Exam for the M.Sc. in Economics

University of Copenhagen

Political Economics, Fall 2013

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3 hours

Answers should be given in Danish or English

No aids allowed except Danish-English / English-Danish dictionaries

Question 1, Short Questions

a)

Explain, briefly, how a public tax-transfer system can serve both redistributive and insurance purposes. How can one empirically investigate the relative importance of redistributive and insurance motives among voters?

Example answer:

Standard models of political economy with exogenous income or exogenous abilities, including Meltzer and Richard (1981), consider voting models of redistribution, in which a median voter with lower income than the mean can get a majority for a redistributive tax scheme, tranferring resources from rich to poor. When there is a stochastic element in the generation of income, such a redistributive scheme also serves as insurance, as the unlucky will be at least partially compensated by the lucky, and in practice it can be difficult to distinguish pure redistribution from social insurance payouts as ability and effort may be unobservable.

Many models of redistribution from rich to poor would generally see income being a significant predictor of attitudes towards redistribution, while evidence of demand for insurance typically would see job risk or human capital / asset specificity predicting demand for public assistance programs. An empirical test could include both at the same time - and both or one being significant could help in discriminating among possible theoretical explanations.

b)

Consider a legislature with n members, n being odd, trying to divide a cake of size 1. A member's utility is simply the share of the cake received. Bargaining takes place over two periods. Payoff in round 2 is discounted by δ. In both periods, there is an equal chance of being recognized as proposer. We assume that

if members are indifferent, they vote in favor. If a majority approves the proposal in the first round, the game ends and the cake is divided according to the proposal. The constitution says that a second round proposal is automatically made into law.

> (i) A constitutional rule says that the second round proposer can at most get one half of the cake and that the remainder is evenly split between the non-proposers. Derive the proposal of the subgame perfect equilibrium.

Example answer:

A first round proposer needs to get a majority in order to pass his proposal. In order for non-proposers to vote for a proposal they need to get at least as much as if the game progresses to the second round. From the perspective of the first round, the expected payoff in the second round is

$$\delta\left[\frac{1}{n}\frac{1}{2}+\frac{n-1}{n}\frac{1}{2}\frac{1}{n-1}\right]=\frac{\delta}{n}$$

To build a majority, the proposer needs approval from $(n-1)/2$ other members. Thus, a first round proposer will propose

$$1-\frac{n-1}{2}\frac{\delta}{n}$$

for himself, δ/n for the $(n-1)/2$ members of his coalition, and zero for the rest. This will be passed and the game ends in period 1.

> (ii) An alternative constitutional rule says that the second round proposer gets one half, while a randomly selected non-proposer gets one half and the rest of the non-proposers get zero. Derive the proposal, compare with the first rule and comment.

Example answer:

In this case, the discounted, expected payoff in period 2 from the viewpoint of period 1 will be (technically, if we assume simultaneous draws)

$$\delta\left[\frac{1}{n}\frac{1}{2}+\frac{1}{n}\frac{1}{2}+\frac{n-2}{n}0\right]=\frac{\delta}{n}$$

which is exactly the same as above due to the linearity of the problem. Thus, from the viewpoint of the members, the two systems yield equivalent allocations even if system (ii) benefits are much more unequal in the second round, were they to be realized.

Question 2, Regression Discontinuity

The imaginary country of Atlantis has a political system where national elections are held every four years. In 1980, Atlantis changed the rules regarding these elections by introducing voting rights for citizens between 13 and 18. Specifically, children who were born on or after April 1st 1980 were allowed to vote in national elections as soon they turned 13, while children born before April 1st 1980 were not allowed to vote until they turned 18.

You have a theory that participating actively in the democratic process as a teenager makes people more likely to become politicians as adults. As a result, you are interested in empirically estimating the causal effect of voting earlier in life on the likelihood of running for political office as an adult. You have access to a data set covering all children born in Atlantis in between 1978 and 1982. The data set contains the following variables:

- R_i : The number of times child i has run for political office by the time he or she is 30 years old
- Y_i : Income for child i's parents in 1976
- F_i : The amount of money the parents spent on diapers, baby food and other baby equipment for child i
- T_i : The birthday of child i

a)

Assume that everyone who is able to vote in a given election chooses to do so. Explain how you would apply Regression Discontinuity to this data to estimate the effect of voting earlier in life on the likelihood of becoming a politician. Be as precise as you can.

Example answer:

For simplicity, normalize T_i so that children born on April 1st 1980 have $T_i = 0$. Now under the assumptions given, child i's has voted when he or she was 13-17 years old if and only if $T_i \geq 0$ so children with $T_i \geq 0$ vote earlier in life compared to those with $T_i < 0$. To use Regression Discontinuity to see whether voting earlier in life has a casual impact on the decision to run for political office, we would compare R_i for children with T_i just above 0 with R_i for children with T_i just below. In practice, we could do this in a number of ways (only one needs to be described in the answer):

- Computing the mean number of times that children born on different days have run for office, $E[R_i|T_i]$, plotting this against their birthdays, T_i, and measuring the discontinuous jump at $T_i = 0$.

