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ABSTRACT

Observed fiscal policy varies greatly across time and countries. How can we explain this variation across time and countries? This paper surveys the recent literature that has tried to answer this question. We adopt a unified approach in portraying public policy as the equilibrium outcome of an explicitly specified political process. We divide the material into three parts. In Part I, we focus on median-voter equilibria that apply to policy issues where disagreement between voters is likely to be one-dimensional. We thus study the general redistributive programs, which are typical of the modern welfare state: redistribution between rich and poor, young and old, employed and unemployed, resident of different regions, and labor and capital. In Part II we study special interest politics. Here the policy problem is multi-dimensional and we focus on specific political mechanisms: we study legislative bargaining, lobbying, and electoral competition, as well as the possible interactions between these different forms of political activity. Finally, Part III deals with a set of questions that can be brought under the label of comparative politics. Here we deal with policy choice under alternative political constitutions; we model the rationale for separation of powers and contrast the stylized features of congressional and parliamentary political systems, focusing on their implications for rent extraction by politicians, redistribution and public goods provision.

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Political Economics and Public Finance*

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1. General Introduction

Observed fiscal policy varies greatly across time and countries. Over time, the growth in the size of government is striking. For the average of 14 OECD countries, for which data are available, total government spending was less than 10% of GDP just before World War I. It had doubled to 18% just before World War II. By 1960, it was close to 30%. And by the mid 1990s, it had reached almost 50%. The growth of government accelerated after the mid 1930s, and slowed down towards the late 1980s. Equally striking are the differences across countries. In 1990, total government spending as a fraction of GDP was almost 70% in Sweden, and well above 50% in many countries of continental Europe, but below 35% in Japan, Switzerland, the US and Australia.

The composition of spending also varies greatly across time and countries. Government transfers is the component that accelerated most rapidly: in 1937 transfers amounted to only 4% of GDP, on average, for 7 OECD countries for which data are available; by the early 1990s, they had reached over 20%. Over

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the same period, government consumption also increased, but by less (8% of GDP). Public investment, in contrast, has remained roughly constant since 1970, at around 3% of GDP, in most countries. Moreover, the big spenders with regard to public consumption are not always the countries with a large government: in 1990, the US and the UK had higher government consumption than the average of 17 OECD countries, even though their total government spending was considerably smaller than the average of the same 17 OECD countries. The cross country variation in size and composition of spending is even greater in a larger set of more heterogeneous countries, also including developing countries. Finally, the quality and effectiveness of government activities vary considerably across countries, even among countries at comparable levels of development.[1]

How can we explain this variation across time and countries ? Is it associated with systematic variation in other aspects of economic policy? What is the role of alternative political constitutions and collective choice procedures in explaining fiscal policy outcomes? Are the observed patterns of spending and taxation likely to reflect socially optimal policy choices—given some normative criterion? If not, how can we account for the deviations from the normative benchmark? Do these deviations reflect the wishes of a majority of the voters ? These fundamental questions were raised long ago by researchers in the so called public-choice school. But it is fair to say that until recently, they have been neglected by traditional economic analysis. Specifically, policy analysis in traditional public finance was almost entirely normative, ignoring the positive theory of policy choice. This is no longer so. A growing body of research now tackles positive public finance questions head on, fruitfully combining economic and political analysis. The goal of this chapter is to provide a selective survey of this emerging literature.

We try to look ahead, at the most promising and exciting new areas of research in this emerging literature on *political economics.* In the process, we do not always give full justice to the earlier literature on these issues. One reason is the excellent survey by Inman (1987), in an earlier volume of this Handbook, which gives a general account of the literature up until the early eighties. In particular, Inman shows how the literature on political economy relates to some of the fundamental results in social choice and philosophy. There are also excellent surveys of the public choice approach to economic policy; see, in particular, Frey (1983)

[1] Tanzi and Schuknecht (1995) discuss historical data on government spending for OECD countries, while Persson and Tabellini (1999) consider a larger group of countries. The quality of government activities in a very broad group of countries is discussed empirically in La Porta et al (1998).

and Mueller (1989), (1997). Another reason is that some of the earlier literature was based on spatial models of voting, where individual preferences for public policy were not based on explicit economic models. In this survey, instead, we always combine economic theory with the analysis of alternative collective choice procedures. Economic policy always plays an explicit role, even though we sometimes study very simple model economies. To avoid overlap with other existing surveys, we do not discuss the literatures on local public finance, macroeconomic policy, trade and international economic policy. We also restrict ourselves to *static* models of public finance, or more precisely, models with one-time policy choices.[2]

We adopt a unified approach in portraying public policy as the equilibrium outcome of an explicitly specified political process. Policy choices are not made by a hypothetical benevolent social planner, but by purposeful and rational political agents participating in a well-defined decision-making process. Alternative theories seek to capture different features of political institutions and alternative modes of political behavior. Even though there is a variety of models, some general determinants of economic policies emerge from the analysis.

Public policy must strike a balance between the *conflicting interests of different voters*. The conflict largely reflects socio-economic factors, deriving from differences in income, age, employment status, geographical residence, occupation, or the like. In the simplest setting, these socio-economic factors shape the distribution of voters' policy preferences, which, in turn, are aggregated into public policy by the majority principle.

But the resolution of conflicting interests also reflects *political power*. In some cases, the determinants of political power are obvious. For instance, redistribution harms individuals unrepresented or under-represented in the political process, like future generations or citizens not organized in a political lobby. In other cases, political power derives from less obvious features of the political process. For instance, ideologically neutral and well-informed voters are more influential, because they are often the arbiter of the electoral competition between vote maximizing parties. Political power is particularly important when it comes to so-called special interest politics: concentration of benefits and dispersion of costs create very uneven incentives for trying to influence public policy. The groups benefitting most from the policy have strong incentives to get organized and build political power, at the expense of everyone else. This distorts the policymaker's incentives

[2] Scotchmer (this volume), Persson and Tabellini (1995), (1998), Dixit (1996a), Inman and Rubinfeld (1997) and Rodrik (1995) survey these other topics. Dixit (1996a), in particular, takes an approach similar to ours, and covers some common ground.

and leads to suboptimal equilibrium outcomes, including distorted allocations or large government spending. This idea is familiar from the early public-choice literature. More recent contributions have studied "structural" models where policy outcomes are suboptimal, even if political decision making is centralized, as long as groups or individuals acting in a decentralized fashion retain political influence.

In representative democracies, public policy must also strike a balance between the *conflicting interests of voters and politicians.* This prospective *agency* problem is also an old theme of the public-choice school. Sometimes, the problem is challenged by the argument that electoral competition between vote-maximizing candidates could remove the source of inefficiency: if there is an inefficient status quo, what prevents a vote-maximizing political entrepreneur from running at the elections and promising efficient policies?[3] When politicians cannot commit to enforceable or verifiable state-contingent electoral promises, however, the benefits of political competition are weakened and some agency rents remain. The struggle to capture those rents affects the policy outcome. For instance, elected officials may have an incentive to expand tax revenues, since that makes it easier to reap rents from office.

But there are also *conflicting interests of different politicians* about how to split available rents. The resolution of this conflict depends on the constitution, as the details of the decision-making procedure determine who has the power to exploit the political rents for his own benefit. Different constitutions may also be more or less useful for allowing the voters to control their elected politicians by holding them accountable in general elections.

We divide the material into three parts. The division partly reflects methodology, partly substance. In Part I, we focus on median-voter equilibria that apply to policy issues where disagreement between voters is likely to be one-dimensional. As the political mechanism is so simple, we can add more economic structure. We thus study the *general redistributive programs,* which are typical of the modern welfare state. Specifically, we deal with redistribution between rich and poor, between young and old, employed and unemployed, residents of different regions, and labor and capital. We can think of these median-voter equilibria as implemented in Downsian electoral competition between vote-maximizing candidates (parties). But the equilibria in Part I are *preference induced,* in that they only depend on the distribution of individual preferences.

For many aspects of public finance, however, the simplification to policy conflict along a single dimension is too hard to swallow. More general multi-

[3] Stigler (1971) and Wittman (1989) argue along these lines.

dimensional policies generate more narrowly defined special interests. Such situations require precise institutional assumptions to overcome the problems posed by Arrow's impossibility theorem. We illustrate a number of possibilities in Part II, on *special interest politics.* Here, our approach is the opposite to that in Part I. Thus, we simplify on the economic front, by studying a common problem of local, group-specific, public goods provision. However, we illustrate a number of alternative approaches for analyzing how the resulting policy conflict may be resolved. Each of these approaches highlights a different aspect of the political process and therefore suggests different determinants of which groups will gain and which will lose. Specifically, we study legislative bargaining, lobbying, and electoral competition, as well as the possible interactions between these different forms of political activity. The equilibria in Part II are *structure induced*, in that they crucially depend on the assumed institutions.

Finally, Part III deals with a set of questions that can be brought together under the label of *comparative politics,* as we deal with policy choice under alternative political constitutions. But now, we explicitly view a political constitution as an incomplete contract. Politicians cannot commit to verifiable state contingent electoral promises, which aggravates the agency problems between voters and elected representatives. According to this approach, the reason why different constitutions may produce systematically different policy choices is that they entail different allocations of control rights to politicians and voters. We illustrate some key ideas in this nascent literature, drawing on the results in previous parts. Specifically, we model some stylized features of congressional and parliamentary political systems, arguing that their different allocations of proposal and veto rights have important consequences for how well voters can control rent extraction by their political representatives, and for how redistribution and public goods provision are traded off in the legislative process.

Each of the three parts starts with a general introduction providing a more detailed road map to the following sections. We typically give references to the key contributions on which we build at the beginning of each section and in connection with the main results. More extensive references are instead collected in special subsections labeled "Notes on the literature" at the end of each section.

Part I
General redistributive politics

One of the prime goals of political economics is to study the policy implications of conflicting interests among individual citizens. In this first, part we study conflict and heterogeneity in the simplest possible political set-up. We mostly confine ourselves to political equilibria, which exclusively reflect the *preferences* of the citizens. Except in the very last section, an *equilibrium policy is a so-called Condorcet winner; that is, it cannot be beaten by any other policy in a pair-wise majority vote*. Such policies only exist under restrictive conditions on voters' preferences; the classical condition requires voters' preferences to be single peaked. Even though we can allow slightly more general conditions, we must essentially assume that the political problem is one-dimensional—either because the policy space itself is one-dimensional, or because voters' preferences over a multi-dimensional policy are smooth enough to allow their disagreement to be projected on a single-dimensional space.[4] If these conditions are satisfied, a political equilibrium selects the policy preferred by the voter with median preferences. For this reason, such equilibria are often called *median voter equilibria*.

Median-voter equilibria have indeed been extensively studied by economists. One explanation is undoubtedly ease of analysis: such equilibria basically constitute the solution to an optimal taxation problem, given a very special social welfare function, where only the utility of the median individual carries positive weight. The simple political setting has the virtue of enabling the researcher to study richer policy problems and more complex economic environments. Another explanation for their popularity may be that median voter equilibria identify some of the basic political forces shaping economic policy. Virtually everyone dislikes the equilibrium policy. But half the electorate wants to move policy in one direction, and the other half wants to move it in the opposite direction. This fundamental balance of political forces does not reflect political institutions, which may in themselves be endogenous to the political process. In this sense, a median voter optimum resembles a Walrasian equilibrium: once we have reached an

[4]The literature includes a number of generalizations of the single-peakedness condition. The main ones are the monotonicity condition of Roberts (1977), the intermediate preference condition of Grandmont (1978), and the order-restricted preferences of Rothstein (1990). Gans and Smart (1996) discuss a useful single crossing condition, which incorporates the others as special cases.

equilibrium, fundamental forces tend to keep policy in place.

But as direct voting over pairs of policy is rare in modern democracies, it is natural to ask what political institutions could bring about a median voter equilibrium. The most convincing mechanism was already suggested in the classical study by Downs (1957): electoral competition between two office-motivated candidates, (parties), who only care about winning the election and can make binding electoral promises, drives both candidates to the policy preferred by the median voter. These candidates thus become the analog of the Walrasian auctioneer. The existence conditions for median-voter equilibria may be stringent. But there are policy issues concerning all citizens at large, such as the size of broad redistributive programs, where it can be argued that the voters' disagreement tends to be aligned on a single dimension from, say, left to right. In such instances, the assumption of one-dimensional heterogeneity of voters may not be a bad first approximation, in which case the median voter equilibrium is a natural solution concept.[5]

It is thus important to choose an appropriate domain for the analysis. Accordingly, we confine this first part to broad redistributive programs. The general question addressed in this part is *how voters' preferences shape such programs?*

Section 2 studies redistribution between *rich and poor* voters. Here, heterogeneity is one-dimensional, and voters' preferences over a general income tax are monotonically related to their idiosyncratic productivity. The main result is that the size of redistributive programs increases with a specific measure of pre-tax income inequality.

Section 3 studies the conflict between *young and old*. Now, there are two dimension of heterogeneity, and voters' preferences over the generosity of the pension system are systematically related to their age, as well as their income. Large public pensions are supported by a coalition of poor and elderly voters, and the size of social security also exceeds the social optimum, because future generations of tax payers cannot participate in the voting.

Section 4 is devoted to the conflict between *employed and unemployed* individuals. It is then the employment status, or the risk of becoming unemployed, that shapes the preferences over the generosity of unemployment insurance and the structure of other labor market programs. The powerful majority of "insiders" with stable jobs support an over-regulated labor market and under-provision of

[5] Poole and Rosenthal (1991) provide extensive historical evidence that the voting pattern of US Congressmen can largely be represented by a single dimension, and suggest that this single dimension of disagreement can be interpreted as left-to-right in the traditional ideological sense.

unemployment insurance.

Section 5 considers *regional conflict*. The framework is similar to Section 2. But now, individuals belong to two different regions, which have different average incomes. We study how redistributive policies interact with the decision to integrate or separate the two regions, when there are efficiency gains from integration. On the one hand, redistribution changes the incentives to integrate, weakening them for rich regions and strengthening them for poor ones. On the other hand, the threat of regional secession can limit the scope of equilibrium redistribution in an integrated nation.

Finally, Section 6 analyzes the conflict between *labor and capital*. Here, we study how the allocation of the tax burden between these two inputs is determined. Voters' preferences over the structure of the tax system predictably hinge on the relative importance of these two tax bases in their income. In equilibrium, taxes on capital are higher than what is socially optimal, since capital income is more concentrated and a majority of voters primarily rely on income from labor. As mentioned above, the median-voter equilibria can be implemented in Downsian electoral competition. But appealing to such competition without studying its foundations is not satisfactory. Moreover, the Downsian model of representative democracy is highly questionable in some applications. In Section 6, we thus also illustrate a different approach to representative democracy. This is the so-called *citizen-candidate* model, where elections are modeled as a contest between outcome-motivated candidates, who have explicitly chosen to undertake a costly entry decision in order to implement their ideologically preferred policy.

2. Rich vs. poor

How do voters evaluate redistributive programs? And how much income is redistributed? Can fundamental political forces account for the observed growth of social transfers over time, as well as the large cross-country differences in the size of these transfers, such as those mentioned in the General Introduction? These are questions motivating the literature surveyed in this section.

2.1. A simple model of redistribution

We start with a simplified version of a model originally proposed by Romer (1975) and Roberts (1977), and extended and popularized by Meltzer and Richard (1981). We reformulate the model slightly, to avoid unnecessary complications. Consider a

static economy producing a single commodity. Individuals differ in one dimension only, namely their taxable income. As economic agents, they work and consume. As voters, they evaluate a simple redistributive program that pays a lump sum to each individual, financed by a *proportional* income tax. Below, we discuss how to introduce progressive taxation.

The preferences of the i^{th} individual are:

$$w^i = c^i + V(x^i) \ ,$$

where c and x denote consumption and leisure respectively, and $V(\cdot)$ is a well-behaved concave utility function. The private budget constraint is:

$$c^i \leq (1-\tau)l^i + f \ ,$$

where τ is the income tax rate, l^i individual labor supply and f a lump-sum transfer. The real wage is unity. Quasi-linear preferences imply that all income effects are absorbed by consumption. This simplifies the effect of tax distortions and the analysis of the voting equilibrium.

To model income differences, we assume that individual productivity differs, and that productivity, in turn, is equivalent to having more "effective time" available. That is, individuals are also subject to a "time constraint":

$$1 + e^i \geq x^i + l^i \ , \tag{2.1}$$

where e^i captures individual productivity. More productive individuals have a larger effective time endowment, e^i.[6] We assume that e^i is distributed in the population according to a known distribution with mean e, median, $e^m < e$, and a cumulative distribution function $F(\cdot)$.

