Exam for the M. Sc. in Economics
University of Copenhagen
Political Economics, Fall 2015

3 hours
Answer only in English
No aids allowed

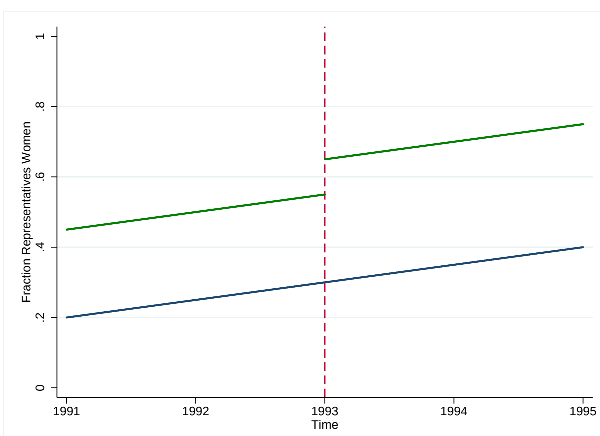
January 13th, 2016

1. a. The method is differences-in-differences. The specification is:

$$Y_{it} = \alpha + \beta_1 Treatment_i + \beta_2 After_t + \beta_3 Treatment_i * After_t + \epsilon_{it}$$

where Y_{it} is the fraction of local elected representatives who are women, $Treatment_i$ is a dummy equal to 1 if the municipality was affected by the law change, $After_t$ is a dummy indicating the period after 1993. The coefficient that captures the causal effect is β_3.

b. The identification assumption is that trends in female representation would have been the same in both treatment and control cities in the absence of treatment. As can be seen in the picture: where the green line represents treatment towns and the blue line represents control towns.



As can be seen in the picture, the trends in female representation before 1993 are parallel. Thus, the picture suggests that control town provide a good counterfactual for what the trends in female representation would have been in the treatment group.

Using the potential outcomes framework:

$$E[Y_{it}|Treatment_i = 0, t = 1] - E[Y_{it}|Treatment_i = 0, t = 0] = \beta_2$$

and:

$$E[Y_{it}|Treatment_i = 1, t = 1] - E[Y_{it}|Treatment_i = 1, t = 0] = \beta_2 + \beta_3$$

and the population differences-in-differences is:

$$\begin{aligned} &E[Y_{it}|Treatment_i = 1, t = 1] - E[Y_{it}|Treatment_i = 1, t = 0] - \\ &- \{E[Y_{it}|Treatment_i = 0, t = 1] - E[Y_{it}|Treatment_i = 0, t = 0]\} = \beta_3 \end{aligned}$$

c. The median voter model does not predict that gender quotas affect policy. Equilibrium policy in the median voter model is driven by the policy preferences of voters. Thus, as long as gender quotas do not change policy preferences, there will not be a change in policy caused by gender quotas.

d. Yes, the answer is different. Citizen-candidate models do not assume that there is policy commitment. Thus, elected candidates can choose their preferred policy. Therefore, as long as policy preferences for women and men differ, we expect to observe policy outcomes more aligned to women's preferences after gender quotas are implemented.

2. a. The method is regression discontinuity. The specification is:

$$y_i = \alpha + \beta Less100_i + f(DistanceToCutoff_i) + \epsilon_i$$

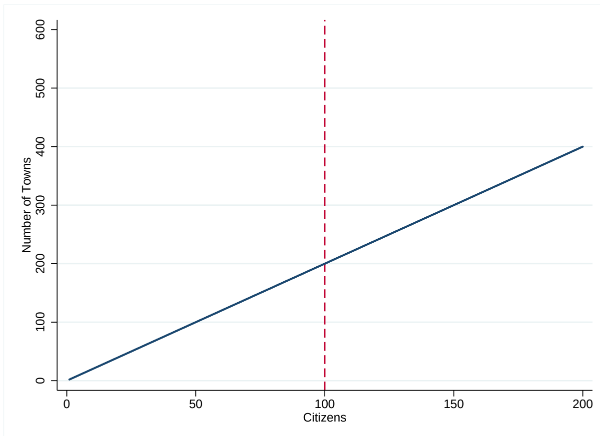
where y_i is a variable capturing public spending or local taxes. $Less100_i$ is a dummy variable indicating if the town has less than 100 inhabitants. $f(DistanceToCutoff_i)$ is a flexible polynomial capturing the functional form of the dependent variable with respect to the running variable. For instance, if we choose it to be a linear polynomial with a different slope on each side of the threshold, the specification would be:

$$\begin{aligned} y_i = \alpha + \beta Less100_i + DistanceToCutoff_i + \\ + DistanceToCutoff_i * Less100_i + \epsilon_i \end{aligned}$$

