Political Economics - Lecture notes

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Abstract.

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This is my lecture notes for the course *political economics* taught at the Department of Economics at the University of Copenhagen. I've written these notes as a student, and as such some of the material might be wrong. If you find any mistakes please create an issue on github and i will correct it.

1 Lecture 1 - Introduction

This course is about political *economics*, i.e. studying how political systems affect outcomes. The course is not about political *economy* which is the old-school Marx/Smith economics. Also this course is not about international political economics, which is concerned with the functions of international organizations and regimes.
What we want to do is to understand and explain differences and similarities in economic policy across time, varying political regimes and geography.

1.1 Political preferences and majority voting (the median voter model)

The median voter model is a workhorse of the field, and we will use it throughout the course. In it we assume that policy is determined by simple majority voting.
Consider a society with N agents, who each have quasi-linear utility w^i of consumption c^i and leisure x^i such that

$$w^i = c^i + V(x^i), \quad V' > 0, V'' < 0 \tag{1.1}$$

Individuals are all taxed by some fixed share $(1-q)$ of their income l^i, and in return receive a fixed transfer f, meaning we can write an individuals budget constraint as

$$c^i = (1-q)l^i + f \tag{1.2}$$

Normalizing the wage to 1 across all individuals we can simply read l^i as the labor supply. A simple way to introduce agent heterogeneity with singular wages is to let the available time for labor be heterogeneous, so instead of having $1 = l^i + x^i$, i.e. total time is fully spent either on labor or leisure we induce some variation in the total time available α^i

$$1 - \alpha^i = l^i + x^i \tag{1.3}$$

We denote the mean of α^i's in the population by α and the median by α^m.

1.1.1 Agent maximization problem

From the perspective of a single agent the tax rate q is fixed, so they simply solve

$$\begin{aligned} &\max_{l^i} c^i + V(x^i) \\ &\quad \text{s.t. } c^i = (1-q)l^i + f \\ &\quad \text{and } 1 - \alpha^i = l^i + x^i \end{aligned} \tag{1.4}$$

Inserting the constraints and taking the derivative w.r.t l^i we get a first order condition of

$$(1-q) = V'(1 - \alpha^i - l^i) \tag{1.5}$$

That is agents choose their labor supply to balance the net income gain from supplying an additional unit of labor with the marginal increase in utility from having one more unit of leisure. Isolating the labor supply we find that

$$\begin{aligned} l^{i*} &= 1 - \alpha^i - V'^{-1}(1-q) \\ &= 1 - \alpha^i - V'^{-1}(1-q) - \alpha + \alpha \\ &= L(q) - (\alpha^i - \alpha) \end{aligned} \tag{1.6}$$

where $L(q) \equiv 1 - \alpha - V'^{-1}(1-q)$ can be shown to be the average labor supply in the population (in equilibrium). To see this notice

$$l \equiv \frac{1}{N}\sum_{i=1}^{N} l^i = \sum_{i=1}^{N} \left[L(q) - (\alpha^i - \alpha)\right] = L(q) \tag{1.7}$$

1.1.2 Indirect utility

Let us assume that the government runs a balanced budget, meaning the transfer individual must be equal to the taxes raised from the average individual, that is

$$f = qL(q) \tag{1.8}$$

The indirect utility of an agent is then utility which is achieved by optimally setting the labor supply given q, put intuitively: now we know how agents behave for any given q and we know how the government sets q, so we can write the indirect utility each agent gets for any choice of q:

$$\begin{aligned} W(q, \alpha^i) &= c^i + V(x^i) \\ &= (1-q)l^i + f + V(1 - \alpha^i - l^i) \\ &= (1-q)\underbrace{\left[L(q) - (\alpha^i - \alpha)\right]}_{\text{optimal } l^i \text{ given } q} + \underbrace{qL(q)}_{\text{GBC}} + \underbrace{V(1 - L(q) - \alpha)}_{\text{insert } l^{i*}} \end{aligned} \tag{1.9}$$

This expression shows us how each agents utility will be in optimum given some q and some preferences $V(\cdot)$. Now in an election individuals recognize that they should not simply vote for the q that optimizes their utility given static labor supply, instead they should vote for the q that yields the highest utility after making changes to ones labor supply. The policy which satisfies

$$q(\alpha^i) = \arg\max_q W(q, \alpha^i) \tag{1.10}$$

is called the *bliss point* of agent i, as this is the ideal choice of policy for this agent. In general this will depend on α^i (imagine someone with $\alpha^i = 1$, they have no change of earning labor income and might as well prefer a very high q).

