The Acemoglu-Robinson (2000) model

Continuum of agents of mass 1

Two classes

Infinite horizon game

Notation

$\lambda \in (1/2, 1)$ = fraction of population belonging to the non-elite (majority)

h^p = human (or physical) capital of non-elite (poor) agent

$h^r > h^p$ = human (or physical) capital of elite (rich) agent

$Ah^i =$ pre-tax income if working in market (taxable) production, $i = p, r$

$Bh^i =$ income if working in non-taxable home production, $i = p, r$, $A > B$

$q =$ probability of conditions being conducive for revolution

$H =$ total taxable resources

$$H = \lambda h^p + (1 - \lambda) h^r$$

$1 - \mu^h =$ fraction of H lost if revolution

Taxes and redistribution

τ = tax rate

Chosen by group in power; explained later

If τ too high, no agent works in market production

Condition for agents to choose market production:

$$(1-\tau)Ah^i \geqslant Bh^i$$

or

$$\tau \leq \frac{A-B}{A} \equiv \widehat{\tau}$$

If $\tau > \widehat{\tau}$, then zero tax revenues (all work in home production); never optimal

$T =$ transfer per agent (elite and non-elite) when setting

$$T = \tau A H$$

Note: total population of mass 1

Post-tax income:

$$(1 - \tau) A h^i + T$$

Three political regimes

- Democracy: taxes set by the median voter = the non-elite ($\lambda > 1/2$)

- Revolution: all elite's assets, net of destruction, confiscated by non-elite

- Elite rule: power rests with the elite, who may:

  – extend the franchise = introduce democracy, or

  – use taxes to redistribute, try prevent revolution

Timing

1. State revealed: conditions conducive for revolution, or not

2. Elite extend franchise, or not; if not, they set τ

3. If conditions conducive at stage 1, the non-elite decide whether to revolt, or not:
   (a) if they do revolt, some output destroyed, remaining output shared among non-elite;
   (b) if not revolting, then – if franchise extended at stage 2 – the non-elite set τ through majority voting (and else, the elite set τ)

4. Capital allocated between market, home production; incomes are realized

$V^p(R)$ = value to non-elite of revolution

Total resources left over after revolution $= \mu^h H$; used in market production

Payoff per period, per non-elite agent $= \mu^h AH/\lambda$

β = time discount factor

$$V^p(R) = \frac{\mu^h AH}{\lambda} + \beta V^p(R)$$

$$V^p(R) = \frac{\mu^h AH}{\lambda(1-\beta)}$$

$V^p(D) =$ value to non-elite of democracy

Under democracy, power rests with median voter (the non-elite)

Thus: maximum redistribution, $\tau = \hat{\tau} = (A - B)/A$ in all periods

$$\begin{aligned} (1 - \hat{\tau})Ah^p &= Bh^p \\ \hat{\tau}AH &= (A - B)H \end{aligned}$$

Once democracy introduced, no reversion to elite rule:

$$V^p(D) = Bh^p + (A - B)H + \beta V^p(D)$$

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

Assume non-elite prefer democracy to revolution: $V^p(D) > V^p(R)$

$$\frac{Bh^p + (A - B)H}{1 - \beta} > \frac{\mu^h AH}{\lambda(1 - \beta)}$$

or

$$Bh^p + (A - B)H > \mu^h AH/\lambda$$

Same as Assumption 2 in AR

Could be written in terms of h^p and h^r

$V^p(E, \mu^h)$ = value to non-elite of elite rule if threat of revolution (probability q)

$V^p(E, 0)$ = value to non-elite of elite rule if no possibility to revolt (probability $1 - q$)

Suppose elite set taxes at some $\tau \in [0, \hat{\tau}]$ when there is a threat of revolution

Always optimal with zero taxation otherwise (no commitment)

$$V^p(E, \mu^h) = \underbrace{(1-\tau)Ah^p}_{\text{post-tax income}} + \underbrace{\tau AH}_{\text{transfer}} + \beta \left\{ \underbrace{qV^p(E, \mu^h) + (1-q)V^p(E, 0)}_{\text{expected value next period}} \right\}$$

$$V^p(E, 0) = Ah^p + \beta \left\{ qV^p(E, \mu^h) + (1-q)V^p(E, 0) \right\}$$

Note that

$$\begin{aligned}(1-\tau)h^p + \tau H &= (1-\tau)h^p + \tau\lambda h^p + \tau(1-\lambda)h^r \\ &= [1-\tau(1-\lambda)]\, h^p + \tau(1-\lambda)h^r \\ &= h^p + [h^r - h^p]\, \tau(1-\lambda)\end{aligned}$$

