University of Chicago February 2021

APII
Problem Set 2

Instructions

Please complete the following questions in groups of no larger than 4 people. One (1) member of each group should submit the assignment to Canvas before 11:59pm on February 24. The names of all group members should be listed on the top of the assignment. Collaboration or communication with any student outside your group is not allowed.

Question 1 [6 points]

Consider the Principal-Agent model discussed in the lecture 6. Suppose that the effort exerted by the agent can take one of two values: $e \in \{\frac{1}{3}, \frac{2}{3}\}$. Also suppose that the Agent's preferences are given by $u(w, e) = 2w^{\frac{1}{2}} - e$. Leisure yields to the Agent a reservation utility $\nu = 1$. The principal's problem can have one of two outcomes: success or failure. The payoff to the Principal is 4 if the outcome is a success and 0 if the outcome is a failure. The probability of a success is $\frac{1}{3}$ if the Agent chooses the low effort and $\frac{2}{3}$ if the agent chooses the high effort.

(a) Let effort be observable. Compute the full-information wages at each effort level. What is the profit maximizing effort for the Principal? **[2 points]**

(b) Now suppose that the Principal cannot observe effort. For each effort level find output-dependent wages that induce the Agent to exert such an effort. **[2 points]**

(c) Which effort level maximizes the profits of the principal if he cannot observe effort? Which wage schedule should he set to induce the agent to exert such effort? **[2 points]**

Question 2 [4 points]

"On account of its many failures, the centralized state everywhere has lost a great deal of legitimacy, and decentralization is widely believed to promise a range of benefits... It is viewed as a way to make government more responsive

and efficient... In a world of rampant ethnic conflicts and separatist movements, decentralization is also regarded as a way of diffusing social and political tensions and ensuring local cultural and political autonomy."

Pranab Bardhan (2002, p. 185)

(a) Use concepts and/or evidence from the class to argue **in favor** of the argument in the quote (maximum $\frac{1}{2}$ page). **[2 points]**

(b) Use concepts and/or evidence from the class to argue **against** the argument in the quote (maximum $\frac{1}{2}$ page). **[2 points]**

Question 3 [6 points]

Instructions:

1. Your answer to this question must include (i) written answers to the questions (i.e. figures and descriptive text) and (ii) a zip file that includes datasets and code that opens/cleans/merges the data and produces all the outputs.

2. You can use R or Stata to answer this question.

3. Try to automatize everything in the code, as we will not be able to replicate data manipulations done manually.

3. Make sure that your code only requires an initial adjustment of the directory containing the relevant files.

4. If you are using any special packages or commands, make sure your code installs them at the beginning.

5. Make sure your code is clear and comment throughout to explain what you are doing.

To answer this question, use the *Institutions and Elections Project* dataset available here.

(a) In the IAEP dataset, the variable *lelecsystem* classifies electoral systems. Use the information from 2011 to draw a map showing the electoral system corresponding to each country in the world. Your map should have five categories: plurality, majority, proportional representation, mixed, missing. Describe your map in one paragraph (i.e. how does the distribution of electoral systems vary across continents? Can you spot any common traits across countries sharing the same electoral system?) **[2 points]**

Hint 1: When combining different datasets, be careful to ensure not to lose observations unnecessarily (countries may be named differently across datasets and country codes may also sometimes differ).
Hint 2: Here are useful resources for drawing maps in Stata and in R.

(b) In the IAEP dataset, the variable *parties* captures the number of parties with more than 5% of seats in the legislature. Use the information on *lelecsystem* and *parties* from 2011 to draw a figure showing the relationship between these two variables. Think carefully of how best to display information and try to make your figure look professional. Is the data in line with Duverger's law? Explain. **[2 points]**

(c) Combine the information from IAEP with the World Bank's data on government spending as a percentage of GDP, available here. For each country, calculate the average of government spending between 2000 and 2012. Draw a figure showing the relationship between this measure and the electoral systems in 2011. Explain what you see. Also explain why you think it is or it is not possible to consider the observed relationship as causal. **[2 points]**