1.2 Majority rule voting

Now knowing how each individual would prefer the tax rate to be set we need a way to aggregate individual wishes into a single global tax rate which applies to everyone. One option is to implement pure majority voting, that is a system with

1. Direct democracy, whatever citizens vote for will be the outcome.
2. Sincere voting, agents vote for the policy that is their bliss point (no strategic voting).
3. Open agenda voting, for all possible pairs q_1, q_2 citizens vote for their prefered option untill all combinations have been tried against each other.

This naturally is not exactly how democracies work, but it serves as a useful framework for modelling the dynamics at play in voting systems.

Arrows imposibility theorem Arrows impossibility theorem states that there is three or more choices for voters to choose from, no ranked voting system (i.e. majority voting) can convert individual votes into a community choice which fulfils

1. Unrestricted domain: all preferences are allowable, there is no requirement for consistency in policy preferences.
2. non-dictatorship: Voters actually matter for the final choice (it is not simply a benevolent social planner who chooses the best option).
3. Pareto efficency: there is no pareto improvements to be made.
4. Independence of irrelevant alternatives: if some given policy is prefered, it should still be prefered in an election with only a subset (including q) of the options available.

Condorcet winners Without any restriction on the election it is possible to have condorcet cycles, which is essentially a set of preferences that is cyclic over some set of alternatives, so $a > b$, $b > c$ and $c > a$ would constitute a condorcet cycle.
A *condorcet winner* on the other hand is a policy q^* which can beat any alternative q in a pairwise vote of (q^*, q). It can be shown that under majority voting, with $q \in \mathbb{R}$ a condorcet winner exists if voters preferences are single peaked, that is if

$$q'' \leq q' \leq q(\alpha^i) \text{ or } q'' \geq q' \geq q(\alpha^i) \Rightarrow W(q'', \alpha^i) \leq W(q', \alpha^i) \tag{1.11}$$

This equation essentially states that for each individual the indirect utility is monotonically decreasing on both sides of $q(\alpha^i)$. This assumption is strong - it is the indirect utility that must behave nicely, not the direct utility. The condorcet winner will furthermore be equal to the median voters prefered policy q^m. To see this see that any $q' < q^m$ will have support from less than half the population and so q^m would win in a pairwise vote. This argument is then identical for $q' > q^m$.

Returning to the indirect utility derived in (1.9) we can show that this does not satisfy single peakedness as defined in (1.11) for sufficiently large $\frac{\partial^2}{\partial q \partial q} L(q)$. To see this note that a positive second derivative corresponds to an graph that is convex implying at least no equilibrium, or of this property is only piecewise that there are multiple equilibria. The second derivative is straight forward to derive as

$$\frac{\partial^2}{\partial q \partial q} = (1 + V'(\cdot))L''(q) + V''(\cdot)L'(q)^2 \tag{1.12}$$

By assumption $V' > 0$ and $V'' < 0$ so we loose single peakedness when the first term is larger than the second, or with a bit of rearranging:

$$L''(q) > \frac{V''(\cdot)}{1 + V'(\cdot)} L'(q)^2 \tag{1.13}$$

Single crossing preferences An alternative to the single peaked preferences assumption is to assume the *single crossing* property. This is different form single peakedness as it not only involves assumptions about the shape of individual agents utility functions, but makes assumptions about the distribution of voter types, specifically assume $\alpha^i \in \upsilon$ where υ is some set of voters. The single crossing property is then that if

$$\begin{aligned} &(\alpha^i < \alpha^{i'} \text{ and } q > q') \text{ or } (\alpha^i > \alpha^{i'} \text{ and } q < q') \\ &\text{then } W(q, \alpha^i) \geq W(q', \alpha^i) \Rightarrow W(q, \alpha^{i'}) \geq W(q', \alpha^{i'}) \end{aligned} \tag{1.14}$$

That is, if we consider two agents and two possible policies such that a) the "stronger" agent prefers the highest tax or b) the "weaker" agent prefers the lower tax, then we can infer that a) the "weaker" agent also prefers the highest tax or b) The "stronger" agent also prefers the lower tax. In other words relatively more extreme individuals prefer policies that are also more extreme. Notice how this is an assumption on the distribution of preferences across α^i's while single-peakedness was an assumption about the individual preferences for a given α^i. When individuals satisfy the single crossing asusmption the median policy q^m will be the condorcet winner and equilibrium policy.