Post-transfer income for poor, $A\{(1-\tau)h^p + \tau H\}$, increasing in τ

Follows from $h^r > h^p$; taxation = redistribution from rich to poor

Let

$$X = qV^p(E, \mu^h) + (1-q)V^p(E, 0)$$

$$X = q\left[(1-\tau)Ah^p + \tau AH\right] + (1-q)Ah^p + \beta X$$

$$X = \frac{q\left[(1-\tau)Ah^p + \tau AH\right] + (1-q)Ah^p}{1-\beta}$$

Substitute into expression for $V^p(E, \mu^h)$

$$\begin{aligned} V^p(E, \mu^h) &= (1-\tau)Ah^p + \tau AH + \beta X \\ &= (1-\tau)Ah^p + \tau AH \\ &\quad + \frac{\beta}{1-\beta}\left\{\left[q\left[(1-\tau)Ah^p + \tau AH\right] + (1-q)Ah^p\right]\right\} \end{aligned}$$

which is increasing in $(1-\tau)Ah^p + \tau AH$, and thus in τ

Assume: $V^r(R) = 0$; thus elite want to avoid revolution if at all possible

Two ways: democracy or transfers

First: find value to non-elite on revolutionary state, when elite pick maximum redistribution, $\tau = \widehat{\tau} = (A - B)/A$

$$\begin{aligned}(1 - \widehat{\tau})Ah^p &= Bh^p \\ \widehat{\tau}AH &= (A - B)H\end{aligned}$$

Gives

$$
\begin{aligned}
V^p(E, \mu^h) &= \frac{[Bh^p + (A-B)H]\,[1-\beta(1-q)] + \beta(1-q)Ah^p}{1-\beta} \\
&= \frac{[Bh^p + (A-B)H] + \beta(1-q)\,[Ah^p - Bh^p - (A-B)H]}{1-\beta} \\
&= \frac{Bh^p + (A-B)H - \beta(1-q)(A-B)(H-h^p)}{1-\beta} \equiv \widehat{V}(q)
\end{aligned}
$$

Insight 1: $V^p(D) = \widehat{V}(1)$

Intuition: democracy amounts to permanent maximum redistribution

Insight 2: $\widehat{V}'(q) > 0$; since $A > B$ and $H = h^p + (1-\lambda)(h^r - h^p) > h^p$

Intuition: value to non-elite of elite rule is increasing in probability of state where transfers occur (the revolutionary state)

Assumption 1 in paper ("revolution constraint") ensures

$$V^p(R) > \widehat{V}(0)$$

Interpretation: elite cannot pacify non-elite in revolutionary state through transfers, if that state is sufficiently unlikely

To find $\widehat{V}(0)$, add and subtract $(A - B)h^p$ in numerator in expression for $\widehat{V}(q)$.

$V^p(R) > \widehat{V}(0)$ can be written:

$$\frac{\mu^h AH}{\lambda(1-\beta)} > \frac{Ah^p}{1-\beta} + (A-B)(H-h^p)$$

Use $H = h^p + (1-\lambda)(h^r - h^p)$ and $\hat{\tau} = (A-B)/A$; this gives

$$\frac{h^r}{h^p} > \frac{\lambda\left[1-\mu^h-\hat{\tau}(1-\lambda)(1-\beta)\right]}{(1-\lambda)\left[\mu^h-\hat{\tau}\lambda(1-\beta)\right]}$$

Always holds if imposing Assumption 1 in paper:

$$\frac{h^r}{h^p} > \frac{\lambda\left[1-\mu^h\right]}{(1-\lambda)\left[\mu^h-\hat{\tau}(1-\beta)\right]}$$

(Typo in AR? Can you go from Footnote 7 to Assumption 1?)

Let q^* be defined from

$$V^p(R) = \widehat{V}(q^*)$$

Interpretation: if $q = q^*$, then non-elite indifferent between revolution or not, if maximum redistribution when revolutionary state occurs

Draw $V^p(R)$, $V^p(D)$ and $\widehat{V}(q)$ in diagram with q on horizontal axis

- If $q < q^*$, then when a revolutionary state emerges the elite choose to introduce democracy

- If $q \geq q^*$, then when a revolutionary state emerges the elite "bribe" the non-elite through redistribution not to revolt
  - Note: payoff to non-elite calculated assuming $\tau = \widehat{\tau}$, which only means a transfer equilibrium *exists* when $q \geq q^*$. The actual level of τ needed to pacify non-elite is lower than $\widehat{\tau}$ if $q > q^*$

Insights

- Elite may choose to voluntarily give up power permanently to avoid revolution, rather than use temporary transfers to non-elite. Intuition: elite cannot commit to continued transfers when threat goes away.

- Democratic equilibrium more likely if revolutionary opportunity is *unlikely* to emerge (q is low). Intuition: none-elite more inclined to start revolution if opportunity is unlikely to come back, making it costlier to bribe them to stay peaceful; only option left for elite is democracy.

- More equal societies less likely to democratise. Why? If h^r/h^p low, then $V^p(R)$ is close to $\widehat{V}(0)$; see figure. Intuition: little redistributive value of revolution.