

Final Exam

Latin American Development in the Long Run

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July 22, 2010
Due: Tuesday, July 26, by 8.30am

Important instructions:

1. Work on the following questions individually.
2. Return your answers by the announced deadline. You may choose between ONE of the following. The first method is preferred, and the second is advised only for those leaving town after the course ends:
 - (a) Leave your answers in the locker number W27, in the 8th floor of Edificio W, by 8.30am on Tuesday.
 - (b) Send your answers via email to leopoldo@mit.edu by 8.30am on Tuesday. You should expect a confirmation of receipt sent by Leopoldo. If you don't, you must resend your original email.
3. Please be brief in all your answers.

1 State Capacity and Democratization

Consider an economy populated by λ rich agents who initially hold power, and $1 - \lambda$ poor agents who are excluded from power, with $\lambda < 1/2$. All agents are infinitely lived and discount the future at the rate $\beta \in (0, 1)$. Each rich agent has income θ/λ while each poor agent has income $(1 - \theta)/(1 - \lambda)$ where $\theta > \lambda$. The political system determines a linear tax rate, τ , the proceeds of which are redistributed lump-sum. Each agent can hide their money from the government and avoid paying taxes but in the process they lose a fraction ϕ of their income. Think of ϕ as a measure of state capacity. When the state is very weak, citizens can hide their income from the government at a very low cost. There are no other costs of taxation. The poor can undertake a revolution, and if they do so, in all future periods, they obtain a fraction $\mu(t)$ of the total income of the society (i.e., an income of $\mu(t)/(1 - \lambda)$ per poor agent). The poor cannot revolt against democracy. The rich lose everything and receive zero payoff after a revolution. At the beginning of every period, the rich can also decide to extend the franchise to the poor, and this is irreversible. If the franchise is extended, the poor decide the tax rate in all future periods (as they would constitute the median voter in a democracy).

a) Suppose that the rich were guaranteed to hold power indefinitely. Find the preferred tax rate of a rich agent (τ^R). Show and explain carefully your derivations.

b) Suppose that the poor were guaranteed to hold power indefinitely. Find the preferred tax rate of a poor agent (τ^P). Show and explain carefully your derivations.

c) Now suppose that $\mu(t) = \mu^l$ at all times. Also assume that $0 < \mu^l < 1 - \theta$. What will be the Markov Perfect Equilibrium? (in particular, state clearly whether the poor agents will start a revolution, whether the rich agents will decide to extend the franchise and democratize and what will be the equilibrium tax rate in this economy). Give an intuition for the result.

d) Now suppose that $\mu^l \in (1 - \theta, (1 - \phi)(1 - \theta) + \phi(1 - \lambda))$. Characterize the MPE in this case. Again, specify whether the poor will start a revolution, whether the rich will democratize and give an expression for the equilibrium tax rate. Why is the restriction $\mu^l < (1 - \phi)(1 - \theta) + \phi(1 - \lambda)$ necessary? Give an intuition for how increases in state capacity (ϕ) affect this equilibrium.

e) Now suppose that $\mu(t) = \mu^l$ with probability $1 - q$, and $\mu(t) = \mu^h$ with probability q , where $\mu^h > 1 - \theta > \mu^l$. Construct a MPE where the rich extend the franchise, and from there on, a poor agent sets that tax rate. Determine the parameter values that are necessary for such an equilibrium to exist. Explain why extension of the franchise is useful for rich agents? Based on the the equilibrium you find, discuss the comparative statics with respect to inequality and state capacity (i.e. whether increases in inequality or in state capacity make democratization more or less likely).

f) In the context of the MPE you found in part e) discuss what will happen in a society with absolutely no state capacity, i.e. $\phi = 0$. What will determine the political regime in this society? Give an intuition for the result.

2 The political economy of pensions

Consider a society with two groups of individuals young (j) and old (v). There is no income inequality; everyone earns an exogenous income y . We normalize population size to 1, so y is also total income. Old people also receive a pension (T).

The utility of an individual in group k is given by:

$$u^k = c^k + \alpha^k H(T)$$

where c^k is private consumption, T is pension consumption, and $H(\cdot)$ is an utility function of pensions with standard properties ($H'(\cdot) > 0$ and $H''(\cdot) < 0$). α^k is a group-specific parameter ($k = \{j, v\}$) with $\alpha^j = 0$ and $\alpha^v = 1$. Pensions are financed with a tax τ on income (same tax for everyone), hence $c^k = (1 - \tau)y$ for all k .

Finally the government cannot borrow or save, (this is a "pay-as-you-go" pension system) so its budget constraint is:

$$\tau y = T$$

2.1 Direct Democracy: Median Voter Theorem

- Show that preferences over policy are single-peaked and defined over a single dimension (e.g. T).
- What is the preferred level of pension expenditure by each group in society? Interpret the first order condition that determines such level, and calculate it for the case $H(T) = \log(T)$.
- Suppose n is the share of young people (and $1 - n$ the share of old). What would be the equilibrium policy in this society? Is single-peakedness important for this result?
- Find the (utilitarian) socially optimal policy, and compare it to the political equilibrium (for a general H). Compute the policy for the case $H(T) = \log(T)$. What explanation could this model propose for the increase in pension expenditure in Colombia?

2.2 Representative democracy: probabilistic voting model

Now assume that citizens elect politicians who run for office. There are two candidates, A and B , and they receive some exogenous rents from power if they get elected. Denote their policy platforms with T^A and T^B . After announcing the platforms, citizens vote and the winner implements the announced platforms (that is, we assume that promises are fulfilled).

Preferences are as in the previous section except that a new parameter σ^{ik} measures the ideological bias of individual i in group k ($k = \{j, v\}$) for party B , and δ captures an aggregate popularity shock for party B . Assume these shocks are uniformly distributed and centered at zero: σ^{ik} has density ϕ^k , so it is distributed uniformly over $\left[-\frac{1}{2\phi^k}, \frac{1}{2\phi^k}\right]$; and δ has density ψ , so it is uniformly distributed over $\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$. Putting this together, the probability that an individual i in group k votes for A , $p^{ik}(T_A, T_B)$, is given by:

$$p^{ik}(T_A, T_B) = \begin{cases} 1 & \text{if } V^k(T_A) - V^k(T_B) > \sigma^{ik} + \delta \\ \frac{1}{2} & \text{if } V^k(T_A) - V^k(T_B) = \sigma^{ik} + \delta \\ 0 & \text{if } V^k(T_A) - V^k(T_B) < \sigma^{ik} + \delta \end{cases} \quad (1)$$

- Find π_k^A , the share of voters for A in each group.
- Find π^A , the total number of votes for A . Simplify the expression and write it, when possible, in terms of the average "ideological density" in society, $\phi = [n\phi^j + (1-n)\phi^v]$.
- Find $P(T^A, T^B)$, the probability that A wins. Show your steps.
- Now find the equilibrium policy proposals. Interpret and discuss the role of ϕ^k , and again compare with the utilitarian social optimum. What are the consequences of an increase in the share of old people ($1-n$)? How do these predictions compare with the ones in the Median Voter Theorem section?

3 The Political Economy of Civil Wars

Using the papers on the reading list and the lectures, do you think that political or economic factors are more important in explaining the incidence of civil war?

Be brief. Write no more than 3 pages on 12pt font.