# LECTURE 11

# INTRODUCTION TO POLITICAL ECONOMY AND ENDOGENOUS TAXATION I

**Aim of Lecture 11**:

- Gain understanding of the political economy approach and become familiar with voting theory
- Study one model of endogenous taxation
- Understand how the distribution in the economy affects economic policy making and thereby economic performance

## 11.1 *Political economy*

### 11.1.1 *Introduction*

The *political economy approach* to fiscal policy recognises that the policy actually implemented by a government is unlikely to be the same as the one a "social planner" would prescribe. The political economy approach views the government as a group of one or more individuals that maximise their *own* utility.

Most work in this field study *democracies*. In a democracy government representatives want to maximise their own utility from the policy they carry out. Utility may come from (*a*) economic policy affecting the representative's budget constraint (*b*) economic policy affecting the probability of being reelected. We should note that the government representative is *endogenous*, since he/she is elected by the population in question. Therefore most of the work in this field use voting theory to determine either policy directly (*direct democracy*) e.g. referenda, or determining the government representatives (*indirect democracy*) who in turn decide upon policy.

This approach explicitly recognises *consumer heterogeneity* and the *redistribution-efficiency trade off*. This is so because economic policy in general has redistributive effects (like consumption taxation and labour-income taxation studied last term). Each individual when deciding how to vote trades off the redistributive effect in favour of himself to the efficiency loss the policy creates. The actual policy would therefore depend on the inequality among individuals in the economy (in terms of wealth, income, skills etc.). If all individuals were identical there would be no redistributive conflict and therefore economic policy would focus solely on efficiency.

This framework is both a *positive* and a *normative* one. The positive side is to describe the actual policy carried out in the economy (given the constitutional framework). The normative side is how we may carry out constitutional reforms in order to improve welfare.

### 11.1.2 *The median-voter theorem*

In order to say something about the policy chosen in *political equilibrium* we need a theory about voting. Basically all studies rely on the *median-voter theorem*, and there are some requirements for this to work. First, the decision must (generally) be *single dimensional*, i.e. only one variable to be decided upon. Second, the voters' preferences over this single issue must be *single peaked*.

*Single-peaked preferences*
Assume a variable $x$, to be decided upon. It may be a capital income tax rate, or the level of public expenditure, or something else which takes on a value corresponding to a real number. Individuals will generally have different preferences over this variable. For example, if you have lower labour income than others you may want a higher labour income tax than others. The preferences of individual $i$ over this variable is said to be *single peaked* if (*a*) there is a value of $x$ that gives the highest utility to individual $i$, say $x^*$ and (*b*) utility is decreasing as $|x^* - x|$ increases with respect to $x$. Single peakedness rules out local optima. Thus we are interested in preferences that has got only one global optimum. I this is the case we may think of individuals as voting on their most preferred option $x^*$. Indeed this implies that strategic voting never will pay.

*Median-voter theorem*
Suppose we have a population of voters, each of them having their own preferred option $x^*$, so we may think of a distribution of these $x^*$s. We then want to know which $x^*$ will win in a majority vote. The median voter theorem does not say how the political equilibrium comes about. It rather states that the median value of $x^*$ (over the population) cannot loose in a majority vote over another value of $x^*$.

Mueller (1989), pp. 65-66: "*If x is a single-dimensional issue, and all voters have single peaked preferences over x, then the median position cannot lose under majority rule. An individual has single peaked preferences if he prefers a unique* $x^*$ *and his utility is strictly decreasing for deviations away from* $x^*$."

The proposal that cannot lose against any other alternative is usually called a *Condorcet Winner*. We could actually find a procedure that would deliver the Condorcet Winner. Pick two alternatives and run a binary election. The winning proposal is than pinned against another alternative in the pool of alternatives, in a new binary election. The winner from this second round is then pinned against another alternative in a third round, and so on. When all elections have been held we are left with a winning proposal. If there is a Condorcet winner, we would always end up with this winning proposal in the last round, regardless of the order of elections (i.e. regardless of the agenda). If there is no Condorcet Winner, the proposal finally winning would depend on the order of elections. Such a situation is called *Condorcet Cycles*. They will be present if preferences are not single peaked, and they may be present if the policy space is multi-dimensional (i.e. if there are several issues, e.g. a labour tax and a capital tax). The next section deals with such situations.