It is easy to verify that in this simple model,

$$l^i = L(\tau) + (e^i - e) \ , \tag{2.2}$$

where $L(\tau) \equiv 1 + e - V_x^{-1}(1-\tau)$ is decreasing in τ by concavity of $V(\cdot)$.[7] Thus, as expected, a higher tax rate distorts the labor-leisure choice and induces the

[6] The original model assumes that individuals only have different productivities when working, whereas we are implicitly assuming that more talented individuals are more productive at generating income as well as at enjoying their leisure time. As shown in the next footnote, however, quasi-linear preferences imply that all individuals find it optimal to consume the same amount of leisure, while more talented individuals have more income and more consumption.

[7] Maximize individual i's utility subject to the budget and time constraints. The first-order condition implies: $1-\tau = V_x(1+e^i-l^i)$, where a subscript denotes a derivative. Take the inverse of $V_x(\cdot)$ and simplify to get the expression for l^i in the text. Note that $L_\tau = 1/V_{xx}(x^i) < 0$.

consumer to work less. By our assumption that $F(\cdot)$ is skewed, the distribution of income is skewed to the right, in conformity with available data in all countries.

Throughout this part, average variables are written without a superscript. Thus, l denotes average labor supply. Since the average of e^i is e, we have $l = L(\tau)$. The government budget constraint can therefore be written:

$$f \leq \tau l \equiv \tau L(\tau) \ . \tag{2.3}$$

Policy is set as follows. Two political candidates compete for office. They commit to electoral platforms formulated over the tax rate. Whoever wins the election enacts his pre-announced policy. Both candidates are completely office-motivated, in the sense that they only care about winning the elections. They thus maximize the probability of winning.[8]

2.2. Equilibrium redistribution

Consider the voters' preferences over policy. Define the indirect utility function of individual i, over τ, as:

$$W^i(\tau) \equiv \widehat{c}^i + V(\widehat{x}^i) \equiv (1-\tau)\widehat{l}^i + \tau L(\tau) + V(1 + e^i - \widehat{l}^i) \ , \tag{2.4}$$

where a $\widehat{\ }$ refers to the private equilibrium choices, and where we used the private budget and time constraints and the government budget constraint to derive the right-most expression.

Let τ^i be the tax rate preferred by the i^{th} individual. Then, τ^i is implicitly defined implicitly by the first-order condition: $W^i_\tau(\tau^i) = 0$. We differentiate the right-most expression in (2.4), noting that we can set $\frac{d\widehat{l}^i}{d\tau} = 0$ by the envelope theorem. We then obtain:

$$W^i_\tau(\tau) = -\widehat{l}^i + L(\tau) + \tau L_\tau(\tau) = -(e^i - e) + \tau L_\tau(\tau) = 0 \ . \tag{2.5}$$

Consider the right-most expression of this condition. The first term is the marginal benefit of a higher tax rate cum redistribution. It is positive for a voter poorer than the average ($e^i - e < 0$) and negative for a voter richer than the average ($e^i - e > 0$). The last term is the marginal cost of higher distorting taxes, in the form of a smaller tax base; this term is always negative, as $L_\tau < 0$. Thus, each

[8] The argument is identical if we instead assume that candidates maximize their expected vote share.

voter trades off the marginal redistributive benefit (or cost) of taxation against its deadweight loss. Equation (2.5) implicitly defines the tax rate preferred by voter i :

$$\tau^i = \frac{e^i - e}{L_\tau(\tau^i)} \ . \tag{2.6}$$

As $L_\tau < 0$, (2.6) implies that a poor voter ($e^i < e$) prefers a positive tax rate, which is larger the poorer he is (the larger is e^i in absolute value), while a rich voter ($e^i > e$) prefers an income subsidy ($\tau < 0$), financed by a lump-sum tax. Individual preferences are thus monotonic in e^i. Furthermore, they are single peaked by a natural restriction on $V(\cdot)$.

It is easy to see that there is only one political equilibrium: both candidates commit to τ^m , the policy preferred by the median voter. If any of the candidates were to announce a different value τ', the other candidate could ensure victory by announcing a policy in the interval (τ', τ^m). Hence, the equilibrium tax rate, τ^m, coincides with the policy preferred by the median voter:

$$\tau^m = \frac{e^m - e}{L_\tau(\tau^i)} \ . \tag{2.7}$$

Up to the alternative model provided in Section 5, all equilibria in this part can be thought of as the result of this kind of Downsian electoral competition.

2.3. Implications and evidence

The model thus predicts that the size of general redistributive programs reflects the preferences of the middle classes (the likely median voters), and is determined by their relative position on the income scale. By (2.7), taxes are higher the greater the distance between median and mean income, a specific measure of income inequality. If the middle classes are *relatively* well off, because there is extreme poverty, equilibrium redistribution is small. If the middle classes are instead relatively worse off, with income highly concentrated at the top, equilibrium redistribution is large. Thus, the model predicts a link between skewedness of income distribution and the size of general redistribution schemes. Concentration of income at the top makes redistribution more attractive for the median voter, and hence increases the equilibrium tax rate. But more extreme poverty has the opposite effect, because it reduces the benefit of redistribution for the median voter. Another prediction of the model concerns the deadweight costs of taxation: the larger these are—as captured by the absolute value of L_τ—the smaller

is equilibrium redistribution. Note, however, that the model really says nothing about selective, or targeted, transfer schemes, such as welfare payments.

Can this simple model explain secular growth in the size of redistributive programs and observed cross-country differences? Two features of the theory can possibly account for the early growth of redistribution. First, the extension of suffrage to poorer voters, early in this century, certainly reduced the relative income of the median voter in Western democracies. Second, again early in this century, economic progress and institutional change very likely reduced the transaction costs of collecting taxes, particularly income taxes, and hence the distortions associated with taxation. In the US, for instance, income taxes only became constitutional in 1913. But what about the period after the 1960s? Electoral laws did not change and no major improvements in the tax collection technologies occurred, and yet government transfers continued to increase as a fraction of national income?

Lindert (1994), (1996) systematically investigates these questions in a panel of OECD countries, in the periods 1880-1930, and 1962-81, respectively. Running panel regressions that also control for average income, demographic structure of the population, and other variables, he finds conflicting results. On the one hand, voter turnout and redistributive transfers are positively related.[9] As voter participation is positively correlated with relative income, this supports the theory. Moreover, high concentration of income (measured as the share of the top quintile relative to that of the middle quintile on the income scale) is indeed *positively* related to redistributive transfers, as predicted by the theory. Finally—though the evidence is somewhat weaker—poverty (the share of the bottom quintile relative to that of the middle quintile) is *negatively* related to government transfers, which is also a prediction of the theory. Income distribution can account for a large fraction of the observed cross country differences in spending: the lower spending in the US, in particular, could be attributed to lower voter turnout among poorer voters and to more extreme poverty, which raises the relative position of the median voter. On the other hand, when these measures of income distribution are replaced by the share of the middle quintile, which roughly measures the relative position of the median voter, it always turns out to be statistically insignificant.

The model we have discussed is static. Simple dynamic versions, where higher redistributive income taxation hurts the incentives to invest in physical or human capital and therefore economic growth, have been analyzed by Alesina and Rodrik (1994), Persson and Tabellini (1994a), and many others. More *wealth* inequality

[9] See, for instance, Shields and Goidel (1997).

(in the sense of lower median relative to mean wealth) should thus be associated with higher taxation and slower growth. Alesina and Rodrik (1994) and Persson and Tabellini (1994a) find robust evidence in historical and cross-country data for more inequality indeed being associated with slower growth. But this is only indirect evidence, and the link between inequality and growth might be due to other economic or political mechanisms. Perotti (1996) indeed finds negative results when trying to relate various measures of income distribution to government transfers, in similar broad cross-country data. Data problems are, however, likely to be paramount in such broad data sets. The evidence from US states, where inequality data are more comparable, seems mixed.[10]

Krusell and Rios Rull (1997) instead focus on sequential voting decisions in a full-fledged dynamic economy. They calibrate a version of a neoclassical growth model with heterogeneity in wealth and labor income, where the same income tax applies to both labor and capital income. The model is formulated so that heterogeneity only affects political decisions, whereas only average magnitudes matter for the economic equilibrium. A median voter result applies, similar to that illustrated above. But the median voter faces a more demanding problem: tax rates are chosen sequentially over time and the decision in each period is taken in full anticipation of how current policy influences the political equilibrium in the next period through its effect on the relevant state variables. Krusell and Rios Rull numerically compute the political equilibrium and calibrate the steady state of the model to data for the US economy. Both steady state tax rates and transfers are remarkably close to recent US data. Interestingly, the model's dynamics plays an important role: with fixed capital and variable labor supply (a static version of the model) the same numerical calibration implies excessively high tax and transfer rates. Thus, the investment elasticity to the tax rate is important for quantitative success. Their paper, however, attempts to explain neither the secular rise of taxes and transfers, nor the observed cross-country differences.

Overall, these empirical results are somewhat disappointing: the secular increase in government transfers and the cross-country differences are huge, even if we restrict the sample to the last 30 years. A closer look at the timing of policy changes reveals a further weakness. In most countries, transfers rose most quickly in the 1960s and 70s, when income inequality was generally on the decline; in the 80s and 90s, in contrast, inequality tended to increase once more, while redistributive transfers rose less quickly.

[10] See Partridge (1997) and Panizza (1997).

One reason why the theory may fail to account for the rise in government transfers in the last 30 years is that the data on transfers do not fit the theory very well. Pensions and health-related transfers are the most rapidly growing components of government transfers. As these systematically benefit older individuals, the simple median voter model above needs to be modified to allow for heterogeneity in age. This is done in the next section. Other transfers belong to social insurance, such as transfers to the unemployed. This kind of spending also differs a great deal across countries. Section 4 investigates the determinants of unemployment insurance, which also differs from simple redistribution between rich and poor voters in several ways. Yet other transfers are very clearly targeted to more narrow groups. Such transfers, and the associated special interest politics, is the topic of Part II.

2.4. Notes on the literature

The theory in this section is based on Romer (1975), Roberts (1977) and Meltzer and Richard (1981). It is straightforward to add public consumption, as an additional policy instrument or to replace the lump-sum transfer, provided the benefits of public consumption are not concentrated to particular income groups. Meltzer and Richard (1985) show that the same incentives to redistribute in cash then arise with respect to redistribution in kind. Cukierman and Meltzer (1991) replace the proportional income tax with a three-parameter tax schedule. Under plausible conditions on skewness of income distribution and labor supply elasticity, a median voter equilibrium exists and the decisive voter chooses marginal progressivity. Peltzman (1980) is an influential early contribution, based on a very different political model and reaching very different conclusions.

A large empirical literature on the determinants of the size of redistributive programs is surveyed in Mueller (1989). The prediction that higher income inequality among voters leads to increased government redistribution has received particular attention in empirical studies. Lindert (1994), (1996) examines a panel of OECD countries with mixed results. The theory is instead supported by the analysis of US time series data in Meltzer and Richard (1983), and by the different approach, based on calibration, of Krusell and Rios Rull (1997). Finally, Husted and Kenny (1997) show that the expansion of voting franchise is positively correlated with the size of redistributive programs by US states and local governments.

Empirical research also investigated the idea that the expansion of redistribu-

tive programs can be attributed to a reduction in the administrative costs of tax collection and the dead-weight costs of taxation. Empirical support is provided by the works of Becker (1985), North (1985), Kau and Rubin (1981) and, more recently, Becker and Mulligan (1998).

A recent literature has studies the links between redistributive policies, income inequality and growth. Alesina and Rodrik (1994) and Persson and Tabellini (1994a) provided the original impetus. Benabou (1996), Krusell, Quadrini and Rios-Rull (1997), and Persson and Tabellini (1998) survey the theory on inequality and growth, while Perotti (1996) discusses the empirical findings on cross country data. The evidence coming from US states, studied by Partridge (1997) and Panizza (1997), does not suggest strong conclusions.

3. Young vs. old

Why have pension expenditures risen so rapidly in all countries in the postwar period, and with so little political opposition? What political forces stand in the way of pension reforms in most industrial countries? And how can a reform package be designed so as to be politically feasible? These are the questions motivating this section. We build on the simple median-voter model of Section 2, but add a second dimension of heterogeneity, age. Public pensions redistribute both *across* and *within* generations, and intra-generational redistribution is a realistic feature of all pension systems. This plays a key role in the political equilibrium, as voters' coalitions form along two dimensions: age and income. The two-dimensional feature of coalition formation somewhat complicates the analysis. It is useful study this in detail, however, as this illustrates how one may compute median voter equilibria with multidimensional heterogeneity.

3.1. A simple model of pensions

Consider an overlapping generations economy, where each generation lives for three periods and population growth is constant. There is no altruism across generations. Individuals work in the first two periods of life, and retire in the last period. They can invest their savings on a world-wide capital market at a given rate of return. Within each generation, labor income is heterogeneous. As in the previous section, some individuals have more effective time to allocate between labor and leisure; these productivity differences are permanent throughout life. A proportional income tax levied on working generations pays for the pensions of

the retirees. A pension consists of the same non-negative lump-sum payment for every old individual. Thus, the pension system redistributes across, and within, generations. For simplicity, we treat the pension system in isolation from other parts of the budget; thus, taxes are only collected to finance pensions to the old under a balanced budget, whereas working generations receive no transfers.

When *young*, individual i maximizes the following utility function:

$$w^{iY} = U(c^{iY}) + \frac{1}{(1+\delta)}U(c^{iM}) + \frac{1}{(1+\delta)^2}c^{iO} + v(x^{iY}) + \frac{1}{(1+\delta)}v(x^{iM}) \ , \quad (3.1)$$

where δ denotes the subjective discount rate; the notation otherwise coincides with that of the previous section, except that the upper-case superscripts denote the period of life. Linearity of consumption when old implies that all income effects are absorbed by c^{iO}. The intertemporal budget constraint of a young generation is:

$$c^{iY} + \frac{c^{iM}}{1+\rho} + \frac{c^{iO}}{(1+\rho)^2} = l^{iY}(1-\tau) + \frac{l^{iM}(1-\tau)}{1+\rho} + \frac{f}{(1+\rho)^2} \ , \quad (3.2)$$

where ρ denotes the given world real interest rate, and f the pension received when old. By assumption, the same tax rate τ is paid in both working periods (see further below). Finally, we assume that $\delta = \rho$. When choosing between labor and leisure, individuals face the time constraint (2.1) in each period, as in the previous section. This means that labor supply when young and (planned) labor supply when middle-aged are still given by (2.2). Consumption when young and (planned consumption) when middle-aged are given by $c = U_c^{-1}(1)$, with income effects completely absorbed by consumption when old.

A *middle-aged* individual behaves in a similar fashion. He maximizes $(1+\delta)w^{iY}$, except that all variables from young age are now given. An *old* individual, finally, just consumes his pension plus his assets (or minus his liabilities).

Let n be the exogenous rate of population growth. Then, the government budget constraint can be written as:

$$f = \tau l^M(1+n) + \tau l^Y(1+n)^2 = \tau L(\tau)(1+n)(2+n) \ , \quad (3.3)$$

where, as previously, non-superscripted variables denote averages. For each old individual, there are $(1+n)$ middle-aged and $(1+n)^2$ young individuals; the right-most expression follows from (2.2) and some rewriting. This constraint (3.3) is typical of a balanced pay-as-you-go pension system, where the contributions paid by the working generations finance the pensions of the currently old.

As real interest rates and real wages are both given in our simple perfect foresight model, the pension system therefore has three effects only: it redistributes across generations, it redistributes within generations, and the taxes needed to finance it distort labor-leisure choices. In a richer model the pension system would have general equilibrium effects via endogenous factor prices. It may also provide social insurance in the face of individual income uncertainty.

Voters' preferences How do different individuals evaluate the generosity of the pension system? Let us start with the simplest case of complete commitment. Individuals are thus assumed to vote over τ (or, equivalently, over f). Once a policy is approved, it remains for ever (or, equivalently, until all generations who voted for it have died).

All *old* voters clearly want the revenue maximizing tax rate, as they only internalize benefits and no costs of higher taxes. Young and middle-aged individuals, however, base their policy preferences on both income and age. Generally, poorer and older individuals prefer higher public pensions, as they benefit more from either intra-generational or inter-generational redistribution.

Specifically, consider a young voter of type i, and let $W^{iY}(\tau)$ be his indirect utility function. By the envelope theorem, a marginal change in τ affects his welfare according to:

$$\begin{aligned} W_{\tau}^{iY}(\tau) &= -[\widehat{l}^{iY} + \frac{\widehat{l}^{iM}}{1+\rho}] + \frac{1}{(1+\rho)^2} \cdot \frac{df}{d\tau} = \\ &\quad -\frac{(2+\rho)}{(1+\rho)}[L(\tau) + e^i - e] + \frac{(1+n)(2+n)}{(1+\rho)^2}[\tau L_{\tau}(\tau) + L(\tau)] \ , \end{aligned} \tag{3.4}$$

where a^denotes a privately optimal choice, as in the previous section, and where the right-most expression follows from (2.2), (3.3) and some manipulations. The expressions in (3.4) are easily interpreted: increasing τ entails a benefit when old (the last term) and a cost in the first two periods of life, due to higher taxes (the first term). The benefit is the same for all young voters. But the cost of higher taxes is higher for the richer among the young (i.e., for those with a higher e^i). Moreover, higher population growth n makes public pensions more attractive, because the same tax rate now gives a higher pension. A higher real interest rate ρ would have the opposite effect, reducing the present value of net benefits from the pension system.