- Computing difference in the mean number of times run for office between children with T_i between 0 and δ and children with T_i between 0 and $-\delta$, $E[R_i|0 \leq T_i < \delta] - E[R_i| - \delta < T_i < 0]$, for some small δ.
- Estimating the regression $R_i = \beta_0 + \beta_1 D + g(T_i) + \varepsilon_i$, where D_i is an indicator for $T_i \geq 0$ and $g(T_i)$ is a flexibly estimated smooth function of T_i (for example a fourth order polynomial). β_1 is the estimated effect of voting earlier in life.

b)

Describe in words under which assumptions the Regression Discontinuity approach described in a) would yield an unbiased estimate of a causal effect. Discuss whether these assumptions are likely to be satisfied and explain whether and how this might be tested.

Example answer:

As laid out in Lee (2008), the key assumption is whether children born just before and just after April 1st 1980 are comparable except for the differences in when they are eligible to vote. This will be the case as long as parents can not perfectly sort into the group of people whose children are eligible to vote early or sort into the group whose children are not eligible to vote early.

While it is clear that parents can influence when they have children, each familiy likely still faces considerable uncertainty regarding when precisely they manage to become pregnant as well as when exactly their child is born. Thus the assumption of imperfect sorting seems likely to hold here (in principle, one might worry about parents affecting birthday through the use of C-sections and labor inducing medication, however, these things would only allow parents to ensure that the child is born earlier thereby hurting the child's opportunity to vote early).

To test whether the imperfect sorting condition holds, we could look at whether there is any discontinuous change in the mean of parents income in 1976, Y_i, at the cut-off for early voting eligibility, $T_i = 0$. Because Y_i refers to income prior to the child's birth, it is a predetermined variable and can not respond to the change in whether children can vote early in life. A discontinuity in the mean of Y_i would therefore be evidence that there is in fact perfect sorting.

(Note that looking at discontinuities in F_i would not provide a valid test of the no sorting condition because this variable is not predetermined at the time the child is born and therefore might be affected directly by whether or not the child is eligible to vote early in life (parents might for example decide to invest more in the wellbeing of a child who can vote early because they want to make sure that the child is ready to make a good decisions early in life).)

c)

Assume that instead of children being eligible to vote at age 13 if they are *born* on or after April 1st 1980, children are eligible if they are *conceived* (if the pregnancy started) on or after April 1st 1980 as determined by the parents' doctor. Assume also that in addition to the data described in a), you have access to the data determining when each child was conceived. In particular, your data contains the variable C_i which measures the day child i was conceived.

Under these two new assumptions, how would your answers change in a) and b)?

Example answer:

In a) the variable measuring birthday, T_i, would simply be replaced by their variable measuring conception, C_i (assuming again that C_i is normalized so that $C_i = 0$ implies conception on April 1st 1980).

In b) the imperfect sorting assumption would refer to whether families are able to perfectly control the date of conception instead of the date of birth. As before, parents obviously have some control over when their child is conceived but still face considerable uncertaint regarding the exact date. An important differences, however, is that the exact date of conception is very hard to verify for outsiders and is determined by the parents' doctor. This leaves open the possibility that doctors are perfectly determining whether a given child will be eligible to vote at age 13 and may base this on characteristics of the parents (such as whether the parents are rich or whether the doctor and parents are good friends). As before, however, we could test for this type of perfect sorting by looking for a discontinuity in the predetermined variable Y_i.

d)

How would you interpret the estimated effect from the Regression Discontinuity in a) if some people who are eligible to vote choose not to do so?

Example answer:

If not all eligible children choose to vote, the group of children with T_i just above 0 will contain some children who did not vote when they were between 13 and 18 and who therefore did not necessarily vote earlier in life compared to children with T_i just below 0. In this case the estimate from our Regression Discontinuity will instead capture the effect of the child *having the possibility* of voting when aged 13-17 (this may be a very relevant interpretation if for example we are evaluating the effect of giving people the *possibility* of voting earlier).

Alternatively we might also think of interpreting our estimate through an equation like $\beta_1 = p \cdot \beta_1^*$. Here β_1 is the estimate we obtain in the Regression Discontinuity, p is the share of children that vote when aged 13-17 if they are eligible and β_1^* is the true effect of voting early in life. The equation then says

that that our estimate is equal to a fraction p of the true effect of because only a fraction p of children choose to actually vote when they are aged 13-17 (note however that the equation implicitly assumes that the effect of voting is the same for all children which is not necessarily the case).

Question 3, The Media

Refering to both theoretical models and empirical results covered in the course, discuss the following statement (write at most one page):

> *"The media plays an important role in politics by informing voters about politicians and their behavior."*

Example answer:

Things to mention:

- Political agency and principal-agent models: Knowing more things (observability) is helpful for voters. The media could make more things observable to voters by reporting on things like politicians activities while in office, the state of the economy, etc.
- Snyder and Stromberg: Using congruence between newspaper markets and congressionl voting districts as a source of exogenuous variation in the level of media coverage, Snyder and Stromberg provide empirical evidence that media coverage indeed impacts voters information about politicians as well as politician behavior while in office and actual policy outcomes
- DellaVigna and Kaplan: It is, however, also possible that the media is able to systematically bias voters beliefs and actions through their reporting if the media has their own political preferences. Studying the gradual introduction of Fox News in the US 1996-2000, DellaVigna and Kaplan, find evidence that this indeed happens in practice as Fox News impacts how many people vote Republican.