Political Economics Handout

The Political Economics of Redistributive Policies

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Chapter 1: Introduction to Political Economics

Economics policies differ widely across countries and – within the same country – even over time. In 2002, within the group of developed countries – in particular among the countries belonging to the OECD (Organization of Economic Cooperation and Development) – government expending ranged from almost 30% in the US to more than 50% in Sweden. Large differences emerged also in the size of the welfare transfers, with the social benefits being as low as 10% in the US but above 20% in Austria, Germany and Sweden. Still in 2002, the role of the public section in providing economic investments was large in the US, France, Greece, Portugal an Spain, where gross investment spending was equal to at least 3% of GDP, but low in the UK, with barely 1% of GDP. Further large differences may be appreciated in other economic policies, related to the welfare state, such as the generosity and the design of the unemployment insurance system, the degree of employment protective legislation (EPL) provided to the workers vis a vis the firm's firing decisions, and primarily the size and the design of the social security systems. Among the economic policies which do not directly enter the realm of the welfare state, large varieties may be found across countries and over time in monetary policies and public debt management.

The tools provided by the economic literature, both in microeconomics and macroeconomics, generally fall short of offering a satisfactory explanation of these wide

differences. Most efforts are indeed aimed at providing normative statement about the most efficient policies to be adopted in the different economic scenarios in order to enhance the economic welfare of our society. Economic theory is instead less successful in presenting positive explanations of the observed economic policies – and of their differences across countries.

A new stream of the economic literature has recently devoted a large attention to the analysis of these differences and of the decision processes behind the determination of the economic policy. This new stream of literature goes under the name of "political economics". Its distinctive aim is to provide an explanation of the observed economic policies, and to evaluate how these policies are influenced by political – rather than economic – factors. The starting point of this new strand of literature is to recognize that economic policies need not to be efficient to be adopted. In other words, economic policies need not to increase the economic well-being of every individual in the society, but rather to obtain enough political support to be adopted by the policy-makers and/or legislated by the relevant body. For instance, labor market reforms need not to increase the well-being or the labor market prospects for all current or potential participants in the labor market, but rather to be backed a sufficiently large political crowd – typically composed of voters, lobbies, and "veto" players (such as trade unions and firms' representatives) – to make their adoption convenient to those elected policymakers, such as for instance the Ministries of Labor and of Finance, who are seeking re-elections.

This chapter describes this new "political economics" approach, by exploiting its similarities with the typical economic analysis. In particular, individuals are examined in their double role of economic and political agents. Some new methodological tools are introduced to explain the political process leading to the aggregation of the individual preferences typically hold by each agent over the economic policy – for instance, how

much redistribution is required by a low-income young individual – into aggregate preferences. These aggregate preferences characterize the will of the society at large, and lead eventually to an outcome, consisting of the implementation of an economic policy. In this chapter, particular emphasis will be posed on the political institutions, which contemplate the elections as the main source of individual preferences aggregation. As discussed in later chapters, the specific characteristics of the different elections, such as the electoral rule, whether the outcome is selected by majority voting or other criteria, will be crucial in determining the political outcome and hence the economic policy.

The goal of this book is to apply this political economics approach to the analysis of the welfare states in several OECD countries. We aim at providing a positive explanation of the differences observed in the size, in the design and in the development of the programs composing the welfare state system in the OECD countries. Why do Spain and the UK protect their workers against the risk of being unemployed using different combinations of employment protective legislation and unemployment benefits? Why is the Italian welfare state composed almost entirely of pension benefits, whereas Scandinavian countries dedicate a much larger amount of public resources to active labor marker policies? These are the type of questions we aim to provide an answer in the following chapters, using a political economic approach, and introducing some methodological tools. The initial analysis will be based on simple political institutions – simple majority voting elections or lobbying – to aggregate individual preferences into a policy outcome. We shall examine whether differences in the economic and demographic scenarios induce different preferences in the electorate of the OECD countries, which then translate in different economic policies. At a later stage, we shall argue that the unexplained differences in the size and the design of the welfare states in these countries, after having accounted for the

demographic and economic differences, may be due to the existence of different political institutions.

1.1 The Political Economics Approach

Individuals take economic decisions. Every day, they select the goods to be consumed, they choose how much to save for future consumption, they select the assets holding in their portfolio or perhaps they decide to delegate these portfolio decisions to an economic advisor or to a financial institution. Indeed, several economists – notably the Nobel Price Gary Becker – suggest that economic motives are so pervasive in families' lives to be behind such important decisions as who to marry, how many kids to have, where to live, whether to migrate or not, and whether to become a criminal, a drug deal or suicide bomber.

For the purpose of this section, the relevant aspect is that most of these economic decisions are affected by economic policies. Consider an individual deciding how to allocate her resources among different assets. Clearly, this agent will consider economic factors in selecting her portfolio, such as the risk profile of the different assets, their expected return, their duration and the co-variance among the possible assets, as well as with her own human capital. All these elements are determined in the financial markets, and the government – or the public sector at large – needs not to influence the working of these markets. Typically, however, the returns from all these assets will be taxed. The public sector will intervene by imposing a capital income tax on these returns, often distorting the portfolio decision. Assume for instance that among these assets there is a government bond, whose returns are not taxed. Clearly, this bond would be more appealing to some investors, mainly those with large capital income, and hence would be

on demand, thanks to its special tax status. Economic decisions are thus influenced by economic policy: in this particular example by a fiscal (or taxation) policy.

Analogously, retirement decisions are strongly affected by the design of the social security system. Generous early retirement pensions for individuals who decide to retire before reaching normal retirement age are very common across European countries. Several studies – see for example Gruber and Wise (1999 and 2004) – showed that individuals react rationally to these incentives provided by the pension system and retire as soon as they are entitled to. Again, an economic policy – the design of the retirement incentives in the pension system – has large effects on individuals' economic decisions.

Individuals' well-being may also be affected by the economic policies, in situations in which agents do not modify their economic decisions. A policy awarding a monetary transfer to people living in a particular geographical area increases the resources of the inhabitants of this region, whose economic well-being will hence increase[1], but needs not to produce relevant changes in their economic decisions.

All these examples suggest that, since economic policies influence the individuals' well-being, and often induce variations in their economic decisions, individuals will care about these policies. Stated differently, they will form an opinion and have preferences over these economic policies. For instance, low income workers will welcome redistributive policies, which provide them with additional resources; whereas high income workers will oppose such policies from which they stand to lose.

A crucial message of this literature in political economics is that the economic policy adopted in the society depends on the preferences of the individual agents. As suggested before, and as displayed in figure 1, economic agents form their preferences over an economic policy depending on the impact that this policy has on their individual economic

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[1] Clearly, this policy may induce other individuals to move to this region to cash in the transfer.

well-being. This information is provided in the market. In the portfolio selection example, individuals will evaluate the net return – after taxes – from the different assets, and will assess how the existence of a tax-shielded bond affects their economic well-being.

Typically, individual preferences over an economic policy will differ according to the impact of the policy on each individual's economic well-being. Indeed, even policies that will undoubtedly enhance economic efficiency may have redistributive effects, as efficiency considerations often oppose equity concerns.
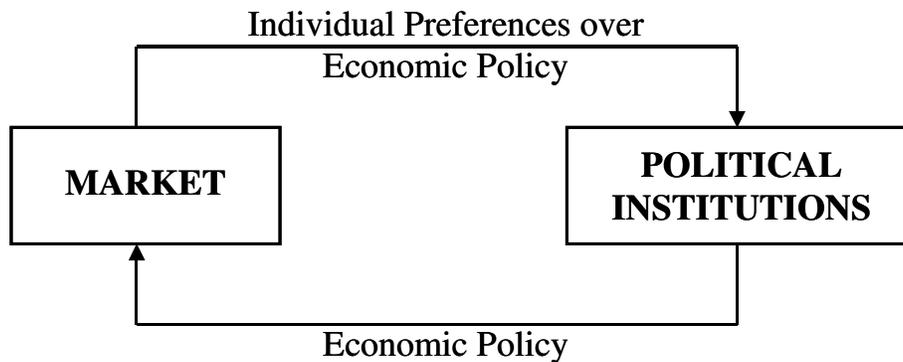
Figure 1: The Political Economics Approach

How are these individual preferences converted into an economic policy? The political economics literature suggests that there are several political institutions through which individual preferences may be aggregated into aggregate preferences, and then into economic policies. In this chapter, we shall concentrate on elections, although several others political institutions have been studied in the literature. Individuals may convey their preferences in elections, which may allow the voters to express them directly, as in referenda (e.g., in Switzerland and in California), or by appointing representatives with a similar policy platform. The economic policy will then depend on the outcome of the

election, and will coincide with the winning proposal, in the case of referenda, or with the policy decided by the elective representative.

Once the economic policy has been selected and implemented, according to the political institution[2] in place, economic agents will react to this policy – as already anticipated – and adjust their economic behavior, and hence the market equilibrium. As displayed in figure 1, this will close the circle from the economic markets to the political institutions and back to the economic markets.

The novelty of this political economics approach is hence to consider every individual in her double role of economic and political agent. As economic agents, individuals take consumption, labor, savings – that is, economic – decisions, while considering as exogenously given the economic policy. As political agents, they express their opinions, or preferences, to try to determine the economic policy at stake, which they regarded as exogenous while making their economic choices.

The economic behavior in this two-sided analysis is displayed on the left part of picture 2. In choosing their optimal economic actions, agents understand that their individual action will not modify the surrounding economic and political scenario, which has to be taken as given. Hence, in their economic behavior, tax payers do not try to change the tax code system; but they do try to take advantage of any loophole to reduce the amount of taxes to pay. Analogously, middle-aged individuals do not question, or try to amend, the incentive's schedule and the design of the social security system. Presumably, they try to calculate when it is optimal – from their individual point of view – to retire; whether they should work one additional year, in order to increase their pension benefit, or retire immediately, and enjoy a generous early retirement pension and the available free time to be spent at the park with their grandkids. All these individual economic decisions are then

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[2] In what follows, we shall see that political institutions do matter in determining the economic policy.

aggregated in the market into equilibrium prices and quantities, for exogenously given economic policies. Hence, the individual behavior by the tax payers will determine the total amount of fiscal revenues; while the interaction of the labor demand – by the individual firms – and of the labor supply – by each worker – will determine the equilibrium wage and employment rate, given the economic policy implemented on the labor market, such as the level and duration of the unemployment benefits, the degree of employment protective legislation, the tax rate on labor income and the payroll taxes for the contribution to the welfare state.

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┌──────────────────┐        ┌──────────────────┐
│ Economic Agents  │        │ Political Agents │
└──────────────────┘        └──────────────────┘
         │                           │
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┌──────────────────┐        ┌──────────────────────┐
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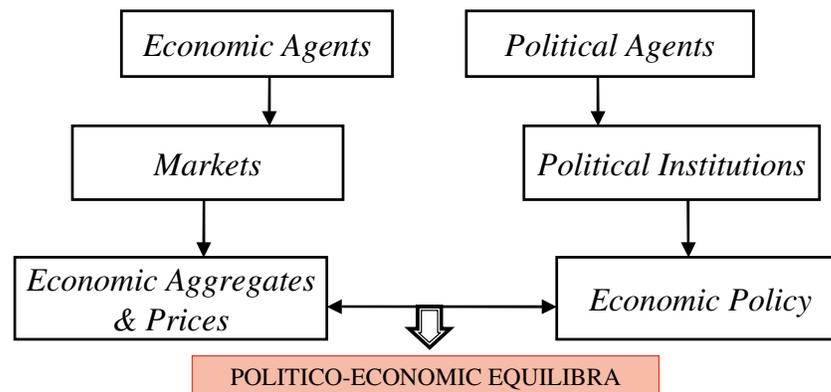
Figure 2: Politico-Economic Equilibria

The political behavior in this two-sided analysis is instead displayed on the right part of figure 2. As political agents, individuals convey their preferences over the economic policy. Individual preferences depend on how the economic policy affects the individual's utility or well-being. Low income workers, who end up being the net winner from a redistributive policy, will clearly express their support in favor of this policy, whereas high income people will show their opposition. The individual preferences over the economic policy are typically characterized by the individual's indirect utility function.

This indirect utility function is obtained in two steps. In the former stage, corresponding to the left side of your analysis, individuals optimize with respect to the economic variables: they maximize their utility function and obtain the optimal value of the economic variables. In the latter stage, the indirect utility function is obtained by substituting these optimal values back into the original utility function. The interpretation of this indirect utility function is that it expresses the individual preferences over the economic policy, when the economic decisions at the individual level have already been taken. In expressing their views over the economic policy in the political arena, e.g., in elections or in lobbying groups, individuals will hence determine their most preferred economic policy by maximizing their indirect utility function with respect to this policy.

There is a clear asymmetry in the individual behavior as economic and as political agent. In their economic decisions, agents understand that their individual action will not modify the surrounding economic and political scenario, which has therefore to be taken as given. In their political arena, on the other hand, individuals may turn out to be more powerful. For example, if, in an election, an individual turns out to be among the *pivotal voters* – that is, among the few voters determining the outcome of the election – she may expect her most preferred economic policy to be adopted by the politicians, who will try to please these key voters. In this situation, this pivotal voter will act as a "monopolist" of the economic policy. She will take into account and exploit the fact that the policy she helps to determine will modify the economic and political scenario. For instance, if a low income worker is pivotal in an election, we may expect the politicians to implement a high level of redistributive policy. This policy will please the low income workers, but will also affect other individuals, such as the high income workers, who will have to bear most of the fiscal burden cost of this redistribution, as well as the economy as a whole, due to distortions introduced by the taxation.

Finally, when individual economic decisions are aggregated in the markets, and political preferences over the economic policies through political institutions, a complete description of the economic and political scenario emerges. These combinations of the typical economic decisions with the "political" decision over economic policy represents the distinctive mark of the political economics approach.

1.2 Political Institutions

The relevance of the political behavior described in the right part of figure 2 is strictly related to the role of the political institutions. After individual preferences over an economic policy have been formed, suppose that any political institution would lead to the same policy outcome. In other words, suppose that – given the initial individuals' preferences – the economic policy would be invariant to the type of political institution used to aggregate these individual preferences. In this case, the political institution would be neutral, as it would have any impact in the process of preferences aggregation and ultimately in determining the economic policy. Clearly, if this were the case, we would not need to examine these political institutions, as they would basically play no role.

However, things are not so simple: political institutions do play a role. In fact, – for a given set of the individuals' preferences – the political institution used to aggregate these preferences does shape the policy outcome.

This is indeed an old result. In 1951, Arrow showed, in his famous Impossibility Theorem, that political institutions are not neutral, as no desirable mechanism is able to aggregate individual preferences consistently. More specifically, his Impossibility Theorem stated that there is no democratic mechanism which allows individual preferences to be aggregated in a *consistent* way, that is, so that the following properties are satisfied: (i)

Rationality; (ii) Unrestricted Domain; (iii) Weak Pareto Optimality; and (iv) Independence.

The first property – Rationality – requires aggregate preferences to be complete and transitive. The political mechanism has thus to able to compare and rank all possible outcomes of the economic policy; and this raking has to be consistent, so that if A is preferred to B, and B is preferred to C, then A has to be preferred to C. The second property demands the political institution to be able to accommodate any individual preference. Hence, for any configuration of individual preferences over the policy – however "crazy" they may seem – the mechanism has to be able to produce has an aggregate decision: a policy outcome. The third desideratum is very intuitive: if every individual weakly prefers A to B – that is, if individuals either prefer A to B, or they are indifferent between A and B; however, no individual prefers B to A – then the mechanism has to rank A over B. Finally, the fourth property requires mechanism to concentrate on the issues at stake. Hence, if the decision is between alternatives A and B, the individual ranking (or preferences) over a third alternative C should not matter for determining what the policy outcome should be between A and B. Therefore, for a political institution, the ranking between social security spending and health spending, that is, the relative preferences between these two alternative expenses, should not depend on how individuals rank each of the two expenses relatively to a third alternative – say, expenditure on defense.

As we shall see in the next section, in the political economics literature the feature to be sacrificed is typically that of unrestricted domain; since individual preferences are often required to be single-peaked.

To provide a flavor of this theorem, we examine the policy outcome under different – yet relatively close – political institutions, for a given set of individual preferences over the

economic policy. The aim of this simple example is to show that the same initial individual preferences will give rise to different economic policy outcome, depending on the political institution, through which these preferences are aggregated. We concentrate on a simple class of political institutions: elections; and exploit the difference emerging for different timing and types of vote-counting within the elections. In particular, we consider a simple majority voting environment, and compare its result – in terms of policy outcome – with an agenda setting election, in which the sequence of the voting among the issues (the timing) plays a role , and with a "Borda" election, in which the counting of the votes may take different forms (or intensities).

In our simple example, we consider 7 voters – we call them voter 1, 2, … and 7 – and 4 alternatives, characterized by A, B, C and D. These voters may be thought of as seven ministers sitting in a committee; each of them is endowed with one vote. The alternatives, on the other hand, may be thought of the level of public spending (and hence taxation to finance this public spending), in which case, A may represent no public spending, B low spending, C medium spending and D high spending. The Ministers' individual preferences over these alternatives are displays in table 1, where the alternative at the top represents the most preferred level of public spending, while the alternative at the bottom the worst.

Agents	1	2	3	4	5	6	7
best	A	A	A	B	B	C	C
	B	B	B	C	C	D	D
	C	C	C	A	D	A	A
worst	D	D	D	D	A	B	B

Table 1: Individual Preferences

1.2.1 Simple Majority Voting

As first political institution, consider a *simple majority voting election*. Every individual indicates her most preferred level of public spending – whether A, B, C or D – and the alternative receiving more votes, that is, a simple majority of votes, will become the policy outcome. In this simple case, ministers 1 to 3 will prefer alternative A – that is, no spending; ministers 4 and 5 will vote for B – that is, low spending; while ministers 6 and 7 will indicate policy C – that is, medium spending. No voters will favor alternative D, consisting of high public spending. According to these votes, the policy outcome of this simple majority voting election will be alternative A, which receives three votes, and hence there will be no public spending. In this case, the strong preferences in favor of alternative A by the first three ministers are sufficient to adopt this policy, despite the opposition of the other ministers, who prefer to the winning policy (A) at least other two alternative policies.

1.2.2 Agenda Setting

Consider now a political institution that contemplates a different type of election to determine the economic policy. Voters are still the seven ministers; however, the preferences aggregation mechanism now includes an *agenda setting*, so that alternatives are voted in a pair-wise comparison in a pre-established order. This sequence of voting is determined by the following agenda:

➢ AGENDA I   A vs B – vs C – vs D

➢ AGENDA II   D vs C – vs B –vs A

➢ AGENDA III   A vs C – vs B – vs D

In agenda I, at the first stage, the pair-wise voting is between alternative A and B; and A will prevail for five votes to two, thanks to the votes by ministers 1, 2, 3, 6 and 7. In the second round, policy A is matched with alternative C: alternative C wins for four votes,

those by ministers 4 to 7, to three. In the third and last stage, alternative C is compared to D and wins, as all ministers prefer C to D. Hence, alternative C – medium government spending – is the winner in this agenda setting election.

In agenda II, the sequence of voting has changed. At the first stage, the pair-wise voting is between alternative D and C; and C clearly prevails. In the second round, C is challenged by policy B, which in fact prevails for five votes – those by ministers 1 to 5 – to two – ministers 6 and 7. In the final stage, alternative B is defeated by policy A, by five votes to two. Hence, alternative A – low government spending – is the policy outcome in the election with agenda (II).

Finally, in agenda III, alternative C prevails over alternative A in the first round by four votes to three, but is defeated by alternative B in the second round by five votes to two. Then, in the third stage, alternative B wins over policy D by five votes to two, and becomes the policy outcome in this election with agenda (III).

This simple example shows that – in this political institution of voting with agenda setting – the policy outcome hinges crucially on the role played by the agenda setter. In fact, depending on the sequence of voting selected by the agenda setter, one of three alternatives (A, B and C) may emerge as a policy equilibrium outcome.

1.2.3 Borda Voting

The last type of political institution we consider is called *"Borda" voting*. Ministers still express their preferences through an election, in which alternatives are simultaneously voted upon. The peculiarity of this preferences aggregation mechanism, with respect to a simple majority voting election, is that individual electors may express more than one preference and thereby convey the intensity of their preferences. Consider a situation in which each of our ministers may give two votes to an alternative and one vote to another

alternative. Clearly, each minister will give two votes to her most preferred policy and one vote to the second most preferred one. If we sum up these preferences, alternative A will obtain six votes – being in first place for ministers 1 to 3 – alternative B will receive 7 votes – determined by two first places (ministers 4 and 5) and three second places (ministers 1 to 3) alternative C will enjoy six votes – two first places (ministers 6 and 7) and two second places (ministers 4 and 5) – while alternative D will only get two votes, as the second choice of ministers 6 and 7. In this Borda counting election, the economic policy adopted would hence be alternative B – a low level of public spending.
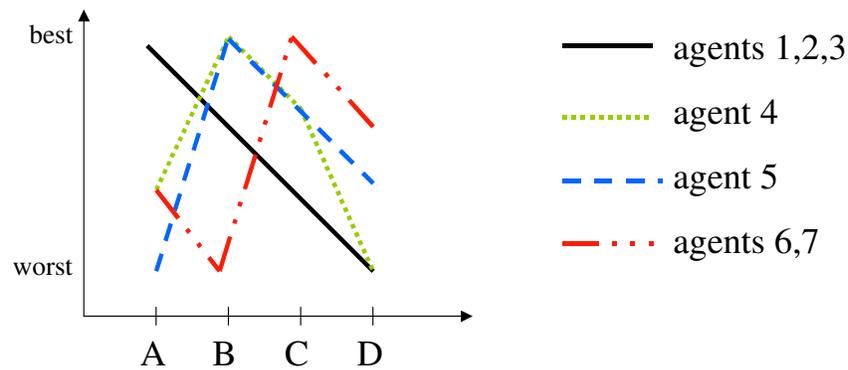

Figure 3: Individual Preferences

Further examples[3] may be provided to show that – given a set of initial individual preferences over the policies, represented in our example at table 1 – different political institutions may lead to different policy outcomes. However, it is now convenient to examine the characteristics of the individual preferences of the voters – our ministers – which lead to the differences in the policy outcomes of these elections.

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[3] For instance, we could consider another Borda counting election, in which voters may attribute three votes to an alternative, two votes to another alternative and one vote to a third alternative.

Figure 3 displays the individual preferences over the four alternatives (A, B, C and D) of our seven voters. A quick look at these preferences suggests that all preferences, but those of ministers 6 and 7, are single-peaked; in other words, they have a single maximum. Voters 1 to 3, whose preferences are characterized by the continuous line, prefer no public spending, and their well-being is reduced as spending increases. Minister 4 has an interior maximum for low level of public spending; no spending or a medium level decrease her utility. Minister 5's preferences are also of this kind: they peak for a low level of public spending, although – as a third choice – she prefer more spending (D) than minister 4 (who indicates A). Ministers 6 and 7's preferences are instead not single-peaked. In fact, their most preferred choice is to have medium level of public spending or – as a second alternative – high spending. As third alternative, however, they prefer no public spending to low spending. In terms of their preferences, this creates an additional peak (or local maximum) at the alternative A (no spending).

This lack of single-peakedness is what gives rise to different possible outcome, depending on the electoral structure. As our example suggests, to be single-peaked, individual preferences have to be *smooth*. In moving away for her ideal alternative, the voter has to prefer alternatives which are closer to the ideal point more than alternatives that are further apart.

What happens, when individual preferences are not single-peaked, is that aggregate preferences need not to be transitive. In fact, as shown in the agenda setting example, aggregate preferences are not transitive in our example at table 1, since A is preferred to B, B is preferred to C, however A is *not* preferred to C.