Consider the special, "golden-rule", case of $\rho = n$. Setting (3.4) equal to zero, we get a condition identical to (2.5), that is, the condition for the optimal tax

rate in the static model of the previous section! When $\rho = n$, the *average* young individual (with $e^{iY} = e^i = e$) gains nothing from the social-security system. But since taxes are distorting, he prefers $\tau = 0$. The social security system becomes attractive for the average young only if $\rho < n$. Young voters poorer than average ($e^i < e$), on the other hand, prefer $\tau > 0$ even if $\rho = n$, as they stand to gain from the *intra*-generational redistribution, just as in the model of the previous section.

Finally, consider a middle-aged voter of type i. By the same logic, a marginal change in τ affects his welfare according to:

$$\begin{aligned} W_\tau^{iM}(\tau) &= -l^{iM} + \frac{1}{1+\rho} \cdot \frac{df}{d\tau} = \\ &\quad -[L(\tau) + e^i - e] + \frac{(1+n)(2+n)}{(1+\rho)}[\tau L_\tau(\tau) + L(\tau)] \ . \end{aligned} \tag{3.5}$$

Comparing this expression with (3.4), the marginal benefit of pensions is now higher because it is closer in time, and the marginal cost is lower because taxes are now only paid for one period. Thus, a voter with the same relative income position $e^{iY} = e^{iM} = e^i$ prefers a higher tax rate when middle-aged than when young. In particular, the average ($e^{iM} = e$) middle-aged voter would prefer $\tau > 0$, even if $\rho = n$, though he would stop short of full revenue maximization.

By (3.4) and (3.5), we can identify a pair of young and middle-aged individuals who always vote alike. Setting the right-most expressions in each of these conditions equal to zero, subtracting one from the other and simplifying, we get:

$$e^{iM} = e^{iY} + \frac{(1+n)(2+n)}{2+\rho}[L(\tau) + \tau L_\tau(\tau)] \ . \tag{3.6}$$

For any young voter of type e^{iY}, there is thus always a middle-aged voter of type e^{iM} with identical policy preferences. This middle-aged voter is richer than his young counterpart, by (3.6) $e^{iM} > e^{iY}$. The intuition was given above; older voters favor social security more as do poorer voters. Hence, for a young individual to prefer the same taxes as a middle aged one, his lower age must be compensated by a lower income.

3.2. Equilibrium pensions

We are now ready to characterize the political equilibrium.[11] By the discussion above, individual preferences are single-peaked and monotonic in income and age.

[11] We only consider interior equilibria, such that $0 < \tau < \arg\max_\tau \tau L(\tau)$.

A median-voter result thus applies. But who is the pivotal voter? Clearly, all old individuals prefer the revenue-maximizing tax rate. Conversely, all young individuals richer than the average prefer tax rates at zero. The median voter will correspond to a pair: a poor young and a richer middle-aged voter, who prefer the same tax rate. Let e^{*m} be the *middle-aged* median voter (yet to be identified)—i. e., not the individual with the median endowment—and τ^{*m} his preferred policy. The relation between e^{*m} and τ^{*m} is obtained by setting the right-most expression in (3.5) equal to zero, and solving for $e^i = e^{*m}$:

$$e^{*m} = e + \frac{(1+n)(2+n)}{1+\rho}[\tau^{*m} L_\tau(\tau^{*m}) + L(\tau^{*m})] - L(\tau^{*m}) \ . \tag{3.7}$$

As before, let e^i be distributed in the population, with c.d.f $F(\cdot)$. In equilibrium, the number of voters in favor of $\tau > \tau^{*m}$ equals the number of voters in favor of $\tau < \tau^{*m}$. By (3.6), equilibrium requires that:

$$\begin{aligned} & 1 + (1+n)F(e^{*m}) + (1+n)^2 F\left(e^{*m} - \frac{(1+n)(2+n)}{2+\rho}[L(\tau^{*m}) + \tau L_\tau(\tau^{*m})]\right) \\ = \ & \frac{1 + (1+n) + (1+n)^2}{2} \ . \end{aligned} \tag{3.8}$$

The left-hand side of (3.8) is the size of the coalition of those voters in favor of taxes higher than τ^{*m}, namely all of the old and a fraction of the middle-aged and the young, respectively. In equilibrium, this coalition must make up exactly half the electorate, the measure of which is given by the expression on the right-hand side. We can also consider (3.8) as an illustration of our previous claim: high pensions are supported by a coalition of *elderly and poor voters cum tax payers*, as those stand to benefit from the inter- or intra-generational redistribution.

To obtain the equilibrium policy τ^{*m}, combine (3.7) and (3.8):

$$\begin{aligned} & (1+n)F\left(e + \frac{(1+n)(2+n)}{1+\rho}[\tau^{*m} L_\tau(\tau^{*m}) + L(\tau^{*m})] - L(\tau^{*m})\right) \\ & +(1+n)^2 F\left(e + \frac{(1+n)(2+n)}{(1+\rho)(2+\rho)}[\tau^{*m} L_\tau(\tau^{*m}) + L(\tau^{*m})] - L(\tau^{*m})\right) \\ = \ & \frac{(1+n) + (1+n)^2 - 1}{2} \ . \end{aligned} \tag{3.9}$$

As F is a monotonic function, (3.9) implicitly defines a unique equilibrium tax rate. This tax rate τ^m is a decreasing function of ρ: a higher ρ reduces the

present discounted value of future pensions, making young and middle-aged voters less favorable to public pensions. A higher population growth rate n, on the other hand, has ambiguous effects on τ^m. On the one hand, a higher n increases the weight of the young and reduces the weight of the old, thus shifting the median-voter identity towards someone less favorable to pensions. On the other hand, a higher n makes pensions more attractive for all young and middle-aged voters. Either effect might prevail, depending on functional forms. Finally, the shape of the income distribution, as described by $F(\cdot)$, also affects equilibrium policy. But then, not only median income matters, as the decisive voters are not median income recipients. In general, more income inequality is likely to make the decisive voters more willing to exploit the pension system for intragenerational redistribution, and increase the equilibrium generosity of the system.

It is useful to consider the special case where $\rho = n$. Here, it can be shown that τ^m is larger than the equilibrium tax rate of the static redistributive model in the previous section. In fact, the two tax rates would coincide if only the young individuals were eligible to vote. As noted above, if $\rho = n$ the young do not benefit from the intergenerational redistribution, and only the intra-generational motives for redistribution would shape their votes. But the old and middle-aged do benefit from intergenerational redistribution, even if $\rho = n$. Their votes thus raise the equilibrium generosity of the pension system beyond what the median young individual prefers.

Suppose we let the normative benchmark be a utilitarian optimum, defined as the maximum of the discounted sum of the welfare of all currently alive and future generations. By the quasi-linearity of preferences, this translates into a discounted sum of the welfare of the average individual in each generation. It is easy to see that the utilitarian optimum has $f = 0$.[12] Relative to this benchmark, the political equilibrium we have studied entails too much redistribution, both across and within generations. First, it redistributes to poor individuals at the expense of rich. As in the previous section, this is a consequence of majority rule and the distribution of income being skewed to the right. Second, the equilibrium redistributes to the currently old and middle-aged voters, at the expense of future generations. This new feature is a consequence of the yet unborn generations not participating in the vote determining their future taxes. There are thus powerful political forces supporting the introduction of a pay-as-you-go, social-security

[12] There may be other reasons, such as social insurance, for positive socially optimal pensions. As these are not included in our simple model with risk neutrality, the argument should be interpreted as deviations from some benchmark, whatever the level of pensions in that benchmark.

system, and keeping its size excessive relative to the social optimum.

One of the political distortions that keeps public pensions too large is that future generations are affected by the system, but do not vote on it. This suggests a simple constitutional remedy: only the young generation should be allowed to vote on social security, since it is the only generation that correctly internalizes the entire tax burden of public pensions. Naturally, this constitutional constraint is hard to enforce, as there would always be a majority of voters willing to repeal it. Moreover, the political equilibrium described above hinges on the assumption of commitment; once voted upon, the policy remains for as long as all generations participating in the vote are alive. Below, we discuss how to relax this assumption.

3.3. Evidence and extensions

We have just illustrated how political forces may bring about and shape a pension system of the kind observed in many western democracies. Does the evidence support some of the specific predictions of the model? There are few empirical studies. The demographic composition of the population is clearly an important determinant of the size of pensions. Lindert (1996), Perotti (1996) and Tabellini (1990) all find that, in panels of industrial countries and in cross sectional correlations of larger country groups, pension expenditures *as a fraction of GDP* is larger the greater is the share of elderly in the population. But this finding does not discriminate well against other possible models of equilibrium pensions. A social planner would also spend more on pensions, if there were a larger number of elderly. The model's prediction is really that pensions *per retiree* would be higher, the higher the weight on old voters (a lower n in the model), as this shifts the median voter equilibrium towards a more generous pension system.[13] Further, population growth is, in reality, not constant over time. Being faithful to the theory, one should also look at the effect of changes in expected future population trends (this is the second and opposite effect of n on the political equilibrium above). But no empirical study of which we know incorporates these features, nor has anyone studied the effect of the real interest rate, ρ.

The model also predicts pensions to increase with appropriate measures of income inequality. This is only very weakly supported by the evidence. Lindert (1996) and Perotti (1996) find no significant effect of income distribution variables

[13] In a cross-section study of social spending in Swedish municipalities, Strömberg (1996) explicitly tests—and finds support for—a political model based on the age of the median voter against a social-planner alternative.

on pensions. Tabellini (1990), on the other hand, finds a positive correlation between a Gini index of inequality and pensions in a large sample of countries, controlling for age and initial income. But measures of inequality are bound to be highly imperfect for such a large sample of countries. And measuring income distribution in accordance with the model is even more tricky; as noted above, the relative income of the decisive voter is age-dependent and does not coincide with median income.

The simple model studied in this section can be generalized in many directions. If we add capital accumulation, the social security system generates *general equilibrium* effects, at least in a closed economy. An expansion of the program reduces private savings, raises the real interest rate and lowers the real wage. This benefits rich savers and hurts borrowers, thus adding another dimension to the political determinants of the equilibrium. As Cooley and Soares (1999) show, these general equilibrium effects can sometimes play a dominant role in studying the preferences over the pension system.

With individual income uncertainty, the pension system also has *social insurance* benefits. Conesa and Krueger (1998) incorporate both types of effects in their analysis of the political support for pension reform. They study a rich model with heterogeneity in three dimensions: age, assets and income. Conesa and Krueger use numerical methods to study the economy's dynamic adjustment over time to different types of pension reform. Their results illustrate clearly how hard it is to muster majority support among the present voters for reforms of the pension system, even though the reforms bring about significant long-run benefits.

The assumption of *commitment* can also be modified without altering the nature of the results. Suppose that the effect of majority decisions only lasts one period, rather than for ever, as assumed above. Thus, every other period, voters get to decide on social security contributions today and tomorrow. In the absence of reputational effects, all young voters would now vote against any positive contributions, since the pension they will receive two periods hence is not affected by the current vote. The old and a fraction of the middle-aged individuals, on the other hand, continue to support the social security system. Unless they are out-numbered by the young, the same factors as above, namely ρ, n and the function $F(\cdot)$ will shape the equilibrium policy, even though the precise characterization will differ and the system will be less generous. Indeed, such a model of limited commitment might be a good vehicle for studying the evolution of social security over time, in the face of changing population trends. The ongoing and predicted aging of the population, experienced in most western democracies,

would introduce interesting dynamics in public support for the pension system. Studying these dynamics might give a deeper understanding of the forces behind the political struggle over pension reform.

Absent any commitment, positive pensions could not be sustained in the simple model of this section, except through reputational forces. All taxpayers would oppose the system, as their pension would be independent of the current vote. Presumably, two generations of taxpayers would also outnumber the old generation. No commitment is, however, as unrealistic as full commitment. Abolishing the pension system from one day to the next would not only meet political resistance not fully captured by our simple median voter model, but would be ruled out as unconstitutional in many countries. Moreover, reputational mechanisms could link the voting outcomes across period, and in this case equilibria with social security could even be sustained without commitment.[14]

Altruism across generations is another mechanism that may help sustain equilibria with positive social security in the absence of commitment. Tabellini (1991), (1990) shows that, even if altruism is so weak that it will not support private inter-vivos transfers, it can nevertheless affect political behavior. Poor young and middle-aged individuals could be induced to vote in favor of the social security system, because the (lump-sum) benefit to their parents or grand-parents outweighs the cost of the small taxes they must pay. With a larger number of poor voters than rich, this could be enough to support public pensions.

One may, of course, also study the links between pensions and other targeted government transfers, such as welfare payments. Motivated by the growth of government transfers in recent decades, Lambertini and Azariadis (1998) study an overlapping generations model with capital formation, where policy consists of pensions to the elderly and welfare payments to the poor. Their model of political equilibrium is different from ours; they use a legislative bargaining model of the type discussed in Part II below. But higher income inequality can lead to the formation of a coalition like the one discussed in this section—namely of old voters and poor young voters—which implies higher equilibrium transfers of both types.

[14]Reputational equlibria in overlapping generations (OLG) models may be quite different from the usual applications of the folk theorem, in that they may require generational chains of punishments or rewards. In a simple two-period OLG model, for example, sustaining a reward from the current young to the current old requires that the current young expect that their hypothetical deviation from the equilibrium would lead to future punishment from the next (yet unborn) generation.

3.4. Notes on the literature

The theory of voting over social security has followed different approaches. Browning (1975) and Boadway and Wildasin (1989a,b) have studied the determinants of social security in voting models with commitment, where all voters have the same income and differ only in age. Cukierman and Meltzer (1989) consider public debt (equivalent to social security in their model) in an overlapping generations economy with income heterogeneity, weak altruism within the family, and policy commitments. Tabellini (1990) formulates a median-voter model with income heterogeneity and weak altruism within the family, but no commitment (i.e., in each period, voters choose a tax rate with lump-sum transfers to the currently old). The model of this section, where voters differ in age and income, but where there is commitment and no altruism, combines features of all these approaches. These results are perhaps closest to those of Cukierman and Meltzer (1989), though that paper focuses on general equilibrium effects on the real interest rate and neglects tax distortions. General equilibrium effects and their effect on voters' preferences have also been studied by Cooley and Soares (1999). Conesa and Kruger (1998) include not only general equilibrium effects, but also social insurance benefits of the pension system, in their analysis. A general survey of the positive political theories of social security is provided by Verbon (1988), while Feldstein (1998) and Siebert (1998) discuss the recent reform experiences of various developing and industrial countries.

In the absence of policy commitment, social security systems can be sustained by reputational equilibria. This idea was pursued by Kotlikoff, Persson and Svensson (1988), and more recently by Boldrin and Rustichini (1996), Cooley and Soares (1999) and Azariadis and Galasso (1997). The idea that altruism within the family also induces voters to support intergenerational redistribution is investigated by Tabellini (1990), (1991).

Some papers have studied the political determinants of social security in settings different from voting. Grossman and Helpman (1996a) consider a model where members of different generations lobby the government, as in part II below. Earlier papers relying on the idea that the ability of different generations to influence the political process affects the size and viability of social security include Patton (1978), Stuart and Hansson (1989), Loewy (1988). More recently, Lambertini and Azariadis (1998) have focused on legislative bargaining among (representatives of) different interest groups.

The validity of the empirical prediction that more inequality leads to more spending on social security has been investigated by Lindert (1994), (1996) with

negative results whereas Tabellini (1990) obtained more encouraging results. Looking at data of Swedish municipalities, Strömberg (1996) finds support for the prediction that the composition of social spending is systematically related to the age of the median voter.

4. Employed vs. unemployed

In the previous sections, voters knew their relative income with certainty when choosing their policy. An important role of some redistributive transfer programs, however, is to provide insurance against income risks, as in the case of unemployment insurance or public health insurance.[15] Voters evaluate such programs on the basis of their relative risk, besides their relative income. In labor markets, the distribution of risk among individuals is also affected by government regulation, such as hiring and firing rules. This section analyzes the political determinants of unemployment insurance as well as labor market regulations.

