Latin American Development in the Long Run
Final Exam 2010
Due Date: Tuesday, July 27, 1pm, 9th Floor

Answer only 2 Questions

1 Public goods provision and democracy

A public good G, financed with a linear tax rate (τ) on income y_i, gives agent i in the economy a utility of $\theta^i G$. There is a mass 1 of individuals in the society, and there are just two classes: the landowners l and the capitalists c. A fraction $1-\delta > 1/2$ of the agents are capitalists. Income is the same for all individuals and denoted by y. Thus the government budget constraint is $\int_i \tau y_i di = \tau y = G$. Utility for individuals in group j is

$$u^j = (1-\tau)\, y + \theta^j G.$$

Assume that landowners are not benefitted as much by the public good as capitalists, and specifically that $\theta^c > 1 > \theta^l$. Thus, the preferred level of public goods and taxes for landowners are $\tau^l = G^l = 0$, while capitalists prefer $\tau^c = 1$ and $G^c = y$. Individual utility is defined over the discounted sum of per-period utility with discount factor $\beta \in (0,1)$, so for individual in group j at time $t = 0$, it is

$$U^j = \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t \left[(1-\tau_t)\, y + \theta^j G_t\right], \tag{1}$$

Landowners constitute an elite that establish policy in a non-democratic regime and, as in Acemoglu and Robinson (2005) theory of democratization, will choose policy subject to a revolution constraint. If a revolution is attempted, it always succeeds but a fraction μ_t of the product of the economy is destroyed forever in the process. After a revolution, capitalists set the tax rate. Suppose that μ_t is equal to $\mu^H = \mu$ with probability q and to $\mu^L = 1$ with probability $1-q$. Aside from setting the tax rate, the elite can democratize at the beginning of each date, in which case from then on the society is democratic (this is irreversible), and taxes are decided by majoritarian elections. Since capitalists are in the majority, majoritarian elections will lead to their most preferred tax rate, τ^c, in the future. The elite can also use repression in order to prevent revolution. Repression is costly because it destroys a fraction of output at that time. In particular, letting ω denote the decision of repression, with $\omega = 0$ denoting no repression and $\omega = 1$ denoting repression, net consumption will be given by:

$$\hat{y}^j = \omega\,(1-\kappa)\, y + (1-\omega)\left((1-\tau)\, y + \theta^j G\right), \tag{2}$$

That is, κ is the cost due to repression -a fraction ω of income is destroyed when repression is used-. However, if repression is used landowners will set their preferred tax level $\left(\tau^l = 0\right)$.

The timing of events is as follows

1. The state $\mu_t \in \{\mu^L, \mu^H\}$ is revealed.
2. The elite decide whether or not to use repression, $\omega \in \{0,1\}$. If $\omega = 1$, the poor cannot undertake a revolution and the stage game ends.
3. If $\omega = 0$, the elite decide whether or not to democratize, $\phi \in \{0,1\}$. If they decide not to democratize, they set the tax rate τ^N.
4. The citizens decide whether or not to initiate a revolution, $\rho \in \{0,1\}$. If $\rho = 1$ a share μ_t of output is destroyed in all future periods but capitalists set their preferred tax rate. If $\rho = 0$ and $\phi = 1$ the tax rate τ^D is set by the median voter (a capitalist) in all future periods and the destruction of output is avoided. If $\rho = 0$ and $\phi = 0$, then the tax rate is τ^N.

Focus throughout on a Markov Perfect Equilibrium of this game, where strategies only depend on the current state of the world (and on previous actions in the stage game). Follow the next steps to find the unique MPE of the game.

1. Find $V^c(R, \mu^S)$ and $V^l(R, \mu^S)$, the return to capitalists and landowners if there is a revolution starting in threat state $\mu^S \in \{\mu, 1\}$.

2. Derive the *revolution constraint* and interpret it.

   (Hint: recall that the *revolution constraint* binds if the capitalists prefer a revolution in the state $\mu_t = \mu^H$ rather than to live in nondemocracy without any concession from the landowner elite. In other words, denoting $V^c(N)$ the value in nondemocracy with no concessions ever, find when $V^c(R, \mu^H) > V^c(N)$.)

3. Suppose that the revolution constraint you found in the previous section binds.

   (a) Find $V^c(N, \mu^H, \tau^N = \hat{\tau})$, the value to the capitalists in the state $\mu_t = \mu^H$ when the elite set a tax rate $\hat{\tau}$, and are expected to do so in the future when μ^H recurs, and there is no revolution.

   (Hint: As in the model studied in class, set up and solve a system of equations for $V^c(N, \mu^H, \tau^N = \hat{\tau})$ and $V^c(N, \mu^L)$, where the latter is just the value in non-democracy when the state is μ^L. Notice that in the low threat state the elite can set its preferred policy since $\mu^L = 1$)

   (b) Leave repression aside for a moment and notice that the elite would like to prevent revolution via a concesion in terms of $\hat{\tau}$ if they can. Show that the elite will be able to do so when $\mu \geq \mu^*$, where $\mu^* = \beta(1-q)\frac{\theta^c - 1}{\theta^c}$.

   (Hint: Notice that the best response of the capitalists is

   $$\rho \begin{cases} = 0 & \text{if } V^c(R, \mu^H) \leq V^c(N, \mu^H, \tau^N = \hat{\tau}) \\ = 1 & \text{if } V^c(R, \mu^H) > V^c(N, \mu^H, \tau^N = \hat{\tau}) \end{cases} \tag{3}$$

   Hence, compare $V^c(N, \mu^H, \tau^N = \hat{\tau})$ with $V^c(R, \mu^H)$ for the best possible offer of $\hat{\tau}$ that the elite can give to citizens).