In what follows, we shall restrict our individual preferences to be single-peaked and we will hence violate the second feature in Arrow's Impossibility Theorem, regarding unrestricted domain. Fortunately, in most economic situations, individual preferences

indeed are single peaked, as agents have *smooth* preferences, as shown in the following example.

1.3 An Example of Indirect Utility Function, Single-Peaked Preferences and Bliss Point

Consider an economy populated by three groups of individuals. They consume a private good (C) and a public good (G). Their preferences over these two goods are the following:

$$U_i(C,G) = C + \gamma_i \, lnG \qquad (1)$$

where the parameter γ_i of the utility function depends on the agent's income: $\gamma_i = A - Y_i$. Agents differ according to their income, Y_i. They can be Poor (P), Middle Income (M) and Rich (R). In particular, their income is respectively $Y_P = \frac{1}{2}$, $Y_M = \frac{2}{3}$, and $Y_R = 1$ and the proportions in the population are $\alpha_P = 45\%$, $\alpha_M = 30\%$, and $\alpha_R = 25\%$.

The public good is financed with a lump-sum tax (T), so that the government budget constraint is *G=T*. Finally, assume that *A=1*.

In this simple case, individuals take no economic decision: they exclusively consume all their net income and the public good that they receive from the public sector. It is thus easy to write down the indirect utility function of the agents. Using the utility function of an individual *i*, where *i* represents consumer's type, at equation (1), and substituting in the individual and the government budget constraints, respectively, $C = Y_i - T$, and $G = T$, and $\gamma_i = A - Y_i$, we obtain the following *indirect utility function*:

$$V(G) = [Y\text{-}G] + \gamma_i \, lnG = Y_i - G + (A - Y_i) \, ln(G)$$

Clearly, this indirect utility function only depends on the economic policy, which in this example is summarized by the public good, G, or analogously by the lump-sum tax, T, because of the government budget constraint.

It is well known that individual preferences have a graphical interpretation. Consumers' preferences can be depicted in different ways. If we consider the preferences over the consumption of private, C, and public good, G, these preferences are represented by the direct utility function, $U_i (C,G)$. They are displayed in figure 4 as indifference curves between C and G, while the straight line represents the individual budget constraint: $C = Y_i - T$;

If on the other hand, we consider the preferences over the level of public good, as measured by the indirect utility function above, $V(G)$, they are displayed in figure 5. Clearly, figure 5 can be constructed from figure 4. The points in which the utility function crosses the individual budget constraint tell us the level of utility that is obtained for the different values of G. This information is reported in figure 5, where for every value of G, the indirect utility function, $V(G)$, measures the corresponding value of the utility. As can be appreciated by looking at figure 5, the indirect utility function is single-peaked, and the maximum is at G^*.
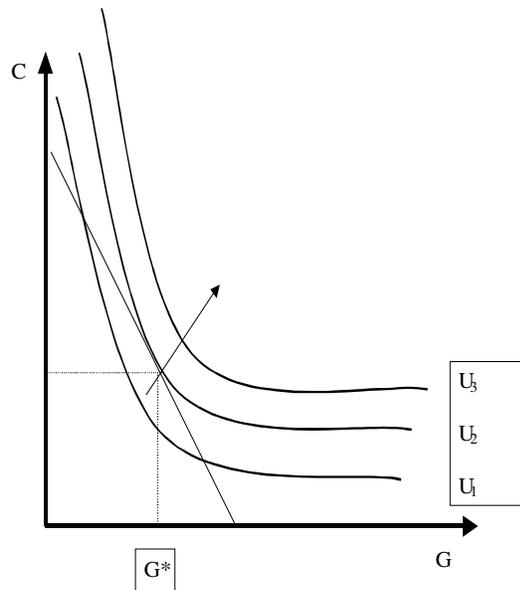

Figure 4: Individual Preferences

Alternatively, to guarantee that preferences over *G* are single-peaked, we can show analytically that *V(G)* is a concave function with respect to *G*. This is done by checking that the second derivate of *V(G)* with respect to *G* is negative: $V''(G)=d^2V(G)/dG^2<0$. Since $V(G) = Y_i – G + (A - Y_i)\ ln(G)$, we have that

$$V'(G) =dV(G)/dG= -1 + (A - Y_i)/G$$

and thus

$$V''(G)=d^2V(G)/dG^2=-(A - Y_i)/\ G^2<0.$$
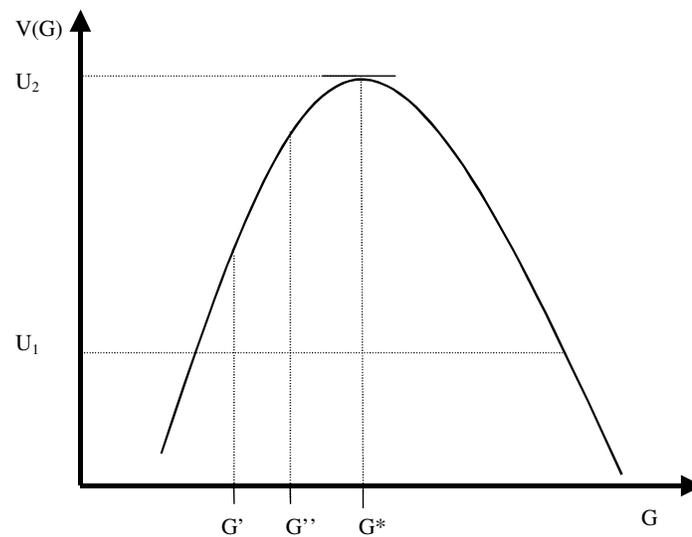
Figure 5: Indirect Utility Function

A useful concept to summarize (single-peaked) individual preferences is the bliss point, which represents that policy level at which individual preferences are maximized. To calculate the bliss point for agent i, we simply have to maximize the individual indirect utility function with respect to the level of public good, G.

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Max V(G) w.r.t G = Max Y_i – G + (A - Y_i) ln(G) w.r.t G

Max V(G) w.r.t G = Max $Y_i - G + (A - Y_i) \ln(G)$ w.r.t G

The first order condition (FOC) becomes:

$$-1 + \frac{A - Y_i}{G} = 0$$

and hence, we have that the bliss point of a type-*i* individual is equal to

$$G_i^* = A - Y_i$$

Hence, $G_P^* = 1 - \frac{1}{2} = \frac{1}{2}$, $G_M^* = 1 - \frac{2}{3} = 1/3$ and $G_R^* = 1 - 1 = 0$.

Chapter 2: Electoral Models

The most common political institutions are undoubtedly the elections. During elections, voters may choose directly the economic policy, as in referenda, or they may select political candidates as their political representative in legislative bodies. In the later case, individuals will possibly base their voting behavior also – if not exclusively – on the policy platform presented by the candidates. As such, they effectively provide their elected representatives with an entitlement to adopt the platform that they presented during the electoral campaign. What arises from an election is thus an incomplete contract between a majority of the electorate and its political representatives, in which the politicians are called to govern taking into account the interests of their supporting majority. We shall discuss these political equilibria shortly, as we introduce the concept of *median voter*, to indicate the pivotal voter in these simple majority elections.

However, voters may also decide to base their political decision on additional factors; besides their preferences over the economic policy, they may feel closer to one candidate or another, because of ideological reasons or just due to sympathy. Candidates then have to choose the electors, i.e., the votes, that they try to reach (and capture) by targeting their economic policies. As we shall discuss later, the *probabilistic voting model*, used among others by Dixit and Londregan (1996), analyzes this type of environment and suggests that political candidates will find it more convenient to concentrate on the more ideologically neutral sector of the electorate, as these individuals are easier to convince by use of the economic policy, and hence to "swing".

So far, we assumed that – once elected – political candidates will maintain the promises made during the political campaign, and implement the announced policy. Whether this is indeed the case, it depends on the motivations of the politicians and on their carrier concerns. Politicians may be *opportunistic*, in which case they only care about being elected, or *partisan*, when they assign value to the policy that is actually implemented. In the former case, during their electoral campaign, they propose the policy platform that maximizes their probability of winning the elections. Being in office may either provide these individuals with an ego-rent (for instance from being powerful, well known and often on television) or with actual rents from bribes or legal contributions. Once in power, they have no incentives to change the policy announced during their electoral campaign, unless a new policy may increase their future reelection probability. Partisan politicians, on the other hand, may have an incentive to renegade on the platform presented at the election, in order to move closer to their most preferred policy. Thus, to the extent that voters know these politicians' true preferences over economic policies, no commitment on an economic policy different from their most preferred policy will typically be credible.

To address these issues, a stream of this literature on elections has taken a dipper look at the entire political process from the initial candidacy of a citizen to a political post or office, to her electoral campaign and finally to the role of an elected representative as a policy-makers. These models, mainly due to Besley and Coate (1997) and Osborne and Slivinski (1996), suggest that these *Citizen Candidates* are motivated to become politicians and run for elections by their specific preferences for economic policy. If they believe that no politician with a policy platform sufficiently close to theirs will run, they will have an incentive to enter the political area and participate as candidates to the elections in order to have a chance of implementing their most preferred policy. These

models may rationalize the entrance in the political race of several non-professional-politicians candidates, such as businessmen, sportsmen or actors.

Another line of this political economics literature has analyzed legislative models – rather than electoral models – by concentrating on post-electoral politics. The main idea in these models is that – once elected – politicians decisions over policies will be largely affected by the institutional constraints that will characterize the decisions' process. A situation of bargaining in agenda setting is examined by Baron and Ferejohn (1998); while Shepsle (1979) considers the restrictions imposed on a multi-issue policy outcome by the allocation of the decision process in policy jurisdictions.

A final stream of literature has stressed the role of lobbies in the economic policy decision process. These *lobbying models*, due among others to Becker (1983) and Grossman and Helpman (1994), suggest that beyond the incentives provided to the politicians by the elections and by the legislative restrictions, lobbying activities – consisting of campaign contributions, pressure during the legislative process and even bribes – may strongly affect the economic policy decisions by the policy-makers. We will return to these models in the next chapter.

2.1 Majority Voting Models

In this section, we introduce the first model of political aggregation discussed above, consisting of a simple majority voting election. To begin with, it is convenient to consider a case of direct democracy – a referendum – in which voters directly determine a one-dimensional economic policy[4], such as the level of public spending (as in the example in chapter 1) or the size of the welfare state (see chapter 5) or the degree of flexibility in the

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[4] Later on, we shall discuss the case of a simple majority voting in a two candidates election.

labor market (see chapter 6). There is commitment over this economic policy: once determined by the election, the economic policy will certainly be implemented.

Individuals' preferences are assumed to be single-peaked over the economic policy at stake, in order to comply with the requirement discussed in chapter 1 for the aggregate preferences to be rational (that is, complete and transitive). As we saw in the example at the end of chapter 1, single-peakedness is typically guaranteed in several economic examples. This simple peak, or maximum, in the individuals' preferences is denominated *bliss point*, and represents the most preferred economic policy by the individual.

Finally, let us denote as the *median voter*, the voter whose bliss point divides the distribution of bliss point in the electorate in half: 50% on her right and 50% on her left. Clearly, this suggests that 50% of the voters would prefer to have a higher economic policy, for instance more public spending, than the median voter; while 50% of the voters would prefer to have a lower economic policy, for instance less public spending, than the median voter.
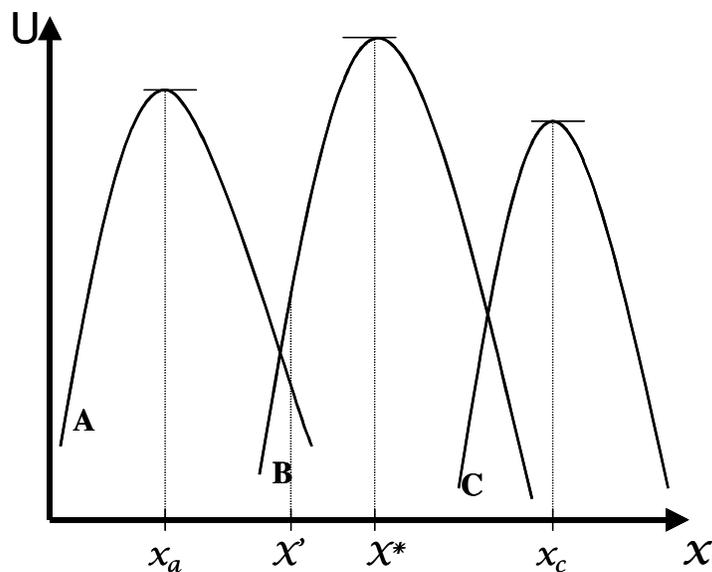

Figure 1: Median Voter's Theorem

One of the most powerful, and more widely used, results of this literature – the median voter's theorem – suggests that this median voter is the pivotal voter in this election. The decision by the median voter turns out to coincide with the electorate's decision. More precisely, the *median voter's theorem* states that if the economic policy is one-dimensional, and preferences are single-peaked over this dimension, the median voter's bliss point represents the equilibrium outcome of the simple majority voting game.

To understand this result, notice that with single-peakedness, individual preferences are smooth. In fact, as an individual moves away from her bliss point along one direction her utility decreases. For instance, if an individual compares two points to the right of her bliss point ($x_b < x' < x''$, where x_b is the bliss point), then the utility associated with the point that is further away from the bliss point is lower than the utility of the point closer to the bliss point: $U(x_b)>U(x')>U(x'')$.

Now consider figure 1: there are three voters, and the median clearly corresponds to voter B, whose bliss point is X*. According to the median voter's theorem, X* is hence the economic policy which arises in a simple majority voting over X. To see why X* will prevail in a simple majority voting over any other alternative X, let us analyze a point to the left of X*, such as the point X'. Clearly voters B and C – indeed any voter to the right of the median voters, i.e., whose bliss point is larger than the median voter's – will prefer X* to X', while voter A will prefer X' to X*. Analogously, if we take any point to the right of X*, such as for instance Xc, we still have that two voters will prefer X* to Xc. Clearly, the situation is reversed, and voters A and B – indeed any voter to the left of the median voters, i.e., whose bliss point is lower than the median voter's – will prefer X* to Xc, while voter C will obviously prefer Xc.

To summarize, 50% of the voters – those to the right of the median voter – prefer the median voter's bliss point to any lower level; whereas the remaining 50% – those to the left of the median voter – prefers the median voter's bliss point to any higher level. Hence, the median voter's bliss point represent an economic policy outcome of this simple majority voting election, since there will always be a majority of the electorate that prefers this bliss point to any other alternative.
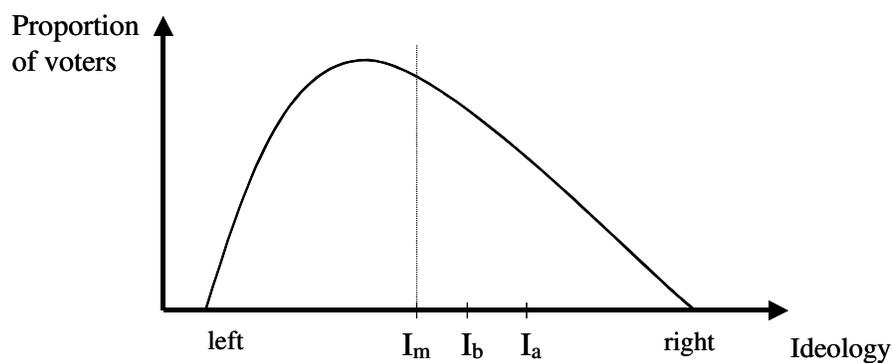
Figure 2: Distribution of Voters' Ideology

The median voter's theorem may also be applied to a different type of simple majority voting election, in which voters do not determine an economic policy, as in a referendum, but rather select a political candidate to be put in office. Consider an election at majority voting for political candidates or parties, in which there are two opportunistic candidates (or parties or coalitions) running for office. The candidates' decision consists of selecting a political platform, which may represent an indication of a specific economic policy, for instance how the candidate expects to boost economic growth if elected, or a broader package, which can be summarized along a left-to-right scale. Clearly, individual voters care about this political platform or ideology. In fact, we assume that there exists a distribution of voters' ideology, displayed at figure 2, which indicated the mass of electors

who have extreme left wing, left wing, left-to-center, center, right-to-center, right and extreme right ideology.

In order to win the elections, each candidate will have to position her policy platform on this ideology line with the aim of maximizing her probability of winning the election, given her opponent policy platform decision. Suppose that candidate A placed her platform in Ia, what should candidate B do? Since this ideology distribution is (by assumption) skewed to the left, he should locate his platform to the left of candidate A, in order to gain her the support from those voters, whose ideology is on the left of Ia, and who constitute a majority of the electorate. For instance, he can choose Ib and win the election, by obtaining the votes of more than 50% of the electorate. In this situation, candidate A would clearly have an incentive to re-position her platform to the left of candidate B, in order to gain more than 50% of the electorate, and hence to win the election. The hypothetical process of re-positioning by the two candidates would finally be concluded when both candidates locate their platform at Im, which represents the ideology of the median voter. If candidate A is at Im, candidate B would have no incentive to move from Im, as by repositioning himself he would lose the election for sure; and analogously for candidate B. Hence, both candidates would converge[5] to Im. The platform or the economic policy to be implemented would be Im, but the identity of the elected candidate would be uncertain, since voters are indifferent between the two candidates that present identical platforms.

This median voter result is thus robust to different specification of the model, and provides some powerful empirical implication. First, it suggests that elections should lead to *policy moderation*, as both candidates or parties would have to move towards the centre, i.e., towards moderate positions, while abandoning extreme positions. Second, it implies that

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[5] Stated differently Im represents a Nash equilibrium of the voting game between the two candidates.

both parties will run on the same (or at least on similar) platform, thereby renouncing to differentiate themselves strongly from their opponents, in economic policy issues.

Finally, it is worth stressing that, although these results are roughly in line with the outcome of several recent elections – such as the tightest race in 2000 US Presidential election, between Bush and Gore – the intuition and the results of the median voter's model apply only to two-party or candidates elections.

2.2 Probabilistic Voting Model

In this section, we examine the outcome of a simple majority voting election, in which voters base their political decision not only on their preferences over the economic policy, but also on additional factors. In particular, we consider a simple majority voting election, in which electors vote in office a political candidate or a party. Unlike in the median voter's model, described above, however, in their voting decisions, voters do not exclusively consider the policy platform chosen by the two candidates. Their vote is also affected by how ideologically close they feel to be to the candidates, or by their sympathy towards them.

2.2.1 The Candidates

We consider an election with two opportunistic candidates (or parties) running for office. These candidates – call them A and B – have no preferences over the economic policy which will be implemented after the election, i.e., they are not partisan. They are opportunistic and only seek to maximize the probability of being elected, perhaps because, if in office, they receive some private rents, such as ego-rents, bribes or contributions. During their electoral campaign, candidates have to select a policy platform, which identifies their position over several issues. For simplicity, we assume the platform to be

two-dimensional, so candidates have to express their views over two issues – call them *X*

and *Y* – which may represent, for instance, the size of the welfare state and the type of

foreign policy. Both candidates determine their policy platform simultaneously, yet

independently; the platforms are represented by *(X_A,Y_A)* and *(X_B,Y_B)* respectively for

candidate *A* and *B*. There is commitment over this platform: once elected, a candidate is

bound to implement her platform.

2.2.2 The Voters

Voters in this model are quite sophisticated. They base their choice of the political

candidates on an objective factor and on subjective perceptions. The former element in

their voting decision is the policy component and is easy to quantify, by evaluating how

each candidate' policy platforms affects the voters' indirect utility function. The latter

factors are instead more subjective. They capture the ideological view of the voters, or

their sympathy towards the candidates, and the average popularity of the candidates

among the entire electorate.

To make the election outcome interesting, we consider that in our society voters differ in

their economic situation and in their ideology. The heterogeneity in the voters' behavior

will stem from these differences in the economic and ideological background.

In particular, individuals are partitioned in three income groups. They can be poor (*P*),

middle income (*M*) and rich (*R*), and their income is respectively Y_P, Y_M and Y_R, with $Y_P<$

$Y_M <Y_R$. Moreover, the share of the total population in each group is respectively α_P, α_M

and α_R, with $\alpha_P+\alpha_M+\alpha_R=1$.

The impact of the policy platforms launched by the two candidates is the same effect on

all individuals in the same group. This effect can be measured by the indirect utility

functions, where $U^J(X_A,Y_A)$ and $U^J(X_B,Y_B)$ represent the indirect utility function induced

respectively by candidate A and B policy platforms for an individual of group J. Clearly, these utilities will typically differ if candidates choose different platforms. Moreover, the same platform will have a different impact on the individuals belonging to different income group. For instance, a platform involving a large welfare state will typically increase the well-being of the poor voters, while decreasing the welfare of the rich.

Within each income group, individuals differ depending on their ideology or sympathy towards the two candidates. In particular, σ^{iJ} measures the *ideology* of a voter *i* in group *j*. If $\sigma^{iJ} > 0$, voter *i* in group J is *ideologically* closer to candidate *B*, whereas if $\sigma^{iJ} < 0$ the voter is *ideologically* closer to candidate *A*. Clearly, if $\sigma^{iJ} = 0$, the voter is ideologically neutral, as she does not lean towards any of the two candidates. Since voters have different ideology within each income group, there will be voters close to candidate A among the poor, as well as among the middle-income or the rich.

How are voters *distributed* according to their ideology within each group? For instance, how many voters are ideologically close to candidate A or B among the poor? To simplify the analysis, we assume that individuals are distributed according to a uniform distribution function, centered on an average ideology equal to zero, with a group-specific density, Φ^J.
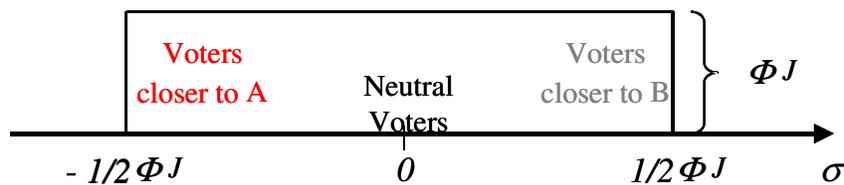

Figure 3: Distribution of Ideology

In other words, within each income group – say among the poor – there are as many individuals who strongly prefer candidate A, as voters who are neutral or who have a

slight preference for candidate B. However, the distribution of ideology may differ *across*

income group. For instance, middle income voters may have a higher density than the

other groups, $\Phi^M > \Phi^P$ and $\Phi^M > \Phi^R$. In a uniform distribution function, the density, Φ^J,

represents an important summary statistic to characterize the shape of the distribution of

ideology. For instance, as the density, Φ^J, increases, the distribution function becomes

more concentrated around the average (which we assumed to be equal to zero), and hence

the group becomes less ideological, as fewer voters have a strong ideology or sympathy

towards a candidate, while more voters are neutral, or almost neutral. Individuals' voting

decision is also affected by an additional subjective element, which we refer to as the

candidates' average popularity before the election. This average popularity is common to

all the voters, and proxies the "mood" of the electorate as the elections approach. We

measure this average popularity with δ: if $\delta > 0$, candidate *B* is more popular than

candidate *A* and viceversa for $\delta < 0$. Clearly, if $\delta = 0$, candidates are equally popular (or

unpopular).

Typically, the average popularity before the election is determined by the outbreak of a

scandal or by other news which may affect the entire electorate's subjective perception of

the candidates. If a negative shock hit candidate A, for instance because of the media

report the breaking news of US President Bill Clinton affair with Monica Lewinsky, this

candidate popularity will plunge, while candidate B's popularity will rise, and hence $\delta > 0$.
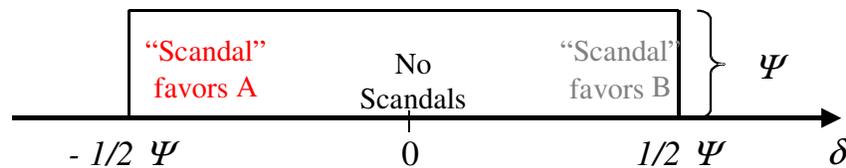
Figure 4: Distribution of Ideology

Candidates cannot control their average popularity before the election, as they cannot entirely control the outbreak of a scandal. However, they are aware of the fact that scandals – in their favor or against them – may occur. The average popularity – or the likelihood of a scandal occurring – is assumed to be distributed according to a uniform density function, centered around zero, and with density ψ, as displayed in figure 4. In other words, we assume that all scandals that affect candidate A or B are equally likely to occur than no scandal at all, $\delta=0$, in which case both candidates share the same popularity. To summarize, voters consider three elements before deciding who to *vote* for:

1) *Policy*: the utility induced by the candidates policy platform, $U^J(X_A,Y_A)$ and $U^J(X_B,Y_B)$. This factor is *group specific*

2) *Individual Ideology*: σ^{iJ}

3) *Average Popularity*: δ.