Proof that single crossing leads to q^m: Think of the median type α^m who naturally has prefered policy q^m. Any $q < q^m$ will be dismissed by α^m and any agents with $\alpha^i > \alpha^m$ giving a majority to q^m. Likewise for any $q > q^m$.
We can show that the expression in (1.9) does satisfy the single crossing property in (1.14). To see this notice that when adding and subtracting $(1 - q)\alpha^i$ to (1.9) we get

$$\begin{aligned} W(q, \alpha^{i'}) &= L(q) - V(1 - L(q) - \alpha) - (1 - q)(\alpha^{i'} - \alpha^i) - (1 - q)(\alpha^i - \alpha) \\ &= W(q, \alpha^i) - (1 - q)(\alpha^{i'} - \alpha^i) \end{aligned} \tag{1.15}$$

So consider a case where individual $\alpha^{i'}$ prefers q to q', i.e.

$$W(q, \alpha^{i'}) \geq W(q', \alpha^{i'}) \tag{1.16}$$

From the rewrite in (1.15) this directly implies

$$W(q, \alpha^{i}) - (1-q)(\alpha^{i'} - \alpha^{i}) \geq W(q', \alpha^{i}) - (1-q')(\alpha^{i'} - \alpha^{i}) \tag{1.17}$$

Rearanging we then have

$$W(q, \alpha^{i}) \geq W(q', \alpha^{i}) - (q'-q)(\alpha^{i'} - \alpha^{i}) \tag{1.18}$$

Now notice that if $(q'-q)(\alpha^{i'} - \alpha^{i}) \geq 0$ we have shown that $W(q, \alpha^{i'}) \geq W(q', \alpha^{i'})$ implies $W(q, \alpha^{i}) \geq W(q', \alpha^{i})$. Since $(q'-q)(\alpha^{i'} - \alpha^{i}) \geq 0$ is logically identical to the requirements posed in the single crossing definition, and the implication is exactly what the single crossing property entails, we have shown that our model does have the single crossing property.

1.3 Reflections on the median voter theorem

Everything above relies on the policy being single dimensional, which is probably a poor fit for the real world. However we could consider this single dimension to not be as conrete as a tax rate, but rather a "left-right" leaning, in which case one could argue for some kind of single-dimensionality. Without a single dimensional policy, it is however not generally possible to find a condorcet winner.

2 Lecture 2 - Electoral competition I

In this lecture we will begin studying a model of electoral competition, that is a model for how politicians propose platforms in the competition to be elected. We consider two party competition where there is one policy objective (e.g. the size of the public sector) and politicians are opportunistic i.e. they have only one goal, which is getting elected. Politicians must commit to a proposal before the election and must provide this policy after being elected (this doesn't matter to much when their only goal is getting elected).

Model setup Consider a continuum of citizens with quasi-linear utility from consumption c_i and a public good g so

$$w^i = c^i + H(g) \tag{2.1}$$

Individuals are taxed and accordingly have a budget constraint of

$$c^i = (1-\tau)y^i \tag{2.2}$$

Here y^i is distributed according to $F(\cdot)$ so that $E[y^i] = y$, the median income is y^m so $F(y^m) = 1/2$ and we assume that $y^m < y$ implying a right skewed distribution of income.
The government earns taxes τ and uses these to provide the public good g so

$$g = \int \tau y^i f(y^i)\ dy^i = \tau y \tag{2.3}$$

The *indirect utility* can then be found by inserting the governments budget constraint in (2.1):

$$\begin{aligned} W^i(g) &= \left(1 - \frac{g}{y}\right) y^i + H(g) \\ &= (y-g)\frac{y_i}{y} + H(g) \end{aligned} \tag{2.4}$$

This equation shows the central tradeoff in the model, namely that individuals gain utility from increasing g but then face paying a higher tax reflected in the fact that higher g decreases the utility from private consumption. The loss of private consumption is more costly for individuals with a higher income.