A central determinant of such programs, emphasized by Wright (1986) and Saint-Paul (1993), (1996), is the likely conflict of interest between employed and unemployed voters, or more generally between *insiders* (those with a well paid and protected job) and *outsiders* (the unemployed and workers in secondary markets). To keep things simple, we abstract from idiosyncratic unemployment risk, even though risk differences are realistic and could be added. The remaining conflict of interest then becomes very stark: the risk of future unemployment is lower for currently employed workers/voters, who therefore want less unemployment insurance than the unemployed. Instead, currently employed voters find it more expedient to protect themselves against unemployment risk through tight firing restrictions, even though such restrictions would increase unemployment and unemployment duration. As employed voters constitute a majority, political equilibria generally exhibit underprovision of unemployment insurance and overly restrictive labor market regulations. Closing the section, we discuss how labor market reforms may become politically feasible.

[15] We rarely observe private unemployment insurance. But we do not discuss the underlying informational problems, which presumably provide a rationale for government insurance. It is not straightforward, however, to provide such a rationale. Under moral hazard, a government facing the same information constraints as private agents, would not generally be able to outperform the market. Under adverse selection, there is more scope for outperforming the market, as the government might rely on compulsion.

4.1. A simple model of unemployment insurance

All individuals are alike, apart from their employment status, and they maximize expected discounted lifetime utility of consumption over an infinite horizon:

$$V^J = \mathsf{E}_0[\sum_{t=0}^{\infty} \beta^t U(c_t^I) \mid I = J \text{ at } t = 0], \quad I, J \in \{E, U\} \ .$$

where E_0 is the expectations operator conditional on information available at time 0, t the time period, β a discount factor ($\beta = \frac{1}{1+\delta}$ in the notation of Section 3), and $U(\cdot)$ a well-behaved concave utility function. Individuals are either employed or unemployed and the E and U superscripts denote these two states. Labor supply is exogenous and set equal to one. For simplicity, we also assume that there are no credit markets (see further below). Hence, unemployment insurance entails no distortions and consumption equals current income. If employed, individuals thus consume their real wage, normalized to unity, less taxes, $c_t^E = 1 - \tau_t$. If unemployed, they receive an unemployment benefit, c_t^U.

Individual employment status follows an exogenous stochastic (Markov) process. In each period, a currently employed individual becomes unemployed with probability φ (for firing rate), whereas a currently unemployed individual becomes employed with probability ϑ (for hiring rate). By the Markov assumption these transition probabilities remain constant over time, irrespective of an individual's employment history, and are the same across individuals. The aggregate rate of unemployment u_t is given by:

$$u_t = \varphi(1 - u_{t-1}) + (1 - \vartheta)u_{t-1} \ . \tag{4.1}$$

In each period, unemployment consists of the previously employed who were laid off (the first term), plus the previously unemployed who did not find a job (the second term). We focus on the steady state, where u_t has converged to a constant. Solving (4.1) for $u_t = u_{t-1} = u$ yields:

$$u = \frac{\varphi}{\varphi + \vartheta} \ . \tag{4.2}$$

We assume that $\varphi + \vartheta < 1$ and that $\vartheta > \varphi$, so that u is less than 50%.

Finally, as in the previous sections, we treat this government program in isolation from other policies. The government budget constraint implies that unemployment subsidies must be financed by taxes on currently working individuals:

$$uc_t^U = \tau_t(1 - u) \ .$$

Using (4.2), the government budget constraint can be written as:

$$c_t^U = \tau_t \frac{\vartheta}{\varphi} \ . \tag{4.3}$$

Voters' preferences Assume initially that unemployment insurance is chosen today (at $t = 0$), *given* that u is already at its steady-state value, and stays in place for ever: that is, $\tau_t = \tau$, and $c_t^U = c^U$ for all t. How do voters evaluate such a program? To answer this question, consider the value functions of employed and unemployed voters, respectively. Making use of the previous expressions for c^E and c^U; these can be written as:

$$\begin{aligned} V^E &= U(1-\tau) + \beta[(1-\varphi)V^E + \varphi V^U] \\ V^U &= U(\tau\frac{\vartheta}{\varphi}) + \beta[\vartheta V^E + (1-\vartheta)V^U] \ . \end{aligned} \tag{4.4}$$

The solution yields the state utilities as a function of the policy τ:

$$\begin{aligned} V^E &= \frac{\beta\varphi U(\tau\frac{\vartheta}{\varphi}) + (1-\beta(1-\vartheta))U(1-\tau)}{(1-\beta)(1-\beta(1-\vartheta-\varphi))} \\ V^U &= \frac{(1-\beta(1-\varphi))U(\tau\frac{\vartheta}{\varphi}) + \beta\vartheta U(1-\tau)}{(1-\beta)(1-\beta(1-\vartheta-\varphi))} \ . \end{aligned} \tag{4.5}$$

Taking the derivative of these expressions with regard to the policy τ, and setting it equal to zero, we find the insurance policy desired by employed and unemployed individuals, respectively:

$$\begin{aligned} \frac{U_c(c^E)}{U_c(c^U)} &= \frac{\beta\vartheta}{1-\beta(1-\vartheta)} \leq 1 \\ \frac{U_c(c^E)}{U_c(c^U)} &= \frac{(1-\beta(1-\varphi)}{\beta\varphi} \geq 1, \end{aligned} \tag{4.6}$$

where the inequalities follow from $\beta \leq 1$. Evidently, the currently employed prefer incomplete insurance ($c^E \geq c^U$), while the currently unemployed prefer over-insurance ($c^U \geq c^E$). Even though both sets of voters face a probability of changing status in the future, accounting for this is not enough to compensate for the fact that current unemployment insurance redistributes from employed

to unemployed voters. By contrast, a utilitarian social planner—equivalently, an individual who maximized his expected utility behind a veil of ignorance over his current employment status—would always prefer full insurance, $c^E = c^U$. This is intuitive, as there is neither aggregate risk, nor individual incentive problems due to information or distortive taxation. Adding such inefficiencies would lower the desired insurance levels discussed above, but not eliminate the conflict between employed and unemployed.

Note that the qualitative results do not hinge on the absence of credit markets. With perfect credit markets and no aggregate risk, individuals would be able to fully insure their unemployment risk. Yet, some individuals would still want to use public unemployment insurance to redistribute in their favor. In particular, unemployed voters, or more generally voters whose risk of being unemployed is higher than average, would want public unemployment insurance since it would redistribute towards them in expected value (discussed by Wright (1986)). If private insurance markets were absent but individuals could still save, they would have an incentive to self-insure. As a result, the tax cost of financing the program would weigh more heavily in their preferences and they would prefer less unemployment insurance in the labor market (this is discussed by Hassler and Rodriguez-Mora (1997)).

4.2. Equilibrium unemployment insurance

With only two types of voters, the political equilibrium is simply the policy preferred by the largest group, namely those currently employed.[16] To get explicit results, let the utility function be iso-elastic $U(c) \equiv c^{1-\gamma}/(1-\gamma)$, with γ denoting the coefficient of relative risk aversion. The first expression in (4.6) and the definitions of c^E and c^U, imply that the equilibrium tax rate τ^E satisfies:

$$\frac{\tau^E \vartheta}{(1-\tau^E)\varphi} = \left[\frac{\beta\vartheta}{1-\beta(1-\vartheta)}\right]^{1/\gamma} . \tag{4.7}$$

>From the government budget constraint (4.3), we can easily derive the corresponding equilibrium unemployment benefit, c^U.

[16] The equilibrium generalizes to the case discussed above of idiosyncratic unemployment risk, when the latter is modeled as idiosyncratic hiring and firing parameters h^i and f^i. The political equilibrium would still be a median-voter equlibrium even with such two-dimensional heterogeneity. But as in the case of pensions, the decisive voter would be a pair, namely an employed high-risk type and an unemployed low-risk type with different values for f^i and h^i.

How is equilibrium policy affected by changes in the parameters of the model? The implicit function theorem implies:

$$\begin{array}{llll} \dfrac{\partial \tau^E}{\partial \varphi} > 0, & \dfrac{\partial c^U}{\partial \varphi} < 0; & \dfrac{\partial \tau^E}{\partial \vartheta} \lesseqgtr 0, & \dfrac{\partial c^U}{\partial \vartheta} > 0 \\ \dfrac{\partial \tau^E}{\partial \beta} > 0, & \dfrac{\partial c^U}{\partial \beta} > 0 & \dfrac{\partial \tau^E}{\partial \theta} > 0, & \dfrac{\partial c^U}{\partial \theta} > 0 \ . \end{array} \tag{4.8}$$

A higher firing rate φ reduces the equilibrium unemployment benefit but raises the equilibrium tax. Intuitively, with a higher firing rate, employed voters still want to retain the same marginal rate of substitution between consumption if employed or unemployed, as is evident from (4.6). But that rate has become more expensive, as equilibrium unemployment is larger, as is evident from (4.2). It is optimal to adjust both margins, raising the tax rate but reducing the unemployment benefit. Conversely, if the hiring rate ϑ is higher, the risk of becoming unemployed is less menacing, and the decisive voter is willing to accept a higher marginal rate of substitution of consumption if employed vs. unemployed. In this sense, less insurance is needed. But insurance is now cheaper to buy, because unemployment falls with a higher ϑ. Hence, the unemployment benefit rises and the tax rate falls, only if the individual is sufficiently risk averse (more precisely, if $\theta > 1$).[17] A higher discount factor or a higher rate of risk aversion, finally, would imply a more generous program, as the future risk of unemployment now carries more weight in the decision.

Evidence and extensions. From a positive point of view, it is interesting to note that the unemployment benefit, c^U, is negatively related to unemployment: parameter changes which increase unemployment also reduce the unemployment benefit. The reason is that the decisive voter reacts to changes in the cost of providing unemployment insurance. [18] The model also has unambiguous predictions regarding the effect of the general turnover in the labor market on the generosity

[17] Note that the above are pure comparative statics experiments. Specifically, they assume that a parameter difference has fully manifested itself in a different steady state unemployment rate before the choice of unemployment insurance takes place.

[18] These comparative statics results would be less clear cut with individual specific hiring and firing rates. In that case, parameter changes would alter the identity of the median voter and, as unemployment increases, the median voter would be more likely to be unemployed. This would tend to move the size of equilibrium unemployment insurance (also as measured by benefits) in the same direction as the rate of unemployment.

of equilibrium unemployment insurance. To see this, consider a fall in both ϑ and φ such that the ratio$\frac{\vartheta}{\varphi}$ and hence, aggregate unemployment u, stay constant. It is easily shown that both τ and c^U decrease for such an increase in turnover. It is unclear whether these two predictions are consistent with the development over time of unemployment insurance in European countries, where indeed unemployment has generally increased and turnover in the labor market has generally decreased over the last two decades. It has not yet been explored whether these predictions are consistent with the evidence, even though it would seem feasible and well worth the effort. It is quite clear, however, that the model's predictions for Europe vs. the US are counterfactual: Europe has both higher unemployment and lower turnover, at least in recent times, but higher unemployment benefits.

Such counterfactual cross-sectional predictions, motivate Hassler and Rodriguez-Mora (1997) to study the role of self insurance. They show that once self insurance is allowed, higher turnover does indeed make the employed prefer less generous unemployment insurance: when turnover is high, private savings become a close substitute for unemployment insurance, making the latter less valuable. Hassler and Mora also discuss the difficulty of sustaining positive unemployment insurance if there is no commitment to policy in future periods; this point is closely related to our discussion about the sustainability of the pension system in the previous section.

Our simple model of *endogenous* policy above focuses on the link from unemployment and its determinants to unemployment benefits. Much of the traditional literature on *exogenous* policy discusses the link in the opposite direction. That is, generous unemployment benefits may generate higher unemployment, either by pushing up equilibrium wages or by pushing down equilibrium search effort.[19] In an interesting recent paper, Hassler et al (1998) try to incorporate both links in a model with labor market search and endogenous policy. They show that there may very well be multiple equilibria: one with high unemployment and generous benefits and another with low unemployment and less generous benefits.

4.3. Equilibrium labor market regulations

Unemployment insurance is not the only policy where the preferences of the employed and the unemployed clash. Labor markets in many industrial countries, particularly in Europe, are heavily regulated. In particular, firings are restricted or costly for the firm, not by contract, but by law. These regulations protect

[19] Layard and Nickell (1998) survey the relevant literature.

those currently employed but harm the unemployed, since they discourage new hires and thus increase unemployment duration. We now investigate the political determinants of these regulations, largely following Saint-Paul (1996).

Consider the same economy as above, but without public unemployment insurance: the unemployed earn a given subsistance wage, and consumption of the employed is exogenously given.[20] To model firing regulations, redefine the probability of becoming unemployed, φ, as:

$$\varphi = \chi + q,$$

where q is voluntary quits, and χ is firing (layoffs) by the firms. We treat q as an exogenous parameter, but χ as a policy variable. The latter captures the influence on firings of specific labor market legislation. The more difficult it is to legally fire a worker, the lower is χ and, hence, the lower is φ. We can thus interpret χ as a measure of labor market flexibility: a higher χ amounts to more flexibility. As discussed by Saint-Paul (1996), who uses earlier results by Pissarides (1990), firing restrictions also make firms less willing to post vacancies. Thus, firing restrictions reduce the hiring rate, ϑ. Specifically, suppose—as does Saint-Paul (1996)—that the hiring rate is a given concave function of the firing rules:

$$\vartheta = H(\chi), \quad \text{such that} \quad H_\chi > 0, \quad H_{\chi\chi} < 0. \tag{4.9}$$

That is, more flexible labor markets allow firms to increase firings (χ increases) but also tend to increases the hiring rate, though at a decreasing rate. Firms are thus assumed to be more willing to hire workers, if they know it is easier to lay them off during bad times. This means that increasing labor market flexibility involves a trade-off between firing and hiring rates. This trade-off is more favorable when labor markets are very rigid, that is when χ is low, for the hiring rate increases more, in this case, as a result of increased flexibility.

This formulation implies that labor market flexibility generally has an ambiguous effect on steady-state unemployment, depending on the value of χ. In fact, by (4.2):

$$\frac{\partial u}{\partial \chi} = \frac{H(\chi) - (\chi + q)H_\chi(\chi)}{(\varphi + \vartheta)^2} \lesseqgtr 0 \tag{4.10}$$

[20] This rules out general equilibrium effects of changes in the unemployment rate, operating through the government budget constraint. These effects would make the voting problem dynamic, as voters would have to consider the dynamic adjustment to the steady state - recall that by (4.1), unemployment gradually adjusts to the steady state. While these dynamic effects are unlikely to overturn the conclusions of this subsection, they complicate considerably the analysis.

By concavity of $H(\chi)$, this derivative is more likely to be negative for low values of χ. That is, additional labor market flexibility is more likely to reduce unemployment when labor markets are very rigid, due to the greater marginal effect on hiring noted above. We make this explicit by assuming that $u(\chi)$, that is, unemployment as a function of labor market flexibility for given q, has a unique minimum $u(\widetilde{\chi})$ at a specific level of labor flexibility $\widetilde{\chi}$.

This simple model is obviously a short-cut, in that it does not treat firm behavior explicitly, squeezing what is essentially a dynamic problem into a static reduced-form hiring function. The ambiguous effect of firing protection on unemployment, due to the opposite reaction of the firing and hiring rate, is also a well-known property also of more sophisticated theoretical models of unemployment, the ambiguity is often the basis of arguments that easier firing rules would not necessarily help reduce the high European unemployment - see, for instance, Mortensen and Pissarides (1998) for a survey of the theoretical literature on the natural rate of unemployment, and Blanchard (1998) on European unemployment.

Without further excuses, we now turn to the political equilibrium. Clearly, employed and unemployed voters disagree over flexibility: the currently employed insiders want to protect their jobs, and thus dislike flexibility, while the unemployed outsiders welcome flexibility as it raises the hiring rate. The unemployed constitute a minority, however, and equilibrium policy is thus chosen so as to please the employed voters.

Formally, the equilibrium policy is the value of χ, which maximizes the employed voters' expected lifetime utility. As in the previous subsection, the maximand is given by V^E in (4.4), except that φ is now replaced by $\chi + q$ everywhere. The first-order condition for χ is obtained by taking the partial derivative of V^E with respect to χ, given (4.9), and setting it equal to zero. After some rewriting, we can express the equilibrium condition as:

$$H(\chi) - (\chi + q)H_\chi(\chi) = - \ \ (1-\beta)/\beta \tag{4.11}$$

The right-hand side of (4.11) is strictly negative, as must be the left-hand side. But then, it also follows from (4.10) that, in equilibrium, $\frac{\partial u}{\partial \chi} < 0$. That is, equilibrium unemployment is above its minimum, defined by $u(\widetilde{\chi})$, and would be reduced by additional labor-market flexibility. To protect their jobs, the majority of employed voters restricts firing to the extent that unemployment increases. This also has costs for the insiders, however. If unemployed in the future, they will have to wait longer for a job. At some point, these costs of unemployment become high

enough to outweigh the benefits to insiders of tighter labor-market restrictions.[21]

This result, that high equilibrium unemployment is also caused by overly tight firing rules, contrasts with the previously quoted arguments, that is, that increasing labor market flexibility would not necessarily reduce European unemployment. These arguments are based on an incomplete theory, however, as they view the level of existing regulations as random. But policy choices are certainly not random: existing labor market regulations largely reflect the preferences of the majority of "insiders". If so, their predicted effect on unemployment is clear: easier firing rules, if politically feasible, would reduce unemployment. The view that existing policy choices are not random, but systematically related to the political and economic environment, also has important implications for how to approach empirically the unemployment effects of alternative labor market policies and institutions. These implications have, so far, been neglected so far in the existing empirical literature on the economic causes of unemployment - see Layard and Nickell (1998) for a very good recent survey.

