Political Science 836—Spring 2015
Final Exam

There are four problems, each with multiple parts, worth 60 points total. Please be sure you understand what a problem is asking before beginning to work on it—I will give little credit for the correct answer to the wrong problem. Clearly indicate your final answer (e.g., by circling it) to each part of each problem. Further, do show enough of your work that I can give partial credit if necessary, but given that constraint please be as concise as possible.

Please take a close look at all four of the problems immediately upon receiving the exam. If you have any questions, please relay them to Degi, who will write to me for a response. Given the time difference, I cannot guarantee that I will be available beyond the first 20 minutes of the exam, so do look over all questions before beginning work.

Good luck!

1. (15 points—Citizen candidates and delegation) Consider a citizen-candidate model in which the election winner decides whether to delegate to a specialist with fixed preferences. There is a large, finite set of citizens who vote strategically. Two-thirds of all citizens have preferences over outcomes $x \in \Re$ given by the payoff function $-\left(x - x_L\right)^2$, whereas the remaining one-third have preferences given by the function $-\left(x - x_R\right)^2$, where $x_L = -\Delta$, $x_R = \Delta$, and $\Delta > 0$. (Draw yourself a picture.) In addition to this policy payoff, any citizen who enters the race incurs a cost $\delta > 0$, and any citizen who enters and wins receives a payoff $v > 0$. The specialist has preferences over outcomes $x \in \Re$ given by the payoff function $-x^2$. The timing of events is as follows:

   - Entry. Each citizen chooses between entering and staying out of the race.
   - Voting. Each citizen votes for one of the candidates or abstains. The winner is decided by plurality rule, with ties settled by a fair lottery.
   - Delegation. The winning candidate decides whether to delegate policy authority to the specialist.
   - Resolution of uncertainty. A random shock $\omega \in \{-\epsilon, \epsilon\}$ is realized, where $\Pr\left(\omega = \epsilon\right) = \frac{1}{2}$.
   - Policy choice. Whoever has policy authority—the election winner or the specialist, depending on whether policy authority has been delegated—chooses a policy $p \in \Re$.

   The outcome x is jointly determined by the policy and the shock, with $x = p + \omega$. Restrict attention to equilibria in which citizens play weakly undominated voting strategies and abstain from voting if all candidates have the same ideal point.

   (a) Derive the condition such that any election winner, left or right, prefers to delegate rather than choose policy herself. (Hint: The analysis is similar to that in Section 5.1.)

   (b) Assume that the condition in part (a) is met. Derive the condition for existence of a two-candidate equilibrium in which two candidates with ideal point x_R have entered. If necessary, describe voting strategies off the equilibrium path necessary to support this equilibrium.

   (c) Now assume that the condition in part (a) is not met. Derive the condition for existence of a two-candidate equilibrium in which two candidates with ideal point x_R have entered. If necessary, describe voting strategies off the equilibrium path necessary to support this equilibrium.

   (d) How, if at all, do your answers to the previous parts of the problem change if the election winner can impose discretion limits on the specialist? (I will give full credit for the correct intuition, even if no formal analysis is presented.)

2. (15 points—Veto players) Consider a policy environment similar to that in Exercise 8.4, where $\tau \in [0, 1]$ is a linear tax imposed on both rich and poor, who have per-capita incomes of $y^r = \frac{\theta}{\eta}$ and $y^p = \frac{1-\theta}{1-\eta}$, respectively. There is a deadweight loss of taxation

of $\frac{\omega}{2}\tau^2$, where $\omega > \theta$. Net tax revenue is returned as a lump sum transfer to poor residents only. Thus, the transfer paid to any poor citizen is

$$\frac{\tau - \frac{\omega}{2}\tau^2}{1-\eta}.$$

Any departure from the status quo tax rate $\bar{\tau}$ must be approved by two veto players, whose preferences are identical to those of rich and poor citizens, respectively.

(a) What tax rate is most preferred by each of the veto players?
(b) For all possible locations of the status quo $\bar{\tau} \in [0,1]$, find the winset for this configuration of veto players.
(c) What is the core for this configuration of veto players?
(d) Suppose the rich veto player has agenda-setting power. For all possible locations of the status quo, find the equilibrium tax rate.

3. (15 points—Legislative bargaining) Consider the following infinite-horizon model of legislative bargaining over public and private goods. In any period, whoever is chosen as agenda setter proposes an allocation of an infinitely divisible resource between public and private goods, where y is the level of public-goods spending and $\mathbf{x} = (x_1, \ldots, x_N)$ is the distribution of private goods. Total spending must satisfy $y + \sum_i x_i = 1$. If a proposal passes, legislator i receives utility

$$u_i(y, x_i) = y + \alpha x_i,$$

where the parameter α measures the degree to which members value private over public goods. Legislators have identical recognition probabilities, and payoffs are discounted according to the common discount factor δ. All other elements of the model are identical to the infinite-horizon (Baron-Ferejohn) model of legislative bargaining of Section 6.1.3.