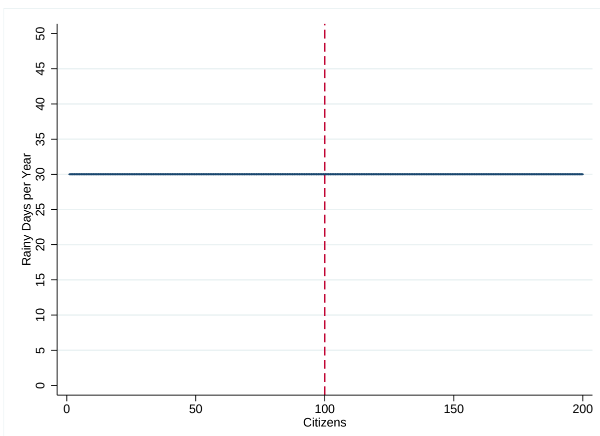
The coefficient that captures the causal effect is β.

b. The identification assumption is that there is imperfect sorting of towns across the discontinuity. That is, towns do not have perfect control on the number of citizens they have, and thus cannot position themselves on either side of the threshold.

There are two main tests that can provide evidence suggesting the identification assumptions holds. First, the distribution of towns with respect to the number of citizens living in them must be a smooth function. The following graph shows the case were the distribution is smooth across the threshold:



Second, the characteristics of the towns must the "same" right above and below the threshold. For example, we can check if the average number of rainy days is smooth across the threshold:



c. Direct democracy might be more prone to elite capture. Many decisions at the town meetings are taken by an open vote. Thus, there is no secret ballot. If the towns have very few employers, the citizens will be afraid that contradicting the views of their employers could threaten their jobs or possibilities of promotion. Note that an underlying assumption in this argument is that the elite prefers lower spending and taxation.

After the abolition of the secret ballot, in areas where there were more tenants -or inquilinos, that is, agricultural workers who depend on a landowner- there was much higher drop in voting for right-wing parties than in areas where the proportion of tenants was much lower.

Baland and Robinson argue that the lack of a secret ballot allowed landowners to control the vote of their workers. Landowners were able to offer their workers "good" enough working conditions such that they would stay working with them and accept voting for the politicians supported by the landowner. The tenants accepted such contract because their outside option -becoming urban workers or mine workers- was much worse. With the introduction of the secret ballot, the landowner could not control any more the voting behavior of his workers because it was not observable any more, and thus not contractible upon.

d. It does not invalidate an analysis based on a RDD. However, interpretation of the effects will be different. A potential story is that towns below the threshold have citizens with significantly lower education because individuals with higher education prefer to live in bigger towns. The fact that the discontinuity in education appears in the period 1987-1991, suggests that it might be a consequence of direct democracy in towns with less that 100 inhabitants. For instance, individuals with higher education might move out of towns with less than 100 inhabitants because they want higher public spending. Moreover, they might leave the towns because they do not not have time to participate in the open town meetings (higher education correlates with higher wages. Thus, they have more incentives to spend time at work rather than at the meetings). Thus, sorting of individuals across the threshold is part of the treatment effect. If the effect shows up 8 years after the law was passed could be due to frictions in the relocation process.

After 1987, if we still detect lower spending and taxation below the threshold, it cannot be considered only an effect of elite capture any more. It could also be due to the town becoming poorer (and thus losing tax base) because those citizens with higher education (and thus higher income) are leaving the town.