Therefore, voter *i* in group *J* will *vote* for candidate *B*, if the utility associated with the platform indicated by this candidate plus her individual ideology – recall that σ^{iJ} can be positive or negative, and that $\sigma^{iJ}>0$ indicates an ideology closer to candidate B – and plus the average popularity – again δ can be positive or negative, and $\delta>0$ indicates an average popularity in favor of candidate B – is larger than the utility associated with the platform launched by candidate A:

$$U^J(X_B,Y_B)+ \sigma^{iJ}+\delta > U^J(X_A,Y_A)$$

2.2.3 Timing of the Game

The process from the initial formation of the individual preferences over a policy outcome to its final implementation encompasses four different stages:

1   *Electoral Campaign*. At this stage, candidates announce – independently and simultaneously – their *policy platform* (X_A, Y_A) and (X_B, Y_B). In taking this decision, they know the distribution of individual ideology; and hence how many voters in each group are ideologically closer to candidate A or B. However, they do <u>not</u> know their average popularity, which is realized soon before the election, although they do know how likely they are to be caught into a scandal.

2   Before the election, the *Average Popularity* of the candidates, δ, is determined (i.e., a *Scandal* may occur).

3   *Election.* Voters choose their favorite candidate, A or B.

4   *Policy*: after the election, the winner implement her *policy platform*

2.2.4 The "Swing" Voter

Before moving to the analysis of the candidates' platform decisions, it is convenient to introduce the concept of *swing voter*. The *"Swing" voter* is the voter who – after considering the policy platform, her ideology and the average popularity – is *indifferent* between voting for candidate *A* or *B*. Consider a swing voter in group J. Since she is indifferent whether to vote for candidates A or B, she will have to receive the same utility from voting one of the two candidates. If we identify the swing voter in group J with σ^J we thus have that

$$\sigma^J = U^J(X_A,\ Y_A) - U^J\ (X_B,\ Y_B) - \delta.$$

Hence, σ^J indicates the ideology of the swing voter in group *J*. Since we assumed a uniform distribution of ideology within group, notice that mass of swing voters in each group will depend on the group density: the higher the density, the higher the number of swing voters.

Why is this "swing" voter relevant? As we will show below, candidates' platforms are designed to target the swing voter. This is because the swing voter, by being indifferent between the two groups is easy to convince – that is, to swing – for the politicians. A small change in the policy platform of one of the candidates in the direction of increasing this swing voter's utility is sufficient to gain her vote. On the contrary, a voter, who has a strong ideological bias in favor of candidate A, will be more expensive to convince, as candidate B would have to allocate more resource to this voter's group in her policy platform to please this reluctant voter.

In figure 5, we show that the swing voter divides the voters in two groups. Being the swing voter indifferent between voting for candidate A or B, the voters to the left of the swing voter, $\sigma^{iJ} < \sigma^J$, who are ideologically closer to A, will vote for candidate A; while those voters to the right of the swing voter, $\sigma^{iJ} > \sigma^J$, who are ideologically closer to B, will vote for candidate B.

Finally, notice that the identity of the swing voter is unknown to the candidates, when they select their policy platform, because it depends on the realization of the average popularity, which takes place before the election[6].
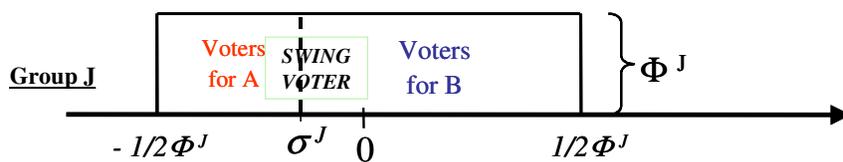

Figure 5: Swing Voter

2.2.5 The Candidates' Decisions

As discussed in the timing of the game, candidates have to set their policy platform – simultaneously and independently from one another – before their average popularity is known, that is, before a possible scandal outbreak. Due to this uncertainty, candidates – despite being opportunistic – are unable to choose their platform in order to win the election for sure. They may only maximize the probability of being elected, subject to the occurrence of a scandal. In maximizing their chances of being in power, candidates will select their platform in an attempt of please as many citizens as possible. However, economic policies often have redistributive effects, so that their implementation may please some group of voters, while upsetting others. In this respect, candidates use all the available information, such as the distribution of ideology distribution within group and the distribution of scandal probability, to guide their decision.

Let us examine candidate A's political decision. By using the swing voter in each group, we can identify those individuals who will vote for candidate A: they are the voters to the left of the swing voter, as displayed in figure 6. By using the definition of swing voter, we can easily obtain the mass of the voters for candidate A in group J, by obtaining the area displayed in figure 6. The votes for A in group J are equal to

$$(\sigma^J + 1/2 \Phi^J) \Phi^J = \sigma^J \Phi^J + 1/2 =$$

$$= 1/2 + \Phi^J [U^J(X_A, Y_A) - U^J(X_B, Y_B)] - \delta \Phi^J$$

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[6] For illustrative purposes, in figure 5, the swing voter has a negative ideology, $\sigma^J < 0$. However, it may well be the case that $\sigma^J \geq 0$.
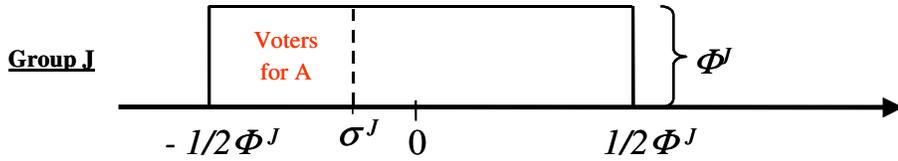
Figure 6:

Voters for Candidate A

By applying the same reasoning in all groups, and summing up votes across groups, we have that the total share of votes for candidate A in society – which we indicate with Π_A – is equal to

$$\Pi_A = \Sigma\,\alpha^J/2 + \Sigma\,\alpha^J\Phi^J\,[U^J(X_A,Y_A) - U^J(X_B,Y_B)] - \delta\,\Sigma\alpha^J\Phi^J.$$

When does candidate A win the elections? In order to win the election, she will have to obtain the majority of votes, that is, $\Pi_A > 1/2$. Modifying the equation above, we have

$$\Pi_A = 1/2 + \Sigma\alpha^J\Phi^J\,[U^J(X_A,Y_A) - U^J(X_B,Y_B)] - \delta\underline{\Phi} > 1/2$$

since $\Sigma\alpha^J = 1$ and we defined $\underline{\Phi} = \Sigma\alpha^J\Phi^J$, as the average density among the three income groups, that is, the average ideology in society. Then, we have that candidate A wins the election, $\Pi_A > 1/2$, if the following expression holds:

$$\Sigma\,\alpha^J\Phi^J\,[\,U^J(X_A,Y_A) - U^J(X_B,Y_B)] - \delta\,\underline{\Phi} > 0$$

This expression, which depends on both candidates' policy platforms, on the average popularity and on the ideology densities in the different groups, may also be written as a function of δ, to highlight that the candidate A chances of winning the election depends on the realization of the average popularity:

$$\delta < \Sigma\,\alpha^J\Phi^J\,[\,U^J(X_A,Y_A) - U^J(X_B,Y_B)]\,/\underline{\Phi} = \underline{\delta}$$

Therefore, candidate A wins the elections, if the realization of the shock that takes place before the election, δ, is below a certain threshold $\underline{\delta}$. The intuition is straightforward: candidate A wins the election, if she is not hit by a scandal.

As discussed earlier, candidates are unable to control the outbreak of these scandals; they may however select their policy platform in order to maximize the probability of winning the election or – analogously – in order to reduce the probability of losing the election if a scandal breaks out. As shown in figure 7, the probability of winning the election is the same as the probability that a scandal below a certain threshold occurs, $Pr\,(\Pi_A > 1/2) = Pr\,(\delta < \underline{\delta})$. Moreover, notice that this threshold, $\underline{\delta}$, is endogenous, as it depends on the candidates' platform. Candidate A will hence maximize the probability of winning the election by setting its policy platform, (X_A, Y_A), in order to maximize the probability that the scandal is below this threshold:

$$Pr\,(\delta < \underline{\delta}) = 1/2 + (\Psi/\underline{\Phi})\,[\Sigma\alpha^J \Phi^J\,(U^J(X_A,Y_A) - U^J(X_B,Y_B))]$$

As suggested by the equation above, the policy platform chosen by candidate A, (X_A, Y_A), will aim at pleasing voters in the more numerous (higher α^J) and less ideological (higher Φ^J) groups.
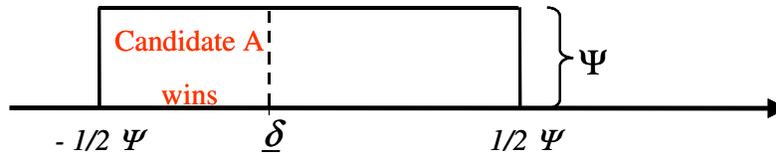

Figure 7: Candidate A's Probability of Winning the Elections

Clearly, economic policies targeting more numerous (income) groups (large α^J) have the advantage of providing benefits to more potential voters. However, some voters in these numerous groups may be highly ideological, and hence difficult to convince, despite the

benefits provided by the platform. The idea of targeting less ideological groups (large Φ^J) captures this element. Groups with a large mass of non-ideological voters – that is, with several swing voters – are easy targets for politicians to swing by using their policy platforms accordingly, almost regardless of their size.

Notice that candidate B will follow the same strategy. She will choose her policy platform, (X_B, Y_B), in order to maximize her probability of being elected $Pr\ (\Pi_B > 1/2)$. In a simple majority voting election between two candidates, this clearly amounts to minimize the probability of candidate A winning the election: $Pr\ (\Pi_B > 1/2\ ) = Pr\ (\delta > \underline{\delta}) = 1 - Pr\ (\delta < \underline{\delta})$. It is important to stress that, since the maximization problem of candidate B mirrors that of candidate A, both candidates will set the same policy: $(X_A, Y_A) = (X_B, Y_B)$.

Hence, also according to this probabilistic model, as in the median voter model, both candidates would converge to a common policy platform. The electoral incentives will help to determine the economic policy, which targets the less ideological – or swing – voters, rather than the median voter. Yet, the identity of the elected candidate will be determined by the popularity shock.

2.3 An Example of Simple Majority Voting and Probabilistic Voting

Consider the economy described in section 1.3, populated by Poor (P), Middle Income (M) and Rich (R) individuals, with incomes equal $Y_P = \frac{1}{2}$, $Y_M = \frac{2}{3}$, and $Y_R = 1$ and proportions $\alpha_P = 45\%$, $\alpha_M = 30\%$, and $\alpha_R = 25\%$. The indirect utility function is

$V(G) = [Y\text{-}G] + \gamma_i\ lnG = Y_i - G + (A - Y_i)\ ln(G)$.

Questions:

a) Calculate the political equilibrium in a majority voting election;

b) Calculate the political equilibrium in a probabilistic voting model, in which the density
   of the ideology distribution function is equal to one in every income group, $\Phi^J = 1$ for
   all J, and the density of the average popularity, ψ, is equal to one.

Solution:

a) Recall that the agents' bliss points are $G_i^* = A - Y_i$; and hence $G_P^* = 1-1/2 = 1/2$, G_M^*
   $= 1-2/3 = 1/3$ and $G_R^* = 1-1 = 0$.

   Under majority voting, since preferences are single-peaked, the median voter's
   theorem applies; and hence the political equilibrium outcome corresponds to the
   middle income voters' bliss point: $G^* = G_M^* = 1/3$. To see this, suppose that this
   policy, $G^* = 1/3$, were to be compared to a lower level of public good, for
   instance, $G = 0$. Clearly, poor and middle income voters would prefer G^* to $G = 0$,
   while only the rich would prefer $G = 0$. On the other hand, if this policy, $G^* = 1/3$,
   were to be compared to a higher level of public good, for instance, $G = 1/2$;
   clearly, rich and middle income voters would prefer G^* to $G = 1/2$. Hence, $G^* = 1/3$
   is the economic policy which would arise as a political equilibrium in this
   simple majority voting election.

   Notice that for $G^* = 1/3$:

   $$C_P = Y_P - G = 1/2 - 1/3 = 1/6$$

   $$C_M = 2/3 - 1/3 = 1/3$$

   $$C_R = 1 - 1/3 = 2/3$$

   and

   $$U_P = 1/6 + 1/2 \ln(1/3)$$

   $$U_M = 1/3 + 1/3 \ln(1/3)$$

   $$U_R = 2/3$$

b) Probabilistic Voting.

Recall that the 3 groups are such that $Y_P = \frac{1}{2} < Y_M = \frac{2}{3} < Y_R = 1$, and $\alpha_P = 0.45 > \alpha_M = 0.30 > \alpha_R = 0.25$.

Individual ideologies within group are distributed according to a uniform distribution function with zero mean and unitary density:

$$\Phi^J = 1 \quad \forall j$$

-1/2 Φ   1/2Φ
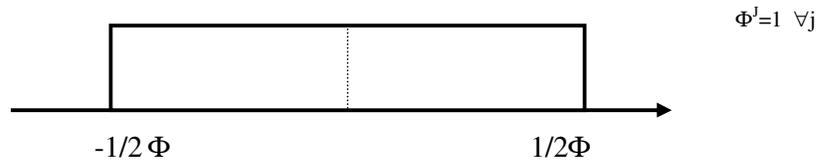
Analogously, the average popularity is distributed according to a uniform distribution function with zero mean and unitary density:

$$\Psi = 1$$

-1/2 Ψ   1/2Ψ
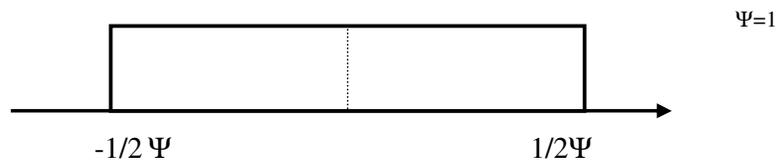
How do candidates choose the level of public good, G? Let us identify the swing voter in group j: $\sigma^J = V^J(G_A) - V^J(G_B) - \delta$

In any group j, the fraction of the voters in favour of candidate A is equal to

$$\left[\sigma^J + \frac{1}{2\phi^J} \right] \phi^J = \sigma^J \phi^J + \frac{1}{2}.$$

Hence, by summing up over all groups, we have that the fraction of all voters for A is:

$$\pi_A = \Sigma \left[V^J(G_A) - V^J(G_B) \right] \alpha^J \phi^J - \delta \Sigma \alpha^J \phi^J + \frac{\Sigma \alpha^J}{2}$$

Since $\overline{\Phi} = \Sigma \alpha^J \phi^J$, then

$$\pi_A = \Sigma \alpha^J \phi^J \left[V^J(G_A) - V^J(G_B) \right] - \delta \overline{\Phi} + \frac{1}{2}$$

Candidate A wins the election if $\pi_A > \dfrac{1}{2}$, that is, if

$$\sum \alpha^J \phi^J \left[V^J(G_A) - V^J(G_B) \right] - \delta \overline{\Phi} + \frac{1}{2} > \frac{1}{2}$$

or $\delta < \dfrac{\sum \alpha^J \phi^J \left[V^J(G_A) - V^J(G_B) \right]}{\overline{\overline{\Phi}}} = \overline{\delta}$

$$\Pr(\pi_A > \frac{1}{2}) = \Pr(\delta < \overline{\delta}) = \overline{\delta} + \frac{1}{2}$$

Hence, candidate A maximizes

$$\max_{\{G_A\}} \frac{1}{2} + \frac{\sum \alpha^J \phi^J \left[Y_i - G_A + (A - Y_i)\ln(G) \right]}{\overline{\overline{\Phi}}} - \frac{\sum \alpha^J \phi^J V(G_B)}{\overline{\overline{\Phi}}}$$

by taking first order conditions, we have

$$\alpha_P \left[-1 + \frac{A - Y_P}{G_A} \right] + \alpha_M \left[-1 + \frac{A - Y_M}{G_A} \right] + \alpha_R \left[-1 + \frac{A - Y_R}{G_A} \right] = 0$$

$$\alpha_P + \alpha_M + \alpha_R = 1 = \frac{\alpha_P(A - Y_P)}{G_A} + \frac{\alpha_M(A - Y_M)}{G_A} + \frac{\alpha_R(A - Y_R)}{G_A}$$

$$G_A = A(\alpha_P + \alpha_M + \alpha_R) - \alpha_P Y_P - \alpha_M Y_M - \alpha_R Y_R$$

Since $A(\alpha_P + \alpha_M + \alpha_R) = 1,$ and $\alpha_P Y_P - \alpha_M Y_M - \alpha_R Y_R = \overline{\overline{Y}}$, we have

$$G_A = 1 - \left[0.45 \cdot \frac{1}{2} + 0.3 \cdot \frac{2}{3} + 0.25 \cdot 1 \right] = 1 - 0.675 = \underline{\underline{0.325}}$$

Hence, we have two different equilibria. With respect to the level of the public good, we have

$$\boxed{G_{PV}{*}=0.325 < G_{MV}{*}=0.33}$$

respectively in the probabilistic voting model and in the median voter model, which reflect the different decisions by the "swing" voter and by the median voter.

Chapter 3: Lobbying

Several economic policies – such as social security or pension issues – affect the interests of a vast majority of the population, and often become hot issues in the political candidates' platforms during the electoral campaigns. On the other hand, some other policy decisions create only concentrated benefits for a small number of well-defined individuals with small (sometimes negligible) costs being diffused in the whole society. Examples of the latter policy areas include the provision of some local public goods, some targeted trade policy and the regulation of some specific markets – such as for instance taxis and lawyers. Yet, if these policy issues are not relevant to the large majority of the voters (and hence to the median voter) or to the undecided (or swing) voters, they may fail to gain the central political stage, unless a specific group of well-organized political actors exert a large effort to put these issues under the spotlight. Alternatively, these issues may fail to capture the policy-makers attention, unless organized, powerful political actors work to push these policy measures forward.

When there is an opportunity for a relatively small and well-organized group to obtain a large (and concentrated) benefit while spreading the cost on the entire society – thereby imposing only a small (or negligible) penalty on the citizens – this group may consider to exert pressure on the policy-makers – that is, to *lobby* – in order to promote the policy that best suits their interests. As such, lobbying is the process that is used by a small group to obtain a policy which favours them, even though this policy might not be beneficial to the entire society or even to a majority of the electorate. This chapter characterizes the process of lobbying as one of the possible types of political process through which individual preferences are aggregated into a policy outcome. This political process has the distinctive

feature of providing more power – and hence more favourable outcomes – to some specific groups. To address these issues, in the remaining part of this chapter, we consider an economic policy decision regarding the provision of a local public good, such as a bridge, a road or even a local subsidy of some kind. To measure the impact of the lobbying activity on the final policy outcome, we compare four alternative scenarios, which differ in the determination of the policy-making process. In the first case, we compute the social optimum, as obtained by the decision of a utilitarian social planner who cares about all the citizens. The second scenario describes an environment of complete fiscal federalism, in which the decision on the local public good is taken at local level by a representative citizen. In the third scenario, instead, fiscal federalism is only partial. In fact, while the decision on the public good (hence on the spending) is taken at the local level, the financing of the public good is centralized. This creates a situation of "soft budget constraint" that gives raise to overspending. Finally, in the forth scenario, we analyze a lobbying model in which a group of citizens exerts pressure on the policy-makers. We consider a semi-benevolent (utilitarian) social planner, who cares about all citizens, but also about the lobby's contributions, and determine how this lobbying activity modifies the policy-maker's incentives, and may thus distort the economic policies.

3.1 The Economic Policy: A Local Public Good

To address the impact of lobbying on the policy decisions, we consider a special case of economic policy, which typically provides benefits to a small – and well-defined – group of individuals, while spreading the cost on all citizens. We concentrate on the determination of a locally provided public good (a bridge on a river, a road or a local subsidy, such as the citizen's income in Alaska), and on its redistributive effects.

The economy is populated by three distinct groups of individuals, who can be easily distinguished from each other by some relevant characteristic (e.g. preferences, occupation, income, geographic location). Consistently with the analysis of a *local* public good, it is convenient to consider that individuals differ in their geographic location. These three separate groups of individuals – identified as belonging to group (or area) 1, 2, and 3, have the same income $y > 1$, but may be heterogeneous in their relative size. The relative size of group i is characterized by α_i, with $\alpha_1 + \alpha_2 + \alpha_3 = 1$.

Since groups differ in their geographic location, there may be three different local public goods $g_i = \{g_1, g_2, g_3\}$, where g_i benefits only group i and is provided in equal per capita amounts. The utility function of an individual in group i is thus the following:

$$U_i = C_i + \ln(g_i)$$

where C_i represents private consumption in group i. The economy is completely static, hence consumers have no incentive to save for future consumption and consume all their net income, which is given by the difference between their income y and any tax that may be levied by the policymaker.

To consider the different incentives faced by the politicians and hence the different policy outcome, we consider four alternative (political) process of policy outcome determination:

1. Social optimum.

2. Complete Fiscal Federalism: local public goods decided at a local level.

3. Local public goods decided at a local level, but financed at a central level.

4. Lobbying.

3.1.1 The Social Optimum

In the social optimum, we consider the decision of a social planner – that is, of a benevolent dictator, who cares exclusively about the utility of all citizens. In particular, if

the social planner is utilitarian, she will care about the sum of the utility of all citizens, weighted by their relative size. The social planner decision will hence be taken to maximize this overall utility, with respect to the three local public goods, g_1, g_2, g_3, subject to the aggregate resource constraint. Hence, we have the following maximization problem:

$$\text{Max } U = \alpha_1 U_1 + \alpha_2 U_2 + \alpha_3 U_3$$

$$\text{w.r.t. } \{g_1, g_2, g_3\}$$

$$\text{s.t. } \alpha_1(g_1 + C_1) + \alpha_2(g_2 + C_2) + \alpha_3(g_3 + C_3) = y(\alpha_1 + \alpha_2 + \alpha_3)$$

where the utility function for each group is $U_i = C_i + \ln(g_i)$, and the last equation represents the resource constraint, which equalizes the total amount of (private and public) goods consumed in the economy – the left hand side of the equation – with the total amount of resource (that is, the total income in the economy, which is on the right hand side). By simple algebra, the resource constraint can be rewritten as follows:

$$\alpha_1 C_1 + \alpha_2 C_2 + \alpha_3 C_3 = y - g_1 \alpha_1 - g_2 \alpha_2 - g_3 \alpha_3$$

Using this resource constraint, the maximization problem of the social planner described above can be simply written as follows:

$$\underset{g_1, g_2, g_3}{Max} \quad \alpha_1(C_1 + \ln(g_1)) + \alpha_2(C_2 + \ln(g_2)) + \alpha_3(C_3 + \ln(g_3))$$

or alternatively as:

$$\underset{g_1, g_2, g_3}{Max} \quad y + \alpha_1(\ln(g_1) - g_1) + \alpha_2(\ln(g_2) - g_2) + \alpha_3(\ln(g_3) - g_3)$$

This maximization process yields the following set of first order conditions:

$$FOC(g_1): \alpha_1 \left[\frac{1}{g_1} - 1 \right] = 0 \Rightarrow g_1 = 1$$

$$FOC(g_2): \alpha_2 \left[\frac{1}{g_2} - 1 \right] = 0 \Rightarrow g_2 = 1$$

$$FOC(g_3): \alpha_3 \left[\frac{1}{g_3} - 1 \right] = 0 \Rightarrow g_3 = 1$$

Thus, in the social optimum, the benevolent (utilitarian) social planner provides every group with the same amount of the local public good, $g_i = 1 \; \forall i$. Rather than representing a realistic description of an actual political process of policy determination, this scenario represents a useful benchmark for comparison. This result represents in fact the optimal policy. Any deviation from this policy will be due to a distortion in the process of policy determination.