Prefered policy We can solve for an agents preferred policy by maximizing the indirect utility w.r.t. g,

$$\frac{\partial W^i}{\partial g} = -\frac{y^i}{y} + H_g(g) \qquad (= 0) \tag{2.5}$$

where H_g is the derivative of H w.r.t. g. Solving for g shows that the individuals optimal policy level is

$$g^i = H_g^{-1}\left(\frac{y^i}{y}\right) \tag{2.6}$$

By assumption H is strictly concave and since the first term in W^i is linear, we can infer that this too is strictly concave. This in turn tells us that *preferences are single peaked* in this model. By this logic we can also infer that H_g^{-1} is decreasing in y^i. So higher income individuals prefer less of the public good, intuitively this is because high income implies a large marginal cost of increased taxes, while the marginal benefit of g is identical across all individuals.

2.1 A benchmark for election performance

Before we study how elections affect the choice of g, let's first consider what level a benevolent social planner (i.e. a good dictator) would choose. The utilitarian welfare function is simply

$$SWF^U = \int_{y^i} W^i(g) f(y^i) y^i \tag{2.7}$$

i.e. the aggregated indirect utility over all individuals. Inserting in this equation we can simplify the expression quite a bit

$$\begin{aligned} SWF^U &= \int_{y^i} \underbrace{\left((y-g)\frac{y^i}{y} + H(g)\right)}_{W^i(g)} f(y^i)\ dy^i \\ &= W(g) \end{aligned} \tag{2.8}$$

where $W(g)$ is the average indirect utility, or equivalently the indirect utility of the individual with $y^i = y$. The social planner accordingly would provide a level of g equal to

$$g^* = H_g^{-1}(1) \tag{2.9}$$

which is simply (2.6) evaluated for the average voter (we get the 1 from dividing y/y).

2.2 Downsian electoral competition

Now instead of a social planner let us consider a situation where there is held an election for the political position to choose g. There are two parties $P = A, B$ and the probability that candidate P wins the election we denote p_P. Candidates receive an "ego-rent" R from holding office and get 0 if they loose, consequentially they seek to maximize $p_P \cdot R$. The share of votes each candidate receive we denote π_P, and using this we can write p_A and p_B as

$$\begin{aligned} p_A &= Pr[\pi_A > 1/2 | g_A, g_B] \\ p_B &= 1 - p_A \end{aligned} \tag{2.10}$$

Once again we assume that voters vote sincerely. The proposals g_A, g_B are announced before the election.

Simple example Let us first assume that all voters have the same income so $y^i = y$ and $W^i(g) = W(g)$ for all i. In this case

$$p_A = \begin{cases} 1, & \text{if } W(g_A) > W(g_B) \\ 1/2, & \text{if } W(g_A) = W(g_B) \\ 0, & \text{if } W(g_A) < W(g_B) \end{cases} \tag{2.11}$$

and of course $p_B = 1 - p_A$. In this case there is an unique Nash equilibrium where $g_A = g_B = g^*$. To see this notice that g^* maximizes $W(g)$ by definition. Any deviation from this level by either candidate will therefore immediately set $p_P = 0$ which gives the politician utility $0 < \frac{1}{2}R$. In this case we can thus say that political competition induces politicians to propose good policies.