3. a. σ^{iJ} and δ are ideology parameters. σ^{iJ} allows voters to differ ideologically within income groups. For instance, it means that voters within the rich group can have different views regarding gay marriage, abortion, and religion. δ allows for aggregate shocks to the popularity of each party or candidate. An example of δ would be the effect that the Lewinsky scandal had on Clinton's election prospects.

b. The swing voter is the voter who, for each income group, is indifferent between parties A and B. We can refer to her as σ^J, that is, the value of σ^{iJ} that makes voter i indifferent btw parties A and B

$$W^J(g_A) = W^J(g_B) + \sigma^J + \delta$$

That is:

$$\sigma^J \equiv W^J(g_A) - W^J(g_B) - \delta$$

c. All voters in group J with $\sigma^{iJ} < \sigma^J$ prefer party A. Recall, σ^{iJ} uniformly distributed on $\left[-\frac{1}{2\phi^J}, \frac{1}{2\phi^J}\right]$. Hence the share of people in group J who vote for A is given by

$$F^J\left(\sigma^J\right) = \phi^J\left(\sigma^J - (-\frac{1}{2\phi^J})\right) = \phi^J\sigma^J + \frac{1}{2}$$

d. Party A's vote share is

$$\begin{aligned}\pi^A &= \sum_J \alpha^J\left[\phi^J\sigma^J + \frac{1}{2}\right] \\ &= \sum_J \alpha^J\left[\phi^J\left(W^J(g_A) - W^J(g_B) - \delta\right) + \frac{1}{2}\right]\end{aligned}$$

e. Probability that party A wins is

$$p_A = \Pr_\delta[\pi^A \geq 1/2]$$

$$= \Pr_\delta\left[\sum_J \alpha^J\left[\phi^J\left(W^J(g_A) - W^J(g_B) - \delta\right) + \frac{1}{2}\right] \geq 1/2\right]$$

$$= \Pr_\delta\left[\sum_J \alpha^J\phi^J\left(W^J(g_A) - W^J(g_B)\right) - \sum_J \alpha^J\phi^J\delta + \sum_J \alpha^J\frac{1}{2} \geq 1/2\right]$$

$$= \Pr_\delta\left[\sum_J \alpha^J\phi^J\left(W^J(g_A) - W^J(g_B)\right) \geq \sum_J \alpha^J\phi^J\delta\right]$$

$$= \Pr_\delta\left[\delta \leq \frac{1}{\phi}\sum_J \alpha^J\phi^J((W^J(g_A) - W^J(g_B))\right]$$

where $\phi = \sum_J \alpha^J\phi^J$ is the average density across groups.

Since δ is uniformly distributed on $\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$ we get

$$\begin{aligned}p_A &= \Pr_\delta\left[\delta \leq \frac{1}{\phi}\sum_J \alpha^J\phi^J((W^J(g_A) - W^J(g_B))\right] \\ &= \psi\left[\frac{1}{\phi}\sum_J \alpha^J\phi^J\left(W^J(g_A) - W^J(g_B)\right) - (-\frac{1}{2\psi})\right]\end{aligned}$$

or

$$p_A = \frac{1}{2} + \frac{\psi}{\phi}\left(\sum_J \alpha^J \phi^J \left(W^J(g_A) - W^J(g_B)\right)\right) \tag{3.10}$$

f. In a Nash equilibrium each party chooses policy which is optimal given the opponent's policy (best response). Party A, given g_B, chooses g_A, solving

$$\max_{g_A} p_A R = \left(\frac{1}{2} + \frac{\psi}{\phi}\left(\sum_J \alpha^J \phi^J \left(W^J(g_A) - W^J(g_B)\right)\right)\right) R$$

g. The FOC is:

$$\begin{aligned} \frac{\psi}{\phi}\left(\sum_J \alpha^J \phi^J W_g^J(g_A)\right) R &= 0 \Leftrightarrow \\ \sum_J \alpha^J \phi^J W_g^J(g_A) &= 0 \end{aligned}$$

The solution is equivalent to maximizing a weighted social welfare function, where the weights are α^J and ϕ^J. We can see in the FOC that the polician maximizes his probability of winning the election when the marginal gains in votes equal the marginal losses in votes.

h. Party B, given g_A, chooses g_B to maximize:

$$\begin{aligned} & \max_{g_B}(1 - p_A)R \\ = & \max_{g_B}\left(1 - \left(\frac{1}{2} + \frac{\psi}{\phi}\left(\sum_J \alpha^J \phi^J \left(W^J(g_A) - W^J(g_B)\right)\right)\right)\right) R \end{aligned}$$

The FOC is:

$$\begin{aligned} -\frac{\psi}{\phi}\left(\sum_J \alpha^J \phi^J W_g^J(g_B)\right) R &= 0 \Leftrightarrow \\ \sum_J \alpha^J \phi^J W_g^J(g_B) &= 0 \end{aligned}$$

The interpretation of the FOC is the same as in question g.