### 11.1.3 *Multidimensional policy issues*

The median-voter theorem has been criticized because of its restriction to one-dimensional issues. In reality voters have to decide upon many issues at the same time. In fact Arrow has shown in his famous *impossibility theorem* that if generalised to many issues we can not guarantee that we have a voting outcome. Often we see the consequences of this when we theoretically try to look at voting outcomes of multi-dimensional issues: the *voting cycle*.

We will look at a multidimensional example. Consider a two dimensional issue. Suppose individual A has got an ideal point in the two-dimensional space (denoted by a star in Figure 1). Utility is strictly decreasing in the distance from this point. Suppose the indifference curves are such as depicted in Figure 1.

Similarly, suppose individual B has an ideal point, denoted by a star in Figure 2. The indifference curves are denoted by dashed lines. Finally, individual C's ideal point and indifference curves are depicted in Figure 3. Combining all individuals into one graph gives us Figure 4.

We will now establish the preference ordering for individual A (you are asked to do the same for individuals B and C in the exercise). Suppose we restrict to proposals that are ideal points of the individuals. Call these proposals A, B and C. As can be seen by looking at individual A's indifference curves in Figure 4, individual A gets higher utility of proposal C than proposal B (of course her ideal proposal is A). Therefore the preference ordering of A is: A $\succ$ C $\succ$ B. So, if there was an election between B and C, individual A would vote for C. How would B vote? How would C vote? Which proposal wins? You'll work this out easily, but what about an election between A and B, or A and C? This is the next exercise!

## Problem 1 *Voting cycles (Condorcet cycles)*

Consider Figure 4.

(*a*) The preference ordering of individual A was $A \succ C \succ B$. Show the preference ordering of individuals B and C.

(*b*) Which policy proposal is the Condorcet winner?

(*c*) Assume a policy proposal $a$ which is not A's ideal point, but lies north-east of $A$, giving rise to the following preference ordering:

$$\text{A: } a \succ C \succ B$$
$$\text{B: } B \succ a \succ C$$
$$\text{C: } C \succ B \succ a$$

Where must $a$ lie in Figure 4?
Show that there are voting cycles and consequently no Condorcet winner.

(*d*) Assume the following agenda:
1. Election between $a$ and $B$.
2. Final election between the winner in stage 1 and $C$.

Which is the proposal winning in the final election?