3.1.1 Complete Fiscal Federalism

In this second scenario, we consider a situation of complete fiscal federalism in which the level of the local public good is entirely determined at the local level. In particular, each group i will have to choose the size of the local public good, g_i, but also the tax level, τ_i, to impose on its members in order to provide the desired level of local public good g_i. Complete fiscal federalism implies that both spending and taxation concerning the financing of the local public good are decentralized at the local level. Hence, for every group i, the budget constraint becomes $C_i = y - \tau_i$, and the size of the public good becomes $g_i = \tau_i$.

Since individuals are identical within each group, we can consider a representative individual for very group i, who will take the policy decision over $g_i = \tau_i$ in order to maximize the utility of the (identical) individuals in the group. The maximization problem is thus:

$$\underset{g_i}{Max}\ U_i = \underset{g_i}{Max}\ C_i + \ln(g_i) = \underset{g_i}{Max}\ y - g_i + \ln(g_i)$$

which yields the following first order condition and solution:

$$FOC(g_i):\quad -1 + \frac{1}{g_i} = 0 \quad \Rightarrow g_i = 1$$

Hence, the aggregate spending on all local public goods is $g = \alpha_1 g_1 + \alpha_2 g_2 + \alpha_3 g_3 = 1$.

Interestingly, on these local public good decisions, the scenario with complete fiscal federalism yields the same result as the benevolent social planner. This should not be surprising. When the local public good is entirely decided at a local level, and the citizens interested in the public good determine both the spending, g_i, and the taxation, τ_i, i.e., the financing of the local public good, they fully internalize the cost and benefit from the local public good provision.

3.1.2 Partial Fiscal Federalism

We now consider a situation in which the size of the public good is decided at a local level, but its funding is done centrally, through a tax on all citizens' income, that is, on the income of citizens in all geographic areas. As we shall see, results will look very different in this case.

In this scenario, each group i chooses the level of its own local public good, g_i, and the financing of all the local public goods is determined residually by setting a national tax rate, τ, on all incomes. This combination of a decentralization of the spending decision and of a centralization of the financing gives raise to a "soft" budget constraint, since individuals in every group do not fully internalize the cost of their own group local public good, while they are determining its level. To see this, consider the aggregate budget constraint for all local public goods:

$$\tau\left(\alpha_1 + \alpha_2 + \alpha_3\right) = \alpha_1 g_1 + \alpha_2 g_2 + \alpha_3 g_3.$$

Total spending on local public goods (the right hand side of the equation above) is financed through a national tax, τ, on all income (the left hand side of the equation above). Unlike in the previous scenario, where both spending and financing were decided at the local level, here spending is decided at a local level in every group, but the financing – i.e., the tax rate, τ – is determined residually to balance the budget.

The *individual* budget constraint for a citizen in group *i* looks as follows:

$$C_i = y - \tau = y - \alpha_1 g_1 - \alpha_2 g_2 - \alpha_3 g_3$$

where the last equation is obtained by substituting in the aggregate budget constraint.

In the political process, a representative citizen in each group will hence choose the level of her own local public good, g_i, in order to maximize her utility function, given the individual budget constraint above.

We hence have the following maximization problem:

$$\underset{g_i}{Max}\ U_i = \underset{g_i}{Max}\ C_i + \ln(g_i) = \underset{g_i}{Max}\ y - \alpha_1 g_1 - \alpha_2 g_2 - \alpha_3 g_3 + \ln(g_1)$$

which yields the following first order condition and solution:

$$FOC\left(g_i\right): -\alpha_1 + \frac{1}{g_1} = 0 \Rightarrow g_1 = \frac{1}{\alpha_1} > 1$$

As expected, the spending in the local public good is larger than the social optimum. This is because, when taking their political decision at the local level, individuals fail to fully internalize the costs of the public good. In fact, a unitary increase in the local public good for one group, only increases the taxes associated with that public good by a fraction α_i. This leads to another interesting conclusion. Small groups are more likely to spend more, since they internalize an even smaller percentage of the costs associated with their local public good.

When summing up over all groups, the aggregate spending is three times larger than optimal:

$$g = \alpha_1 g_1 + \alpha_2 g_2 + \alpha_3 g_3 = \frac{\alpha_1}{\alpha_1} + \frac{\alpha_2}{\alpha_2} + \frac{\alpha_3}{\alpha_3} = 3$$

To summarize, the concentration of benefits within each group – due to a *local* public good – and the dispersion of costs – due to general taxation – lead to **overspending**.

3.2 Lobbying

We now analyze a scenario in which individuals in one of the three groups – that is, citizens in one of the three geographic locations – decide to exert pressure on the policy-makers, through a process of lobbying. This pressure may occur in many different ways. Citizens may spend time and/or money in chasing politicians and in convincing them to pursue a specific policy that favours them. Citizens may use their time to write letters to the politicians, or to organizing sit-ins or other forms of protests in order to convince the politicians to endorse their policy. Alternatively, individuals may provide resources (money) to the politicians such as electoral campaign contributions, gifts, or plain bribes. All these lobbying activities aim at distorting the politicians' preferences – and the policy decisions – away from achieving the wellbeing of all citizens (the social optimum) in order to pursue more closely the interests of the lobbying group. To the extent that – otherwise benevolent – politicians are willing to modify their policy-decisions due to the influence of the lobbies, the resulting policy will typically *not* result in the social optimum.

To address this issue, we consider the simple environment in which the policy-maker decides over the level of some local public goods, as described in the previous section. The political process through which policy decisions are taken resembles the social planner situation described in section 3.1.1 in that the policy-maker is a (partially)

benevolent social planner. As before, there are three groups that differ in their geographic location. Yet, one of them – for simplicity group 1 – constitutes a lobby, while the other two groups (2 and 3) do not. Clearly, the lobby (group 1) will try to influence the decision maker – i.e., the benevolent social planner – in order to obtain an allocation of public goods in its favour, and hence less favourable to groups 2 and 3.

In this section, we abstract from two additional, relevant issues that deserve further analysis. First, we do not address the question of which group will choose to constitute a lobby; we simply assumed it to be group 1. Second, we do not discuss the free-rider problem in lobbying activities. This situation may occur because each single individual in a group may refrain from pursuing a costly (in terms of money and/or time) lobbying activity and prefer to rely on the action of the fellow group members. Clearly, if all individuals share this incentive, no lobbying activity will take place. In this section, we simply assume that the free rider problem does not arise.

In the model described here, the lobby tries to influence the policy-maker's decisions by providing monetary transfers. In particular, the lobby (group 1) chooses a contribution to the politicians, which depends on the policy outcome: $C_1(g_1)$. It is convenient to describe this possible contribution as follows:

$$C_1(g_1) = U_1(g_1) - b_1 \geq 0$$

where $U_1(g_1)$ is the utility provided to group 1 by the level of local public good g_1 and b_1 is the reservation utility of group 1. It follows that the total utility to the individuals in group 1, after the cost of lobbying $C_1(g_1)$ and the realization of the policy outcome (g_1) is given by the reservation utility: $U_1(g_1) - C_1(g_1) = b_1$. This implies that group 1 is willing to pay the legislator – at most – the entire amount between group 1's utility from a

policy g_1 and the reservation utility, b_1, which can hence be interpreted as an equivalent

of the "consumer" surplus for the lobby.

The policy-maker, on the other hand, is a (semi-)benevolent social planner, who cares

about two issues, the social welfare and the lobby's contribution. In particular, the policy-

maker gives weight η to the social welfare, $U = \alpha_1 U_1 + \alpha_2 U_2 + \alpha_3 U_3$, where U_i represents

group i's utility, and weight $(1-\eta)$ to the lobby's contribution: $C_1(g_1)$. The parameter η,

$0 \le \eta \le 1$ is thus a measure of the policy-maker's benevolence. To summarize, the policy-

maker thus has the following objective function:

$$
\begin{aligned}
W(g_1, g_2, g_3) &= \\
&= \eta\left(\alpha_1 U_1 + \alpha_2 U_2 + \alpha_3 U_3\right) + (1-\eta)\alpha_1 C_1(g_1) \\
&= \eta\left(\alpha_1 U_1 + \alpha_2 U_2 + \alpha_3 U_3\right) + (1-\eta)\alpha_1\left[U_1 - b_1\right] \\
&= \alpha_1 U_1(g_1) + \eta\left[\alpha_2 U_2(g_2) + \alpha_3 U_3(g_3)\right] - (1-\eta)\alpha_1 b_1
\end{aligned}
\tag{1}
$$

where the last expression is obtained by substituting the equation for the lobby's

contribution in.

The aggregate and the individual budget constraints remain the same as in the case of the

partial fiscal federalism (see the previous section), respectively:

$$
\tau(\alpha_1 + \alpha_2 + \alpha_3) = \tau = \alpha_1 g_1 + \alpha_2 g_2 + \alpha_3 g_3
$$

and, for individuals in any group i:

$$
C_i = y - \tau = y - \alpha_1 g_1 - \alpha_2 g_2 - \alpha_3 g_3
$$

The utility for a group i is thus:

$$
U_i = y - \alpha_1 g_1 - \alpha_2 g_2 - \alpha_3 g_3 + \ln(g_i)
\tag{2}
$$

Finally, the policy-maker chooses g_1, g_2 and g_3 in order to maximize the following

welfare function:

$$W(g_1, g_2, g_3) =$$
$$= \alpha_1 \left[y - \alpha_1 g_1 - \alpha_2 g_2 - \alpha_3 g_3 + \ln(g_1) \right]$$
$$+ \eta \alpha_2 \left[y - \alpha_1 g_1 - \alpha_2 g_2 - \alpha_3 g_3 + \ln(g_2) \right]$$
$$+ \eta \alpha_3 \left[y - \alpha_1 g_1 - \alpha_2 g_2 - \alpha_3 g_3 + \ln(g_3) \right]$$
$$- (1 - \eta) \alpha_1 b_1$$

which is obtained by substituting the utilities at equation 2 in equation 1.

The policy-maker's maximization leads to the following first order conditions and results:

$$FOC(g_1): \alpha_1 \left[\frac{1}{g_1} - \alpha_1 \right] - \eta \alpha_1 \alpha_2 - \eta \alpha_1 \alpha_3 = 0$$

$$\Rightarrow g_1 = \frac{1}{\alpha_1 + \eta \alpha_2 + \eta \alpha_3} > 1$$

$$FOC(g_2): -\alpha_1 \alpha_2 + \alpha_2 \eta \left[\frac{1}{g_2} - \alpha_2 \right] - \eta \alpha_2 \alpha_3 = 0$$

$$\Rightarrow g_2 = \frac{\eta}{\alpha_1 + \eta \alpha_2 + \eta \alpha_3} < 1$$

$$FOC(g_3): \Rightarrow g_3 = \frac{\eta}{\alpha_1 + \eta \alpha_2 + \eta \alpha_3} < 1$$

The results summarized by these equations suggest that the policy outcomes resulting from the lobbying process is **not** efficient. As expected, the lobbying group (group 1) is above to distort the policy-maker's decisions in order to obtain more local public good than socially optimal. In fact, $g_1 > 1$ while the optimal level of local public good, as determined in section 3.1.1 is $g_i = 1 \quad \forall i$. The other groups that do not lobby receive instead less local public good than is socially optimal ($g_2, g_3 < 1$). As a result of the lobbying activity, public consumption is hence misallocated, although it cannot be

determined a priori whether there will overprovision of the local public good at the aggregate level, that is, whether $\alpha_1 g_1 + \alpha_2 g_2 + \alpha_3 g_3 > 1$, or not.

Lobbying models are useful tools to analyze the occurrence of economic policies that deliver targeted redistribution, that is, policies that combine a concentration of benefits with a small cost to be spread out across all the citizens (and the entire electorate). Examples of such policies are regulation in specific markets that provide market power to a limited number of professionals or firms, while spreading the cost to all consumers.

Yet, as mentioned earlier, lobbying models have typically a drawback, since they fail to successfully address the free-rider problem. This internal free-riding problem within the lobbying group might occur when individuals within a group expect other members of the group to pay the (monetary and/or time) costs of lobbying and hence choose not to contribute. If all individuals were to follow this behaviour, there would never be lobbying in equilibrium. A real-life example of this type of problem can be found in the labor market, in the decrease in union density. Over time, the share of workers affiliated to the labour unions has drastically fallen. Since the unions act (also) as a lobby for the workers, one explanation of this pattern is the occurrence of the free-riding problem. Particularly once the unions have already established their bargaining power in the bargaining table with the firms' representative and the government, the benefits from the negotiation accrue to all workers, while the costs are borne by a smaller group – the union members. This leaves the question how to enforce lobbying in order to reduce free-riding. Social pressure has often been viewed as a possible solution, especially when potential lobby members are physically close and the lobbying activity is observable (as in the case of the labor unions). Finally, but related to this issue, another question remains (almost) unanswered by the lobbying models. Why do some groups start lobbying, while others do not? One of the suggestions from the literature is that groups in which free-riding is more

difficult to free-ride and where the concentration of benefits is higher are more likely to form a lobby.

Chapter 4: Facts, Data and Relevant Issues of the Welfare State

Welfare states represent one of the most pervasive institutions in modern societies. Indeed, all countries experience some degree of government intervention in order to modify the market allocation of the resources. In socialist countries, public intervention has historically taken the form of a complete control of the resource allocation, with no role being left for the markets or the private property; whereas in market economies, government involvement has been more moderate and has taken less extreme forms.

According to the US President Theodore Roosevelt "the object of the government is the welfare of the people. The material progress and the prosperity of a nation are desirable chiefly so far as they lead to the moral and material welfare of all good citizens". If the *mission* of the government is to improve the well-being of the citizens, then a welfare state can be defined as the set of programs and instruments, which are used to improve the welfare of the citizens.

Two important sets of issues arise with the respect to public intervention. The first – and more fundamental – question is whether individuals can *trust* the government. These doubts are clearly expressed in the words of another US President, Thomas Jefferson: "Sometimes it is said that man cannot be trusted with the government of himself. Can he, then, be trusted with the government of others? Or have we found angels in the form of kings to govern him?" Secondly, even when government's good intensions are taken for granted, one may ask whether is in fact possible to perform *Pareto-improving* economic policies that increase the well-being of all citizens. Several of the existing welfare programs indeed entail strong redistributive elements, which enhance the economic well-being of some individuals, while decreasing those of others.

The former question was partially addressed in the previous chapters, in which governments – or policy-makers – were analyzed under different perspectives, as office-seeking politicians seeking re-election or as partisan politicians aiming at implementing their most preferred policies. The latter issue will instead be addressed in the following chapters, which deal with some of the programs typically composing the welfare state and with their redistributive natures.

The aim of this chapter is to provide a description and some evidence of the government intervention in the economic environment. For this reason, it is convenient to concentrate initially on the size of the government by analyzing the relative importance of different instruments of public intervention. Particular relevance will be given to the size and composition of the welfare state programs across countries and over time, and to the role played by the government on the labor market directly – through the use of unemployment benefits – and indirectly – via the existence of employment protective legislation, that determine the degree of rigidity of the labor market. The chapter will then provide a brief overview of the classical economic explanations provided in literature to justify government intervention in the economy. The last part will present the political-economics perspective on this issue, by relating the existence of large welfare state – or more generally of extensive government intervention – to the demand for redistribution among political agents – that is, among voters.

4.1 Economic Policies and the Role of the Government

Government involvement in the economy can take several forms. The most obvious intervention – perhaps the most disliked one – is given by the taxation. The public sector needs resources to perform its several activities, and these resources are mainly obtained as tax revenues. The several types of taxation can be divided in three main groups: direct

taxes, indirect taxes and contributions. Labor income taxes, capital income tax and corporate taxes belong to the first group. They are levied respectively on the workers', savers' and firms' income. They are typically progressive, as higher marginal tax rates are applied to higher income; however, they may also be proportional, if the same tax rate is applied, regardless of the taxpayers' income. Indirect taxes, instead, are not levied on agents' income, but they often apply to consumption, production or trade. Typical examples of indirect taxes are the value added tax (VAT), the sales tax on consumption, and the import tariffs. Some of these taxes, such as the sales tax on consumption, may indeed turn out to be regressive, as low income individuals channel a larger share of their income to consumption – hence paying proportionally more taxes – than high income families. Finally, the contributions – the third group of tax revenues – are usually directed to the financing of a specific welfare program, such as social security, health care or unemployment benefits, and are typically proportional to labor earning, although floors and ceilings on taxable earnings often apply.

However, the government involvement in the economy is also on the – more popular – spending side. Tax revenues are typically used to provide transfers to different groups of individuals or firms, to finance public investments and to purchase goods or services. The purchase of products – such as provisions for the army, the public hospitals and schools – and of services – such as labor service by teachers, nurses or physicians in public schools and hospitals, which is measured by their wages – by the government is defined as government "consumption". Government investment refers instead to the purchase of equipment or to the build up of public infrastructures, such as bridges or highways. Most of the focus of the following chapters will, however, be placed on the first item on this list: the government transfers – such as old age pensions, non-contributory pensions, disability pensions and unemployment benefits – and more specifically to the welfare state.

Apart from tax revenues and public spending, government intervention also includes imposing regulations on the functioning of the several markets – such as labor, good, and financial markets – and on the trade policy. In the labor market, for instance, the government may impose some employment protective legislation, which introduces different procedures in the process of dismissing an employee, such as, for instance, the length of the notice period and possible severance payments. In the product market, the government may impose barriers to entry in a specific market – such as, for instance, taxi or legal services – thereby reducing the degree of competition. Alternatively, natural monopolies – such as electricity and gas transportation networks or railways – may be regulated by governments, through the set up of specific authorities, in order to limit the monopolistic pricing behavior by the firms. Financial markets – stock exchanges, financial intermediaries and so on – are also highly regulated, typically in an attempt to protect the savers against the risks arising from asymmetric information between the financial institution and the individual saver. Perhaps the most regulated area concerns however trading. Governments may affect the degree of openness of an economy by levying tariffs on their imports, or they may decide to imposing quotas on the amount of particular goods and services to be imported. In several countries, governments also own some firms, typically considered to belong to strategic industries or to be "national champions". Finally, governments provide several public goods, such as defense, legal and judiciary systems.

The degree of government's involvement in the economy differs substantially across countries, while being rather stable over time. Table 1 displays the size of several types of government expenditures over the GDP in different countries in 2002. European countries are divided in three groups: Continental Europe, Mediterranean Europe and Scandinavian Europe; while the UK and the US below to the Anglo-Saxon countries.

Scandinavian countries – Denmark, Finland, Norway and Sweden – enjoy the largest share of total government spending, of average more than 45% of GDP, followed by the Continental European countries – the largest are France and Germany – that also feature a large share of total government spending, of average more than 43% of GDP; while in Mediterranean countries, total government spending is around 38% of GDP. In the UK and the US, instead, government intervention is particularly limited, as total spending is respectively equal to 35.7% and 29% of GDP. The variability in government spending is hence quite large, ranging from 29% in the US to more than 50% in Sweden.

Table 1: Government Expenditure

Country	Total	Consumption		Subsidies	Social benefit and other transfers	Gross investment
		Goods and Services	Wages			
Austria	44,69%	8,21%	11,19%	2,44%	21,31%	1,54%
Belgium	40,69%	9,74%	11,41%	1,50%	16,25%	1,79%
France	47,33%	9,71%	13,52%	1,23%	19,44%	3,42%
Germany	43,05%	10,92%	8,16%	1,73%	20,45%	1,79%
Netherlands	39,71%	12,65%	10,00%	1,47%	13,47%	2,12%
Continental Europe	43,09%	10,25%	10,86%	1,68%	18,18%	2,13%
Greece	37,53%	3,97%	11,72%	0,16%	17,73%	3,96%
Italy	39,85%	7,67%	10,54%	1,20%	18,03%	2,41%
Portugal	39,97%	5,51%	15,00%	1,07%	14,75%	3,64%
Spain	35,54%	7,15%	10,45%	1,18%	13,56%	3,20%
Mediterranean Europe	38,22%	6,08%	11,93%	0,90%	16,02%	3,30%
Denmark	48,67%	8,39%	16,74%	2,21%	19,63%	1,70%
Finland	43,13%	7,51%	13,09%	1,55%	18,51%	2,47%
Norway	39,19%	6,55%	12,57%	2,13%	15,25%	2,69%
Sweden	50,42%	9,76%	16,40%	1,64%	20,45%	2,16%
Scandinavian Europe	45,35%	8,05%	14,70%	1,88%	18,46%	2,26%
UK	35,74%	11,50%	7,21%	0,46%	15,54%	1,03%
USA	28,96%	5,38%	9,19%	0,35%	10,70%	3,35%

Source: Author's calculation from OECD Economic Outlook Database (No. 71, Vol. 2002 Release 01) June 2002

In all countries, the most relevant item is given by social benefits and other transfers, which includes social security and redistributive transfers. This element ranges from

10.7% in the US to 21.3% in Austria. Continental countries spend a large share of their

GDP, more than 10%, in goods and services; while public expenditure in wages – and

hence public employment – is particularly large in Scandinavian countries, with almost

15% of GDP. Finally, gross investments obtain a rather small share of the GDP, between

1% in the UK and almost 4% in Greece.

Table 2 Tax Wedge (including employer's social security contributions)

	1981	1987	1993	1999	2004
AUSTRALIA	--	--	--	30,4	28,6
BELGIUM	49,8	53,5	54,6	56,9	54,2
CANADA	24,7	29,0	30,8	31,1	32,3
DENMARK	42,7	47,7	46,9	44,5	41,5
FINLAND	42,4	45,5	49,3	47,4	43,7
FRANCE	-	-	-	48,1	47,4
GERMANY	41,9	45,1	46,4	51,9	50,7
IRELAND	34,7	42,7	40,0	32,4	23,8
ITALY	47,3	49,4	49,2	47,1	45,7
JAPAN	17,3	21,4	21,2	24,0	26,6
NETHERLANDS	48,3	49,5	45,7	44,3	43,6
NORWAY	43,1	42,6	36,8	37,3	36,9
PORTUGAL	29,9	34,5	33,3	33,4	32,6
SPAIN	37,4	37,9	38,0	37,4	38,0
SWEDEN	50,8	51,7	45,6	50,5	48,0
SWITZERLAND	29,1	28,5	28,7	29,8	28,8
UNITED KINGDOM	37,6	36,0	32,6	30,8	31,2
UNITED STATES	35,3	30,6	31,2	31,1	29,6

Source: OECD Taxing Wages, 2006

Clearly, these differences in government spending are reflected in a similar variability in

the level of taxation. Table 2 displays the tax wedge on labor income (including

employer's social security contributions) from 1981 to 2004. In the early 80s, the tax

wedge ranged from 17.3% in Japan to 50.7% in Sweden. In 2004, the lowest tax wedge

was in Ireland, 23,4%, and the largest in Belgium, 54.2%. Table 2 shows also the

evolution of these tax rates over time. In the 80s and in the early 90s, they have been increasing in several countries – most notably in Germany, from 41.9% in 51.9% in 1999 – but they were reduced in the UK, from 37.6% in 1981 to 20.7% in 1999, due to the reforms by the Thatcher's Conservative government. Tax wedges have decreased in several countries – most notably in Ireland – in the last decade.