Adding variation in y^i Now let us assume that $y^i \sim F(y^i)$. Because voters preferences are single peaked we know from the median voter theorem that the median voters preferred policy will be a condorcet winner and have majority support. Therefore we now have

$$p_A = \begin{cases} 1, & \text{if } W^m(g_A) > W^m(g_B) \\ 1/2, & \text{if } W^m(g_A) = W^m(g_B) \\ 0, & \text{if } W^m(g_A) < W^m(g_B) \end{cases} \tag{2.12}$$

Where W^m is the indirect utility of the median voter. Following a similar argumentation as before the Nash equilibrium will therefore be for both politicians to propose $g_A = g_B = g^m$.
Now because of the skewness in the income distribution we have that $y^m/y < 1$. Because H_g^{-1} is decreasing this implies

$$g^m = H_g^{-1}(y^m/y) > H_g^{-1}(1) = g^* \tag{2.13}$$

which is to say with varying income politicians propose a higher level of g than what is optimal. This is because every voters vote counts equally so politicians can disregard the fact that taxation is extremely costly to those with the highest income. The social planner on the other hand takes this into account. This model gives us a testable prediction, which is that a more skewed income distribution should produce larger public sectors.

Voters vs. tax payers Notice that politicians only care about the part of their population that is eligible to vote. So the relevant measure of y^m should be calculated only within the voters. Notice that y should be calculated within the full population as this enters the equations through the taxes, which we assume you must pay regardless of your voting status. If some of the population is not eligible to vote we have to take this into account. One way to test the consequences of a more skewed distribution is thus to consider changes to voter eligibility laws which allow poor people to vote. These purely affect y^m while leaving y unaffected.

2.3 Beyond the median, Gerber and Lewis (2004)

The paper by Gerber and Lewis gather data from 2.8 million individuals votes from Los Angeles county in the 1992 general election. The data contains information on individuals voters choices in elections on all levels and includes votes on concrete policy proposals. From these data they estimate a county-level distribution of voters policy preferences. This lets the authors infer the policy position of the median candidate in each district.
The authors also measure politicians behavior in whatever chamber they are elected to. This allows them to estimate the position on the liberal-conservative axis of each politician (both elected in LA and not).

With these informations the authors can ask whether the position of the median voter in the local district affects the position of politicians. According to the median voter theorem politicians should vote in accordance with their local median voter, but it is obvious that peer and party effects can be competing explanations. The authors regress the preferred policy of LA politicians on the local median voters position as well as the median position of the own-party delegation in whatever chamber the politician has been elected to.

The authors also investigate the role of district heterogeneity by interacting the median voters preferred policy with the variance of voters positions within the district.

The authors find a significant role of median voters preferences *in districts with homogeneous voters*. In heterogeneous districts this effect doesn't seem to exist to nearly the same degree. The authors also find evidence from peer effects in political stances.

3 Lecture 3 - Electoral competition II

So far we've studied a version of the downsian model with full policy convergence which implies that the median voter theorem also applies to representative voting democracies. This has revealed an important mechanism which forces politicians to run on popular platforms, often called the *affect* mechanism.

There are however good arguments against the downsian model. First of it's conclusions are mainly based on the discontinuity in probability of winning, disregarding any uncertainty about voters preferences. Additionally the model must obviously be incomplete, as other things than the preferences of the median voter surely must matter to some degree.

3.1 Probabilistic voting

We will now relax the assumption about perfect information about voters preferences. We do this by introducing a candidate specific trait (e.g. ideology) which voters have preferences about. Importantly we assume uncertainty on the distribution of voter preferences with regards to this dimension.

We depart from exactly the same point as last time, so the modelling framework is identical. This time however we assume there are three population groups $J = R, M, P$. Within groups income is identical at y^J and they therefore also have the same indirect utility function W^J. Each groups share of the total population is given by $\alpha^J = \alpha^R, \alpha^M, \alpha^P$, and we assume that $y^R > y^M > y^P$. The average income in the population is

$$y = \sum_J \alpha^J y^J \tag{3.1}$$

The voters care about g as well as ideology, captured by the two bias-parameters σ^{iJ} and δ which capture bias in direction of candidate B (w.l.o.g.). Thus voters in group J prefer candidate A iff

$$W^J(g_A) > W^J(g_B) + \sigma^{iJ} + \delta \tag{3.2}$$

We assume that

$$\sigma^{iJ} \sim U\left(\frac{-1}{2\phi^J}, \frac{1}{2\phi^J}\right) \qquad \delta \sim U\left(\frac{-1}{2\psi}, \frac{1}{2\psi}\right) \tag{3.3}$$

The bounds of the distributions are simply chosen to simplify calculations. The important parts are that a) bias parameters are equally likely to be positive or negative, so the bias can be both in favor and disfavor of candidate B with equal probability. And b) a higher ϕ^J (or ψ) implies more moderate voters, in the sense their votes are less likely to be tilted by ideology.
In this setup σ^{iJ} measures varying degrees of ideological focus within each income group, while δ measures an aggregate bias across the whole population, e.g. from scandals, campaigning etc.