i. From FOC's g^S is given by :

$$\sum_J \alpha^J \phi^J W_g^J(g^S) = 0$$

Recall that:

$$W^J(g) = (y - g)\frac{y^J}{y} + H(g)$$

because everyone in group J has the same income y^J. Insert this expression into the FOC (**??**) to get:

$$\sum_J \alpha^J \phi^J \left(-\frac{y^J}{y} + H_g(g^S) \right) = 0$$

or

$$\sum_J \alpha^J \phi^J H_g(g^S) = \frac{1}{y} \sum_J \alpha^J \phi^J y^J$$

Since

$$\phi \equiv \sum_J \alpha^J \phi^J$$

we can rewrite the last expression as

$$\begin{aligned} \phi H_g(g^S) &= \frac{1}{y} \sum_J \alpha^J \phi^J y^J \\ H_g(g^S) &= \frac{1}{y} \frac{1}{\phi} \sum_J \alpha^J \phi^J y^J \end{aligned}$$

and further

$$H_g(g^S) = \frac{\tilde{y}}{y}$$

where

$$\tilde{y} = \frac{1}{\phi} \sum_J \alpha^J \phi^J y^J$$

is a weighted average of group incomes. Finally, let's express the equilibrium policy

$$g^S = H_g^{-1} \left(\frac{\tilde{y}}{y} \right).$$

j. In the median voter theorem it's the median voter the one who is influential in setting the policy. In the probabilistic voting model swing voters are the most influential ones at setting the equilibrium policy.

k. The agent who is indifferent is characterized by the following ideological bias:

$$\sigma^J \equiv W^J(g_A) - W^J(g_B) + h(C_A - C_B) - \hat{\delta}$$

or:

$$\sigma^J \equiv W^J(g_A) - W^J(g_B) - h(C_B - C_A) - \hat{\delta}$$

To find the vote share of politician A, recall that all voters in group J such that $\sigma^{iJ} < \sigma^J$ prefer A:

$$F^J\left(\sigma^J\right) = \phi^J \left(\sigma^J - (-\frac{1}{2\phi^J}) \right) = \phi^J \sigma^J + \frac{1}{2}$$

Thus, party A's vote share is

$$\begin{aligned}
\pi^A &= \sum_J \alpha^J \left[\phi^J \sigma^J + \frac{1}{2}\right] \\
&= \sum_J \alpha^J \left[\phi^J \left(W^J(g_A) - W^J(g_B) - \hat{\delta} + h(C_A - C_B)\right) + \frac{1}{2}\right]
\end{aligned}$$

Probability that party A wins is

$$p_A = \Pr_\delta[\pi^A \geq 1/2]$$

$$= \Pr_\delta\left[\sum_J \alpha^J \phi^J \left(W^J(g_A) - W^J(g_B)\right) - \sum_J \alpha^J \phi^J \hat{\delta} + \sum_J \alpha^J \phi^J h(C_A - C_B) + \frac{1}{2} \geq 1/2\right]$$

$$= \Pr_\delta\left[\hat{\delta} \leq \frac{1}{\phi}\left(\sum_J \alpha^J \phi^J (\left(W^J(g_A) - W^J(g_B)\right) + \sum_J \alpha^J \phi^J h(C_A - C_B)\right)\right]$$

where $\phi = \sum_J \alpha^J \phi^J$ is the average density across groups. Thus:

$$p_A = \frac{1}{2} + \frac{\psi}{\phi}\left(\sum_J \alpha^J \phi^J \left(W^J(g_A) - W^J(g_B) + h(C_A - C_B)\right)\right)$$

l. The objective function is:

$$p_A W^J(g_A) + (1 - p_A) W^J(g_B) - \frac{1}{2}(C_A^J + C_B^J)^2$$

Taking the FOC with respect to C_A^J and C_B^J:

$$C_A^J : \psi h \alpha^J (W^J(g_A) - W^J(g_B)) - (C_A^J + C_B^J) \leq 0$$

$$C_B^J : -\psi h \alpha^J (W^J(g_A) - W^J(g_B)) - (C_A^J + C_B^J) \leq 0$$

If $W^J(g_A) < W^J(g_B)$, the first derivative is negative. Therefore, the optimal contribution of group J to politician P is:

$$C_P^J : \max\{0, \psi h \alpha^J (W^J(g_P) - W^J(g_{P'}))\}$$

It is never optimal to finance both politicians. The politician who gives group J the highest welfare will be the only funded by J.