Extensions Are there policy reforms that retain job security for insiders and, at the same time, reduce unemployment? If so, they would clearly be politically feasible, for they would receive the support of both employed and unemployed voters. Higher public employment could be one solution. Marginal employment subsidies or other devices to stimulate labor demand by private firms would be another solution. In both cases, however, some tax payers would have to foot the bill. It would also be more difficult to fully analyze the equilibrium provision of alternative public policies. One way would be to combine this model with the one studied in Section 2, where there is income heterogeneity among employed workers and the tax burden is not evenly shared among these.

Saint-Paul (1996) discusses other paths to reform. One is labor-market segmentation. Suppose the law would provide two kinds of firing restrictions: tighter ones for old jobs, but looser restrictions (or no restrictions at all) for new jobs. Such a two-tier system would protect the job security of insiders, while, at the same time, reducing unemployment. Thus, it would be an improvement for all voters, and would be supported politically. In the long run, a problem might emerge, however. As more and more workers would become employed on more

[21] With endogenous income taxes or unemployment subsidies, there would be a further cost of higher unemployment: providing unemployment insurance becomes more expensive, as taxes must increase or, equivalently, lower unemployment benefits can be financed out of given tax revenues.

flexible contracts, insiders might become a political minority in the sense that their labor market protection could be scrapped and their rents eroded. Expectations of this long-run outcome could reduce the support of insiders for a two-tier labor market. Saint-Paul (1996) shows a possible solution. Less protected jobs should only remain so temporarily. That is, the law should specify a conversion clause: after some time, new jobs should either become regular and enjoy the full benefits of tight firing rules, or they should be scrapped. Such a reform would still reduce unemployment, without adverse long-run political consequences.

Research on these issues is still scarce. High equilibrium unemployment has become a pervasive and persistent phenomenon in Europe during the last two decades. At a general level, the discussion above suggests that this phenomenon reflects similar political forces, namely the political preferences of the majority, consisting of the insiders in the labor market. But there is also a very interesting variation across countries, with regard to the extent of the unemployment problem and the timing and type of policy reforms adopted. Some countries, notably Spain, that introduced tight labor market restrictions at an early stage, experienced very high unemployment and have only lately introduced reforms in the direction of a two-tier systems.[22] In the UK, labor markets were instead deregulated in more conventional ways in the eighties, by various reforms diminishing the influence of unions. Countries like Sweden introduced legislation providing higher job security in the early seventies, but avoided high unemployment—for some time, at least—by expanding public employment. Understanding such differences in policy reform is an important topic for future research.

Another interesting question is why different countries resort to different combinations of firing protection and unemployment insurance to protect the insiders against the risk of becoming unemployed. Buti, Sestito and Pench (1998) point out that in cross country data, there is a negative relationship between these two policies: countries, such as Italy, where firing is very difficult also tend to have very small unemployment insurance programs, and viceversa. In the previous subsection, we discussed some comparative static results, relating equilibrium unemployment insurance to exogenous hiring and firing rates. But what makes countries choose different combinations of these instruments ? One possible answer is related to the political influence of the insiders: firing protections are of more benefit to the currently employed, while unemployment insurance is of more

[22] Recent US development towards two-tier labor contracts have been characterized by differences in wages, rather than in job security. This difference may relate to the oft-noted difference in wage flexibility on the two sides of the Atlantic (we owe this observation to Alan Auerbach.)

benefit to the currently unemployed. Thus, the combination of these two tools that is chosen probably reflects the relative political influence for the insiders. But to more thoroughly address this issue, we must go beyond the simple median voter model discussed so far, and investigate other sources of political influence. Labor unions in many countries are very well organized and well connected with political parties on the left. Moreover, their political activities go well beyond the voting behavior of their members. Such activities take us into the domain of special interest politics, however, which is the topic of Part II below.

Finally, another first-order question is to understand why European and US (more generally Anglo-Saxon) labor markets differ to such an extent. An interesting possibility is that we observe a manifestation of multiple equilibria. The simple model in this section includes a two-way mapping: from labor market policy to unemployment and from unemployment to policy. Suppose it was enriched with, say, a search model of the labor market, so that equilibrium unemployment was explicitly determined by maximizing choices of firms and workers. It is not inconceivable that such a model would allow for multiple equilibria with different levels of unemployment being supported by different equilibrium labor-market policies, in analogy with the aforementioned paper by Hassler et al (1998).

4.4. Notes on the literature

A huge literature discusses how exogenous economic policy affects unemployment - see the recent surveys by Bertola (1998), Layard and Nickell (1998) and Mortensen and Pissarides (1998). Research on what mechanisms determine the economic policies that have impact on the labor market is, however, much more scant. The model of voting over unemployment insurance of subsections 4.1-4.2 draws on Wright (1986). It can be extended to allow self insurance through borrowing and lending, as in Hassler and Rodriguez-Mora (1997), or to allow feedback effects from unemployment insurance to equilibrium unemployment, as in Hassler et al. (1998). The political conflict between insiders and outsiders and the issues discussed in subsection 4.3 have been studied by Saint-Paul (1993), (1996), who also discusses the political feasibility of alternative reforms.

5. North vs South

Income inequalities often reflect *regional* (as opposed to individual) features. Regions are rich or poor, due to their endowments of natural resources, their sector-

ial or occupational composition, their cultural and sociological attributes, or just historical accident. Programs redistributing across individuals then also redistribute among regions. But a regional conflict can be dealt with in other ways than through majority decisions on taxes. In particular, acute regional conflict can lead to secession. Viceversa, redistributive gains may induce poor regions to seek political integration with richer regions. But secession or integration also entail other considerations, relating to economies of scale in public good provision, taste heterogeneity, political and cultural values. Which regions are more likely to integrate politically ? And which regions or groups of voters are more likely to favor secession ? How does the threat of secession modify the size of redistributive programs ? How is the size of these programs affected by political integration ? This section addresses these questions in a simple extension of the model from Section 2, suggested by Bolton and Roland (1997) and Persson and Tabellini (1994c). Redistribution is individually based and there are no intergovernmental transfers. But as average income differs across regions; a policy redistributing from rich to poor individuals also redistributes across regions. And regions, unlike individuals, have the option to opt out of a redistributive program, or join it through integration. We study how the voters' choices of broad redistributive programs interact with the decision to secede and integrate in political equilibrium.

5.1. A simple model of regional redistribution

Consider our previous basic model of redistribution from rich to poor regions, but with the population spread over two regions, $J = R, P$. These regions are identical in all respect, except in the distribution of individual endowments, e^i, and in population size. Let N^J be the population of region J, with total population $N = N^R + N^P$. Average and median endowments in region J are denoted e^J and e^{mJ}, respectively. Region R has a higher *average* endowment; specifically: $e^R \geq 0 \geq e^P$. We normalize such that the nation-wide average endowment is zero: $(N^R e^R + N^P e^P)/N = 0$. As before, the nation-wide median endowment below the average: $e^m < 0$.

We need some motive for the two regions to form a single jurisdiction. A natural assumption is that public revenue can also be allocated to the consumption of a national public good, g, which yields the same per capita utility $H(g)$ to every citizen in every region. The public good is non-rival and excludable across, but not within, regions. Enjoying the utility from this public good requires the two regions

to be politically united. If they are separate, the public good must be separately provided in each region, foregoing the economies of scale associated with common provision. Examples of these types of public goods are national defense, the administration of justice, the enforcement of law and order. The government budget constraint, if the regions remain united, is $Nf + g = N(\tau L(\tau))$, or:

$$f + \frac{g}{N} = \tau L(\tau) \ . \tag{5.1}$$

The notation is as in Section 2. Thus, f is a lump-sum transfer to every individual, τ is a proportional income tax rate, and $L(\tau)$ is average labor supply. Under separation, each region J faces the same budget constraint, except that averages refer to regional averages, and N is replaced by regional population N^J:

$$f^J + \frac{g^J}{N^J} = \tau^J(L(\tau) + e^J) \ .$$

Throughout the section, we assume that equilibrium redistributive transfers are positive ($f > 0$), with or without separation. Under this assumption, there is no conflict between citizens over the amount of public goods to provide, and the equilibria with or without separation are straightforward extensions of the results derived in Section 2.

First, suppose that the two regions remain united. As in Section 2 (with $e = 0$), the tax rate preferred by the pivotal voter with median endowment is $\widehat{\tau}^U = e^m/L_\tau(\tau^m)$. Moreover, all voters agree that the public good should be provided in the quantity

$$\widehat{g}^U = H_g^{-1}(\frac{1}{N}) \ . \tag{5.2}$$

Intuitively, the opportunity cost of providing one more unit of the public good is a reduction of lump-sum transfers for all voters. Since the marginal utility of income is 1, the opportunity cost for every voter is $1/N$. Equating this to the marginal benefit of the public good, H_g, yields (5.2) which coincides with the standard efficiency condition for a pure public good.

Next, suppose that the regions are separated. Voters within each region agree that the optimal amount of the public good in region J is : $\widehat{g}^J = H_g^{-1}(1/N^J)$, for $J = R, P$. As in Section 2, the tax rate preferred by the regional median voter is a function of the difference between median and average endowments within each region, given by:

$$\widehat{\tau}^J = \frac{(e^{mJ} - e^J)}{L_\tau(\widehat{\tau}^J)} \ . \tag{5.3}$$

The lump-sum transfer is residually determined from the relevant government budget constraint, given the equilibrium values $\widehat{\tau}^J$ and $\widehat{g}^J$.

5.2. Integration or not?

We now ask which of these equilibria is preferred by a majority of the voters within each region. This is the appropriate question when analyzing the determinants of political integration: that is, when two separate regions consider whether or not to become politically united. Formally, suppose that voters in both regions have to vote yes or no over a proposal of integration in a separate regional referendum. If a majority votes yes in both regions, then nation-wide policy is set in national electoral competition, producing policy $(\widehat{\tau}^U,\ \widehat{g}^U)$. If a majority votes no in at least one region, then region-wide policy is set in regional electoral competition, producing regional policies $(\widehat{\tau}^J,\ \widehat{g}^J)$, $J = R, P$. As discussed further below, a decision about separation may require a more complex procedure than a majority vote in each region. Moreover, in the presence of a credible threat to secede, equilibrium national policy may be adapted to avoid disruptive separation.

As preferences are single peaked and monotonic in endowments, the preferences of the regional median voters—given the perfectly foreseen policy consequences in each case—are decisive for the outcome of each regional referendum. Let $[W^{mJ}(\widehat{\tau}^J) + H(\widehat{g}^J) - \frac{g^J}{N^J}]$ be the indirect utility of the median voter in region J if separated, given the regional equilibrium tax rate $\widehat{\tau}^J$ and public good $\widehat{g}^J$. The term

$$W^{mJ}(\tau) \equiv (1-\tau)(L(\tau)+e^i) + V(1-L(\tau)) + \tau(L(\tau)+e^J) \qquad (5.4)$$

refers to the indirect utility from private consumption and leisure and is defined as in (2.4). Given (5.4), the indirect utility of the median voter in region J, if the two regions are united, is: $[W^{mJ}(\widehat{\tau}^U) - \widehat{\tau}^U e^J + H(\widehat{g}^U) - \frac{\widehat{g}^U}{N}]$, where $\widehat{\tau}^U$ is the equilibrium national tax rate (such that $f > 0$), and $\widehat{g}^U$ is optimal public good provision - recall the assumption that the national average endowment is zero. From the point of view of the regional median voter, integration evidently matters for two reasons: the lump sum transfer he receives is different, as both the tax rate and the tax base differ, and the quantity and cost of the public good are different.

Exploiting the above expressions, we can express the net gain from integration for the median voter in region J as:

$$\Delta^J \equiv W^{mJ}(\widehat{\tau}^U) - \widehat{\tau}^U e^J + H(\widehat{g}^U) - \frac{g^U}{N} - [W^{mJ}(\widehat{\tau}^J) + H(\widehat{g}^J) - \frac{\widehat{g}^J}{N^J}]$$

$$= \quad [W^{mJ}(\widehat{\tau}^U) - W^{mJ}(\widehat{\tau}^J)] - \widehat{\tau}^U e^J + \sigma^J \ , \tag{5.5}$$

where $\sigma^J = (H(\widehat{g}^U) - \widehat{g}^U/N) - (H(\widehat{g}^J) - \widehat{g}^J/N^J) > 0$ is a measure of the efficiency gain of integration.. If Δ^J is positive (negative), a majority of voters in region J finds integration superior (inferior) to separation. The right-most expression in (5.5) identifies three effects of integration. The first term, within square brackets, is a purely political "autonomy loss" . If the relative income of the regional and the national median voter do not coincide i.e. if ($e^{mJ} \neq e^m$), integration changes the identity of the decisive voter and thus equilibrium policy (i.e. $\widehat{\tau}^J \neq \widehat{\tau}^U$). This can never improve the welfare for the regional median (as $W^{mJ}(\widehat{\tau}^J)$ constitutes a maximum), so the autonomy loss must be non-positive. The second term, $-\widehat{\tau}^U e^J$, is a "tax-base effect", due to differences in average per-capita income between regions. The tax-base effect from integration is negative (positive) for the median in the rich (poor) region, as $e^R > 0$ ($e^P < 0$). The last term, σ^J, as explained above, is an "efficiency gain" of integration, due to the economies of scale in public good provision.

Consider first the special case $e^J = 0$, i.e. average income in region J is identical to the national average. This means that the tax base effect is zero and that (5.5) reduces to $\Delta^J = [W^{mJ}(\widehat{\tau}^U) - W^{mJ}(\widehat{\tau}^J)] + \sigma^J$. Integration could still be sub-optimal for a majority in region J, if the regional distribution of relative income differs enough from the nation-wide distribution. Then, the autonomy loss may be large enough to compensate for the efficiency gain. Next, suppose that $\widehat{\tau}^J = \widehat{\tau}^U$, because $e^{mJ} - e^J = e^m$. Then (5.5) reduces to: $\Delta^J = -\widehat{\tau}^U e^J + \sigma^J$. Clearly, the poor region always gains from integration while the rich region could lose if it is so rich that the negative tax base effect more than offsets the efficiency gain. Not surprisingly, the poor region is thus more likely to prefer integration. It is entirely possible, however, that integration is favored by the rich and opposed by the poor region. This could happen if e^R is small and $e^{mR} \simeq e^m$. That is, the rich region is not very rich and its income distribution is similar to that of the integrated nation, while the income distribution in the poor region is very different from the integrated nation, so that the autonomy loss in taxation is very costly for the poor region. Finally, note that the efficiency gain, σ^J, is always larger for a smaller region (that is the smaller is N^J relative to N), as the economies of scale are then more important. Summarizing, the gains from integration are larger for a *poorer* and *smaller* region, and for a region with a relative income distribution more similar to the rest of the nation.

Integration could be efficient for reasons beside the economies of scale in public good provision. In particular, the parameter σ^J could also reflect lower trade and

transaction costs under political integration. This observation suggests that as economic integration increases throughout the world, secession becomes a more likely outcome. That is, international economic integration could lead to political disintegration, because it reduces the cost of political separation. The idea of a "Europe of Regions" is a natural implication of this line of thought. Alesina, Spolaore and Wacziarg (1997) document the effect of trade openness on country size and note that in the 50 years after World War II, a period of great trade liberalization, the number of countries more than doubled.

But efficiency is not a sufficient condition for integration to occur. If integration is chosen democratically under majority rule, efficiency enhancing political integration might be foregone, for fear of its redistributive consequences. Alesina and Spolaore (1997) analyze a related set-up but focus on heterogeneity in preferences rather than heterogeneity in income. They conclude that democracy can lead to an inefficiently large number of nations or, equivalently, that the size of democratic countries can be inefficiently small.