Table 3: Welfare State Expenditure in 1980 and 2003

1980						
	FR	DE	IT	NL	SW	US
Welfare state Expenditure	20,8	23,0	18,0	24,1	28,6	13,3
Pension	9,6	10,9	8,9	6,7	8,4	6,3
Family benefit	2,4	2,3	1,1	2,4	3,9	0,8
Labour market	0,0	0,5	0,6	2,1	1,6	0,9
Health	5,6	6,8	5,5	5,0	8,3	3,7
Housing	0,4	0,1	0,0	0,3	1,1	0,0

2003						
	FR	DE	IT	NL	SW	US
Welfare state Expenditure	28,7	27,2	24,2	20,7	31,3	16,2
Pension	12,3	11,7	13,9	5,8	10,8	6,3
Family benefit	3,2	1,9	1,2	1,6	3,5	0,7
Labour market	2,9	2,9	1,1	2,6	2,5	0,7
Health	7,6	8,0	6,2	5,8	7,1	6,7
Housing	0,8	0,2	0,02	0,3	0,6	0,00

**Source: Author's calculation from OECD Database SOCX 2007**

4.2 Size and Composition of the Welfare State

Most of the focus of this chapter and of the following chapters is on the welfare state. The aim is to present the differences across countries in the size and composition of welfare state and to illustrate the motivation behind the introduction and the expansion of these schemes over time.

Table 3 provides two snapshots of the size and composition of the welfare state in six OECD countries – France, Germany, Italy, the Netherlands, Sweden and the US – in 1980 and in 2003, as provided by OECD data. The composition of the welfare state in each country in the two years is then displayed at figures 1 to 3, with some pie charts, which underline the relative importance of each program of the welfare state.

In 1980, Sweden was already spending almost 30% of its GDP in welfare state expenditure, as opposed to around 13% in the US. All other countries in the sample were between 18% in Italy and 24% in the Netherlands. In 2003, Sweden has still the largest welfare state – spending 31.3% of GDP – and the US the lowest with 16.2%. While the Netherlands reduced their welfare state expenditure, all other countries experienced a remarkable growth.

Figure 1: Welfare State Composition in France and Sweden 1980 and 2003
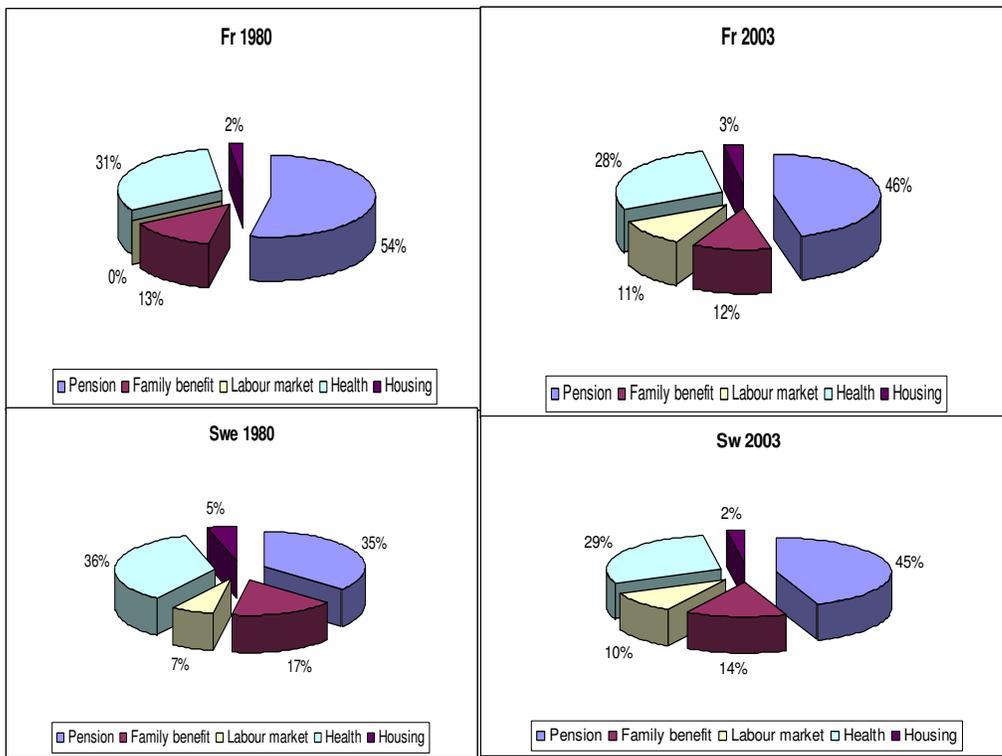
As shown in figure 1, in France, the large expansion in welfare state expenditure is mainly due to labor market programs, while the relative importance of the pension system in the total welfare spending has dropped from 54% to 46%. In Sweden, instead, the relative importance of pension spending over total welfare spending has increased from 35% to 45%, while public health spending has been reduced and labor market programs increased. Figure 2 displays the situation in Italy and the US. In Italy, the entire increase in welfare spending is due to the rise in social security expenditure, which accounted for 55% of welfare spending in 1980 and for 62% in 2003. In the US, instead, the only significant variation has been in public health spending: from 32% of total welfare spending, in 1980, to 46% in 2003.

Figure 2: Welfare State Composition in Italy and the US in 1980 and 2003
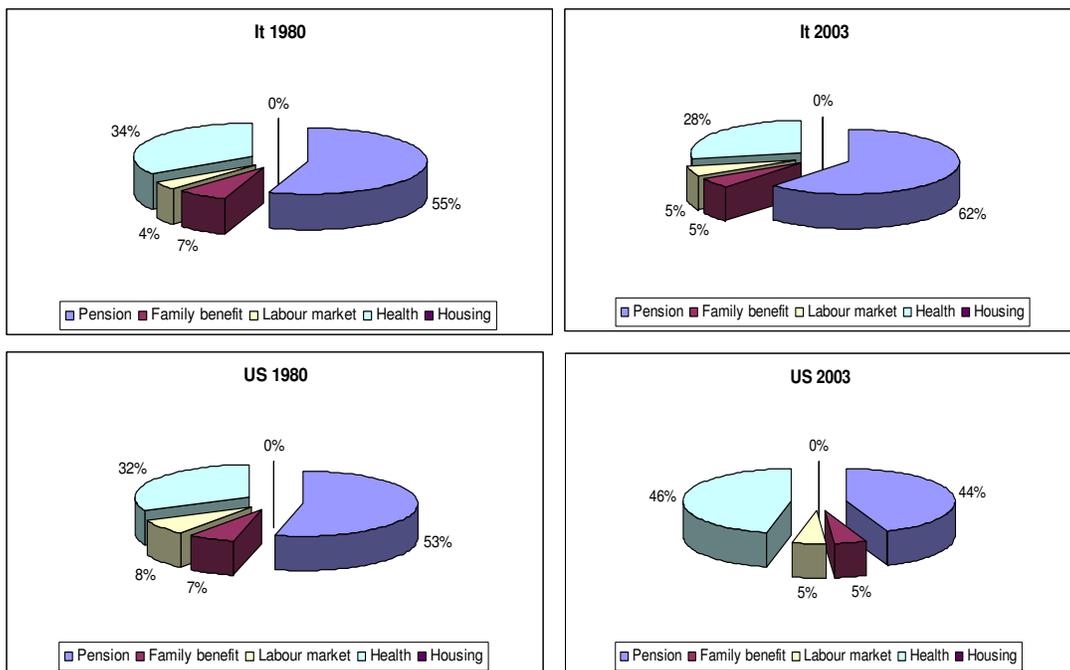
Finally, figure 3 depicts the evolution in Germany and the Netherlands. In the former country, the increase in welfare spending – from 23% in 1980 to 27.2% in 2003 – is due to

an increase in health care – from 6.8% of GDP to 8% – and in labor market programs –

from 0.5% of GDP to 2.9%. In the Netherlands, instead, pension and family benefits have

been reduced by almost 1% of GDP.

Figure 3: Welfare State Composition in Germany and the Netherlands
in 1980 and 2003
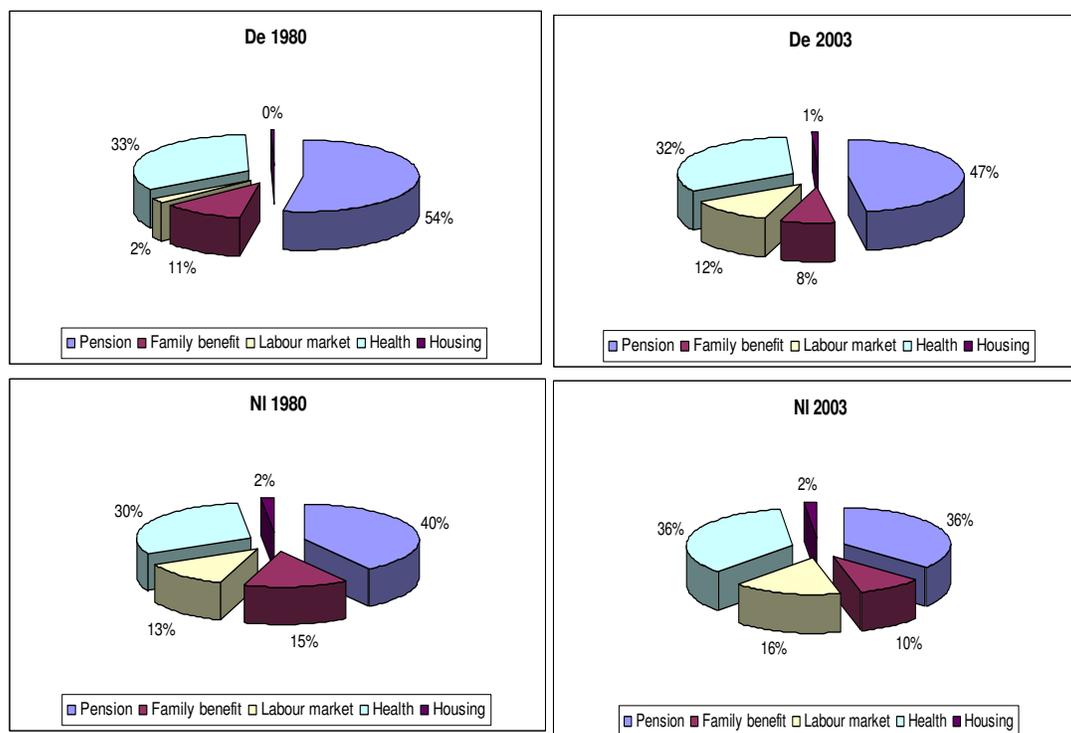
These figures show that – in all countries – the largest majority of social spending is

channelled towards the elderly as pensions and health care. The next figure uses OECD

data to display the spending on elderly citizens in terms of cash and in-kind benefits. In

the following chapters, we will address the political decisions over the determinations of

these welfare state programs.

Figure 4: Support for the Elderly

Chart 2. **Support for senior citizens and health benefits are key areas of social spending**

A. Public social expenditure by broad social policy area [a], in percentage of GDP, in 2001
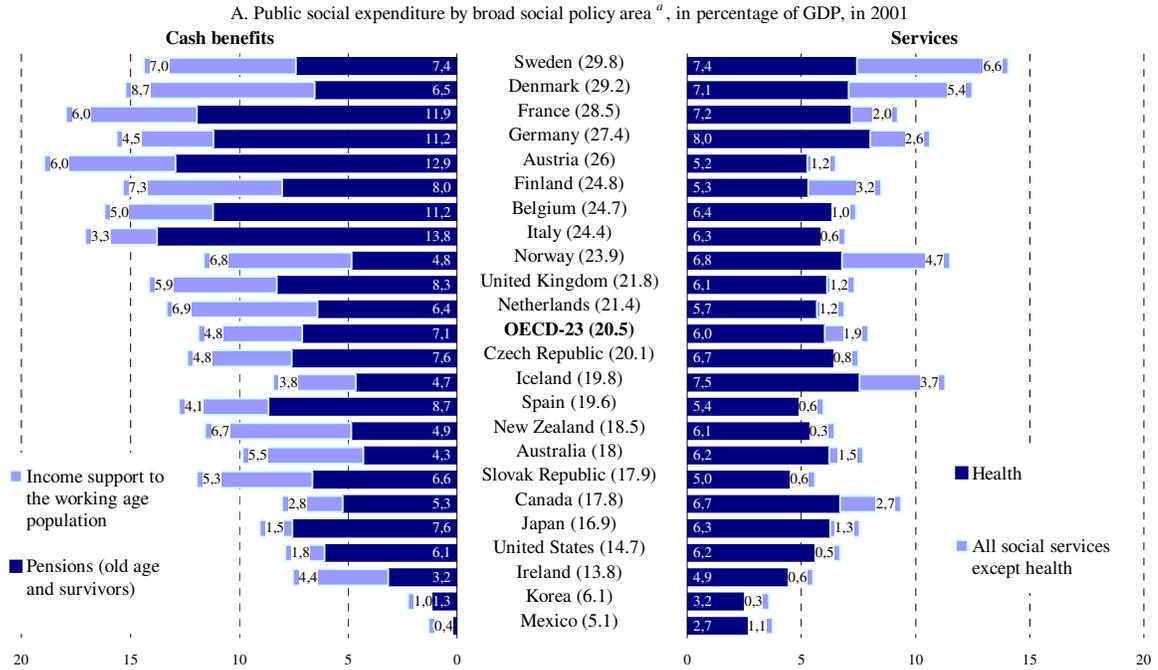
4.3 Labor Market Issues

One of the most important scenarios, in which the government intervenes both directly –
by imposing taxes or providing transfers – or indirectly – by regulating its structure or the
behavior of its main players – is the labor market. Conventional "demand-supply"
economics suggest that the key players on this market are the workers, who offer their
labor services, and the firms, who demand these services. The interaction between labor
demand and labor supply gives raise to an equilibrium wage and to an equilibrium level of
employment, such that the number of workers who are willing to supply their services at
the equilibrium wage is exactly equal to the number of jobs that the firms want to fill for
that equilibrium wage. Yet, the government may get involved in this market in several
manners and for several reasons.

Workers may choose not to offer their labor services individually in a competitive fashion
and to create a cartel representing all the workers, which has a market power in facing the

labor demand, that is, in bargaining with the firms. This cartel is represented by the unions, and their role in the economy is typically regulated by laws which establish according to important characteristics such as their degree of coverage and of centralization. Governments also determine the degree of regulation in the labor market, which establishes its rigidity, that is, how difficult it is to dismiss a worker. Finally, governments may force direct and large tax burdens on the labor market, as they impose labor income taxes and social contribution on earnings.

Table 4: Unions' Characteristics in 1999

	Density \1	Coverage\2	Centralization \3
France	9,1	95,0	2,0
Germany	29,0	92,0	2,0
Spain	21,1	78,0	2,0
Italy	23,7	82,0	2,0
United States	14,3	18,0	1,0
Japan	24,0	21,0	1,0
European Union	43,1	82,3	1,9

\1 Percentage of workers enrolled in a union

\2 Percentage of workers whose wage is determined by the union

\3 Degree of Centralization of the wage Bargaining 1 at firm level, 3 central

Source: OCSE, 1999

The role of the unions in western economies dates back to the XIX century. Besides their historical development, however, unions may be characterized according to three main features: density, coverage and degree of centralization. The density rate is calculated as the percentage of workers enrolled in a union, and hence measures the success of the

union in attracting workers. This element is not directly related to the role of the state, although those governments that are ideologically close to the unions – typically left wing governments – may adopt policies, which induce the workers to join the unions, while those that are not sympathetic will oppose them. Historically, density has been rapidly decreasing in most OECD countries, as new generations of workers have proved less keen on joining in the unions. In 1999, the average density in the EU was equal to 43.1, mainly due to the existence of Gant countries, in which union's membership has a tangible impact on the workers' rights and entitlement to benefits. In the large continental countries, Germany, Italy and Spain, the density is between 21% and 29%, while it is down to less than 10% in France.

However, the unions' relevance, as defined by the impact of the unions in the wage bargaining is better measured by their coverage, which is equal to the percentage of workers whose wage is determined by the unions. According to table 4, 95% of the French workers in 1999 had their wage contracted for by the unions, despite the unions only "representing" 9.1% of all workers. This phenomenon of extra-coverage, that is, the difference between the coverage and the density, provides an estimate of the importance of the free-riding in the union's membership. To the extent that unions are already established, and hence bargain the contract and the wage for most of the workers, individual workers have no incentive to join them, because of the monetary cost (the membership) and even the stigma that may be attached to joining a union in some working environment. As displayed at table 4, the extra-coverage represents a persuasive European phenomenon.

The final element characterizing a union is its degree of centralization, which describes whether the wage bargaining occurs at firm, sector or central level. Depending on their degree of centralization, unions internalize certain information and concerns in its

bargaining process with firms' representatives and government, while leaving others aside. The US and Japan display a very decentralized model in which unions bargain at the firm level, thereby sharing within the firm possible concerns and information on how labor cost may shape the firm's competitiveness. Continental European countries, instead, typically bargain at the sector level, while some Scandinavian countries present a very centralized bargaining. For the purpose of this course, it is important to stress that the second and third features of the unions – as described here – are established by law, and hence may be considered under the direct influence of the government's economic policy.

One of the most important regulations placed by the government of the labor market is the so-called *employment protective legislation*, or EPL. The EPL is composed of the laws, rules and regulations that concern the dismissal of a worker by the employer. Large degrees of EPL correspond to a strict regulation, and hence to a rigid labor market, in which it is difficult to dismiss a worker. The rational of the EPL is to protect workers against the risk of becoming unemployed, in particular, when firing is "unfair". This legislation may take different forms. According to the OECD (1994), the measure of EPL can be decomposed in: (1) procedural inconveniences to dismissals (mainly capturing the complexity of the procedures needed to issue a dismissal notice); (2) notice and severance payments requirements, (the time elapsed between the decision to layoff a worker and her/his effective removal from the payroll); and (3) difficulty of dismissals, which measure the relevance of litigation costs and any possible bias in the judicial enforcement process. Cazes, Boeri and Bertola (1999) suggest that the third component of EPL – the difficulty of dismissal – accounts for most of the reduction in the dismissal rate associated with a stricter EPL. In other words, the EPL can be characterized as a deadweight cost, such as litigation cost, although there exists also a severance payment component, which plays a possible role of insurance against the unemployment risk.

OECD countries differ widely in their degree of EPL. As displayed at table 5, European countries, such as Germany, France and Spain, feature stricter labor market regulations than for instance the US. These differences appear both when regular and temporary workers are considered. For temporary workers, however, some flexibility has been introduced in the 90s, as shown at table 5, in the case of Denmark, Germany and Italy.

Table 5: Degree of employment protective legislation

| | Regular Workers | | Temporary Workers | | Overall Index | |
	1985	2003	1985	2003	1985	2003
France	2,5	2,5	3,1	3,6	2,8	3
Germany	2,6	2,7	3,8	2,0	3,2	2,4
Spain	3,8	2,6	3,75	3,5	3,8	3,1
Italy	1,8	1,8	5,4	4,1	3,6	1,95
Japan	2,4	2,4	1,8	1,25	2,1	1,8
United States	0,2	0,2	0,3	0,3	0,2	0,2
Denmark	1,5	1,5	3,1	1,4	2,3	1,4

\1 Qualitative Measures increasing in the degree of rigidity from 0 to 6.

OECD, 2006

Reforms on the labor market for regular workers have instead proved extremely difficult. An inventory of reforms available at the Fondazione Rodolfo Debenedetti website (www.frdb.org) suggests that reforms of employment protection have been parametric, involving only marginal groups of the workforce and have been enforced "at the margin", that is, only limited to new hires. This is confirmed by the updating of the OECD index of the strictness of employment protection for regular workers, displayed in Figure 5 (drawn

from OECD data): the EPL for "regular" workers, that is, workers with permanent contracts, has hardly changed at all in OECD countries over the decade, with the notably exception of Finland, Portugal and especially Spain. The degree of EPL hence seems to represent a stable politico-economic equilibrium, since governments refrain from adopting any reform measures. Characterizing these equilibria is the task setup for the next chapters.

Figure 5: Changes in the Degree of EPL for Regular Workers
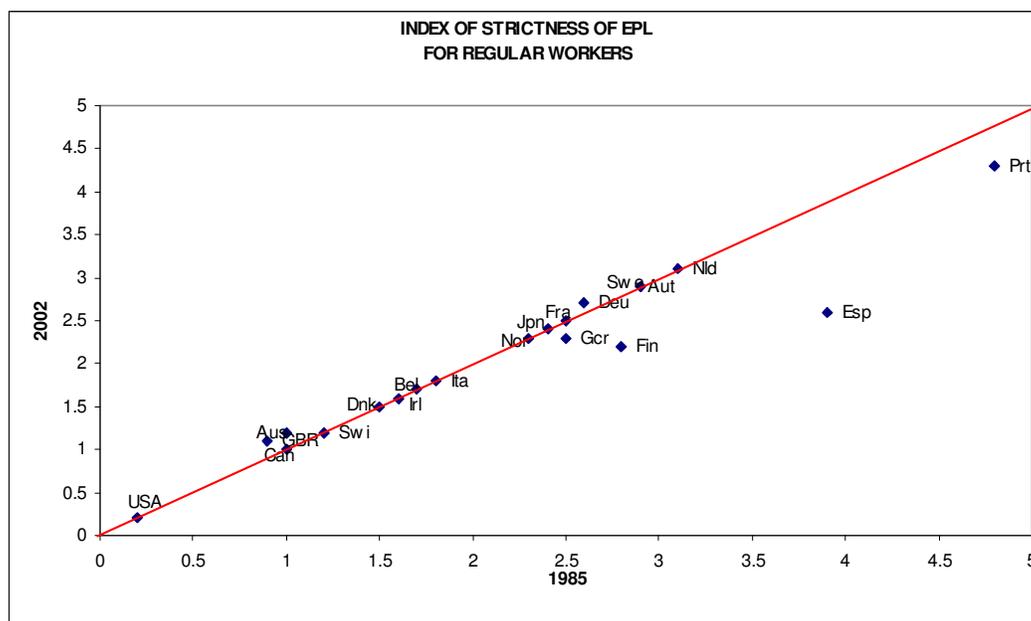
Source: Boeri, Conde-Ruiz and Galasso (2006)

The last – but far from least – form of government intervention in the labor market is represented by the labor market taxation. Governments collect a large amount of revenues in the labor market both in order to finance specific programs, such as public pension, health care or unemployment benefits – these taxes are often called social contributions –

and to finance general government spending. Table 2 that displayed the tax wedge confirms the existence of large difference among OECD countries.

Table 6: Unemployment rate in the Labor Market

	Labor force participation	Unemployment rate
Australia	77,11	5,09
Austria	78,36	5,78
Belgium	67,69	8,43
Canada	79,25	6,76
Switzerland	86,32	4,30
Czech Republic	71,07	7,95
Germany	78,24	9,10
Denmark	80,99	4,81
Spain	71,26	9,16
Finland	74,64	8,41
France	69,28	9,87
United Kingdom	75,95	4,84
Greece	64,89	10,37
Hungary	59,98	7,32
Ireland	72,46	4,36
Iceland	84,58	2,61
Italy	62,59	7,79
Japan	78,01	4,43
Republic of Korea	68,48	3,73
Luxembourg	69,08	4,65
Mexico	58,58	3,50
Netherlands	77,90	4,95
Norway	79,05	4,59
New Zealand	67,82	3,68
Poland	63,95	17,75
Portugal	77,54	7,66
Slovak Republic	68,66	16,16
Sweden	78,31	5,81
Turkey	52,97	10,05
United States	66,04	5,08
7 Major OECD Countries	-	6,05
EURO area 12 countries	71,60	8,58
OECD Total	-	6,49

Source: OECD Economic Outlook, July 2000.