Probability of winning The parties want to maximize the probability of winning. Notice first that within each group J we can identify the swing voter by the σ^{iJ} that solves the equation in (3.2) with equality, that is the swing voter will have

$$\sigma^J \equiv W^J(g_A) - W^J(g_B) - \delta \tag{3.4}$$

As all voters in J with $\sigma^{iJ} < \sigma^J$ will vote for candidate A. Since σ^{iJ} is uniformly distributed we can calculate the share that votes for candidate A as[1]

$$\begin{aligned} F^J(\sigma^J) &= \frac{\sigma^J + (2\phi^J)^{-1}}{2(2\phi^J)^{-1}} \\ &= \phi^J\left(\sigma^J + \frac{1}{2\phi^J}\right) \\ &= \phi^J\sigma^J + \frac{1}{2} \end{aligned} \tag{3.5}$$

Aggregating this vote share over all three groups we then find

$$\begin{aligned} \pi_A &= \sum_J \alpha^J\left(\phi^J\sigma^J + \frac{1}{2}\right) \\ &= \sum_J \alpha^J\left(\phi^J(W^J(g_A) - W^J(g_B) - \delta) + \frac{1}{2}\right) \end{aligned} \tag{3.6}$$

This expression is continuous and we have thus been able to alleviate the discontinuous nature of the simple model by introducing the stochastic preferences for ideology. Now candidate A wins whenever $\pi_A \geq 1/2$, which happens with probability p_A. This probability is w.r.t δ which is the final stochastic term we haven't done anything with yet. We can write

$$\begin{aligned} p_A &= Pr[\pi^A \geq 1/2] \\ &= Pr\left[\sum_J \alpha^J\left(\phi^J(W^J(g_A) - W^J(g_B) - \delta) + \frac{1}{2}\right) \geq 1/2\right] \\ &= Pr\left[\sum_J \alpha^J\phi^J\left(W^J(g_A) - W^J(g_B)\right) \geq \sum_J \alpha^J\phi^J\delta\right] \\ &= Pr\left[\delta \leq \frac{1}{\sum_J \alpha^J\phi^J}\sum_J \alpha^J\phi^J\left(W^J(g_A) - W^J(g_B)\right)\right] \end{aligned} \tag{3.7}$$

where the third step can be reached by writing out the sum in additive parts, and seeing that $\sum_J \alpha^J\frac{1}{2} = \frac{1}{2}$. Now using the distribution of δ we have that

$$\begin{aligned} p_A &= \psi\left[\frac{1}{\sum_J \alpha^J\phi^J}\sum_J \alpha^J\phi^J\left(W^J(g_A) - W^J(g_B)\right) - \left(-\frac{1}{2\psi}\right)\right] \\ &= \frac{1}{2} + \frac{\psi}{\phi}\sum_J \alpha^J\phi^J\left(W^J(g_A) - W^J(g_B)\right) \end{aligned} \tag{3.8}$$

where $\phi \equiv \sum_J \alpha^J\phi^J$. Once again here we are reaffirmed that this model does not feature the discontinuous jump we had in the simple model.

Politicians proposed *g* Having derived the probability of winning we can now find a Nash equilibrium between the two politicians. Assume like before that each of them gets a rent from holding office R, so the best response function of party A is to maximize $p_A \cdot R$, i.e.

$$\max_{g_A} p_A \cdot R \tag{3.9}$$

[1] Recall in the uniform distribution on $[a, b]$, $F(x) = \frac{x-a}{b-a}$

which has first order condition

$$\frac{\psi}{\phi}\left(\sum_J \alpha^J \phi^J W_g^J(g_A)\right) \cdot R = 0 \tag{3.10}$$

Clearly this expression is only 0 when $\sum_J \alpha^J \phi^J W_g^J(g_A) = 0$. This expression represents the best response of A given some fixed g_B. In a parallel way we can solve the best response of party B given any g_A. This is the solution to

$$\max_{g_B} \ (1 - p_A) \cdot R \tag{3.11}$$

Taking the derivative of this w.r.t g_B will quite easily yield a similar expression to the one for g_A, namely $\sum_J \alpha^J \phi^J W_g^J(g_B) = 0$. Now since these two equations are symmetric the solutions must be as well, so we can conclude that $g_A = g_B = g^S$ where g^S is simply shorthand for the symmetric equilibrium policy.