Finally, what is the effect of integration on the size of government ? It is easy to see that even though g^U is larger than g^J, the implied tax burden is smaller as $\frac{g^U}{N} < \frac{g^J}{N^J}$. The effect of integration on the size of f can go either way, depending on whether integration increases or reduces the distance between median and mean income. But Persson and Tabellini (1994c) show that, with enough symmetry, integration is likely to *reduce* the equilibrium size of redistributive programs.[23] Both forces thus push in the same direction: political integration is likely to create smaller governments. Alesina and Wacziarg (1998) provide empirical evidence supporting this proposition. Controlling for a number of other variables, they show that larger countries tend to have smaller governments. This effect is particularly robust for government consumption, where the effect of the economies of scale is likely to be strongest. The effect of country size on government transfers is more fragile, however, and disappears when controlling for openness to international

[23] Suppose that the two regions are of equal size and the distribution is the same within each region, so that $e^{mR} - e^R = e^{mP} - e^P < 0$. Then, by (5.3), they also have the same tax rate if separated, $\widehat{\tau}^J$. To compare $\widehat{\tau}^J$ and $\widehat{\tau}^U$, we need to compare the median of the integrated nation, e^m, with the average of the regional medians, $(e^{mR} + e^{mP})/2$. If $e^m > (e^{mR} + e^{mP})/2$, then integration reduces the distance between median and mean income (recall that, by assumption, $e^m < 0$ and $(e^R + e^P)/2 = 0$), and the size of government shrinks; the opposite happens if inequality goes the other way. It turns out that, if the regional distributions are skewed to the right, then $e^m > (e^{mR} + e^{mP})/2$ is more likely (Persson and Tabellini (1994c) provide a sufficient condition).

trade.[24]

A related question concerns the effects and the determinants of centralization of government functions, within a pre-existing political entity. It is beyond the scope of this chapter to survey the large literature on fiscal federalism that touches upon this question. In Part II, however, we discuss the effect of centralization on equilibrium spending on *local* public goods, and we show that, contrary to the results of this section, centralization of local public goods can very well lead to larger equilibrium spending.

5.3. The threat of secession

How does the threat of secession influence redistributive policies, if the two regions are already politically integrated? The answer to this question depends on aspects of the constitution, such as the procedure for seceding and for setting national policy. In this subsection, we assume that secession is constitutionally feasible if approved by a majority of the citizens in any of the two regions, and we continue to assume that redistributive policies are the result of electoral competition between office-motivated politicians. Specifically, consider the following three-stage game. (i) A tax rate and a level of public goods (τ^U, g^U) are set in (Downsian) electoral competition at the nation-wide level. (ii) Voters in each region take a decision, by referendum, on whether or not to secede. (iii) If a majority of voters in one region votes in favor, secession takes place, and both regions reset their policies in connection with new regional elections.

We already know the outcome at stage (iii) to be $\widehat{\tau}^J$ and $\widehat{g}^J$ from the previous analysis. At stage (ii), secession will be rejected if neither regional median voter gains from it. Formally, the condition for no secession is that the nation-wide tax rate belongs to the set:

$$NS \equiv \left\{\tau \mid \Delta^J(\tau) \equiv [W^{mJ}(\tau) - W^{mJ}(\widehat{\tau}^J)] - \tau e^J + \sigma^J \geq 0, \quad J = R, P\right\} \ , \quad (5.6)$$

where $\Delta^J(\tau)$ is defined exactly as in (5.5), but for an arbitrary nation-wide tax rate. (We have also not made explicit the dependency of this set on the model parameters (such as N^J, e^J, etc.)).

If the no-secession set is empty, secession is the only feasible outcome: no tax rate can induce both regions to stay united. As noted in the previous subsection,

[24] Rodrik (1998) and Cameron (1978) emphasize the positive correlation between openness and the size of government. They explain this with the idea that more open economies are more exposed to exogenous shocks and thus prefer higher social insurance.

an empty NS is more likely if the efficiency costs of breaking apart are small (σ^J is small for J), or if the two regions are very different either in average income or in regional income distribution.

If NS is non-empty, secession never occurs in equilibrium and the equilibrium tax rate belongs to NS. The reason is that, by definition of NS, both regional median voters are worse off with secession than with integration and $\tau \in NS$. Hence, a majority of the voters in the united nation are also worse off with secession than with integration and $\tau \in NS$. Anticipating the secession outcome, a majority of voters prefers$\tau \in NS$ to any alternative $\tau' \notin NS$, at stage (i). Hence, the equilibrium belongs to NS, and secession does not take place.

Identifying the equilibrium tax rate in this set is not straightforward, however. Due to the possibility of secession, individual preferences may fail to be single peaked at stage (i), so the pivotal voter need not have median endowment, e^m. In general, the equilibrium could be anywhere in this set. But it is more likely to be at the boundary, if the average income in the two regions differs a great deal. In this case, voters in the rich region can credibly threaten to secede if the tax rate is too high. To avoid this outcome, the optimal tax rate for the pivotal voter at stage (i), $\widehat{\tau}^U$, leaves the *rich* region just indifferent between secession and integration: $\Delta^R(\widehat{\tau}^U) = 0$. This is the case studied by Buchanan and Faith (1987), where the threat of secession limits the extent of politically feasible redistribution. But the opposite situation is also possible: a majority of the voters in the poor region want high tax rates, and have a credible threat to secede. To prevent this, the nation-wide policy could involve a higher tax rate than otherwise optimal for the national pivotal voter. This takes the equilibrium to the opposite boundary of NS, where the *poor* region is just indifferent: $\Delta^P(\widehat{\tau}^U) = 0$. A higher tax rate is more likely if the costs of break-up are small, for instance because both regions can exploit the economies of scale on their own, and income inequality in the poor region is much stronger than in the whole nation, so that the poor region values autonomy highly, because its preferred tax rate is much higher than with integration. In this case, the threat of secession does not constrain redistribution, but instead enhances the political power of the region preferring high taxes or, more generally, enhances the power of the poor voters.

To summarize: if the national policy is set in nation-wide electoral competition, the threat of secession can influence the equilibrium policy in either direction: secession can either impose a ceiling or a floor on equilibrium tax rates. But rich and large regions are more likely to secede. And a rich region's secession threat imposes a ceiling on the equilibrium tax rate.

5.4. Notes on the literature

There are several recent surveys on local public finance and fiscal federalism, also focusing on political economics. See, in particular, Scotchmer (this volume), Inman and Rubinfeld (1997), Inman (1987), as well as the early work by Oates (1972).

One of the first papers to study the economic determinants of the size of nations was Friedman (1977), who modeled the government as a tax maximizing Leviathan. Subsection 5.2, on integration, draws on Persson and Tabellini (1994a) and Bolton and Roland (1997). The political choice of whether or not to integrate was also studied by Alesina and Spolaore (1997), Casella and Feinstein (1990) and Casella (1992), who focus on heterogeneity of preferences rather than income.

The choice of whether or not to integrate politically is similar to the constitutional choice of instrument assignment to a vertical hierarchy of governments. This choice has also been studied by political economists. With a theoretical perspective, Besley and Coate (1998a) discuss how the equilibrium policies, and the choice between centralization and decentralization, hinge on economic factors (such as the strength of externalities) and political factors (such as the structure of decision making in the legislature). Crémer and Palfrey (1996a), (1996b) and Lockwood (1997) also analyze the voters' choice over the degree of centralization, contrasting alternative constitutional procedures. Empirical studies of the determinants of centralization include Oates (1972) and Panizza (1997), with regard to a sample of countries, and Wallis and Oates (1988) with regard to the US states.

The question of how the threat of secession modifies equilibrium re-distribution, addressed in subsection 5.3, has been studied by Buchanan and Faith (1987) and by Bolton and Roland (1997). Olofsgård (1999) extend this work, so as to allow for mobility across borders. Finally, Alesina, Spolaore and Wacziarg (1997) discuss the evidence relating the size of government to country size.

6. Capital vs. labor

This section has two goals. The first is to address a positive question: to analyze how the tax burden is split among different tax bases, in particular between labor and capital. According to the basic principles of optimal taxation, labor should be taxed much more highly than capital, as capital is a more elastic tax base, particularly in the long run. Indeed, many proponents argue that the optimal

steady-state tax rate on capital income is zero[25]. Yet, the observed effective tax rates on capital are positive and often large. In a sample of 14 OECD countries, the average effective tax rates on capital and laborover the period 1991-95 were about the same (about 38%). These measured tax rates vary considerably across countries and over time. In a number of countries, effective tax rates on capital are higher than on labor, even in countries with fairly competitive labor markets, such as the UK and the US.[26] One simple reason for high taxes on capital is that this is what a majority of the voters prefer. This result immediately falls out, once we generalize the simple model from Section 2 to include capital as well as labor. Capital income is more concentrated than labor income. Hence, a majority of the voters gain from shifting a larger share of the tax burden to capital, despite the efficiency losses. Another often discussed reason for high taxes on capital is the celebrated capital-levy problem (Fischer (1980)). The elasticity of already accumulated capital is zero. Hence, sequential policy decisions run into a typical credibility problem and, in equilibrium, capital is taxed even more highly than what is ex-ante optimal for a majority of the voters. Both results are discussed in subsection 6.2, within the familiar median voter model with Downsian candidates.

Our second goal in this section is methodological: to explore an alternative model of representative democracy, where candidates are not motivated by the desire of winning the elections per se, but by the desire to implement their own preferred policy. Hence, in subsection 6.3 we abandon the traditional Downsian model of electoral competition. Instead, we study a representative democracy, where the voters elect outcome-motivated politicians who choose policy once in office. Different candidates represent different ideologies. This setup directs the attention to a new question: who is chosen by the voters to make policy decisions ? Voters realize that different political candidates will make different policy choices once in office. A general result is that this way of modelling representative democracy generates *strategic delegation*. The reason is timing: policy choice takes place after the elections, and possibly much later. At the time of the elections, voters realize that policy will be chosen in an environment where the policymaker will

[25] Auerbach and Hines (this volume) present and discuss this result, originally due to Chamley (1986). See also Lucas (1990). But with unionized labor markets, a labor tax can be as distorting even more distorting than a capital tax; see for instance Daveri and Tabellini (1997).

[26] The source is Daveri and Tabellini (1997), who, in turn, extend a methodology formulated by Mendoza, Razin and Tesar (1994) which exploits information on tax income and aggregate tax bases. Effective tax rates on capital from detailed studies of the tax code, using the methodology originally developed by Jorgenson, such as King and Fullerton (1984), often give a very different picture than the "macro" methodology of Mendoza et al.

face a different set of incentive constraints. To cope with these forthcoming incentive constraints, they find it optimal to elect someone with preferences different from their own. In this setting, following Persson and Tabellini (1994b), strategic delegation here allows voters to circumvent the capital levy problem: the elected policymaker has stronger ex-post incentives to protect accumulated capital than the majority itself. This is just an example, however, and many other instances of strategic delegation have been studied in the literature. We will also return to this theme in Part II. Finally, we extend the model further, and ask whether the suggested equilibrium with an elected *citizen candidate* is in fact consistent with optimal entry into the political process. Thereby, we discuss the model of representative democracy recently proposed by Osborne and Slivinsky (1996) and Besley and Coate (1997).

6.1. A simple model of capital and labor taxation

To deal with capital formation and credibility problems in a simple way, we extend our simple model from Section 2 to include two time periods. The preferences of the i^{th} individual are:

$$w^i = U(c_1^i) + c_2^i + V(x^i),$$

where the notation follows the previous sections. The labor-leisure choice is only made in period 2. In that period, the individual is thus constrained by the same time constraint (2.1) as before. The period 1 and period 2 budget constraints are:

$$\begin{aligned} c_1^i + k^i &= 1 - e^i \\ c_2^i &= (1-\tau_L)l^i + (1-\tau_K)k^i, \end{aligned}$$

where τ_L and τ_K are the tax rate on labor and capital. Both exogenous gross factor returns have been normalized to unity.

To avoid two-dimensional individual differences, we make the simplifying, but counterfactual, assumption that type i's endowments of initial wealth $1-e^i$ and of effective time $1+e^i$ are perfectly negatively correlated. The idiosyncratic parameter e^i thus captures the relative importance of labor and capital in an individual's income. Solving the utility maximization problem, for given tax rates, we get the labor and capital supply functions, which—by the quasi-linear preferences—only depend on the "own tax rate":

$$l^i = L(\tau_L) + e^i \tag{6.1}$$

$$k^i = K(\tau_K) - e^i. \tag{6.2}$$

As before, we assume that e^i is distributed with a c.d.f $F(\cdot)$. For simplicity, we now set the mean to zero: $e = 0$. Since asset income is more concentrated in the population than labor income, it is now natural to assume that the median value of e^i, defined by $F(e^m) = \frac{1}{2}$, is positive.

The final piece to complete the model is the government budget constraint:

$$\tau_L L(\tau_L) + \tau_K K(\tau_K) = G. \tag{6.3}$$

For simplicity, we abstract from the use of government revenue in this section and only treat the (per capita) revenue requirement G as a given parameter. We also assume that $Max[\tau_L L(\tau_L)] > G > 1$: the labor tax base is large enough to finance the whole of G, but the capital tax can never be sufficient for this purpose. This assumption, which could be somewhat relaxed, rules out multiple equilibria in subsection 6.2.

6.2. Electoral competition between Downsian candidates

In this subsection, we study equilibrium tax policy under the traditional assumption used throughout the first part. Two office-motivated candidates run against each other in a plurality election. Each candidate makes a binding commitment to an electoral platform, namely a vector of tax rates $\boldsymbol{\tau} = (\tau_L, \tau_K)$. In equilibrium, both candidates announce the same policy platform, namely that preferred by the median voter at the time of elections. The voters' preferences hinge crucially on the timing of elections.

Ex-ante elections We start by assuming that elections take place *at the beginning* of period 1, before private agents have chosen the amount to save in period 1. The platform of the winning candidate is enacted without further re-optimization. A different timing assumption is discussed below.

To characterize the voters' policy preferences, we follow the same approach as in Section 2. Let $W^i(\boldsymbol{\tau})$ be the indirect utility function of individual i :

$$\begin{aligned} W^i(\boldsymbol{\tau}) &= U(1 - K(\tau_K)) + V(1 - L(\tau_L)) + (1 - \tau_L)L(\tau_L) \\ &+(1 - \tau_K)(K(\tau_K) + (\tau_K - \tau_L)e^i &= W(\boldsymbol{\tau})+(\tau_K - \tau_L)e^i \ . \end{aligned}$$

Then, maximize this function with regard to the two tax rates, subject to the government budget constraint and the supply functions defined above. Combining

the resulting first-order conditions, we get:

$$\frac{K(\tau_K^i) - e^i}{K(\tau_K^i)} \left[1 + \frac{\tau_L^i}{1-\tau_L^i}\eta_L(\tau_L^i)\right] = \frac{L(\tau_L^i) + e^i}{L(\tau_L^i)} \left[1 + \frac{\tau_K^i}{1-\tau_K^i}\eta_K(\tau_K^i)\right] \ , \quad (6.4)$$

where $\eta_y(x) \equiv \frac{dy}{dx}\frac{x}{y} < 0$ denotes the elasticity of y with regard to x. Together with the government budget constraint (6.3), this condition defines the tax policy preferred by voter i, $\boldsymbol{\tau}^i$.

The individual thus wants taxes to be set according to a modified "Ramsey Rule". Consider first the policy preferred by the individual with average relative income from labor and capital. This policy also has some normative appeal; due to quasi-linear preferences, it coincides with the utilitarian optimum. Clearly, with $e^i = e = 0$, the condition reduces to the familiar inverse elasticity formula of optimal commodity taxation, showing that capital should indeed be taxed more lightly than labor, if its supply is more elastic. Intuitively, the average individual does not care about redistribution, only about efficiency: thus his favored tax policy just minimizes the deadweight loss associated with taxation. We refer to this Ramsey policy as $\boldsymbol{\tau}^*$

When $e^i \neq 0$, redistributive preferences modify this pure efficiency condition in a predictable way. That is, individuals with more labor than capital income ($e^i > 0$) want the tax rate on capital to be higher and the rate on labor income to be lower, and vice versa if $e^i < 0$ (recall that elasticities are defined to be negative)

$$\begin{matrix} \tau_K^i \gtreqless \tau_K^* \\ \tau_L^i \lesseqgtr \tau_L^* \end{matrix} \quad \text{as} \quad e^i \gtreqless 0 \ . \quad (6.5)$$

The monotonicity of these preferences imply that $\boldsymbol{\tau}^m$, the tax policy preferred by the median voter with endowment e^m is a unique Condorcet winner.[27] As $e^m > 0$, the implied equilibrium tax policy $\boldsymbol{\tau}^m$ has a higher taxation of capital and a lower taxation of labor than our normative benchmark policy $\boldsymbol{\tau}^*$. In this sense, there is thus overtaxation of capital, due to the skewed distribution of wealth, which implies that the pivotal voter relies relatively more on labor income than capital income.