All these institutional features, such as the degree of EPL, the different strengths and characteristics of the unions, the size and redistributive element in the unemployment

insurance system, and the labor market taxes are all crucial elements which combined with the other features affecting the labor demand and supply determine the level of employment in the labor market and the unemployment rate. Table 6 presents the labor force participation and the unemployment rates in several OECD countries in the year 2004. Large differences occur, as the unemployment rate varies from less than 3% in Iceland – a country characterized by an extremely large labor force participation – to around 10% in France and Spain, but even more in the Slovak Republic, Poland and Turkey, which displays also the lowest participation rate, 53%.

4.4 The Economic Approach to Government Intervention

The economic literature has envisaged a wide variety of reasons and situations in which government intervention is needed in order to improve on the working of the markets. In any such occasion, markets do not operate efficiently, and the intervention of a benevolent government may indeed increase the well-being of the individuals. These *market failures* occur in the case of public goods, externalities, asymmetric information or when the market structure is characterized by a monopoly (or a natural monopoly).

Public goods are those products or services that are *non-rival* in consumption and *non-excludible*. Because of these characteristics, competitive markets do not provide the correct incentives to produce the efficient level of these goods. To see this, consider the former feature, non-rivalry in consumption. For typical goods – say, an apple – consumption by an individual prevents another person to consume the same good; this element eliminates possible free-rider problems, as the second person will have to buy the good, if she wants to consume it, and will not be able to free ride on other individuals' purchasing of the good. A public good, for instance a lighthouse, is instead non-rival, as the "consumption" by a boat of the service provided by the lighthouse does not prevent

another boat from using it. In this case, the second boat will not have an incentive to "buy" the services of the lighthouse, but will find more convenient to pretend not to need – or not to use – it, and free ride on the other purchasers of the service. The latter characteristic, the non-excludability, prevents the seller of the good to exclude the second boat from using the public good. In the case of the lighthouse, it is clearly impossible to exclude the second boat from enjoying the service of the lighthouse, if this boat is not willing to pay for the service. In these occasions, producers on the competitive market will have no incentive to provide any level of the public good, since they will not be able to sell it, due to the free-riding behavior by the potential consumers. The conventional wisdom in the economic literature is thus that the efficient provision of public goods, such as parks, railroads, legal system and defence, belongs to the public sector.

Another typical situation that calls for government intervention occurs when production or consumption *externalities* take place. A negative production externality represents a situation in which the production of a good or service has a negative impact on the welfare of other individuals, without the markets providing for a compensation of this negative effect. This typically occurs when, as a by-product of its production process, a firm pollutes the nearby areas, without providing to its cleansing or paying an appropriate compensation for it. In other words, the firm does not *internalize* the entire cost of production, as it is not called up to face the cost of polluting, and hence produces an amount that is not socially efficient, that is, its production is too large. In this situation, the government may intervene in order to increase the welfare of the individuals, by imposing regulation that limit this firm production or by taxing the firm on its production in order to reduce its level to the socially efficient amount. A similar situation occurs – for the case of negative consumption externalities – when individuals smoke in a restaurant, thereby decreasing the utility from consuming their dinner to the other customers.

Markets may also lead to inefficient allocations, if some agents have *market power* – that is, the ability to affect prices. The extreme form of market power is monopoly, when in the market for a product there is one seller only. This monopolist will typically choose to increase prices above their marginal cost, by supplying less goods than a seller in a competitive market would do. This market failure is magnified in the case of natural monopolies, that is, in situations in which the cost structure of the sector of production naturally leads to the existence of a unique producer (and seller). This is typically the case when there are large initial fixed costs of production and small additional marginal costs, such as, for instance, in the production and distribution of electricity or gas. In markets in which monopoly power emerges because of large entry costs or non-competitive behavior by the incumbent firm, the government may guarantee more competition by imposing competitive behavior through an anti-trust body. In natural monopoly, or when competition cannot be directly achieved, the government may instead try to regulate the working of the monopolist by imposing price caps.

Another major reason of market failure is due to asymmetric information. Often the two potential sizes of a market, buyers and sellers, have different information on some characteristics. This asymmetry of information may eventually lead to the disappearance of these markets. Consider a possible market for health insurance. A private insurance company would be willing to offer a contract to cover health costs to subscribers in exchange for a premium. Since the insurance company can not perfectly discriminate among health types – due to the asymmetric information problem – it will have to charge the same premium to all insured persons. In order to calculate the cost of this premium, the insurance company has to evaluate the average health status and the average health hazard among its subscribers. The larger is the expected number of "good risks", the lower is premium charged by the insurance company. However, those persons who perceive to

have low health risk (notice that this represents a private information) will not be willing to pay a high premium, and hence will not subscribe the insurance. Thus, a problem of *adverse selection* will occur, as the insurance company will remain with "bad health risks" only, which will not be willing to take on.

Interestingly, the same type of reasoning applies to several insurance programs, which are not offered by the private market, but instead belong to welfare state, such as pension system – which provides retirement income, through annuities, and is hence related to longevity risk – unemployment insurance and health care. An additional problem which arises because of asymmetric information is known as the moral hazard problem. Individuals covered by insurance – say car theft insurance – have a lower incentive to undertake all the necessary actions in order to decrease the probability that the negative event will occur, since they are insured against this risk. The role of the government in these markets is to force all individuals to pay for the insurance, as all citizens are for instance required to contribute to the health care system, regardless of their information on their risk type (whether they are a good or bad heath risk). This compulsory behavior imposed by the government thus avoids any adverse selection problem, despite the asymmetric information.

The economic literature also provides additional explanations for the government involvement in the economy – in particular, in the establishment of a welfare state. These motivations hinge on equity considerations and on a paternalistic view of the state. According to the former justification, even if the market reaches an efficient allocation of resources, governments may still want to intervene in order to decrease the degree of income inequality in the society or to reduce the share of the population below the poverty line. The underlying philosophical reason is that the society may have a preference for less inequality in income or consumption (but notice that equity may be defined in several

ways). According to the paternalistic view, instead, individuals are not farsighted enough to look after themselves – for instance buying enough insurance – and the government may need to implement specific programs in order to force the individuals to do so. This paternalistic justification has often been applied to social security programs.

4.5 The Political-Economics Approach to Government Intervention

The political economics approach to government intervention takes a completely different view. Government intervention needs not to be justified by its role of increasing economic efficiency (e.g., due to market failures), or of providing income redistribution for equity reason. Rather, government intervention depends on political reasons. Politically appointed policy-makers set the economic policies in an attempt of increasing their probability of winning the election. No equity or efficiency reasons are needed; policy-makers only care about obtaining the votes of a majority of the electors, who are effected by their economic policies.

Since the focus of the following chapters is on welfare state and labor market; the policy-makers will have to consider the different lines of redistribution introduced in the welfare state. Four types of redistribution are crucial in a welfare state and labor market framework: (i) by income – typically from the rich to the poor; (ii) by age – usually from the young to the elderly; (iii) by employment status – between insiders and outsiders, that is, between employed and unemployed; and (iv) by factor of production – between labor and capital, that is, between workers and capitalists.

4.6 Citizens' Opinions on the Welfare State

Before turning to the political economics explanation leading some countries to establish and to develop large welfare state – and highly regulated labor markets – it is useful to ask

how individuals feel about the size and the degree of redistribution of current welfare states in European countries. The answers to these questions will help to address the important concerns about the future political sustainability of these schemes.

Table 13. Who wants to expand the welfare state?

Question: In your opinion, should the state (a) reduce taxes and compulsory contributions, cutting pensions and/or transfers to households, (b) maintain taxes and compulsory contributions at current levels, or (c) increase pensions and/or transfers to households, by raising taxes and/or compulsory contributions?'

	France (%)	Germany (%)	Italy (%)	Spain (%)
Don't know/no answer	19.1	6.5	16.1	27.7
Less transfers and taxes (% of those who answered)	35.0	26.9	42.8	15.9
Maintain (% of those who answered)	51.2	59.1	39.7	53.2
More transfers and taxes (% of those who answered)	13.8	14.0	17.4	30.9

Characteristics of those who wants to shrink the welfare state:
Dependent variable: 1 = reduce, 2 = maintain, 3 = increase

	Coefficient	Std.-Error	Coefficient	Std.-Error	Coefficient	Std.-Error
Public sector worker	0.051	0.079	0.041	0.080	0.004	0.089
Unemployed	−0.012	0.107	−0.003	0.108		
Permanent job	0.040	0.071	0.030	0.072	0.031	0.084
Employed	0.190	0.055***	0.135	0.058**		
Self-employed	−0.352	0.072***	−0.368	0.073***		
Young (<35)	−0.209	0.045***	−0.228	0.046***	−0.243	0.063***
Old (>54)	0.110	0.053**	0.134	0.054**	0.208	0.098**
Male	−0.067	0.037*	−0.070	0.038*	−0.110	0.057*
Poor	0.119	0.046**	0.119	0.047**	0.120	0.084
Rich	−0.031	0.046	−0.030	0.047	−0.016	0.066
Compulsory educ. only	−0.036	0.044	−0.011	0.046	0.011	0.069
University degree	−0.062	0.052	−0.067	0.053	−0.138	0.077*
Unskilled worker	0.165	0.088*	0.133	0.088	−0.050	0.132
Medium skills worker	0.255	0.077***	0.238	0.078***	0.156	0.120
Union member	0.153	0.048***	0.136	0.050***	0.208	0.068***
Left			0.202	0.059***	0.288	0.087***
Right			−0.040	0.056	−0.146	0.086*
Informed about pensions					−0.254	0.065***
Spain	0.616	0.066***	0.651	0.068***	0.890	0.143***
France	−0.116	0.066*	−0.079	0.068	0.090	0.154
Italy	−0.196	0.067***	−0.163	0.069**	−0.003	0.154
East Germany	0.163	0.053***	0.210	0.056***	0.269	0.087***
	Obs = 3978 LR = 346.9 Pseudo R2 = 0.04		Obs = 3825 LR = 363.3 Pseudo R2 = 0.04		Obs = 1697 LR = 201.8 Pseudo R2 = 0.06	

Notes: Ordered probit. The reference individual is middle-aged, female, high school educated, middle third of the income distribution, and centre political ideology. Significance is denoted by asterisks (* = 10%, ** = 5%, *** = 1%). LR = likelihood ratio test that all coefficients except the constant are zero. 'Don't know' is treated as a missing observation.

Source: Authors' survey.

Table 14. Opinions about shifting resources from young to old

Question: 'In this case <maintaining size>, should the state (a) allocate more resources to pensions and less to unemployed or young job seekers, (b) allocate less resources to pensions and more to unemployed and young job seekers, or (c) keep the current situation?'

	France (%)	Germany (%)	Italy (%)	Spain (%)
Don't know/no answer	9.0	3.3	7.3	9.0
More to pensions (% of those who answered)	13.9	16.6	18.5	10.2
Less to pensions (% of those who answered)	19.9	21.6	46.2	30.2
Status quo (% of those who answered)	66.2	61.8	35.2	59.6

Who wants to shift resources from the young to the old people, given no change in the size of welfare state? (probit estimates with sample selectivity correction)

	Coefficient	Std.Error	Coefficient	Std.Error
Unemployed	−0.314	0.184*	−0.285	0.180
Young (<35)	−0.014	0.077	−0.014	0.074
Old (>54)	0.240	0.092***	0.201	0.094**
Compulsory educ. only	0.140	0.065**	0.118	0.064*
Union member	−0.030	0.089	−0.056	0.081
Permanent job	0.239	0.124*	0.178	0.121
Spain	−0.234	0.200	−0.155	0.168
France	0.069	0.175	0.069	0.136
Italy	−0.627	0.300**	−0.476	0.277*
High unemployment region			−0.159	0.067**
Constant	0.737	0.439*	1.033	0.260***
	Obs = 4558	Censored = 2525	Obs = 4558	Censored = 2525

Notes: Wald test that all coefficients except the constant in the main equation are zero is 39.9 for the first regression and 31.3 for the second. The selectivity equation (not reported) is highly significant. Main instruments are income and skill levels. Estimation is by joint maximum likelihood.

Source: Authors' survey.

Table 13, taken from Boeri, Boersch-Supon and Tabellini (2003), shows that a large majority of individuals in France, Germany, Italy and Spain is in favor of maintaining or even increasing the level of welfare state taxes and transfers; hence hinting at a currently sustainable welfare state.

Interestingly, among those opposing the welfare state there are the young and the self-employed; whereas employed, old, poor, medium or low skilled and union members are in favor of the welfare state.

Table 14 instead presents the answers to a question, which highlights the intergenerational line of redistribution, between young and old. First, notice that, in every country, a majority of the interviewed supports the current pension system (that is, the status quo) or may even want to increase it. Second, elderly individuals, those with permanent job, and

with compulsory education only are clearly in favor of more pension system, whereas the

unemployed prefer more resources to be awarded to the unemployed and to the young

workers rather than to the retirees.

Chapter 5: Redistributive Transfers in the Welfare State

The seminal contribution in the political economics of the welfare state dates back to mid70s, with the work by Romer (1975), Roberts (1977), and Meltzer and Richard (1981), which gave raise to a large literature aiming at linking the existence of redistributive policies to political reasons, and more specifically to electoral outcomes. The basic idea in these initial contributions is that – in democracies – economic policies are chosen by office-seeking policy-makers in an attempt to maximize their probability of winning the election. Politicians thus consider the preferences of a majority of the voters, as indicated by the median voter theorem presented in chapter 2, or of the swing voters, as suggested by the probabilistic voting model, and determine the economic policy accordingly.

This chapter concentrates on a particular economic policy, consisting of an income redistribution scheme. Individuals may be taxed a proportion of their labor income, and these tax revenues may be redistributed to all citizens in a lump-sum fashion, that is, regardless of the citizens' specific characteristics, such as income, age, gender or geographic location. Thus, since every individuals contribute in proportion to her income, while the benefits are not related to income, this system entails a strong element of redistribution from the rich, who pay large contributions, to the poor, who instead pay little taxes. Also the political environment is quite simple, as individual (that is, voters) preferences are aggregated at simple majority voting, and hence the median voter theorem may be applied, provided that preferences are single-peaked. The economic model presented in the next section will illustrate the characteristics of this redistributive policies and the political environment.

The crucial insight of this political-economics approach to redistribution relies on the hypothesis of selfish voters. Since they only care about their own well-being, as provided for instance by consumption and leisure, poor voters will support larger redistributive programs, which they benefit from, whereas richer voters, who are net contributors to these programs, will oppose them. The determination of winners and losers from this redistributive policy will be addressed in the following section.

As a result, discussed in details in the last section of this chapter, the size of the welfare state is related to the degree of income inequality in the economy. In particular, in democracies, in which the dimension of the redistributive policy is determined by selfish voters, a more unequal distribution of income induces more redistribution. This literature proposes a specific measure of income inequality: the distance between the median and the mean income in the economy. The main message is that the relevant group in the political arena is the middle class, that is, the individuals with the median income. Therefore, if the middle class becomes relatively poorer, for example because of an increase in the income of the rich, the size of the system will increase, whereas if the middle class becomes relatively richer, for example because of a reduction in the income of the poor, the size of the system will decrease.

5.1 The Economic Model

To fully understand the features of this simple redistributive system, it is convenient to consider a simple economic model, as used by Meltzer and Richard (1981). The economy is populated by individuals, whose total mass (that is, the population size) is normalized to one. This economy is static, and hence individuals only leave for one period: today. Agents in this economy work and use their labor income, net of taxes and transfers, to purchase and consume the only produced good.

The crucial line of redistribution in this environment is income, and hence individuals have to differ according to income. In order to introduce these income differences, individuals are assumed to be heterogeneous with respect to their ability to work, which is indicated by e. This working ability, e, determines the individual productivity and hence the amount of time that she will devote to work, and ultimately her labor income. As it will become clear after examining the optimization problem of the economic agents, there exists in fact a close link between the individual ability type, e, and her labor income, $n(e)$. Individuals abilities vary from the lowest, e_l, to the highest one, e_u, and hence they are distributed on the support $[e_l, e_u]$, with $e_l < 0$, and $e_u > 0$, according to a cumulative distribution function $G(e)$. The average ability in society is assumed to be equal to zero,

$E(e) = \int_{e_l}^{e_h} e dG(e) = 0$; that is to say that the individual with average ability in society has an

ability equal to zero, $e=0$, and a corresponding, typically positive, income $n(0)>0$. Furthermore, as shown in figure 1, the distribution of abilities is assumed to be skewed, so that the median ability, e_M, is below the average ability: $e_M < E(e) = 0$.

Figure 1: Distribution of Ability in the Economy
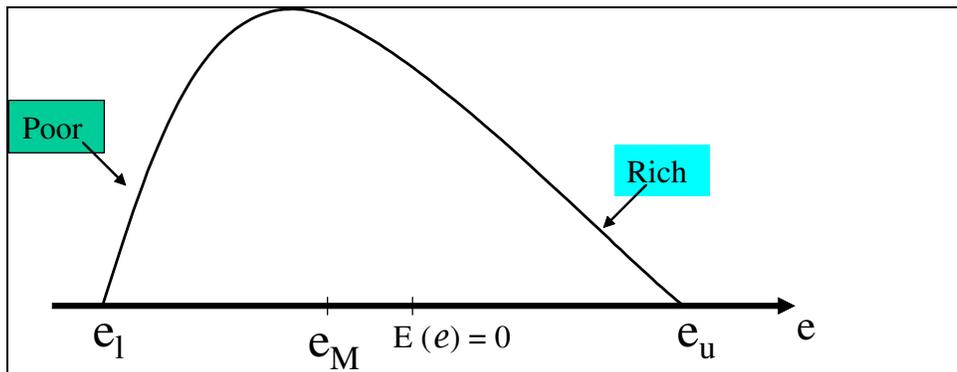
The total endowment of disposable time for an individual to divide between labor and leisure depends on the individual's ability level. The individual time constraint is in fact equal to

$$l + n = 1 + e \qquad (5.1)$$

where l is the amount of leisure, n represents the time spent working, the average time endowment in the economy is normalized to 1, and e is the individual ability.

Individuals care about consumption and leisure – they dislike to work. Their preferences over consumption and leisure are summarized by a quasi-linear utility function:

$$U = c + V(l) \qquad (5.2)$$

where c denotes consumption, l is leisure, and $V(l)$ is a concave function, which implies that individuals always enjoy an increase in their leisure (or free time), but at a decreasing rate. In other words, the marginal utility of leisure is always positive, but decreasing. This characteristic of the utility function will be relevant in discussing the efficiency cost of taxation (and redistribution).

Finally, the consumer budget constraint is given by her net labor income, since every individual will use all her resource to consume, as there exists only one period in this economy, and hence no savings will take place:

$$c = n \cdot w(1 - \tau) + T \qquad (5.3)$$

where n is the amount of labor supplied, w is the wage, which is normalized to one ($w=1$), τ is the tax rate on the labor income and T is the lump-sum transfer provided to every

individual. Notice that the fiscal policy is represented by a pair (τ, T), which every economic agent takes as given, while deciding on her best economic actions – in terms how much to work and hence to consume. As argued in chapter 1, individuals will then take *political* decisions on the size of the redistributive system, by voting on the tax rate, τ. To summarize, every individual – as characterized by her working ability, e – will take her economic decision by maximizing her utility function at eq. 5.2, with respect to her leisure, l, and to her consumption, c, given her budget constraint at eq. 5.3, her time constraint at eq. 5.1, and the fiscal policy, (τ, T).

The income redistribution policy has been characterized by a tax rate, τ, imposed on every workers' labor income, and by a lump-sum transfer, T, provided to all individuals. Additionally, given also the static nature of the economy, which prevents government borrowing (when would the government pay back, if the economy only lasts one period?), this redistributive policy is assumed to be budget balanced. Hence, the government budget constraint is

$$T = \tau \cdot E(n(e)) = \tau \int_{e_l}^{e_h} n(e)dG(e) \tag{5.4}$$

Equation 5.4 simply states that all tax revenues collected from the labor income are transferred back to the individuals in a lump-sum fashion. However, it plays a crucial role in determining the individual preferences of the fiscal policy and the individual voting decisions, as it allows the fiscal policy to be entirely summarized by a unique parameter, the tax rate τ.

5.2 The Redistributive System: Winners and Losers

To appreciate the working of this redistributive system, and hence to identify the winners and losers from redistribution, it is convenient to abstract away from any economic decision and thus to assume that every individual works full time.

In this scenario, leisure is set equal to zero for all individuals, regardless of their ability type, $l=0$. However, labor supply, and thus labor income, will depend on individual ability. In fact, by using the time constraint at eq. 5.1, it is easy to see that an ability type-e labor supply becomes equal to $n(e) = 1+e$. A type-e individual tax burden, that is, the amount of taxes paid by a type-e individual, is hence equal to $\tau(1+e)$.

In this case, the total amount of fiscal revenues – and hence the transfer – is equal to

$$T = \tau \cdot E(1+e) = \tau \int_{e_l}^{e_h} (1+e)dG(e) = \tau \qquad (5.5)$$

Under this scenario, the total level of consumption obtained by a type-e individual, and hence her utility from consumption, since the utility function at eq. 5.2 is linear in consumption and the amount of leisure was assumed to be equal to zero, is given by the following expression:

$$c = (1-\tau)(1+e)+T = (1-\tau)(1+e)+ \tau = 1+e- \tau e \qquad (5.6)$$

The expression above shows that the fiscal policy, as characterized by the tax rate, τ, may have a positive or negative impact on the agent's utility – respectively increasing or decreasing her consumption – depending on whether the agent's ability is below or above the average ability in the economy. In fact, for negative ability type ($e<0$), a positive tax

rate indeed increases the agent's consumption, and viceversa for a positive ability type ($e>0$).

Figure 2 provides a graphic interpretation of this result, by separating – for every individual – the tax burden from the transfer. The horizontal axis in figure 2 measures the ability type, from the lowest ability type in the economy, e_l, to the extreme left on the axis, to the highest ability type, e_u, on the extreme right. Clearly, the lower is an individual's ability – and thus income – the lower is her tax burden, as displayed in figure 2 by the continuous line. Due to redistributive nature of the system, the transfer is instead unrelated to individual income, and is hence depicted as a horizontal (dotted) line in figure 2. It is now easy to see that the winners from this redistributive policy, that is, those who contribute to the system, through taxes, less than they receive as transfer, are located on the left of this graph. They are clearly the low income individuals, $e<0$, to whom a positive tax rate increases the utility, since $-\tau e > 0$. In fact, the lowest income type, e_l, enjoys the largest gain from redistribution, as measured by the difference between the dotted line (the transfer) and the continuous line (the taxes). As income increases, however, the gain decreases, as individuals contribute more in taxes. In fact, as her ability type turns positive, $e>0$, an individual contributes more to the system than she receives from it, $-\tau e < 0$, and hence is a net contributors, that is, a loser from the redistributive game. Thus the losers are clearly the high ability workers, that is, the rich individuals located on the right of figure 2.

According to the (indirect utility) function defined at eq. 5.6 – for the case of no economic decision, since agents are not allowed to chose how much to work – individual preferences over the tax rate, τ, are single-peaked. In particular, the preferences of the low ability individuals – those with a negative ability type, $e<0$ – are increasing in τ, till a maximum at $\tau=100\%$, whereas the preferences of the high ability individuals ($e>0$) are decreasing in

τ, with a maximum at $\tau=0$. Therefore, if the political environment is one of simple majority voting, as discussed in chapter 1, the political equilibrium outcome would coincide with the tax rate chosen by the median voter. In this setting, the median voter would be the agent with the median ability type, $e_M<E(e)=0$, who would chose a positive tax rate, specifically, a tax rate equal to 100%.