   (c) Suppose a revolution can be averted (the condition you found in b holds). Find an expression that defines the level of taxation $\hat{\tau}$ that the elite will provide in the high threat state if they choose a concession. Find also the values of democracy for the elite and the capitalists, $V^l(D)$ and $V^c(D)$. (Notice that in this model democracy always prevents a revolution, that is, $V^c(D) \geq V^c(R, \mu^H)$. Indeed, democracy leads to the same policy outcome as a revolution but without destruction of output)

   (d) Find the payoff to playing a strategy of always repressing in the high threat state, denoted $V^l(O, \mu^H | \kappa)$ and $V^c(O, \mu^H | \kappa)$ for the elite and capitalists respectively.

   (Hint: Set up and solve the appropriate system of equations for $V^j(O, \mu^H | \kappa)$ and $V^j(N, \mu^L)$).

4. When is it beneficial for the elite to use repression versus redistribute or concede democratization?

   (Hint: Recall that when $\mu < \mu^*$ the elite cannot avoid a revolution with a concesson. Thus, to understand when repression occurs you need to compare $V^l(O, \mu^H \mid \kappa)$ to $V^l(D)$ when $\mu < \mu^*$. When $\mu \geq \mu^*$, instead, compare $V^l(O, \mu^H \mid \kappa)$ to $V^l(N, \mu^H, \tau^N = \hat{\tau})$ since redistribution can avoid a revolution. Use these observations to determine two threshold values for the cost of repression, κ^* and $\bar{\kappa}$, such that the elite are indifferent between their various options at these threshold levels. Let κ^* be such that the elite are indifferent between promising concession at the tax rate $\tau^N = \hat{\tau}$ and repression, $V^l(O, \mu^H \mid \kappa^*) = V^l(N, \mu^H, \tau^N = \hat{\tau})$, and use $\bar{\kappa}$ for indifference between repression and democracy, i.e. $V^l(O, \mu^H \mid \bar{\kappa}) = V^l(D)$.)

5. Summarize your findings (state the features of the unique MPE of this game) and discuss the comparative static implications. In particular, suppose development is associated with an increase in θ^c, the value of the public good for the capitalists. Will development make democracy more or less likely?

   Now suppose development is associated with an increase in θ^c, the value of the public good for the capitalists, *and* a fall in θ^l, the value of the public good for landowners. In this case, will development make democracy more or less likely?

2 Modernization Theory

"Perhaps the most widespread generalization linking political systems to other aspects of society has been that democracy is related to the state of economic development. Concretely, this means that the more well-to-do a nation, the greater the chances that it will sustain democracy" (Seymour M. Lipset, 1959, "Some Social Requisites of Democracy: Economic Development and Political Legitimacy", American Political Science Review, Vol 53, No. 1.)

1. Use the readings discussed in class to critically assess this "widespread generalization." In particular, briefly address which theoretical mechanisms, among those discussed in class in Lecture 10 suggest that democracy may, or may not, follow naturally as a result of economic development (limit your answer to one page).

2. Throughout the course, we have encountered several other instances that run against this "modernization" view, that is, the idea that institutions will gradually be transformed into more efficient or complete forms as development unfolds. Choose one topic, other than democratization, that doesn't fit the modernization paradigm and briefly discuss it. Be brief, and refer to specific theoretical arguments and/or empirical evidence (limit your answer to one page).

3 The Regulation of Entry

Read "The Regulation of Entry" by Simeon Djankov, Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer published in the Quarterly Journal of Economics in 2002. You can download the paper from the course's website.

In the different parts of this question, you will be asked to use the Agency framework we discussed in class (based on Banerjee, 1997) to interpret and criticize their results. You are expected to use only the basic framework we discussed in class and not the more complicated version in the paper.

a) Think about their main variables of interest: number of procedures, official time and official cost. Based on these measures, can we conclude that they correspond to red tape? Why are these measures likely to underestimate the obstacles to starting a firm? Why are they likely to overestimate them?

b) Now let's try to match their variables and results to the agency framework we discussed in class. What are the "slots" in the context of this paper? Is there reason to believe that they are scarce? Who would be the H types and whould be the L types? What is their measure of testing/red tape? What is their measure of allocative efficiency?

c) They argue that their results are consistent with the "tollbooth theory". Which of the theories we discussed in class is more closely related to the "tollbooth theory"? Explain carefully, using the framework and notation we used in class, why the "tollbooth" theory could predict the correlations observed in Tables IV and V. Be very explicit on what would need to vary across countries for this theory to explain the patterns in the data. Is the evidence in Tables IV and V conclusive in support of the "tollbooth theory? If not, what additional evidence would you need?

d) Again, using the simple framework we discussed in class, propose an alternative theory (different from the "tollbooth theory") that would also explain the same correlations observed in Tables IV and V. Be very explicit at what would need to vary across countries for the theory to explain the patterns in the data. **You can use some of the theories we discussed explicitly in class.**

e) Finally, in class we talked about variation across countries in the "greediness" of public officials and variation in the effectiveness of political institutions in constraining the corrupt behavior of public officials. Which type of variation do you think best explains the different patterns of corruption across countries? Justify your answer, by making reference to other papers we discussed during the course. Be very brief (maximum 1/2 a page).