[27] The monotonicity follows because we can write agents' indirect utility in this model as

$$W^i(\boldsymbol{\tau}) = W(\boldsymbol{\tau}) + (\tau_L - \tau_K)e^i \ ,$$

which is linear in the idiosyncratic parameter e^i. (The linearity property is not destroyed if we substitute the government budget constraint into this expression.)

Ex-post elections Next, suppose that elections are held at *the end* of period 1, after the savings decision has been made. This is the case of tax policy under "discretion", discussed by Fischer (1980) and Persson and Tabellini (1990). Under this assumption, agents still behave according to (6.1)-(6.2) in their economic decisions, except that the expected tax rate on capital replaces the actual tax rate in the savings function. Their voting behavior is now different, however, as it takes place once aggregate capital is given. Hence, we refer to their policy preferences as *ex post*.

To describe these preferences, note that when elections are held, the elasticity of capital with regard to the *actual* tax rate is zero: $\eta_K(\tau_K) = 0$. The capital stock depends on the expected tax rate; once the capital is in place, changing τ_k does not further reduce it. With this in mind, consider the average voter with $e^i = 0$. This voter has no stake in redistribution and only cares about efficiency. He would like to tax capital as highly as possible (the inelastic factor), so as to reduce the distorting tax on labor (the elastic factor). Thus, his ex-post optimal policy is $\tau_K = 1$, for any aggregate capital stock inherited from the past.[28] For a "laborer", with $e^i > 0$, the redistributive motive reinforces these incentives for ex post expropriation. Thus, since $e^m > 0$, a majority of the voters wants to set $\tau_K = 1$ for any outstanding capital stock.

It follows that this is the tax policy announced by both candidates in their electoral platforms. As this is perfectly foreseen when the savings decision is made, nobody saves anything. In equilibrium, $k = 0$ and all the revenue must be raised by taxing labor alone: $\tau_L L(\tau_L) = G$. [29] This is the classical "capital-levy problem": low taxes on capital are not credible to investors foreseeing the outcome in the subsequent political equilibrium. In this simple model, this problem manifests itself in a disastrous equilibrium: that is, a tax policy with a confiscatory capital tax, which gives individuals no incentive to save.

Clearly, this prediction is too strong. Even though we observe higher taxes on capital than those prescribed by simple optimal taxation models, we rarely observe confiscatory rates. The literature has suggested a number of reasons why credibility problems might not have such drastic consequences. These include reputational effects, linking future expected taxation to current taxation, and the

[28] Recall our previous assumption that the capital tax base cannot be large enough to finance the whole of G.

[29] For lower values of G, such that $G < Max_{\tau_K}[\tau_K K(\tau_K)]$, there are better equilibria in a social welfare sense. But, unlike the prescription of the Ramsey Rule, these also have very unbalanced taxes, with all the revenue being raised by the capital tax and the labor tax set at $\tau_L = 0$. These other equilibria are discussed by Persson and Tabellini (1998a).

possibility for agents to protect their capital ex post, by tax avoidance or capital flight. All these forces mitigate the credibility problem in capital taxation, but do not necessarily entirely remove the problem. Thus, lack of credibility may compound the overtaxation of capital for purely political reasons.

6.3. Equilibrium taxation with citizen candidates

Up to this point, we have retained two crucial assumptions about the political process. First, candidates are office-motivated: they only care about winning the election per se. Second, they can make binding promises ahead of the elections. Neither assumption is very palatable. It is hard to justify the assumption of binding electoral promises: policy decisions are made once in office, without being constrained by promises made during the electoral campaign. Moreover, politicians often have their own political agenda, their ideology or view of the world, which motivates their policy decisions once in office. In this subsection, we consider a different model of the political process, based on alternative assumptions. Politicians are directly motivated by policy outcomes; they are "citizen candidates". That is, each candidate for political office is just an ordinary individual in society who—like everybody else—is solely motivated by her utility function. Moreover, tax policy is chosen after the election, once in office. This means that pre-election announcements by political candidates are never credible. Voters are forward looking, and select among candidates on the basis of their "ideology", correctly predicting that an elected candidate will simply set the ex post optimal policy.

We first follow Persson and Tabellini (1994b) by showing that this kind of environment naturally invites the voters to resolve credibility problems in capital taxation via strategic delegation. We then discuss another important aspect of the political process, to which this approach naturally directs attention: the entry stage on the political arena. Here, we borrow from Besley and Coate (1997) and show that such strategic delegation is indeed an equilibrium—though not the only one—in a game with endogenous and costly entry by citizen-candidates.

Preferences over candidates Assume that the prospective policymaker is one of the individuals in the model, uniquely identified by her endowment e^P, were P stands for policymaker.[30] The timing of elections is also crucial in this setting.

[30]What we call the policymaker endowment can also be interpreted as reflecting her ideology on a left to right scale.

Here we assume that elections are held at the start of period 1, before the savings decision.[31] But policy is set at the end of period 1, after the elections and after capital has been accumulated.

At this point in time, any elected policymaker maximizes her ex-post utility, taking into account that, since capital is already in place, $\eta_K(\tau_K) = 0$. Thus, as discussed in the previous subsection, any elected policymaker with $e^P \geq 0$ finds it optimal to set $\tau_K = 1$ for all k.If the policymaker has $e^P < 0$, however, he behaves differently. He still perceives $\eta_K(\tau_K) = 0$, and this pushes him to set a high τ_K. But the redistributive motive pulls him in the opposite direction. He is at an interior optimum and his preferences for τ_K can be obtained from the modified Ramsey rule in (6.4), by setting $\eta_K(\tau_K) = 0$. We denote this interior optimum capital tax rate, as a function of e^P and k, by $T(e^P, k)$. It is implicitly defined by (6.4) with $\eta_K(\tau_K) = 0$ and by the government budget constraint, (6.3). It can be shown that this function has partials $T_e, T_k > 0$. Intuitively, the higher is the average tax base k, the greater is the efficiency gain from taxing it; conversely, the lower is e^P algebraically, the greater is capital income relative to labor income for policymaker P, and hence, the lower is her desired capital tax rate.

We can summarize the above discussion as follows. The tax rates enacted by policymaker P, if elected and given outstanding capital k, are defined by:

$$\begin{aligned} \tau_K^P &= \begin{array}{ll} 1 & \text{for} \quad e^P \geq 0 \\ T(e^P, k) & \text{for} \quad e^P < 0 \end{array} \\ \tau_L^P L(\tau_L^P) &= \begin{array}{ll} G - k & \text{for} \quad e^P \geq 0 \\ G - T(e^P, k)k & \text{for} \quad e^P < 0 \ . \end{array} \end{aligned} \tag{6.6}$$

Clearly, these preferences imply a monotonic relation between an elected officeholder's endowment e^P and her chosen tax policy. Call this mapping $\boldsymbol{\tau}(e^P)$. This mapping is known and understood by voters and investors at the time of elections. Seeing who wins the elections, investors correctly anticipate the forthcoming tax policy and invest accordingly. Voters also take this into account when they vote: they realize that electing a policymaker with a high value of e^P discourages investment through the expectation of high capital tax rates. And conversely, a policymaker with a low value of e^P is a credible signal that τ_K will be kept low.

More precisely, the voters' ex ante preferences over tax rates map one for one into preferences over policymakers. Specifically, the utility of voter i is given by

[31] If elections were held ex post, after the capital accumulation decision, nothing essential would change relative to the Downsian equilibrium. This case is thus ignored.

$w^i = W^i(\boldsymbol{\tau}(e^P))$. And the policymaker preferred by individual i is:

$$e^{iP} = \arg\max_{e^P}[W^i(\boldsymbol{\tau}(e^P))] \ .$$

Given the assumed election timing, e^{iP} is the policymaker type who finds it ex post optimal to carry out the ex ante optimal policy of individual i. Such policy, denoted $\boldsymbol{\tau}^i = (\tau_K^i, \tau_L^i)$, is implicitly defined by (6.4) and (6.3). Thus, knowing τ_K^i, we can implicitly find e^{iP} from the expressions:

$$\begin{aligned} \tau_K^i &= T(e^{iP}, K(\tau_K^i)) \\ \tau_L^i L(\tau_L^i) &= G - \tau_K^i K(\tau_K^i) \ . \end{aligned} \tag{6.7}$$

Recall that $T(.)$ is strictly increasing in e^P only for $e^P < 0$, while the ex ante optimal tax rate on capital for voter i, τ_K^i, is increasing over the whole range of e^i. Several conclusions follow. First, every voter prefers a policymaker who relies more on capital than on herself—i.e. $e^{iP} < e^i$. Indeed, every voter prefers a policymaker in the minority of the population, with $e^i \leq 0$. "Right-wing" candidates thus have a natural advantage in this setting, as they more credibly protect capital from overtaxation out of self-interest. Second, the induced preferences over policymaker types are themselves monotonic in voter type.

In other words, when the electoral horizon is long enough, there is a motive for strategic delegation: to protect capital from expropriation, the majority elects a policymaker with higher capital income than average. Indeed, by the monotonicity established above, the policymaker, e^{mP}, preferred by the median voter, e^m, is the unique Condorcet winner in the population; i.e. this is the only candidate who would win a pair-wise contest against any other candidate. It is thus tempting to argue, as in Persson and Tabellini (1994b), that the election of e^{mP} and the ex post implementation of τ^m, that is, the median voter's ex ante optimal policy, is the equilibrium outcome. This argument is not complete, though. Why would e^{mP} find it optimal to run as a candidate? She would also rather have somebody else set policy, given the credibility problem. To know whether e^{mP} running and getting elected is an equilibrium, we really must study an explicit prior stage, where political candidates enter the competition.

Endogenous entry of candidates Let us thus assume that the ex ante elections-cum-policy game is preceded by an entry decision of prospective political candidates. With this addition, the game has the following stages. (i) Any individual (of any type e^i) in the population can decide to run as a candidate, at a cost (in

terms of second-period consumption) of ε. (ii) An election is held among those running as candidates; whoever receives a plurality of the vote wins, any tie is resolved by tossing a coin. (iii) Individuals make their savings decisions. (iv) The elected candidate chooses a tax policy $\boldsymbol{\tau}$; if no candidate had decided to run, a default policy $\overline{\boldsymbol{\tau}}$ is implemented. (v) Individuals make their labor supply decision.

>From the discussion above, we already know how to characterize the outcome from stages (iii)-(v). At stage (ii), each individual anticipates this outcome and votes for the candidate maximizing her expected utility, given the vote of other individuals.[32] At stage (i)—again anticipating the outcome at the following stages—an individual chooses to enter only if this gives her higher expected utility than not entering, given the entry decision of other individuals.

We now adapt the results in Besley and Coate (1997) to this model and characterize its different equilibria.

Single-candidate equilibria We have already argued that the policymaker type e^{mP} preferred by the median voter e^m is the unique Condorcet winner among potential candidates. Thus e^{mP} is assured to win against any other candidate if she decides to run. But if she runs, no alternative candidate $e^{P'}$ will ever find it worthwhile to incur the entry cost of running; this would not in any way affect the policy outcome and hence not the utility of $e^{P'}$, who would thus only bear the cost of running. This means that whenever e^{mP} runs in equilibrium, she must run as an uncontested candidate. The condition for such an equilibrium to exist is:

$$W^{mP}(\boldsymbol{\tau}(e^{mP})) - W^{mP}(\overline{\boldsymbol{\tau}}) \geq \varepsilon \ . \tag{6.8}$$

The condition says that the utility gain, relative to the default policy, for e^{mP} from running and choosing her ex post optimal policy must outweigh the cost of running. It is obviously fulfilled if the default policy $\overline{\boldsymbol{\tau}}$ is far sufficiently far from the equilibrium policy $\boldsymbol{\tau}(e^{mP})$ or else if the running cost is small. As there is no gain from holding office per se, no second candidate of type e^{mP} has an incentive to run, as she would just incur the entry cost without influencing policy.[33] In this equilibrium, the majority thus succeeds in completely resolving the credibility problem by strategic delegation to a "right-wing" policymaker, who is assured

[32] We also rule out weakly dominated voting strategies. Together, these conditions imply sincere voting in one- and two-candidate elections. For a more careful discussion, see Besley and Coate (1997).

[33] This suggests a free-rider problem among the e^{mP} types. One can also add exogenous benefits from holding office, as do Osborne and Slivinsky (1996).

to win the election and who has the right ex post incentives to implement the majority's preferred ex ante policy $\boldsymbol{\tau}^m$.

Two-candidate equilibria Even though candidates occasionally run uncontested in majoritarian electoral systems, single-candidate races are not very common. We therefore study the conditions for equilibria with two candidates: e^R and e^L, say. Intuitively, this requires that e^R finds it worthwhile to run, given that e^L is running, and vice versa. As in the single-candidate case, this calculation involves trading off the influence on policy against the entry cost. But it also requires that each candidate stands some chance of winning. In our setting with monotonic candidate preferences, this means that an individual with median policy preferences e^m is indifferent between the two candidates. In this event, the two candidates have the same chance of winning. Formally, sufficient conditions for a two-candidate equilibrium are:

$$\begin{aligned} W^m(\boldsymbol{\tau}(e^R)) &= W^m(\boldsymbol{\tau}(e^L)). \\ \frac{1}{2}[W^I(\boldsymbol{\tau}(e^I)) - W^I(\boldsymbol{\tau}(e^J))] &> \varepsilon, \qquad I, J = R, L, \quad I \neq J \end{aligned}$$

In this kind of equilibrium, two candidates with endowments on opposite sides of the median voter's preferred type e^{mP} are running against each other. Each of them has an incentive to enter so as to balance the other candidate, provided that their endowments are different enough (otherwise, a fifty-fifty chance of winning does not offset the cost of running). It follows that there are many different two-candidate equilibria. In each of these, a right-wing candidate with $e^R < e^{mP}$ balances a left-wing candidate with $e^L > e^{mP}$ at the same utility distance from the median voter's preferred policy. All voters with endowments $e^i < e^m$ vote for e^R, whereas all voters with $e^i > e^m$ vote for e^L. These equilibrium voting strategies keep a third intermediate candidate from entering. But, as Besley and Coate (1997) discuss, there may also be equilibria with three or more candidates entering.

Discussion In the two-candidate equilibria studied above, the voters only succeed in delegating the credibility problem in an "expected sense", for once elected, the two candidates will pursue different policies. This feature illustrates a general property of the citizen-candidate model; equilibrium policy in two-candidate elections does not converge to the policy preferred by the median voter, given that such a voter exists. This contrasts starkly with the prediction of the Downsian

model with office-motivated candidates. It also contrasts with models of electoral competition, where outcome-motivated candidates who commit to policy platforms ahead of the elections converge to the policy preferred by the median voter—cf. Wittman (1977, 1983). But as Alesina (1988) argues, once we assume candidates to be outcome-motivated, the common assumption of commitment becomes very strong, as it clashes with the elected candidate's ex post incentives. If the commitment assumption is relaxed, policy convergence requires some reputational mechanism fostering long-run cooperation between the candidates.

In general, the citizen-candidate model provides a general equilibrium approach to politico-economic modelling. It is attractive in the sense that it starts from primitives. Assumptions are only made about the individuals' preferences, endowments and technologies, and about the institutions of economic and political interaction. This makes it possible to use the model for a clean welfare analysis of political equilibria. Furthermore, the citizen-candidate model can handle situations where a simple median-voter approach would fail: citizen-candidate equilibria exist under very general conditions, including many conditions where no Condorcet winner exists. We have thus not made the model full justice, by applying it in such a smooth setting.

The citizen-candidate approach is not without its weaknesses, however. The main lesson from this approach is precisely the importance of the entry stage in the political arena. The lack of pre-existing electoral candidates, however, makes it hard to introduce political parties in the analysis.[34] Moreover, multiple equilibria make it hard to use the model for generating testable hypotheses. Nevertheless, the citizen-candidate model is an ingenious construction that offers an interesting alternative for modelling of electoral equilibria.

Finally, the model focuses on representative democracy, but, to date, its applications have neglected the agency problems arising when the candidates' policy preferences are loosely defined, or when endogenous rents from office can motivate policy decisions. In Part III, we return to such agency problems. Their investigation in a setting with citizen-candidates is a difficult, but interesting, topic for future research.

[34] Very recent work by Rivière (1998) and Besley and Coate (1998b) does attempt to introduce parties in a citizen-candidate setting.

6.4. Notes on the literature

There is a large literature on the so-called "capital levy" problem, starting with Fischer (1980). This literature investigates the implications of lack of credibility in capital taxation, as well as how to restore credibility through reputation or institutional design. Persson and Tabellini (1990), (1998) provide extensive surveys of credibility problems in fiscal and monetary policy, while Persson and Tabellini (1995) survey the literature on capital taxation and tax competition. The theories of optimal taxation are surveyed by Auerbach and Hines (this volume).

The modeling of politicians as ideological–or outcome motivated–individuals at least dates back to the work of Hibbs (1977) and Wittman (1977); see also Wittman (1983). Alesina (1988) relaxed the commitment assumption in a setting with rational voters, and showed that policy convergence no longer applies.