**Figure 1**

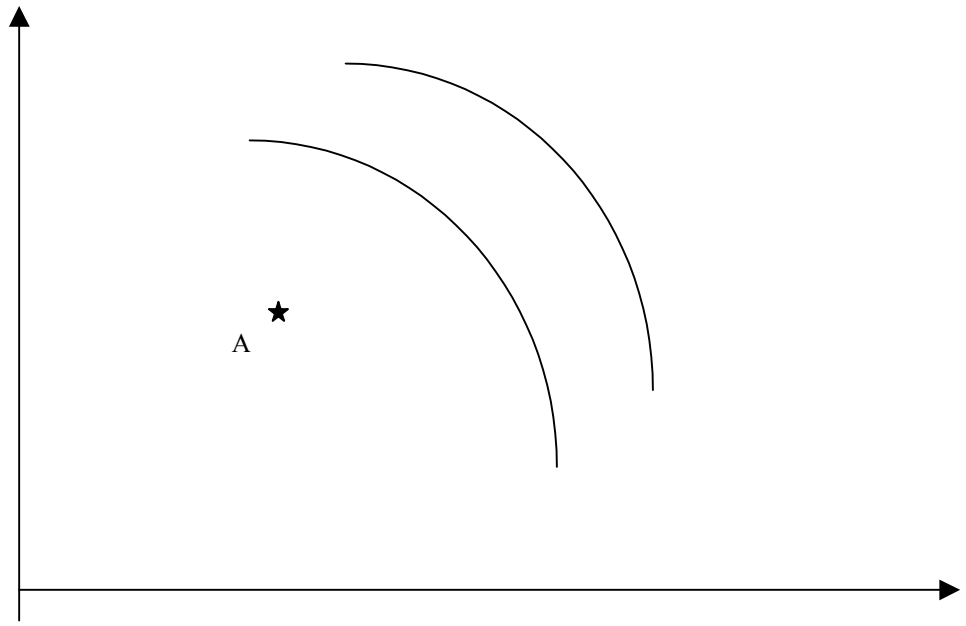



**Figure 2**

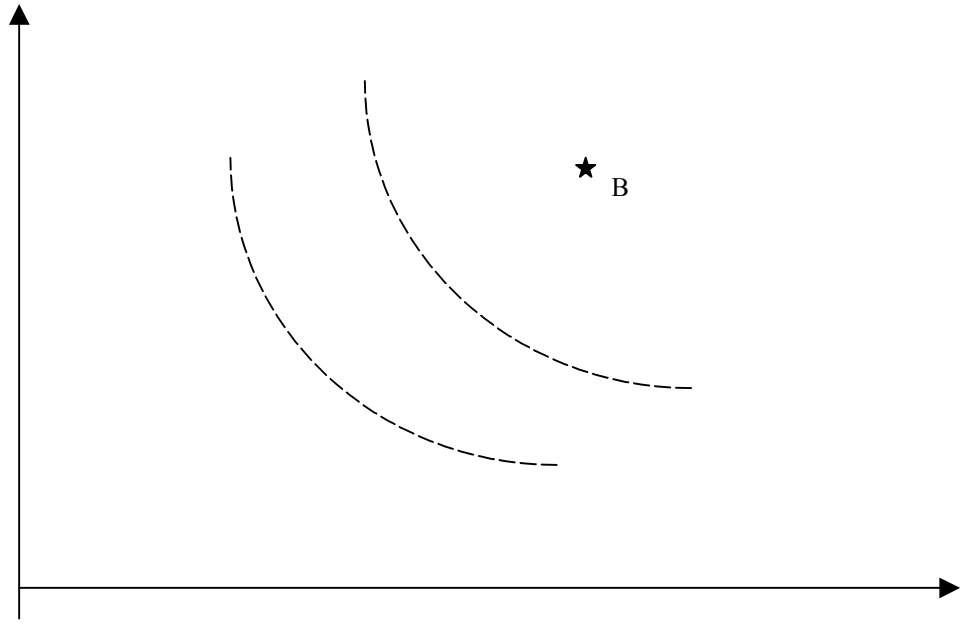


**Figure 3**

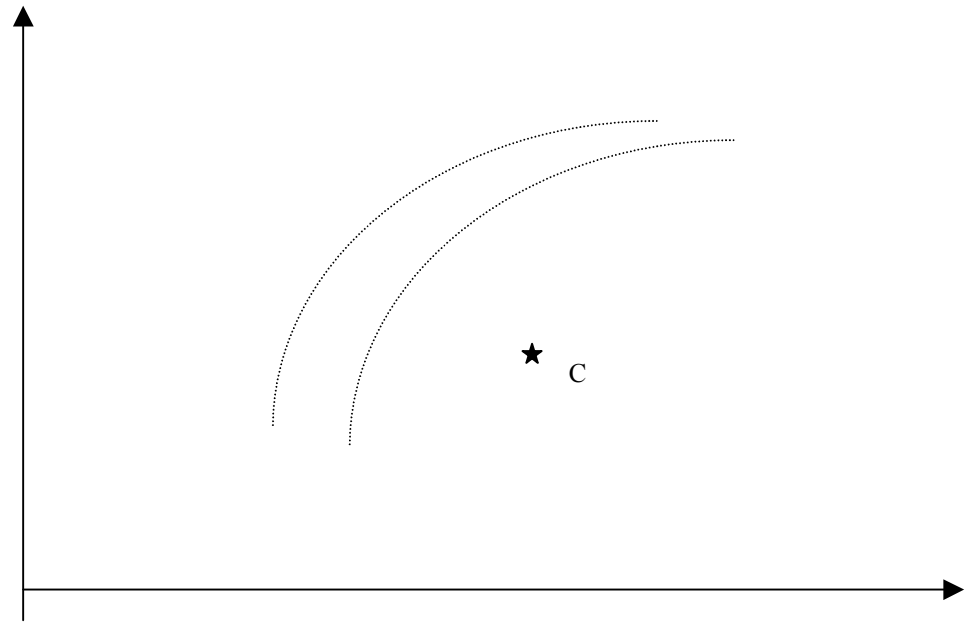
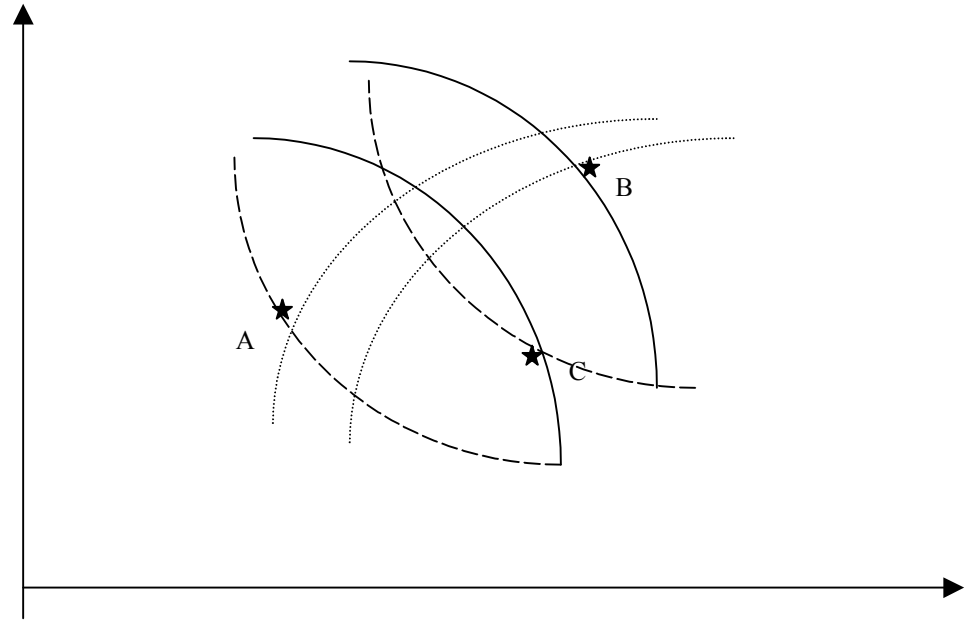



**Figure 4**



### 11.1.4 *Remarks*

We may see the median-voter theorem as a useful theoretical tool in order to capture the link between the preferences of the public and actual policy making from a micro perspective in a logically consistent way.

There are also ways in which we may study multidimensional issues. Plott (1967) provides restrictions on preferences that guarantee a generalisation of the median-voter theorem, however these are very restrictive. An example of this is Renström (1996) where a three-dimensional issue (consumption, labour income and capital income tax rates) reduces to a one-dimensional issue because of a special class of individual preferences.

Another way is to limit attention to ideal points. As you saw in Problem 1, there was a Condorcet winner when holding elections between ideal points, but cycles for alternatives not being ideal points. If we, instead of voting on proposals, we voted on representatives, and once elected the majority elected representative was free to implement her preferred policy, we would actually rule out situations not being ideal points. The reason is that no representative would implement anything else than her ideal point. So, in representative democracies we are more likely to rule out Condorcet Cycles. This was first done in Marsiliani and Renström (2000). Another example is Marsiliani and Renström (2002).

Sometimes, even with single dimensional issues, single peakedness can fail. Again, this is typically the case when we consider proposals that are not ideal points. By restricting to representative democracy, we can restrict to ideal points, and preferences are usually single peaked for those. This was first done in Renström and Yalçin (2003).