Figure 2: Winners and Losers from Redistribution
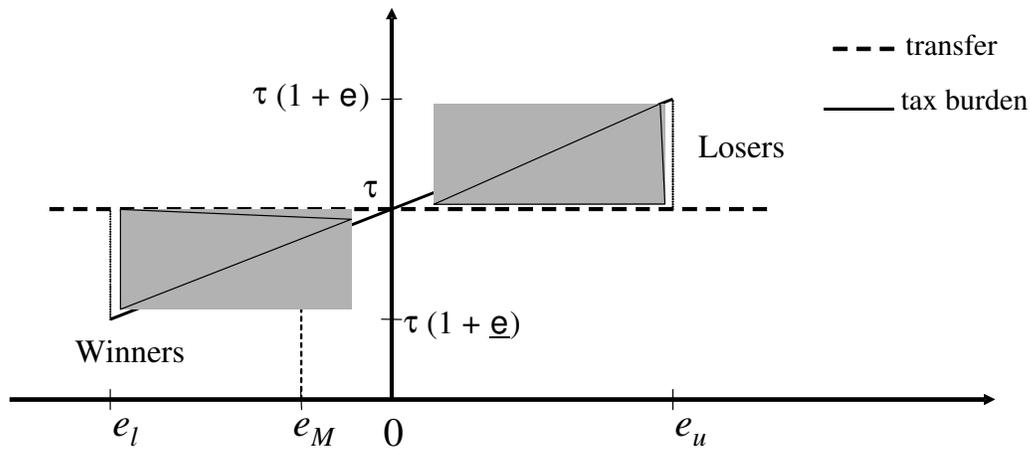
The analysis above has however abstracted from the distortion that a redistributive system may introduce in the economy, because of the effect of taxation on the individual labor supply decision. Under the assumption that all individuals would always work full time, the tax rate needed to finance the redistributive system could not modify the agents' decision on how much to work; thereby leading to an extreme scenario in which individuals preferred either no taxation or 100% taxation – in other words, full expropriation.

If agents are instead allowed to decide how much to work, taxation may impose a distortionary effect on the economy, as the opportunity cost of leisure increases with taxation, and hence individuals prefer to work less for higher tax rates. To see this,

consider the economic decision of a type-e agent, who has to determine her optimal level of consumption, c, and of labor supply, n, for a given fiscal policy (τ, T). This optimization problem amounts to maximize the individual's utility function at eq. 5.2, with respect to l and c, given the budget constraint at eq. 5.3, and the time constraint at eq. 5.1, for a given fiscal policy, (τ, T). By substituting these constraints in the utility function, the maximization problem can be written as follows:

$$\underset{l}{Max}(1-\tau)(1+e-l)+T+V(l) \qquad\qquad (5.7)$$

which yields the following first order condition:

$$1 - \tau = \partial V(l)/\partial l \qquad\qquad (5.8)$$

Equation 5.8 suggests that individuals maximize their utility, by choosing a labor supply, such that the marginal utility from leisure – that is, the right hand side of eq. 5.8 – is equal to marginal utility from the consumption obtained by working one additional unit of time – and which is equal to the net wage, as shown on the left hand side of eq. 5.8. The optimal level of labor supply chosen by an individual will have to satisfy this condition, which is represented graphically at figure 3.

The decreasing curve represents the marginal utility of leisure, which is decreasing in the level of leisure, whereas the horizontal line represents the marginal utility of consumption, which is independent from the level of leisure and equal to $1 - \tau$. The optimal labor supply is determined by the intersection of these two curves at l^*. From the time constraint at eq. 5.1, the optimal labor supply for an ability type-e agent is then equal to $n^*(e) = 1+e-l^*$.

Figure 3: Individual Labor Supply
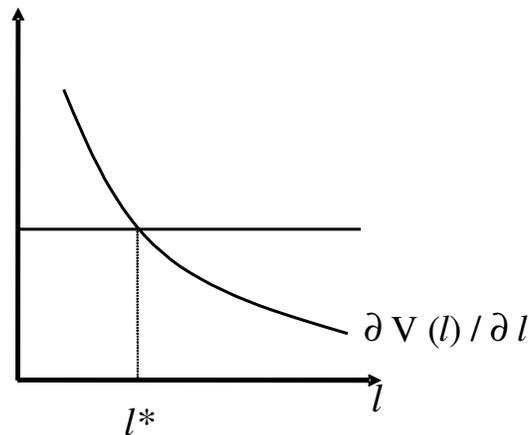
From figure 3, it is easy to see that taxation introduces a distortion in the economy, by reducing labor supply and thus the level of economic production. In fact, an increase in the tax rate shifts down the horizontal line $1 - \tau$, which hence intersects the other curve for a higher level of l^*. In words, since the opportunity cost of leisure has decreased, due to the increase in the tax rate, individuals will prefer to enjoy more leisure and to work less. Every individual's labor supply, $n^*(e)$, – and thus also average labor supply economic $E(n^*(e))$ – will be reduced.

In this new scenario, which accommodates the distortionary effect of taxation, the government budget constraint has to be re-written to incorporate the individuals' labor supply decision, and is equal to $T = \tau E(n^*(e))$. Under this specification, an increase in the tax rate, τ, gives raise to two distinct effects. On one hand, there is a direct increase in the government fiscal revenues, as every individual is required to contribute a large share of her labor income. On the other hand, however, a higher tax rate induces a distortion in the economy, which decreases fiscal revenues, since individuals react to the larger tax burden by working less, and hence by reducing the tax base – defined as the total labor income over which taxes may be levied. The combination of these two effects produces the so-

called Laffer Curve, which related the total amount of tax revenues to the tax rate. As shown in figure 4, for low tax rates, fiscal revenues are positive yet small. As the tax rate increases, revenues increase, yet at decreasing rate, because the distortionary effect of taxation reduces the total tax base. For a medium tax rate, labelled τ_L in figure 4, fiscal revenues reach a maximum and any additional increase in the tax rate indeed produce a reduction in the revenues, as the distortionary impact of taxation prevails over the direct effect. For large level of taxation, the tax base shrinks so the point that fiscal revenues will eventually become zero.

Figure 4: Laffer Curve, the Distortionary Effect of Taxation
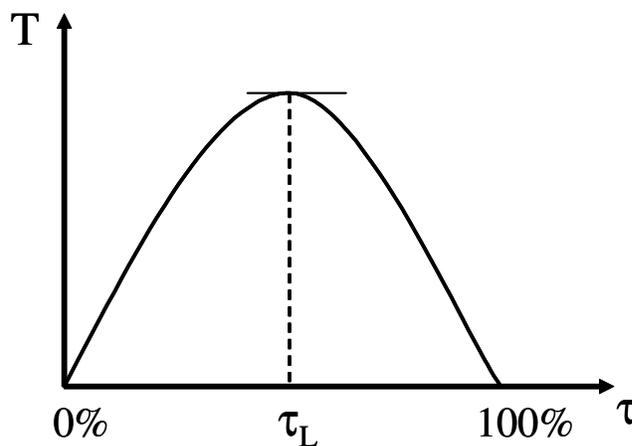
5.3 The Political Decision

As in the previous section, the individual preference of the redistributive system, summarized by the tax rate, τ, will depend on how the system affects the economic well-being of the agent. Under this new scenario, however, the entire utility function has to be considered, as the trade-off between labor and leisure has been tackled.

Therefore, given the economic decision described at eq. 5.7 and 5.8, every individual will take her political decision by maximizing the following indirect utility function with respect to the tax rate, τ.

$$(1 - \tau)\, n^*\,(e) + \tau\, E\,(n^*\,(e)) + V\,(l^*(e)) \qquad\qquad (5.9)$$

where the first term refers to her net labor income, the second to the transfer and the third to the utility associated with her leisure. Because of the Envelop theorem (see the next chapter for a full flagged maximization), in their *political* decision, an ability type-*e* agent will optimally trade-off the costs and benefits arising from the impact of the tax rate on the following three elements, while leaving aside the effect on $n^*\,(e)$ and $l^*\,(e)$. In particular, she considers the direct, *negative* cost of taxation – an increase in τ raises her tax burden by $n^*(e)$; the direct, positive benefit from the transfer – a rise in τ increases her transfer by $E(n^*(e))$; and the cost of the distortion introduced by the taxation, since a rise in τ reduces the tax base, and hence the transfer $E(n^*(e))$, as discussed above.

As in the previous scenario, winners and losers from the redistributive system may easily be defined along ability lines, by using eq. 5.9. Low ability types ($e<0$) – i.e., low income individuals – gain from redistribution, and hence will vote for a positive tax rate, $\tau>0$; whereas high ability types ($e>0$) lose and thus oppose redistribution, $\tau=0$. In this case, however, even very low ability type will not find it convenient to vote for full expropriation, that is, for a 100% tax rate, since – due to distortionary effect of taxation on the tax base – this would not lead to a larger transfer.

Again, since preferences may easily be shown to be single-peaked, the median voter's theorem applies, and the political equilibrium tax rate corresponds the one voted by the agent with median working ability, e_M. Since the ability distribution was assumed to be

skewed, in order to resemble the actual labor income distribution, the median voter has a lower ability (and income) than the average ability (and income) in the economy – that is $e_M <0$, and $n*(e_M)<E(n*(e))$ – and would hence support a positive tax rate, and thus some redistribution.

According to this political-economics literature, the amount of redistribution in the economy depends crucially on the degree of income inequality, as measured by the difference between the median and the average income in the economy. More income inequality – as measured by this differential – thus leads to more redistribution, since the pivotal (median) voter finds herself relatively poorer vis-à-vis the average income in the economy and hence benefits more from redistribution.

If inequality is not measure as the difference between the median and the average income, but rather using some more conventional measures, such as for instance the Gini coefficient, more inequality needs not to lead to more redistribution. To see his consider two possible increases in income inequality. First, when rich agents become richer, income inequality – as measured by the Gini coefficient – increases; the average income in the economy also increases, while the median income needs not to vary. The difference between median and average income widens, thus leading to more political demand for redistribution, as the median voter becomes relatively poorer. Second, consider the case of poor agents becoming poorer. In this situation, inequality – as measured by the Gini coefficient – is still increased, yet the difference between the median and the average income has shrunk, as the former has not changed, while the latter has decreased. The median voter is thus relatively richer, and would require less – rather than more – redistribution.

Since its initial development, several attempts have been devoted to examine how well this positive theory of redistribution explains the data. The two crucial question in this respect

are the following: Can this theory explain the large cross-country differences in income redistribution, with the Scandinavian countries implementing large redistributive efforts and the Anglo-Saxon countries limiting redistribution to a low safety net consisting of means-tested schemes? Can this theory account for the dynamics of Welfare State expenditure, with its large expansion since World War II?

To some extent, this theory of redistribution does well in explaining the early growth of welfare state, which may be also due to two features. First, the extension of voting rights to poor voters, which hence decreases the median ability among the voters – without affecting the average income among the citizens – should in fact lead according to the model to more redistribution. Second, the reduction in the cost of collecting taxes should also lead to more redistribution by decreasing the distortionary effects of taxation.

This theory of redistribution is however less successful at explaining the recent explosion in welfare state expenditure and the large cross-country differences. Part of this lack of success may be due to the fact that intragenerational redistribution, of the type analyzed in this chapter, is not the most relevant line of redistribution. In fact, income is not the only source of difference among the individuals, and modern welfare systems seem to channel the largest share of redistribution through pension systems, which hence privilege the age component, rather than through other programs, as discussed in chapter 4.

Another reason for this partial failure may be attributed to the stationary of the model examined here. In reality, voting does not occur only once, and welfare systems and taxation do seem to vary over time. Moreover, taxation also has dynamic effects on capital accumulation and economic growth. Along these lines, for instance, Krusell and Rios-Rull (1999) embed this static redistributive model in a more dynamic economic and political environment to show that "dynamic distortions" lead to lower political demand for redistribution and a welfare state.

Finally, the theory presented here hinges crucially on the hypothesis that individuals behave selfishly, as they only care about their economic well-being. Hence, poor voters support large redistributive programs, since they benefit from them; whereas richer voters, who are net contributors to these programs, oppose them.

In reality, we do, however, observe (at least some) individuals behaving unselfishly, as several people – for instance – contribute to private charity. This behavior is consistent with altruistic preferences: people may "feel good" about giving to others or they may want to reduce disparity in the society. In the latter case, these individuals would prefer to promote a public income redistribution program that bounds all citizens – not just those willing to give to charity – to contribute.

Analogously, a recent empirical study by Corneo and Gruner (2002) on survey data from twelve countries shows agents may selfishly pursue other personal – yet non economic – goals, such as maintaining or improving their social status. Moreover, individuals may support redistributive programs that reduce their private economic and social well-being because of "public values". In particular, Corneo and Gruner (2002) find that agents are more favorable to redistribute if they believe that the current income distribution in the society is determined more by exogenous reasons, such as family background, than by individual effort.

As argued in Galasso (2003), however, in an economy populated by (a majority of) selfish individuals, who only value their own well-being – i.e., consumption and leisure – but also by *some* unselfish voters, who have "public values", since but they also oppose inequity in the society, the message that more inequality leads to more redistribution is strengthened. In fact, the existence of fair voters limits the political relevance of the middle class. For instance, if the distance between the poor and the middle class increases, because poor individuals become poorer, the level of redistribution need not to decrease, as predicted

above, since the increased poverty may push the (inequity averse) fair agents to support

more redistribution, which may balance the opposite voting behavior of the selfish voters.

Chapter 6: Labor Market Regulations and Unemployment Benefits

In chapter 4, we argued that the government often intervenes in the labor market and that this government intervention has important effects on the labor market outcomes, such as unemployment and labor force participation rates. Unemployment benefits (UBs) and employment protection legislation (EPL) protect individuals against the risks of job loss. Yet, while EPL protects those who already have a job, and does not tax the worker, UBs transfer income to the unemployed and are funded by taxes imposed on labor income. Across OECD countries there is a large variation in the use of EPL and UBs. Plotted against each other, various measures of the two institutions point to a trade-off between EPL and UBs: while "flexicurity" countries adopt a combination of flexible labor market and large income security for the unemployed, by choosing low EPL and generous UBs, other countries, notably in Southern and Continental Europe, adopt strict EPL and smaller UB programs, as shown in figure 1.

Countries' locations along this trade-off correspond to stable political-economic equilibria. Reforms of EPL are mostly marginal: they are confined to introducing "at the margin" more flexible contractual types, rather than modifying rules for workers who already have a permanent contract. Saving on fiscal cost of flexicurity is also proving very difficult: UB systems are adjusted by modifying enforcement rules (e.g., via activation schemes) rather than statutory replacement rates or the maximum duration of benefits. All this points to strong political opposition to reforms moving the different countries along this tradeoff.

Why do different countries resort to alternative combinations of employment protection and unemployment insurance to protect individuals against the risk of being unemployed? Why is it so uncommon to reform these institutional configurations?

This chapter addresses the political-economic explanation of the use of these two labor market policies and discusses the observed trade-off between EPL and UBs across countries. A growing literature in the political economy of labor markets has analyzed these issues (see Wright, 1986, Saint-Paul, 1996, 1999a, 1999b and 2000).

Figure 1: The Unemployment Benefit –EPL Trade-off
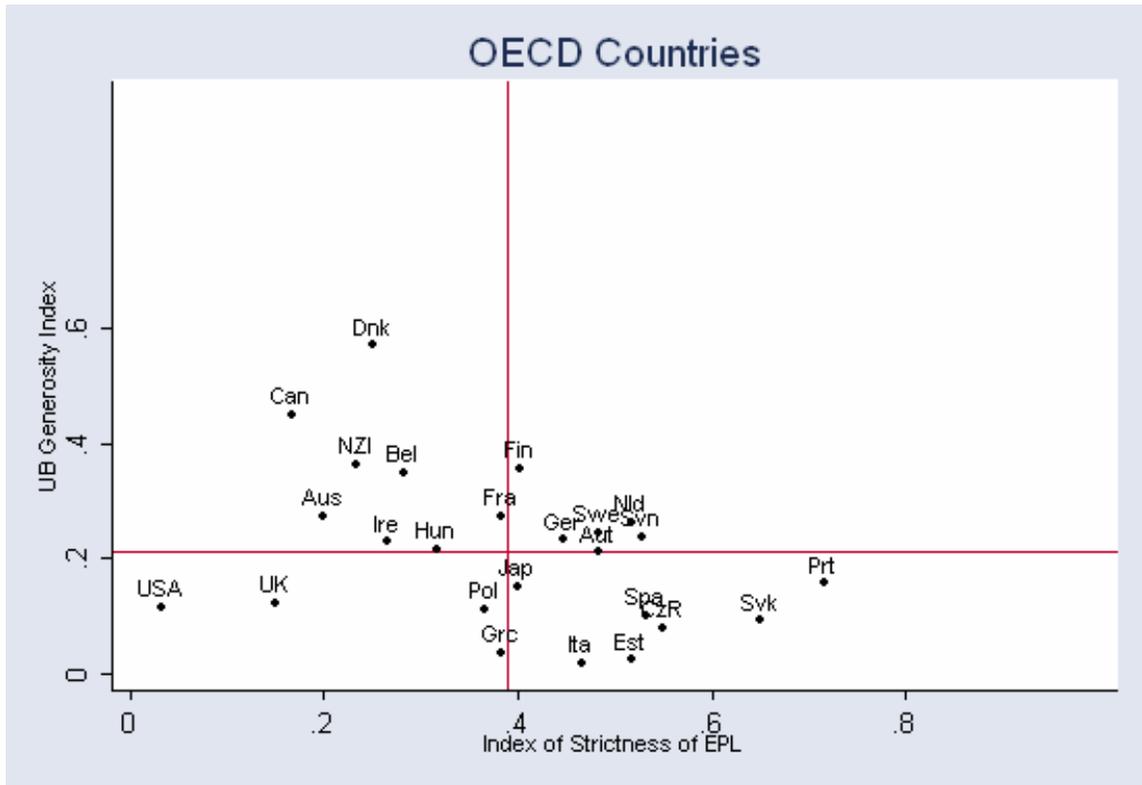
This literature deals mainly with the relationship between insiders and outsiders, where the insiders are the workers and the outsiders are the unemployed. These two groups have different employment status, different preferences and would hence benefit from different policies. For instance, workers typically prefer a high degree of employment protective legislation, which gives them more job security, than the unemployed that prefer a low degree EPL, which would increase their probability of finding a job. With regards to

unemployment benefits, preferences are reversed: the unemployed – who receive the transfers – prefer higher benefits than the workers, who have to pay the income taxes or contributions to finance the unemployment benefits.

6.1 A Simple Political Economy Model

We introduce a simple political-economic model to analyze this issue. The economy is populated by two types of agents: Employed (E) and Unemployed (U). Agents live forever – alternatively, one may think of different dynasties of agents, with current agents caring about the welfare of their entire dynasty (sons, grandsons and so on), which gives them an infinite time horizon. Workers have a fixed labor supply, which is normalized to one unit per period (for instance 40 hours a week). Agents value their current and future (expected) consumption according to a utility function, $U(.)$, which is increasing and concave in the level of consumption (an example of such function is given for instance by a logarithmic utility function, $U(.)=ln(.)$). In other words, agents are risk averse, and are thus willing to purchase insurance against the risk that characterizes this economy: the labor market risk, that is, the risk of becoming unemployed Individual's income, Y_t^i, is determined by the labor market status as follows, respectively for the employed and unemployed individuals:

Employed: $Y_t^E = 1 - \tau_t$

Unemployed: $Y_t^U = I_t$

where τ_t is the tax rate levied on the labor income (notice that the labor income is normalized to one, $w=1$), and used to finance the unemployment benefits; and I_t is the unemployment benefit paid at time t to an unemployed person.

To analyze the issue of the political determination of EPL and UB, we consider a simple economy, in which there are no capital markets – that is, no banks, financial intermediaries or loans – and hence individuals are not allowed to save. This implies that –

for the agents – current consumption equals current income. Another important assumption in this simplified framework is that taxation and unemployment benefits do not create any economic distortions. Clearly, this assumption is hardly satisfied in the real work. In fact, taxation typically reduces the labor demand by the firms – thereby decreasing wages and employment (or creating unemployment) – while generous unemployment benefits tend to reduce the individuals incentives to search for a job, and therefore the probability of finding a job when unemployed – again decreasing wages and employment (or increasing unemployment).

Figure 2. The relationship between Employment and Unemployment
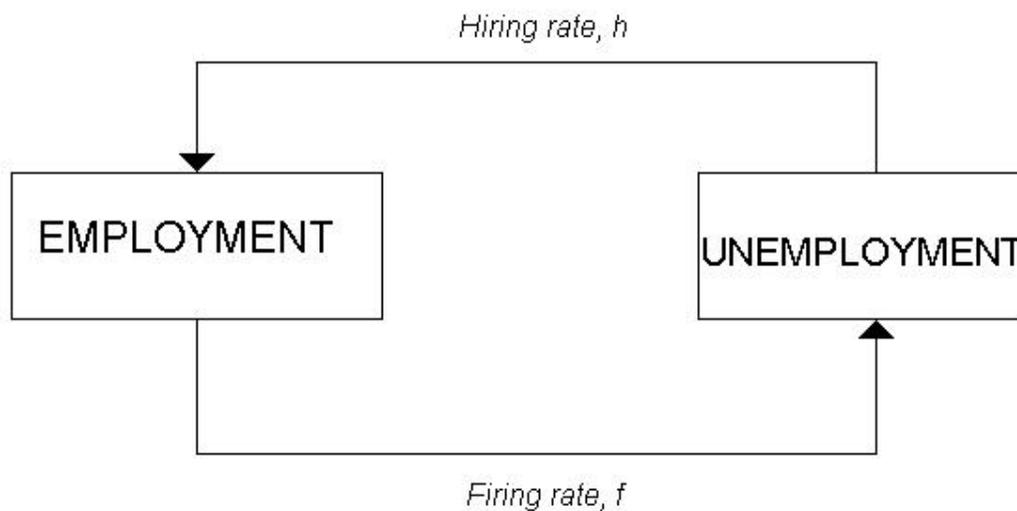
The labor market dynamics in this simple environment are summarized at figure 2. At every period, a percentage f of the employed individuals is fired and hence moves from being *employed* to being *unemployed*. Thus, f represents the firing rate at which an employed worker loses her job. At the same time, a share h of the *unemployed* is hired and becomes *employed*. Thus, h represents the hiring rate at which an unemployed individual

finds a job. It follows that the dynamics over time of the equilibrium unemployment rate

is:

$$u_t = (1-h)u_{t-1} + f(1-u_{t-1})$$

where u_t is the unemployment rate at time t.

6.2 Labor Market Institutions

To analyze the impact of the employment protective legislation (EPL) on the labor market

outcome and its determination in the political system, we examine a case in which both

hiring and firing rates depend on the degree of Employment Protection Legislation, *s*. In

particular, we consider that the firing rate decreases linearly with the Employment

Protection Legislation, *f(s)*. This relation captures the restrictions that EPL places on the

firms' decision to fire a worker and thus reduces the firing rate. But the hiring rate is also

affected: it decreases non linearly as the degree of EPL increase. This is in accordance

with empirical evidence (OECD, 1999) and with economic theory (e.g., Bentolila and

Bertola, 1990) that predicts that, when labor markets are rigid, employers hire less workers

in upturns in order to reduce costs of dismissals during downturns. Their behaviour is

summarized at figure 3, where the degree of EPL, s, is assumed to range between 0 (the

lowest level of EPL) and 1 (the highest).

