ECON 4640: Political Economics

Question 1: Citizen-Candidate Model [50%]

Consider a society inhabited by a continuum of citizens with incomes distributed uniformly between 0 and 2. Each citizen i has preferences over private consumption c and a publicly provided private good g that are given by

$$w^i = \sqrt{c^i} + \sqrt{g}.$$

The public good g is financed through a proportional income tax τ, and the government budget constraint is $\tau y = g$ where y is average income. Private consumption is $c^i = (1-\tau)y^i$.

Consider the following timing:

1. Any citizen may enter as a political candidate at a cost ε.
2. An election is held among the candidates; the candidate who gets plurality wins the election, and a tie is resolved by the toss of a coin.
3. The winning candidate selects a tax rate; if there are no candidates, then a default tax rate $\bar{\tau}$ is implemented.

Note. The mean and median of a random variable $X \sim U[a,b]$ is $(a+b)/2$.

(a) [15%] What optimal policy would a winning candidate with income y^i implement?
Answer: The most preferred tax rate of candidate with income y^i is the solution to

$$\max_{\tau} \sqrt{(1-\tau)y^i} + \sqrt{\tau y}.$$

This is solved by

$$\tau^i = \frac{y}{y+y^i},$$

which is the policy that a candidate with income y^i would implement.

(b) [15%] Suppose that $\varepsilon = 2\sqrt{\frac{1}{2}} - \sqrt{\frac{3}{4}} - \sqrt{\frac{1}{4}}$. In what region must the status quo policy $\bar{\tau}$ lie in order for the equilibrium with only the citizen with median income as candidate to exist? Note that the median income candidate must prefer implementing his/her own tax policy and paying the cost of running to accepting the outside option (i.e. default tax rate $\bar{\tau}$).
Answer: The median and mean incomes both equal 1, and the most preferred tax rate of the median income citizen is thus $1/2$. For the citizen with median income to stand candidate, it must be the case that $w^m(\tau^m) - w^m(\bar{\tau}) \geq \varepsilon$, or equivalently

$$\sqrt{\tfrac{1}{2}} + \sqrt{\tfrac{1}{2}} - \left(\sqrt{(1-\bar{\tau})} + \sqrt{\bar{\tau}}\right) \geq 2\sqrt{\frac{1}{2}} - \sqrt{\tfrac{3}{4}} - \sqrt{\tfrac{1}{4}}.$$

This holds for $\bar{\tau} \leq 0.25$ and $\bar{\tau} \geq 0.75$.

(c) [10%] Characterize the two-candidate equilibria by listing down the three conditions for its existence.
Answer: To run for office, both candidates must have some chance of winning the election. Thus the median voter must be indifferent between the two, that is:

$$\tau^1 = (1 - \tau^2) \tag{1}$$

Both candidates must also prefer to stay in the race rather than to drop out and let the other candidate win, thus:

$$w^1(\tau^1) - w^1(\tau^2) \geq \varepsilon \tag{2}$$

$$w^2(\tau^2) - w^2(\tau^1) \geq \varepsilon \tag{3}$$

(d) [10%] Describe what would happen in a two-candidate equilibrium if the median candidate would enter. How would the set of possible equilibria change if voters voted sincerely, that is, voted for the candidate that gave them highest utility.
Answer: If the median candidate enters the race, then although many voters would prefer the median voter, they would still vote for their preferred candidate among 1 and 2. The reason is that if they changed their vote in favor of the median voter, then they would cause their least preferred candidate to win.

If voters were sincere, then the most polarized platform pairs would no longer be equilibria. The reason is that with extreme platforms, a third candidate could enter in the middle and win the election.

Question 2: Money in Politics [35%]

The main regression specification in Avis et al (2020) is

$$Y_{m,2016} = \alpha + \beta \mathbf{1}\{S_{m,2012} > 142,857\} + \delta_0 \log(S_{m,2012}) + \\ \delta_1 \log(S_{m,2012}) \mathbf{1}\{S_{m,2012} > 142,857\} + \varepsilon_{m,2016}.$$

Results are presented in Table 5, reproduced below.

(a) [5%] Explain the regression equation (each variable).
Answer: $Y_{m,2016}$ is any outcome variable (whether incumbent is reelected etc), $\mathbf{1}\{S_{m,2012} > 142,857\}$ is an indicator for whether the municipality had max campaign spending higher than R$142,857 in 2012, and $S_{m,2012}$ is the max campaign spending in municipality m in 2012.