Have we got any alternatives to the median-voter model? Ideally we would want a theory of voting on representatives who in turn *bargain* over policy proposals, in order to capture political decision making realistically. Recently, there have been advances in economic research regarding these issues. See Persson and Tabellini (2000), and Renström (2002). We can then study the effects of constitutional changes, or make constitutional comparisons (see Marsiliani and Renström (2004a,b)).

## 11.2 *Inequality and redistribution*

### 11.2.1 *The Meltzer and Richard (1981) model of endogenous labour-income taxation*

*The economy*
There are two "goods", consumption $c$, and leisure $1-\ell$, where $\ell$ is labour supply. Individuals differ in productivity (skills), $s$, as in the Mirrlees economy. We will concentrate on a flat tax on labour supply, $\tau$, and a lump sum payment (benefit) from the government, $b$. Normalising the average wage rate to 1, the budget constraint for an individual with skill $s$ is

$$c(s) = (1-\tau)s\ell + b \qquad (11.1)$$

The consumer maximises utility

$$U(c, 1-\ell) \qquad (11.2)$$

subject to the budget constraint taking government policy as given.

This gives the consumer's choice of consumption and labour supply in terms of the tax rate and the lump sum transfer.

As in the Mirrlees economy there may be individuals who choose not to work. These will be the low skilled (the ones with low *s*). This is due to the lump sum transfer *b*.

The government budget constraint is given by

$$\tau\bar{y} = b \tag{11.3}$$

where $\bar{y}$ is per-capita labour income, i.e.

$$\bar{y} = \int_{s_1}^{s_2} s\,\ell(s)\,\gamma(s)\,ds \tag{11.4}$$

*Politico-economic equilibrium*
The winning tax rate proposal is that one preferred by the individual with *median skill*. This tax rate is characterised by the first-order condition to the maximisation problem

$$\max_{\tau} \; U((1-\tau)s^m\ell^m + \tau\bar{y},\, 1-\ell^m) \tag{11.5}$$

where $s^m$ is the median skill.

The first-order condition turns out to be

$$\tau\frac{d\bar{y}}{d\tau} + \bar{y} - y^m = 0 \tag{11.6}$$

where $y^m$ is the median labour income.

Interpretations:

Note that if the median income coincides with the average income then the tax rate is zero.

If the median income is higher than the average then the tax rate is negative, i.e. there is a subsidy on labour income and a lump sum tax (*b* is negative).

If the median income is lower than average then the tax rate is positive. Meltzer and Richard shows also that under mild conditions the tax rate is increasing in the distance between the average income and the median income. When the median is smaller than the average we speak of a *right-skewed distribution*.

11.2.2 *Empirical evidence*
Meltzer and Richard (1983) [We will come back to this in the tutorial]

11.2.3 *Remarks*
Meltzer and Richard showed how inequality (in terms of mean-median distance) may generate higher labour-income taxes in political equilibrium and thereby more distortions (and less efficiency). This is so because each voter looks at how large the gain from redistribution is. The gain is the difference between the benefit received and the tax payed. If the individual earns less than average there is a gain from redistribution. There is also a *disincentive effect* captured by the first term in equation (11.6). The disincentive effect is the reduction in the tax base due to an increase in the tax rate. In political equilibrium it is the median who is decisive. If the median is poorer relative to the mean she has more to gain from redistribution.

## 11.3 *What have we learned?*

- Voting theory is a powerful tool for analysing political-economy situations. Even though the situations are restrictive (single peakedness and single-dimensional issues) extensions can me done, typically by modelling representative democracy (rather than a referendum), and a vast range of situations can be explored.
- The Meltzer and Richard model predicts fiscal policy and economic performance as a function of the income (skill) distribution via the political process (voting). The fiscal instrument in the model is linear labour-income tax.
- More unequal societies (in terms of skewness of the income distribution) would rely on more redistribution in political equilibrium, and lower economic performance, everything else equal.

## 11.4 *Next time*

Next time we will apply the idea of voting to a model allowing for economic growth, Persson and Tabellini, *American Economic Review* (1994).

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