh^R + (A-B)H) \quad (4)$$

2.3 Branch **X**: Elite rule

Consider first the case with $\mu_t = 0$. Then there is no threat of revolution, and as there is no commitment (follows from Markov strategies) there are no promises to fulfill. Hence the elites choose $\tau_t = 0$ and we get

$$V^P(E, \mu_t = 0) = Ah^P + \beta[(1 - q)V^P(E, \mu_t = 0) + qV^P(E, \mu_t = \mu)] \quad (5)$$

$$V^R(E, \mu_t = 0) = Ah^R + \beta[(1 - q)V^R(E, \mu_t = 0) + qV^R(E, \mu_t = \mu)] \quad (6)$$

Consider next the case where $\mu_t = \mu > 0$. Now there is a real threat of revolution. Consider first the case where the elites still play $\tau = 0$. In this case we would get $\tilde{V}^P(E, \mu_t = \mu) = \frac{Ah^P}{1-\beta}$ (as utility is the same independently of the value of μ_t). Acemoglu and Robinson introduce the *revolution constraint* which assumes that in this case, revolution occurs. It requires $V^P(Rev) > \tilde{V}^P(E, \mu_t = \mu)$.

If the revolution constrain holds, the elites can follow two strategies. One is to try to increase transfers. Then they choose a tax rate $\tau^R \leq \frac{A-B}{A}$ (whenever $\mu_t = \mu$). This gives the poor a life time utility

$$V^P(E, \mu_t = \mu, \tau^R) = (1 - \tau^R)Ah^R + \tau^RAH + \beta[(1 - q)V^P(E, \mu_t = 0) + qV^P(E, \mu_t = \mu, \tau^R)] \quad (7)$$

The highest utility the elites can assure the poor, i.e. the most they can do to avoid a revolution, is to choose $\tau^R = \frac{A-B}{A}$. To avoid a revolution, we need $V^P(Rev) \leq V^P(E, \mu_t = \mu, \frac{A-B}{A})$ which holds whenever

$$\begin{aligned} \mu \frac{AH}{(1 - \beta)\lambda} &\leq \frac{Bh^P + (A - B)H + \beta(1 - q)V^P(E, \mu_t = 0)}{1 - \beta q} \\ &= \frac{Bh^P + (A - B)H - \beta(1 - q)(A - B)(H - h^P)}{1 - \beta} \end{aligned} \quad (\Delta)$$

The other strategy the elites can follow is to introduce democracy. In this case, the poor takes over power and assures a value of $V^P(D)$, so revolution is avoided whenever $V^P(Rev) \leq V^P(D)$, i.e. when

$$\mu \frac{AH}{(1 - \beta)\lambda} \leq \frac{Bh^P + (A - B)H}{1 - \beta} \quad (*)$$

The main result of the paper is to show that there are parameter values where (*) holds, but where (Δ) does not hold, so democratization is the only way to avoid a revolution.

Figure 1: A part of the game tree