The problem politicians solve is essentially maximizing a weighted social welfare function, where both population shares α^J and ideological parameters ϕ^J are important. In particular a higher ϕ^J implies less ideological dispersion in group J and this in turn implies a higher weight to this groups preferences W^J. The intuition in this is that for highly ideological groups (low ϕ) changes in g are less important for tipping votes, meaning it requires large changes in proposed g to gain additional votes in these groups. If a group is moderate (high ϕ^J) g is important in determining what they vote and many voters will flip if g is modified.

Equilibrium policies In equilibrium the implemented g will be one which solves

$$\sum_J \alpha^J \phi^J W_g^J(g^S) = 0 \tag{3.12}$$

Recalling the definition of W^J from (2.4) we have that $W_g^J = -\frac{y^J}{y} + H_g(g)$ which we can insert in the FOC above to get

$$\begin{aligned} \sum_J \alpha^J \phi^J \left(-\frac{y^J}{y} + H_g(g^S)\right) = 0 \qquad \Leftrightarrow \\ \sum_J \alpha^J \phi^J H_g(g^S) = \frac{1}{y} \sum_J \alpha^J \phi^J y^J \end{aligned} \tag{3.13}$$

using once again that $\phi \equiv \sum_J \alpha^J \phi^J$ and defining $\tilde{y} = \frac{1}{\phi}\sum_J \alpha^J \phi^J y^J$ which is essentially a weighted average of group incomes, we can rearrange to derive

$$H_g(g^S) = \frac{\tilde{y}}{y} \tag{3.14}$$

as a characteristic of the equilibrium, from which we can directly derive the equilibrium strategy as being

$$g^S = H_g^{-1}(\frac{\tilde{y}}{y}) \tag{3.15}$$

This is immediately similar to the result we derived in the simple case. Now notice that if either α^J or ϕ^J increases $\tilde{y}$ will move closer to y^J, meaning politicians will propose policies that are more favorable to that group of voters.

In this model we have a single policy dimension and single peaked preferences, so the median voter theorem tells us that a condorcet winner exists, and this is equal to the median voters preferred policy $g^m \neq g^S$. The inequality might seem odd, but recall that the median voter theorem addresses the existence of a condorcet winner, it does not state that this will be the implemented policy.

Reflections on testing model predictions The central prediction of this new model is that politicians align their policies with large and moderate voter groups. One way to get good variation in the population groups is to study changes in voter eligibility legislation which at an instant changes the relative sizes of voting groups, although one could argue that changes in voters legislation is endogenous to the political process. To get variations in the voter heterogeneity one could consider cases where voting district boundaries are redrawn.

3.2 On the vote-purchasing behavior of incumbent governments, Dahlberg and Johansson (2002)

The central question posed in Dahlberg and Johansson (2002) is whether incumbent government use their position to increase spending in districts with many swing voters as the probabilistic voting model suggests (or in districts with many party supporters, as suggested by alternative theories). They find that the number of swing voters increase the likelihood of getting the grant; evidence that incumbent politicians does use grants to target swing voters.
To show this they use a special Swedish grant administered by the central government to municipalities in 1997. The nature of the grant is suitable to study their question because, unlike most other government funding, there are no clearly stated purpose of the funds (except for furthering "ecological" development, which was a quite new idea in 1997). The grant was awarded close to an election further increasing the incentive to misuse the grant.

The authors regress a binary variable for a municipality getting the grant on two variables indicating there are many swing voters in a municipality: a) an estimate of the density of "cutpoint voters" (voters close to σ^J) and b) the vote difference between blocs in the previous election (small distance$\Rightarrow$close election). The authors find evidence that many swing voters does increase the probability of getting the grant, while the number of core voters does not. These findings are in line with the probabilistic voting model.

