Political Science 836—Fall 2016
Final Exam

There are three problems, each with multiple parts, worth 60 points total. In addition, there is one extra-credit problem, worth 6 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, please show enough of your work that I can give partial credit if necessary, but given that constraint please be as concise as possible.

Good luck!

1. (20 points—Legislative bargaining and veto players) Consider the following variant of the Baron-Ferejohn model of legislative bargaining in Section 6.1. There are three legislators, each of whom has a recognition probability of one-third. Legislator 1 is a *veto player*, meaning that she must be included in any winning coalition. Voting is by majority rule. Restrict attention to equilibria in which legislator 1, if chosen as agenda setter, chooses each of the other two legislators with equal probability to be in her coalition.

   (a) Consider first the ultimatum (one-period) version of the model, where the three legislators have identical default payoff $\bar{x} \in (0, \frac{1}{3})$.

      i. Derive V_1, the expected payoff in equilibrium for legislator 1.

      ii. Derive V_2, the expected payoff in equilibrium for legislator 2 (equivalently, legislator 3).

      iii. Discuss your results in terms of $\bar{x}$.

   (b) Now consider the infinite-horizon version of the model, where the three legislators have identical discount factor δ.

      i. Derive V_1, the expected payoff in equilibrium for legislator 1, as a function of V_2, the expected payoff in equilibrium for legislator 2 (equivalently, legislator 3).

      ii. Derive V_2 as a function of V_1.

      iii. Use your answer to the previous two parts of the problem to solve for V_1 and V_2 in terms only of δ.

      iv. Discuss your results in terms of δ.

2. (20 points—Career concerns) Consider the following modification of the career-concerns model of Section 7.2.1. As before, in each period t, voters receive utility $u_t = \theta + e_t$, where θ is a random variable that represents the competence of the officeholder in period t and e_t is the *total* effort by the officeholder in that period. Now, however, we assume that e_t is the weighted average of two components, $e_t = \beta o_t + (1 - \beta) h_t$, where o_t is effort observed by voters, h_t is effort hidden from (i.e., unobserved by) voters, and $\beta \in (0, 1)$ is a parameter of the model. Both o_t and h_t are choice variables of the office holder, who bears a cost of total effort $\frac{1}{2}(o_t + h_t)^2$ in each period t. All other elements of the model are unchanged from Section 7.2.1.

   (a) Derive the equilibrium level of observed and hidden effort in period 2. Use this to derive the condition for voters to reelect the incumbent.

   (b) Show how voters impute the competence of the incumbent based on their observed utility, the observed action o_1, and their beliefs about h_1. (Hint: Write down the expression for u_1 as a function of θ, o_1, and h_1.) Use this to derive an expression for the incumbent's reelection probability.

   (c) Derive the equilibrium choice of observed and hidden effort by the incumbent in period 1.

(d) How does period-1 effort $e_1 = \beta o_1 + (1-\beta)h_1$ depend on the relative importance of observed versus hidden effort, as measured by the parameter β? Interpret your result.

3. (20 points—Political transitions) Consider a stylized model of regime change with two players: a Right (R) party and a Left (L) party. At the beginning of the game, the Right party is in power. Assume that in every period that the Right party is in power, it chooses some policy $x \in [0,1]$, where the Right and Left parties receive payoffs from x of

$$U_R = x - 1,$$
$$U_L = -x,$$

respectively. Thus, the Right party has an ideal point of 1 and the Left party has an ideal point of 0. Each party discounts future payoffs according to the common discount factor δ.

Assume that the Right party can be removed from power only by revolution. The cost to the Left party of initiating a revolution is a random variable $\kappa \in \{\underline{\kappa}, \bar{\kappa}\}$, where $\bar{\kappa} > \underline{\kappa} > 0$. In any period in which the Right party is in power, $\kappa = \underline{\kappa}$ with probability q and $\kappa = \bar{\kappa}$ with probability $1-q$.

The cost of revolution is borne only in the period in which it occurs. Assume that $\bar{\kappa}$ is prohibitively high, so that a revolution never occurs when $\kappa = \bar{\kappa}$. If there is a revolution, then policy immediately and permanently switches to $x = 0$—that is, to the preferred party of the Left party.

(a) Draw a figure, analogous to Figure 8.5 in the text, illustrating the structure of the game described above. Let (R, κ) refer to the state when the Right party is in power and the cost of revolution is κ, and (with some notational redundancy) let L refer to the state following a revolution by the Left party.

(b) Write down the Bellman equation for the Left party in state $(R, \bar{\kappa})$.

(c) Derive the condition for the revolution constraint to be binding when $\kappa = \underline{\kappa}$, that is, for the Left party to prefer revolution to always receiving the Right party's most-preferred policy.

(d) Write down the Bellman equation for the Left party in state $(R, \underline{\kappa})$ when the Right party sets policy equal to some $x = \hat{x}$ whenever $\kappa = \underline{\kappa}$ and the Left party never initiates a revolution.

(e) Assume that the revolution constraint is binding. Derive the condition for it to be possible for the Right party to avoid a revolution by offering $x = 0$ whenever $\kappa = \underline{\kappa}$. Explain how your result depends on parameters of the model.

4. (6 points—Miscellaneous) If you have extra time, you may occupy yourself by answering the following questions. Please note that this problem is worth only 6 points total. For each question, I will provide at least partial credit for the correct answer and complete intuition.

(a) For Problem 1, how would your answer change if both legislator 1 and legislator 2 were veto players? Continue to assume that voting is by majority rule.

(b) For Problem 2, now assume that citizens receive utility equal $u_t = \theta(1 + e_t)$, where θ is a random variable, uniformly distributed on the interval $\left[1 - \frac{1}{2\phi}, 1 + \frac{1}{2\phi}\right]$; that the challenger has expected competence $E(\theta) = 1$; and that the cost of effort to the incumbent is equal to $e_t = o_t + h_t$. All other elements of the model are as in Problem 2. Repeat the analysis above.

(c) For Problem 3, now assume that the Left party is initially in power and that the Right power can seize power only by revolution. Derive the condition for it to be possible for the Left party to avoid a revolution by offering $x = 1$ whenever $\kappa = \underline{\kappa}$.