(b) [5%] Which parameter are the authors most interested in? Why and what does it mean?
Answer: β. Municipalities with $S_{m,2012} > 142,857$ have discontinuously a higher cap on campaign spending. Thus by comparing municipalities below and above this cutoff close to the cutoff, we can get the effect of higher caps.

(c) [5%] Why do they control for $\log(S_{m,2012})$?
Answer: They are interested in the difference in the outcomes for municipalities arbitrarily close to the cutoff. Just comparing the averages within a bandwidth

can lead to bias, since for example municipalites with relatively low spending in 2012 could be different than municiplaties with relatively high spending. Measured differences in outcomes could be due to these differences, and not to the different rules on campaign spending. They control linearly for $\log(S_{m,2012})$ on both sides of the threshold (allowing for differentiated slopes on either side of threshold) to be able to estimate the difference arbitrarily close to the cutoff.

(d) [5%] What does it mean that BW (bandwidth) is 0.919 in the first row?
Answer: The data used for the estimation includes municipalities with $|\log(S_{m,2012}) - \log(142,857)| \leq 0.919$. Thus (not required)

$$\log(S_{m,2012}) \in [\log(142,857) - 0.919, \log(142,857) + 0.919] = [10.95, 12.79]$$

$$\Leftrightarrow S_{m,2012} \in [56954, 358613]$$

(e) [5%] How do we interpret the coefficient 0.119 in the second row of Column (1)?
Answer: The share of incumbent reelected just above the cutoff is 11.9 percentage points higher than the share of incumbents reelected just below the cutoff.

(f) [5%] Under which condition can we interpret this as (an estimate of) the causal effect of higher caps on campaign spending?
Answer: The key assumption for identification (= RD estimate is consistent = 'unbiased' in large samples), is that the potential outcome variables are continuous around the threshold. Formally, let $Y_i(1)$ be whether incumbent i is reelected if the cap on campaign spending is high and $Y_i(0)$ be whether i is reelected if the cap is low. Let X_i denote $\log\left(S_{m(i),2012}\right)$ where $m(i)$ is the municipality of i. The identification assumption is that

$$\lim_{x \downarrow 11.87} E[Y_i(0) \mid X_i = x] = \lim_{x \uparrow 11.87} E[Y_i(0) \mid X_i = x]$$

$$\lim_{x \downarrow 11.87} E[Y_i(1) \mid X_i = x] = \lim_{x \uparrow 11.87} E[Y_i(1) \mid X_i = x]$$

where $11.87 = \log(142,857)$. In words, the first equation says that the probability of being reelected if the cap had been low in all municipalities do not jump discontinuously at $x = 11.87$. The second equation says that the probability of being reelected if the cap had been high in all municipalities do not jump discontinuously at $x = 11.87$.

(g) [5%] Do you think this condition holds? Explain.
Answer: Yes (feel free to answer no if you argue well). Such discontinuities as described in the question could happen if for instance certain municipalities are able to manipulate the max campaign spending in 2012 to be just above or below the threshold. This seems unlikely, and if it were the case we would likely see discontinuities in pre-determined characteristics of the municipalities, which we do not see (Table 2).

TABLE 5—EFFECTS OF CAMPAIGN SPENDING LIMITS ON INCUMBENTS

	Linear optimal bandwidth				With controls	Quadratic	Means
	Mean	BW	Observations	(1)	(2)	(3)	(4)
Panel A. All incumbents							
Rerun	0.616	0.919	2,325	0.057	0.061	0.050	0.029
	(0.026)			(0.031)	(0.033)	(0.050)	(0.027)
Reelection	0.227	0.607	1,596	0.119	0.121	0.111	0.102
	(0.025)			(0.040)	(0.040)	(0.043)	(0.028)
Panel B. All incumbents who rerun in 2016							
Reelection (conditional on running)	0.388	0.532	895	0.137	0.139	0.145	0.117
	(0.025)			(0.044)	(0.046)	(0.062)	(0.024)
Change in vote share	−0.107	0.831	1,367	0.017	0.052	0.048	0.049
	(0.012)			(0.017)	(0.023)	(0.030)	(0.012)
Incumbent share of spending	0.461	0.890	1,462	0.043	0.027	0.040	0.036
	(0.010)			(0.019)	(0.020)	(0.026)	(0.015)
Panel C. Incumbents with high spending in 2012							
Reelection (conditional on running)	0.377	0.504	440	0.229	0.207	0.284	0.168
	(0.052)			(0.061)	(0.059)	(0.082)	(0.032)
Change in vote share	−0.150	0.453	418	0.112	0.108	0.115	0.077
	(0.021)			(0.027)	(0.026)	(0.032)	(0.015)
Incumbent share of spending	0.468	0.534	463	0.074	0.054	0.086	0.044
	(0.020)			(0.026)	(0.026)	(0.032)	(0.019)
Panel D. Incumbents with low spending in 2012							
Reelection (conditional on running)	0.434	0.313	194	−0.060	−0.172	−0.087	−0.056
	(0.053)			(0.093)	(0.105)	(0.132)	(0.034)
Change in vote share	−0.071	0.253	147	−0.132	−0.166	−0.204	−0.039
	(0.028)			(0.033)	(0.035)	(0.050)	(0.014)
Incumbent share of spending	0.428	0.253	149	0.008	−0.024	0.002	−0.019
	(0.030)			(0.050)	(0.047)	(0.069)	(0.018)
Bandwidth	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	0.2
Polynomial order	One	One	One	One	One	Two	Zero
Municipal controls	No	No	No	No	Yes	No	Yes