Assume

$$1 < \alpha < \frac{N-1}{2}.$$

Then it is an equilibrium for any agenda setter to offer

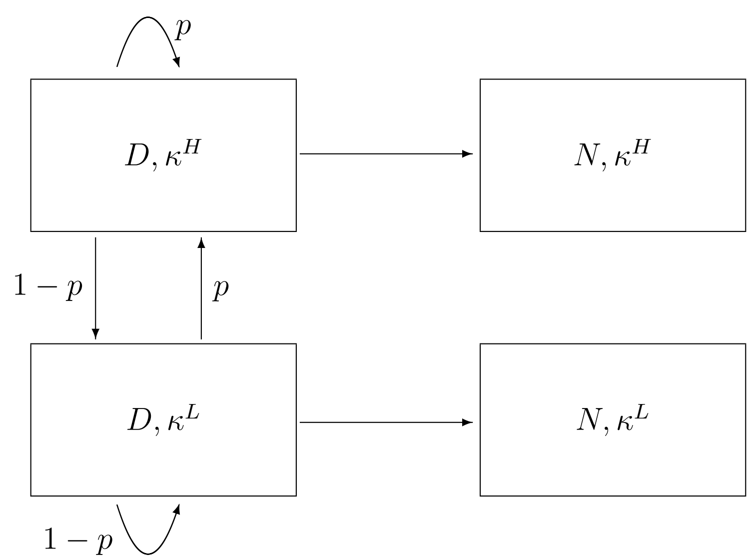
$$\hat{y} \equiv \frac{\delta\alpha}{N(1-\delta) + \delta\alpha},$$

to keep the remainder $(1-\hat{y})$ for herself (that is, to offer no private goods to other members), and for all members to vote for this proposal. Verify this as follows.

(a) Derive the continuation payoff V for any member in terms of $\hat{y}$. (Hint: Remember that the agenda setter receives private as well as public goods.)
(b) Use your answer to part (a), and the fact that any member who is not the agenda setter receives $\hat{y}$ if the proposal passes, to solve for $\hat{y}$. This should equal the value defined above.

(c) Show that any agenda setter prefers offering $\hat{y}$ to providing $\hat{x}$ in private goods to $\frac{N-1}{2}$ members, where $\hat{x}$ is defined as the level of private-goods provision that leaves members indifferent between receiving $\hat{x}$ and accepting the continuation payoff V. (This is probably harder. As always, setting up the problem correctly is worth partial credit.)

4. (15 points—Political transitions) Consider the following variant on the Acemoglu-Robinson model of political transitions. Initially, the political system is a democracy (D). In any period, the rich can mount a coup to force a transition to a dictatorship (N). The cost of a coup is $\kappa \in \left\{\kappa^H, \kappa^L\right\}$, where $\kappa^H < 1$ and $\kappa^L = 1$. The state-transition process is given by the following figure:



Thus, p is the probability that $\kappa = \kappa^H$ in a democracy.

The policy environment is as follows. Whoever has control rights over policy—poor in a democracy, rich in a dictatorship—chooses a tax rate $\tau \in [0, \bar{\tau}]$. *In a departure from the environment discussed in the text*, tax income is returned as a lump-sum transfer to poor citizens only. The after-tax income of any rich citizen in a democracy is therefore $(1-\tau)y^r$, whereas the after-tax income of any rich citizen in a dictatorship (exploiting the fact that the rich would always choose $\tau = 0$) is $(1-\kappa)\, y^r$, where $\kappa \in \left\{\kappa^H, \kappa^L\right\}$ is determined by the state during the coup that led to a dictatorship.

(a) Write down the Bellman equation for the rich in state $\left(D, \kappa^L\right)$.

(b) Derive the condition for the "coup constraint" to be binding when $\kappa = \kappa^H$, that is, for the rich to prefer a coup to always being taxed at the maximal rate $\bar{\tau}$.

(c) Write down the Bellman equation for the rich in state $\left(D, \kappa^H\right)$ when the poor set policy equal to some $\tau = \hat{\tau}$ whenever $\kappa = \kappa^H$ and the rich never initiate a coup.

(d) Assume that the coup constraint is binding. Derive the condition for it to be possible for the poor to avoid a coup by offering $\tau = 0$ whenever $\kappa = \kappa^H$. Explain how your result depends on parameters of the model.