In the dynamic version of the model, the unemployment rate is determined as follows:

$$u_t = f(s)(1-u_{t-1}) + (1-h(s))u_{t-1}$$

In order to calculate the steady state equilibrium value, we need to consider the situation in

which the unemployment rate is constant over time, that is, when $u_t = u_{t-1}$. Using thesetwo

equations, it is possible to turn the dynamic version of the unemployment equation into a

static equation:

$$u = f(1-u) + (1-h)u$$
$$u(1+f-1+h) = f$$

It follows that the equilibrium unemployment rate at steady state is equal to:

$$u(s) = \frac{f(s)}{f(s) + h(s)}$$

## Figure 3. The relationship between $f(s)$, $h(s)$ and s
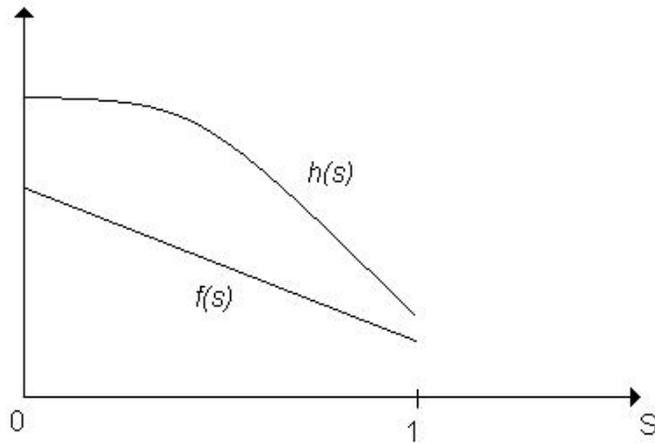
In figure 4, $\hat{s}$ is defined as the rate of Employment Protection Legislation that minimizes unemployment. Since the effect of the EPL on the firing rate (more EPL reduces the firing rate) is supposed to kick in immediately, while the effect on the hiring rate (more EPL reduces the hiring rate) takes more time to arise, we obtain the following figure.

Besides the Employment Protection Legislation, the second policy instrument in the labor market is given by the unemployment insurance. This welfare scheme provides a transfer to an unemployed individual, which is financed by labor income. More specifically, the revenues consist of the labor tax imposed on all workers, $\tau(1-u)$, where $1-u$ represents the total share of workers in the economy. The insurance system then pays a benefit I to all

unemployed individuals (their share is equal to u). Thus, the budget constraint of the unemployment insurance program is:

$$I \cdot u = \tau (1 - u)$$

Figure 4. The determination of the optimal rate of s
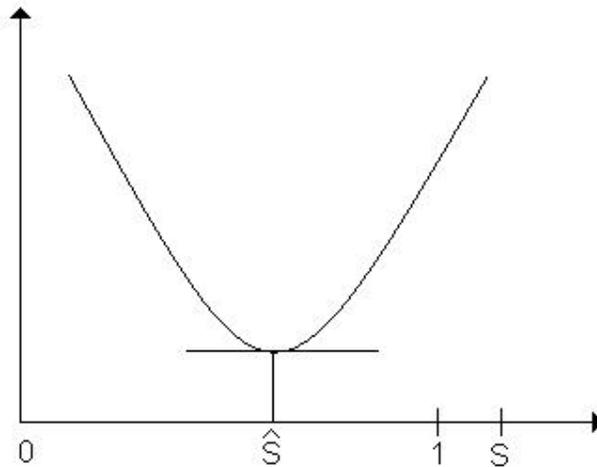
Once the equilibrium unemployment rate has been determined (recall that it may depend on the degree of EPL), it can be substituted into this equation to get the following expression:

$$I = \tau \frac{1-u}{u} = \tau \frac{1 - \dfrac{f}{f+h}}{\dfrac{f}{f+h}} = \tau \frac{\dfrac{f+h-f}{f+h}}{\dfrac{f}{f+h}} \Rightarrow I = \tau \frac{h}{f}$$

It is now convenient to analyze the (indirect) utility function of the different types of individuals. Since all individuals are equal, with the notable exception of their current

state of employment, it is easy to obtain the utility of an employed and of an unemployed

worker. The workers who are currently employed have the following utility:

$$V^E = U(1-\tau) + \beta\left[(1-f)V^E + fV^U\right]$$

Whereas the individual who are currently unemployed have the following value function:

$$V^U = U(I) + \beta\left[hV^E + (1-h)V^U\right]$$

In both these value functions, β represents the discount rate. These expressions combine

the utility during the current period, plus the discounted utility from consuming in the

expected state in the following period. Clearly, the value functions only differ in the state

of the individual, and there is no difference in calendar time. When combining these two

expressions, one can get the following functions.

Employed: $$V^E = U(1-\tau) - \frac{f\beta}{1-\beta+\beta(f+h)}\left[U(1-\tau)-U(I)\right]$$

Unemployed: $$V^U = U(I) - \frac{h\beta}{1-\beta+\beta(f+h)}\left[U(1-\tau)-U(I)\right]$$

It is important to notice for the unlikely case that $\beta = 1$, these two expressions would be

identical and equal to

$$V^E = V^U = \frac{h}{(f+h)U(1-t)} + \frac{f}{(f+h)U(I)}.$$

This is because with $\beta = 1$ the current labor market condition (employed or unemployed)

would have the same value as all future conditions. When $\beta < 1$, instead, the future is

discounted more heavily, and the current status of the individual influences their

preferences.

6.3 The Political game

These two institutions of the labor market are decided through a political economic voting process. We consider the determination of these two instruments separately as two different policy decisions. First, we analyze the political decision over the amount of Employment Protective Legislation by voting over *s*. Second, we consider how the level of Unemployment Insurance (I, τ) is determined, by voting over τ. In both voting procedures, individual preferences are assumed to be single-peaked and the election is assumed to be once-and-for-all voting, that is, once in place, the policy is not modified in the future.

An increase in the amount of Employment Protective Legislation (EPL) reduces the hiring and firing rates, so that labor market dynamics will slow down, the market will become more rigid, and both hiring and firing will become less frequent. For the employed workers, this implies that the probability of being fired decreases, they will hence prefer a high level of EPL. For the unemployed individuals, instead, a high level of EPL is unattractive, because hirings are reduces and thus the probability of an unemployed person to find a job decreases. Hence, the employed can be expected to prefer higher EPL than the unemployed. If the unemployment rate is below 50%, the median voter belongs to the employed workers, and thus the level of EPL will be high, since it is chosen by the employed.

Regarding the Employment Insurance, employed people trade-off the current cost of the program, since they are required to pay higher current contributions, with the future benefits, if they become unemployed and hence receive a transfer. Current unemployed instead trade-off a current gain from Insurance, consisting of the current transfer, with a future cost, occurring in the future when they find a job and have to pay UI contributions. Since the current status matters, $\beta < 1$, the employment insurance reduces the difference

in utility between being employed and being unemployed. Hence, the preferred level of Unemployment Insurance will be higher for the unemployed than for the employed. Yet, since the median voter is a worker, the actual level of Unemployment Insurance will be the one chosen by a worker.

To summarize, when voting over the level of EPL, we have $s^E > \hat{s} > s^U$, where $\hat{s}$ is the level of EPL that minimizes the unemployment rate. Hence, the political system delivers a level of EPL that is larger that the level that minimizes unemployment. In equilibrium, there will be more unemployment than needed. For the Unemployment Insurance, we have $\tau^E < \tau^{FULL} < \tau^U$, where τ^{FULL} is the case of full insurance, with $\beta = 1$, that is, it is the level of UI that provides the individuals will a complete level of insurance against the income risk related to becoming unemployed. Hence, in this case the political system delivers less than full insurance. The political equilibrium of the separate voting system delivers a high degree of EPL but a low level of Unemployment Insurance

<u>Chapter 7: Exercise Section on the Welfare State</u>

1. Income Redistribution, Cost and Benefits

Consider a static economy; the time horizon is limited to one period. Agents consume and work. Their utility function is log-linear:

$$U = c + ln\ (l)$$

where *c* denotes consumption and *l* is leisure. Individuals are heterogeneous in their ability, which is distributed on the support $[e^0,\ e^1]$ according to a cumulative distribution function *G(e)*, where $e^0 < 0 < e^1$. The average ability is equal to 0, in particular, it is calculated as $E(e) = \int_{e0}^{e1} e\,dG(e) = 0$, while the median ability in the economy is less than 0, $(e^m < 0)$.

The total endowment of disposable time depends on the individual's ability level. The individual time constraint is in fact equal to $l + n = L + e$, where *e* is the individual ability, *L* is the average time endowment and *n* represents the time spent working. The consumer budget constrain is

$$c = n(1-\tau) + T$$

where τ is the tax rate on the labor income and *T* is the lump-sum transfer provided to every individual. The fiscal policy is hence represented by a pair $(\tau,\ T)$ and the government budget constraint is

$$T = \tau \cdot \int_{e0}^{e1} n\,dG(e).$$

1   Solve the economic decision for an agent e, for a given fiscal policy (τ, T). What is her

    optimal level of consumption, c, and of labor supply, n? How does the labor supply, n,

    changes with the labor income tax, τ?

2   Using the government budget constraint and the optimal labor supply at point (a),

    write down the transfer, T, as function of the tax rate τ (and of L).

3   Write down the indirect utility function $V(\tau) = c(\tau) + ln\,(l(\tau))$. Which individuals will

    vote in favour of this redistributive system (that is, who will vote $\tau > 0$)?

4   Suppose that the fiscal policy is decided by the voters at simple majority. If $e^m = -2$ and

    $L=4$, determine the political equilibrium tax rate and the political equilibrium transfer.

    Intuitively, how does the equilibrium tax rate changes if e^m increases?

Solution

$$U = c + \ln(l)$$
$$l + n = L + e$$
$$c = n(1 - \tau) + T$$

$$e \in [e^0, e^1], \quad e^o < 0 < e^1, \quad E(e) = \int_{e^0}^{e^1} e \, dG(e) = 0, \quad e^M < 0$$

$$T = \tau \int_{e^0}^{e^1} n \, dG(e)$$

(1) Economic decision for a type - e agent:
   - level of consumption and labor (c, l)
   - how n changes as τ increases

$$\underset{\{l\}}{Max}(L + e - l)(1 - \tau) + T + \ln(l)$$

given $\{\tau, T\}$

$$FOC: -(1 - \tau) + \frac{1}{l} = 0$$

$$l^* = \frac{1}{1 - \tau} \text{ leisure}$$

labor supply: $n = L + e - \dfrac{1}{1 - \tau} = n^*$

consumption: $c = \left(L + e - \dfrac{1}{1 - \tau}\right)(1 - \tau) + T$

$$c^* = (L + e)(1 - \tau) - 1 + T$$

If $\tau \uparrow \Rightarrow l^* \uparrow \Rightarrow n^* \downarrow$

$$\frac{\partial n^*}{\partial \tau} = \frac{1}{(1 - \tau)^2} < 0$$

(2) T as a function of τ

$$T = \tau \int_{e^{0'}}^{e^1} n\,dG(e) = \tau \int_{e^{0'}}^{e^1} \left[L + e - \frac{1}{1-\tau} \right] dG(e) = \tau \left[L \int_{e^{0'}}^{e^1} dG(e) + \int_{e^{0'}}^{e^1} e\,dG(e) - \frac{1}{1-\tau} \int_{e^{0'}}^{e^1} dG(e) \right]$$

$$T = \tau L - \frac{\tau}{1-\tau} = \tau \left[L - \frac{1}{1-\tau} \right]$$

(3) Indirect Utility Function $V(\tau)$

$$V(\tau) = (L+e)(1-\tau) - 1 + \tau \left[L - \frac{1}{1-\tau} \right] + \ln\left(\frac{1}{1-\tau} \right)$$

$FOC(\tau)$:

$$-L - e + L - \frac{1}{1-\tau} - \frac{\tau}{(1-\tau)^2} + \frac{1}{(1-\tau)^2}(1-\tau) = -e - \frac{\tau}{(1-\tau)^2} = MB - MC \Rightarrow e < 0$$

(4) With $e^M = -2,\ L = 4$

$$2 - \frac{\tau}{(1-\tau)^2} = 0 \Rightarrow 2(1-\tau)^2 - \tau = 0$$

$$2\tau^2 - 5\tau + 2 = 0 \qquad \frac{5 \pm \sqrt{25-16}}{4} = \frac{5 \pm 3}{4} \qquad \tau = 2 \qquad \boxed{\tau = \frac{1}{2}}$$

$$T = \tau \left[L - \frac{1}{(1-\tau)} \right] = \frac{1}{2}\left[4 - \frac{1}{1/2} \right] = 1$$

If $e^M \uparrow \Rightarrow \tau^* \downarrow$

2. Pension Systems, Inter and Intra-generational Redistributive Issues

Consider an economy populated by three generations (Young, Adult and Old). Within each generation agents differ according to their income. They may be poor, middle-income or rich ($w_p < w_M < w_R$) in proportions $\alpha_P, \alpha_M, \alpha_R$.

Agents only consider their Lifetime Income. If a pension system is in place, Young and Adult pay a proportional tax rate ,τ, to the system and elderly receive a lump-sum transfer. Population grows at a constant rate n.

(1) Write down the individuals and social security budget constraints.

(2) Do agents vote in favour of the social security system?

(3) Assume that:

$$w_P = 0.2 < \overline{w} = 0.8 < w_M = 1.2 < w_R = 3.2$$
$$\alpha_P = 50\%, \quad \alpha_M = 45\%, \quad \alpha_R = 5\%$$
$$n = 1, \quad r = 2$$

- Find the demographic pyramid

- Find the proportion of the population in favour of the social security system

Solution

(1)

$$I^{Old} = P$$

$$I^{Ad} = w_J(1 - \tau) + \frac{P}{1 + r} \qquad\qquad \mathrm{w}_J = \{w_P, w_M, w_R\}$$

$$I^Y = w_J(1 - \tau) + \frac{w_J(1 - \tau)}{1 + r} + \frac{P}{(1 + r)^2}$$

$$P = \tau\left[\overline{w}(1 + n) + \overline{w}(1 + n)^2\right] \quad \text{where } \overline{w} = \alpha_P w_P + \alpha_M w_M + \alpha_R w_R$$

(2)

$$\boxed{Old} : I^{Old} = P = \tau\left[\overline{w}(1+n) + \overline{w}(1+n)^2\right]$$

$$\frac{\partial I^{Old}}{\partial \tau} = \overline{w}(1+n) + \overline{w}(1+n)^2 > 0 \Rightarrow \tau \uparrow \Rightarrow I^{Old} \uparrow \Rightarrow \boxed{YES}$$

$$\boxed{Adult} : \frac{\partial I^{Adult}}{\partial \tau} = -w_j + \frac{\overline{w}(1+n) + \overline{w}(1+n)^2}{1+r}$$

$$\bullet\, w_j < \frac{\overline{w}(1+n) + \overline{w}(1+n)^2}{1+r} \Rightarrow \boxed{YES}$$

$$\bullet\, w_j \geq \frac{\overline{w}(1+n) + \overline{w}(1+n)^2}{1+r} \Rightarrow \boxed{NO}$$

$$\boxed{Young} : \frac{\partial I^{Young}}{\partial \tau} = -w_j - \frac{w_j}{1+r} + \frac{\overline{w}(1+n)(2+n)}{(1+r)^2} = -w_j\frac{(2+r)}{1+r} + \frac{\overline{w}(1+n)(2+n)}{(1+r)^2}$$

$$\bullet\, w_j < \frac{\overline{w}(1+n)(2+n)}{(1+r)(2+r)} \Rightarrow \boxed{YES}$$

$$\bullet\, w_j \geq \frac{\overline{w}(1+n)(2+n)}{(1+r)(2+r)} \Rightarrow \boxed{NO}$$

(3) 1 old, $(1+n)$ adult, $(1+n)^2$ young

- Total $= 7$ Old $:1/7$, Adult $:2/7$. Young $:4/7$

- $\boxed{Old}$ vote Yes

- $\boxed{Adults}$ vote Yes if $w_j < \dfrac{\overline{w}(1+n) + \overline{w}(1+n)^2}{1+r} = 1.6$

thus:

Poor ($w_P = 0.2$) and Middle ($w_M = 1.2$) vote YES

Rich ($w_R = 3.2$) vote NO

- $\boxed{Young}$ vote Yes if $w_j < \dfrac{\overline{w}(1+n)(2+n)}{(1+r)(2+r)} = 0.4$

thus only Poor ($w_P = 0.2$) vote YES

- $\boxed{Total\ Votes} : \dfrac{1}{7} + (0.5 + 0.45)\dfrac{2}{7} + \dfrac{0.5*4}{7} = \boxed{\dfrac{4.9}{7}}$

3. Redistribution in the Labor Market

Consider an economy with an infinite time horizon, populated by two types of agents: employed (E) and unemployed (U). Agents work and consume. There are no capital markets, and hence in every period each individual's consumption equals her net income. The utility function of an individual i is equal to:

$$V^i = E_0\left[\sum_{t=0}^{\infty} \beta^t \ln(c_t^i)\right]$$

where c_t represents the consumption at time t and $\beta<1$ is the intertemporal discount factor. Every employed individual offers one unit of labor and pays a labor income tax, τ; while every unemployed person receives an unemployment benefit, I_t. The net income of an employed and of an unemployed individuals are respectively:

$$y_t^E = 1 - \tau_t$$
$$y_t^D = I_t$$

Employment evolves according to the following dynamics: the firing rate (that is, the percentage of employed individuals, who lose their job in a period of time) is equal to f; while the hiring rate (that is, the percentage of unemployed individuals, who find a job in a period of time) is equal to h.

1   Write down the equation describing the dynamics of the unemployment rate (that is, the equation that links today's unemployment rate with tomorrow's unemployment rate), and determine the unemployment rate at steady state.

2   Write down the budget constraint of the unemployment system, under the assumption that, in every period, total revenues are collected from the employed persons' labor income tax, τ, and they are used to finance a transfer, I, to every unemployed

individual. Write down the indirect utility function of a current employed (V^E) and of a

current unemployed individual (V^D).

3   Recall that

$$V^e = U(1-\tau) - \frac{f\beta}{1-\beta+\beta(f+h)}[U(1-\tau)-U(I)] \qquad \text{where} \quad \frac{\beta}{1-\beta+\beta(f+h)} = \alpha$$

$$V^u = U(I) + \frac{h\beta}{1-\beta+\beta(f+h)}[U(1-\tau)-U(I)]$$

consider an election with commitment (that is, in which there is one and for all voting

over the tax rate, τ, which is not changed in all future periods). Calculate the tax rate

chosen respectively by the current employed and by the current unemployed

individuals.

Consider $U(\cdot) = \ln(\cdot)$

4.   Which is the equilibrium tax rate if $h=0.75$, $f=0.25$ and $\beta=0.8$?

Solution

(1) $u_t = f(1-u_{t-1}) + (1-h)u_{t-1}$ unemployment dynamics

Steady State s.s.: $u_t = u_{t-1} = u$

$u = f(1-u) + (1-h)u \Rightarrow u = \dfrac{f}{f+h}$ s.s. unemployment

(2) Budget Constraint

$$Iu = \tau(1-u) \Rightarrow I = \tau\frac{1-u}{u} = \tau\frac{1-\dfrac{f}{f+h}}{\dfrac{f}{f+h}}$$

$$I = \frac{h}{f}\tau$$

$$V^E = U(1-\tau) + \beta\left[(1-f)V^E + fV^U\right]$$

$$V^U = U(I) + \beta\left[hV^E + (1-h)V^U\right]$$

(3) $\dfrac{\partial V^E}{\partial \tau} = -\dfrac{1}{1-\tau} - \dfrac{f\beta}{1-\beta+\beta(f+h)}\left[-\dfrac{1}{1-\tau} - \left(\dfrac{h}{f}\right)\dfrac{1}{(h/f)\tau}\right] = 0$

$\dfrac{\partial V^E}{\partial \tau} = -\dfrac{1}{1-\tau} + \dfrac{\alpha f}{1-\tau} + \dfrac{\alpha f}{\tau} = -\tau + \alpha f\tau + \alpha f(1-\tau) = -\tau + \alpha f = 0 \Rightarrow \boxed{\tau = \alpha f}$

$\dfrac{\partial V^U}{\partial \tau} = \dfrac{1}{\tau} + \alpha h\left[-\dfrac{1}{1-\tau} - \dfrac{1}{\tau}\right] = 0$

$\dfrac{\partial V^U}{\partial \tau} = \dfrac{1}{\tau} - \dfrac{\alpha h}{1-\tau} - \dfrac{\alpha h}{\tau} = 1 - \tau - \alpha h\tau - \alpha h(1-\tau) = 0 \Rightarrow 1 - \tau - \alpha h = 0 \Rightarrow \boxed{\tau = 1 - \alpha h}$

(4)

$$\tau^E = \alpha f = \frac{f\beta}{1-\beta+\beta(f+h)}$$

$$\tau^U = 1 - \alpha h = 1 - \frac{\beta h}{1-\beta+\beta(f+h)} = \frac{1-\beta+\beta f}{1-\beta+\beta(f+h)} = \underbrace{\frac{1-\beta}{1-\beta+\beta(f+h)} + \frac{f\beta}{1-\beta+\beta(f+h)}}_{\tau^E} > \tau^E$$

with $h = 0.75, \quad f = 0.25, \quad \beta = 0.8$

$$\tau^E = \frac{0.8*0.25}{1-0.8+0.8(0.25+0.75)} = 0.2$$

$$\tau^U = \frac{1-0.8}{1-0.8+0.8(0.25+0.75)} + \tau^E = 0.4$$

$\Rightarrow$ Equilibrium tax Rate: 0.2

Bibliography

- Arrow, K., (1951), "Social Choice and Individual Values", New York: John Wiley & Sons.

- Baron, D., and J. Ferejohn (1989) "Bargaining in Legislature", *American Political Science Review*.

- Becker, G. (1983) "A Theory of Competition among Pressure Groups for Political Influence", *The Quarterly Journal of Economics*.

- Becker, G. (1985) "Public Policies, pressure groups and deadweight costs", *Journal of Public Economics*.

- Besley, T., and S. Coate (1997) "An Economic Model of Representative Democracy", *Quarterly Journal of Economics*.

- Corneo, G., Gruner, H.P., 2002. Individual preferences for political redistribution. Journal of Public Economics 83, 83-107.

- Galasso, V. (2003), "Redistribution and Fairness: A Note", *European Journal of Political Economy*.

- Grossman, G., and E. Helpman (1994) "Protection for Sale" *American Economic Review.*

- Grossman, G., and E. Helpman *(2001) Special Interest Politics,* The MIT Press*.*

- Gruber, J. and D. Wise (eds.), (1999), "Social Security and Retirement around the World", University of Chicago Press, Chicago.

- Gruber, J. and D. Wise (eds.), (2004), "Social Security Programs and Retirement around the World: Micro Estimation", University of Chicago Press, Chicago.

- Krusell, P., and J.V. Rios Rull (1999), "On the Size of the US Government: Political Economy in the Neoclassical Growth Model", *American Economic Review*.

- Lindbeck, A., and J. W. Weibull (1987) "Balanced-Budget Redistribution as the Outcome of Political Competition", *Public Choice*.

- Meltzer, A.H., Richard, S.F., 1981. A rational theory of the size of government. Journal of Political Economy 89, 914-927.

- Olson, M. (1965) "The logic of collective action" Cambridge: Harvard University Press.

- Osborne, M., and A. Slivinski, (1996) "A Model of Political Competition with Citizen-Candidates", *Quarterly Journal of Economics*.

- Persson, T. and G. Tabellini (2000), "Political Economics", The MIT Press.

- Roberts, K.W.S., 1977. Voting over income tax schedules. Journal of Public Economics 8, 329-340.

- Romer, T., 1975. Individual welfare, majority voting and the properties of a linear income tax. Journal of Public Economics 7, 163-185.

- Rosen, H. (1991), "Public Finance", Irwin.

- Saint-Paul, G. (1996), "Exploring the Political Economy of Labor Market Institutions" Economic Policy 23: 265-315.

- Saint-Paul, G. (1999a), " The Political Economy of Employment Protection", CEPR Discussion Paper, No. 2109

- Saint-Paul, G. (1999b), " Assessing the Political viability of Labor Market Reform: the case of Employment Protection", CEPR Discussion Paper, No. 2136

- Saint-Paul, G. (2000), "The Political Economy of Labor Market Institutions" Oxford University Press.

- Shepsle, K.A. (1979), "Institutional Arrangements and Equilibrium in Multidimensional Voting Models", American Journal of Political Science, 23(1)

- Wright, R (1996), "The Redistributive roles of Unemployment Insurance and the Dynamics of Voting", Journal of Public Economics 31: 377-399.