Notes: Each figure in columns 1–4 reports the estimate and standard error of a separate regression. Standard errors in parentheses, clustered by party. Includes state and party fixed effects. The mean is the estimated value, based on specification (1), of the dependent variable for a municipality at the cutoff point whose spending limit is R$108,039. In panel A the sample consists of all incumbents who are not term limited. In panel B the sample consists of incumbents who choose to rerun in 2016. The sample is further restricted to incumbents with 2012 spending over R$108,039 in panel C and below this amount in panel D.

Question 3: Caps on Campaign Spending [15%]

[15%] Critically discuss the following argument made by a researcher:

> It is tempting to conclude that laws capping campaign spending reduce the influence of money on politics. This is, unfortunately, an illusion. Consider, for instance, the standard probabilistic voting model with campaign finance. The equilibrium in this model does not involve *any* donations. Still, donors can have a large influence on policies. Since the equilibrium involves no donations at all, limiting campaign spending cannot reduce the influence of money on politics. We also have no empirical evidence suggesting that stricter caps on campaign spending reduce the influence of money on election. The closest

is Avis et al (2022) who claim to show that stricter campaign spending caps lead to less wealthy winners of elections. This correlation, however, is likely driven by the fact that larger municipalities both have richer politicians and allow for more campaign spending.

Answer: Some points to discuss

1. The model from Lecture 10 indeed has no donations in equilibrium. This prediction, however, can easily be rejected by data. In (almost) all elections, candidates do receive donations. If the caps are lower than these donations it will influence the amount donated.
2. In the variation of the Lecture 10 model seen in Seminar 6, where donors move first, there are donations in equilibrium. Limiting the amount possible to spend on the campaign will reduce the influence of donations on policy as long as the equilibrium donations are higher than the cap without the limit in place. The reason is that when donations are lower the candidate is willing to give less back to the donor in terms of policy concessions. In the language of the model, if C_A is lower $W^J(\mathbf{g}^*) - W^J(\tilde{\mathbf{g}}_A)$ must be lower:
$$hC_A \geq \frac{1}{\mathcal{J}} \sum_J \left[W^J(\mathbf{g}^*) - W^J(\tilde{\mathbf{g}}_A) \right]$$
3. In the Lecture 10 model, the reason why party A favors the donor (even though the donor does not donate to A), is that the donor will fund candidate B otherwise. If the amount the donor can donate to B is little (there are strict caps on campaign spending), this threat might be less able to deter A from pursuing the socially optimal policy instead.
4. To some extent, it is true that we have no causal empirical evidence proving that stricter caps on campaign reduce the influence of money on election. The absence of evidence does, however, not imply absence of an effect. The researcher does not cite any evidence proving that caps do not reduce the influence of money on election. Thus, this point is a fair point, but not very convincing.
5. Avis et al (2022) compare municipalities around the cutoff around 70% of 2012 max spending being R$100,000. While larger municipalities probably on average had higher spending in 2012, municipalities very close to this cutoff should be equal on observable and unobservable characteristics (unless there is manipulation of the 2012 spending which seems very unlikely, especially given that observable characteristics look balanced around the cutoff). Thus the evidence found in Avis et al (2022) does not come from the fact that larger municipalities both have richer politicians and allow for more campaign spending. (Larger municipalities indeed allow for more campaign spending, but the paper does not compare large with small municipalities. It compares municipalities with on average equal size on each side of the threshold of 70% of 2012 max spending being R$100,000).