Another piece of evidence is from Strömberg (2004) which investigates the distribution of New Deal relief funds throughout the USA in the period after the great depression. Strömberg finds evidence that the number of radio listeners in a county increased the amount of funds received while controlling for county poverty and unemployment. This indicates politicians target "well informed" counties, suggesting this too is an example of spending targeted at areas with non-ideological voters (the reasoning is that radio access gives people information about g, making it more important than σ).

4 Lecture 4 - Redistributive politics I

In this and the next lecture we will shift to another important question, namely what determines the level of redistribution in society, and why this differs so much across time and countries. In this section we discuss the Meltzer-Richard model. This is a classical economists model which assumes rational voters with their own utility in mind when they vote. Naturally this approach yields a conclusion along the lines of an income-based theory for preferences to redistribution in which the relative income determines ones preferences for redistribution. Combining this with the median voter theorem, the difference between mean and median income becomes important for determining the level of redistribution.

Model setup The model setup follows the one in section 1, voters occupy a continuum and each has utility $w^i = c^i + V(x^i)$ subject to the budget constraint $c^i = (1-\tau)l^i + f$ and the time constraint $1 + e^i = l^i + x^i$[2]. $e^i \sim F(\cdot)$ with mean e and median e^m. Just like in section 1 we can solve the voters utility maximization by inserting the constraints in the utility and maximizing w.r.t l^i.

[2] Here we add e^i, in section 1 we subtracted α^i so the sign is flipped.

Once again we can derive a FOC of $l^i = 1 + e^i - V_x^{-1}(1-\tau)$ and we can define the average labor supply of the average individual as

$$L(\tau) = 1 + e - V_x^{-1}(1-\tau) \tag{4.1}$$

implying the FOC can be rewritten $l^i = L(\tau) + (e^i - e)$. The government follows a budget constraint $f = \tau l = \tau L(\tau)$ and the indirect utility is then given by

$$W^i(\tau) = L(\tau) + (1-\tau)(e^i - e) + V(1 - L(\tau) + e) \tag{4.2}$$

Taking the derivative of this and setting equal to 0 we can then solve for τ to derive the individuals bliss point τ^i, first take the derivative

$$\frac{\partial W^i}{\partial \tau} = L_\tau(\tau) - (e^i - e) - V'(1 - L(\tau) + e)L_\tau(\tau) \tag{4.3}$$

From the FOC we have that in equilibrium $V'(1 - L(\tau) + e) = 1 - \tau$. Using this and rearranging gives us the bliss point

$$\tau^i = \frac{e - e^i}{-L_\tau(\tau)} \tag{4.4}$$

Since $L_\tau(\tau) < 0$ this expression is decreasing in e^i. For all individuals with $e^i > e$ therefore prefer negative taxes while those with $e^i < e$ prefers positive taxes.

Downsian voting As we saw in section 1 this model satisfies the single crossing property, so pure majority voting will ensure that the condorcet winner is chosen, and this will be the preferred tax rate of the median voter $\tau^m = \frac{e - e^m}{-L_\tau(\tau)}$. This expression shows the main conclusion; more inequality increases the difference between e and e^m yielding a higher tax rate. Notice this is not the same as saying income inequality causes more redistribution, if for example the income distribution skews because the middle class gains income, this raises e along with e^m. Oppositely if the rich get extremely rich, this changes e^m without affecting e a lot. Also note that the denominator $|L_\tau(\tau)|$ is the change in labor supply as a consequence of taxation, i.e. the deadweight loss of taxation. A higher cost of taxation reduces the desire for redistribution because individuals forego personal income in a tradeoff with the size of the public transfer.

Also take note that like before e^m is the median productivity of the average voter while e is the average income of the average *tax payer*. As a consequence extending voting rights to poorer citizens will decrease e^m but not affect e, resulting in more redistribution.

4.1 Empirical results

A first consideration is that our model assumes that higher income leads to lower desired taxes. However when regressing preferences for distribution on log income we observe a significant but not very predictive relationship, showing that many other variables also matter. With this in mind let us consider some empirical evidence investigating the conclusions from our model.

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