The idea that strategic delegation allows the principal to cope with incentive constraints on the agent was first applied in industrial organization by Vickers (1985) and Fershtman and Judd (1987). It found several other natural applications in political economics, with regard to credibility problems in monetary policy (Rogoff (1985)) and capital taxation (Persson and Tabellini (1994b)), international policy coordination (Persson and Tabellini (1992)), hierarchical decision making by different levels of government inside a federation (Persson and Tabellini (1996), bargaining inside a legislature (Chari, Jones and Marimon (1997), Besley and Coate (1998a) - see also subsection 11.2 in Part II below).

The citizen-candidate model was formulated by Osborne and Slivinsky (1986) and Besley and Coate (1997). It has since been applied to analyze several economic policy problems; references are given in the sections to follow. Besley and Coate (1998b) includes a penetrating discussion of the efficiency properties of political equilibria in citizen candidate models.

Part II
Special interest politics

Many economic policy decisions create concentrated benefits for a few well-defined groups, with the cost diffused in society at large. This occurs in public finance, but also in trade policy and regulation. Whenever economic policy benefits narrowly defined special interests, the political incentives to influence the design of such

policies are much stronger for the beneficiaries than for the majority bearing the cost. A classical example of this systematic bias is agriculture. Farmers in all democracies are generously supported through trade policies, direct subsidies, and various other support programs. Several explanations have been suggested for this phenomenon. Many stress that farmers have more homogenous economic interests and therefore find it easier to get organized. Others emphasize that farmers are less ideologically biased and therefore become a natural target for politicians who vie for electoral support. Some also point out that farmers are concentrated in rural electoral districts which are often overrepresented in legislatures, or that legislators representing rural interests often hold important positions as ministers or chairmen of congressional committees.

The public choice literature has emphasized one of these mechanisms in particular. Due to their higher stakes in the various programs, beneficiaries are more likely to get politically organized, whereas the interests of the unorganized general public are neglected. This idea dates back to the work of Schattschneider (1935), Tullock (1959), Olson (1965), Weingast, Sheplsle and Johnsen (1981), Becker (1983), (1985) and several others. Mueller (1989), (1997) include excellent surveys of the earlier literature. More recent contributions have focused on *structural* models of the political process, trying to identify specific features of the political system that confer power to some groups rather than others, or that entail systematic biases in aggregate spending. In this part, we survey some of these recent contributions. The main results are theoretical. Compared to Part I, we focus more on analytical methodology and less on specific empirical applications.

Multi-dimensionality of policy space renders the simple electoral approach adopted in Part I useless, as it would unavoidably result in Condorcet cycles. To predict likely policy outcomes—and, in particular, which groups are most powerful in the struggle for benefits—we must specify the institutional details of the policy process. Different branches of political economics have taken this route in recent years, specifying the policymaking process as an extensive-form game and assuming rational individual behavior. Some of the empirical implications are not very different from those of earlier public choice literature. The older approach often lacked micro-political foundations, however, relying instead on non-derived influence functions, political support functions, or vote functions. Contributors to the more recent literature have tried to fill this gap, by being more explicit on the institutional assumptions and more uncompromising on the requirements of individual rationality.

To illustrate the effects of the different political determinants of policy, we stick

to the same economic example throughout.[35] We choose a very simple model, which highlights the more general phenomenon of concentrated benefits and dispersed costs in a transparent way. Thus, we study a society where the government uses a common pool of tax revenues to provide an array of publicly provided goods, the benefits of which are completely concentrated to well-defined groups. Two underlying questions motivate the analysis. The first, and most important question, concerns the allocation among groups: which groups are politically powerful and how is this related to political institutions? The other question concerns aggregate outcomes: what is the effect of alternative institutions on the overall size of government?

In Section 7, we formulate the basic model and derive some benchmark allocations. In the subsequent sections, we apply three different state-of-the-art models to our policy example. Each one of these studies a specific feature of the political process in detail.

In Section 8, we formulate a *legislative bargaining* model, developed by researchers in American congressional politics, to study decision-making rules and budgetary procedures. Political power reflects the assignment of agenda setting or amendment rights, and the sequencing of decisions. Institutions that centralize decision-making power by conferring strong proposal rights and limiting amendments induce a small size of government, but distort the allocation in favor of whoever holds such powers.

In Section 9, we use a model of *lobbying* as common agency, developed by researchers in trade policy, to study the influence activities of organized interest groups. The model directs the attention to campaign contributions and the organizational pattern of interest groups. Groups organized as a lobby have disproportionate influence on the final allocation, which generally results in suboptimal allocations. If taxpayers are less politically organized than the beneficiaries of the spending programs, because they have smaller stakes individually, a large government emerges.

In Section 10, we use a model of *electoral competition*, developed by public economists, to study the electoral platforms chosen by two vote-maximizing parties. As in Part I, the parties are office motivated and commit to policy platforms ahead of the elections. But the median-voter result does not hold here, because exogenous intrinsic differences between the two parties, because they are evaluated in a different way by different voters. When choosing which party to support, voters trade off their predetermined ideological party preferences against

[35] The treatment in this part extends a survey along similar lines in Persson (1998).

economic policy platforms. Political power reflects the distribution of voters' ideological preferences across groups; more powerful groups include a large number of "swing-voters", i.e., voters who are mobile across parties because they do not care about ideology. To win the elections, both parties direct economic benefits towards these a-ideological voters.

While these approaches yield useful insights, each of them still gives a partial answer to the question which are the most powerful groups. A formal integration of the different approaches is only beginning to take shape. Section 11 discusses the main results so far. We start by studying the interaction between *elections and lobbying:* office-seeking politicians use the lobbying revenues to influence voters. Next, we illustrate the interaction between *legislative bargaining and elections:* voters in each of multiple voting districts elect outcome-motivated politicians as their representatives in a subsequent legislative bargaining game. Finally, we study the interaction between *legislation and lobbying:* different lobbies seek to influence finance-motivated politicians involved in legislative bargaining to confer benefits on their groups. The results do not always constitute a convex combination of the results from partial models.[36]

Overall, the results in this part remove us very far from the median voter outcome of Part I. Politics is much more than just vote counting. To understand the political determinants of policy, we must pay attention to many fine details of the political process. But the research to date is mainly theoretical. It needs to be integrated with empirical work, to gain a more complete understanding of the relative importance of each of these details.

7. A simple model

Consider a society with $\mathcal{J}$ distinct groups of identical individuals. Group $J = 1, ..., \mathcal{J}$ has size (mass) N^J, $\sum_J N^J = N$, where N is the size of the entire population. Individuals in group J have the quasi-linear preferences:

$$w^J = c^J + H(g^J) \ , \tag{7.1}$$

[36] An important omission is that we entirely disregard bueraucratic behavior and its interaction with other parts of the political process. Economists have recently built structural models of the interaction betwen interest groups and the bureacracy to study regulatory capture (Laffont and Tirole (1993)) and political scientists have studied the legislature's control of bureacracy (Mc Cubbins, Noll, and Weingast (1987)).

where c^J denotes the consumption of private goods (the same for every group member) and g^J is the per-capita supply of a publicly provided good. The increasing and concave function $H(\cdot)$, with $H(0) = 0$, is thus defined over a good, which benefits group J only and must be publicly provided in an equal amount per capita (we could easily add some externalities onto other groups, at the cost of additional algebraic complexity). Individual income is the same in all groups: $y^J = y$. A unit of income (private consumption) can be costlessly converted into one unit of any of the $\mathcal{J}$ publicly provided goods, and taxation is lump-sum. This model can be interpreted in a number of ways: groups could be defined by their preferences, occupation, age or other personal attributes, or by geographical location.

7.1. A normative benchmark

As a normative benchmark, consider the utilitarian optimum, obtained by maximizing the Benthamite welfare function, $\sum_J \frac{N^J}{N} w^J$, subject to the resource constraint $\sum_J N^J(g^J + c^J) = Ny$. The resulting benchmark allocation is pretty obvious, namely to set the vector $\mathbf{g} \equiv (g^J)$ such that the average marginal benefit in each group equals the marginal social cost of unity:

$$H_g(g^*) = 1 \ . \tag{7.2}$$

For future reference, we denote aggregate spending associated with this allocation $G^* = Ng^*$.

This allocation could easily be implemented if each of the group-specific goods were financed by group-specific lump-sum taxes, (τ^J), so that: $c^J = y - \tau^J = y - g^J$. If full decentralization of spending and financing to each group were feasible, this would be the optimal institutional arrangement. The policymakers' incentives would not be distorted, and the socially optimal policy would emerge as an equilibrium.

In the real world, however, it is often impossible to design the tax system so that the tax payers' financing of a group-specific good precisely coincide with the beneficiaries. For instance, the beneficiaries may be identified by their personal attributes or occupation, and not by residence; or, else, their individual characteristics may be unobservable, as in the case of preferences.

Our goal in this part is to explore the incentive problems arising under centralized financing, and how different political institutions change these incentives and the resulting allocations. Thus, throughout, we retain the stark but simplifying assumption that all publicly provided goods must be financed out of a

common pool of tax revenues, with equal contributions from each group. The policy instruments are always the same: the vector $\mathbf{g} \equiv (g^J)$ of publicly provided group-specific goods and a common lump-sum tax, τ, and they are always subject to the same government budget constraint: $N\tau = \sum_J N^J g^J \equiv G$, where G, as above, denotes aggregate expenditures.

In this set-up, individuals have distorted incentives and there is sharp disagreement over policy. The reason is that the cost of financing the public good is shared between the groups. Hence, beneficiaries would like to over-spend on their preferred public good, since the cost of providing this good is shared with others. Conversely, every group wishes to reduce spending on the other public goods, since they do not internalize any benefit from them.

Adding externalities, so that the local public good g^J also affects the utility of groups different from J adds other considerations, but does not remove the incentive problems discussed throughout this part. Even if full decentralization was feasible, it would not deliver the social optimum, as the externalities would not be internalized. Under full centralization, the incentive problems due to cost sharing would remain, as long as different groups preferred different combinations of public goods. For simplicity, throughout this part, we thus neglect externalities.

7.2. The basic common-pool problem

To illustrate these incentive problems, we start with a simple decision-making procedure. Each group decides freely on the supply of the public good whereas the tax rate is determined residually . Individual utility in group J can then be written as:

$$W^J(\mathbf{g}) = y - \tau + H(g^J) = y - \sum_I g^I \frac{N^I}{N} + H(g^J) \ . \tag{7.3}$$

An equilibrium is a vector $\mathbf{g}^D$ (^{D} for decentralized spending), such that each group J maximizes $W^J(\mathbf{g})$ with respect to g^J, taking equilibrium expenditures by all other groups as given. It is straightforward to verify that equilibrium spending here satisfies:

$$H_g(g^{J,D}) = \frac{N^J}{N} \ . \tag{7.4}$$

Since the right hand-side of (7.4) is smaller than 1, all groups overspend compared to the social optimum: $g^{J,D} > g^*$ for all J, and smaller groups overspend to a larger extent. This is the familiar "common pool" problem: each group fully

internalizes the benefit of its own public good, but —as financing is shared—it internalizes only the fraction N^J/N of the social marginal cost of higher taxes. The problem here lies in the collective choice procedure, where the tax rate is residually determined once all spending decisions have been made in a decentralized fashion. Concentration of benefits and dispersion of costs lead to excessive spending when residually financed out of a common pool of tax revenue.

Even though the nature of the problem is evident, the remedy of full decentralization of financing may be difficult to enforce. As mentioned above, it may be hard to adapt the system of financing to the relevant group structure. Common pool problems thus arise in many situations. For instance, they can be due to lack of information, so that some spending decisions must be decentralized to local governments, government agencies, or public enterprises, while financing remains centralized. Moreover, the incentive problem illustrated above does not disappear under fully centralized decisions on spending, as each group will seek to influence the central government to satisfy its own interests. Concentration of benefits and dispersion of costs imply that each group retains an incentive to demand an oversupply of goods to its own group, and an undersupply to the other groups, to avoid paying high taxes. Which groups will be most politically powerful, in taking advantage of this opportunity, depends on group attributes but also on political and budgetary institutions. The remaining sections discuss how the policy problem is resolved in alternative institutional settings and how these settings shape observed policy outcomes.

7.3. Notes on the Literature

This section draws on Persson and Tabellini (1994c). Models of this sort have been extensively used to discuss incentive problems in local public finance and to contrast alternative budgetary procedures. In particular, Besley and Coate (1998a), Lockwood (1998) and Daveri (1998) consider a similar set-up, but assume that local public goods have externalities on other groups. They contrast decentralized and centralized arrangements, pointing to a tradeoff between two opposite incentive problems. Centralization makes it more likely that spillover effects are internalized, but cost sharing generates the incentive problems discussed in the next subsection and throughout this part. Full decentralization on the other hand, prevents the externalities from being internalized. The preferred institutional arrangement thus depends on which of these incentive problems is the worst.

When there is a vertical hierarchy of decision makers, as with federal and local governments, lack of commitment by the principal may induce a "soft budget constraint" on the agent. As common-pool problems, soft-budget-constraint-problems may lead to over-spending. Dewatripont and Maskin (1995) is the classical reference on soft budget constraints in a principal agent set-up. Qian and Roland (1998) and Bordignon, Manasse and Tabellini (1997) have studied versions of this problem in local public finance.

8. Legislative bargaining

A large empirical literature has studied how budgetary institutions correlate with fiscal outcomes. Most of this literature focuses on intertemporal fiscal policy choices, however. Cross-sectional comparisons suggest that specific procedures are associated with smaller budget deficits. In particular, centralization of budgetary power to the prime minister or the finance minister, two-stage budgeting with prior setting of deficit targets, restrictions on amendments of spending proposals, and constitutional limits on deficit spending, seem to promote more fiscal discipline.[37] Less attention has been devoted to implications of alternative budgetary procedures for the size of government, with a few exceptions noted below. This is an unfortunate omission, as one of the underlying problems which "stricter" budgetary procedures are supposed to solve, namely the common-pool problem, may also distort the level of spending.

As noted in the previous section, the problem stems from excessive decentralization of spending: each group is the arbiter of spending on its own local public good. In this section, we analyze a centralized procedure: the policy vector $(\mathbf{g}, t)$ is now assumed to entail spending on geographical districts. To be implemented, a policy must be approved by a majority of districts, according to specific procedural rules. If there is no agreement, a default outcome—the status quo—kicks in. The model of this section thus purports to describe decision making in a legislature, and the rules capture stylized features of the budget process. We draw on the seminal work by Baron and Ferejohn (1989), whose legislative bargaining framework has become a work-horse model for the analyses of the American Congress and other legislatures. We ask how bargaining power is determined inside the legislature, and how alternative procedures shape aggregate spending.[38]

[37] In the U.S., a procedure similar to giving power to the Treasury is to require all spending proposals to be channelled through one committee; see Cogan (1994).

[38] Baron (1993) has applied the legislative bargaining model to a similar policy problem.

8.1. A simple legislative bargaining model

Groups are distinguished by their geographical location and each location is represented by one member in the legislature. This representative is "outcome motivated" and is a perfect delegate of her constituency, in that her preferences are of the same form as in (7.3). The number of districts and representatives $\mathcal{J}$ is now assumed to be odd, with $\mathcal{J} \geq 3$. These assumptions fit well the system of representation in the American congress with plurality elections in multiple single-member districts. Interpretations more fitting to parliamentary systems with proportional representation are also possible, but less straightforward.

The "budget process" in a legislative session consists of the following sequence of events: (i) One of the representatives, $J = a$, is chosen to be the agenda setter.[39] (ii) Representative a makes a policy proposal, $\mathbf{g}$. (iii) The legislature votes on the proposal. If a simple majority approves the proposal—that is, at least $\frac{\mathcal{J}-1}{2}$ other legislators vote in favor—then $\mathbf{g}$ is implemented (a always votes for her own proposal). If not, a status quo outcome, $\overline{\mathbf{g}} = (\overline{g}^J) : \overline{\tau} = \sum \frac{N^J}{N} \overline{g}^J$, is implemented.

In the jargon of the legislative bargaining literature, we are thus considering a *closed rule*—i.e. proposals cannot be amended—with only one round of proposals. Amendments and multiple rounds, with proposal rights alternating between legislators, are discussed below.

8.2. Political equilibrium

Consider first the choices by legislators $J \neq a$ at the voting stage (iii). Clearly, any legislator will only approve proposals $\mathbf{g}$ which, from her own point of view, are not worse than the status quo (we assume that indifferent legislators always vote yes to a proposal). From (7.3) and the definition of $\overline{\mathbf{g}}$, legislator $J \neq a$ votes in favor of $\mathbf{g}$ if:

$$W^J(\mathbf{g}) - W^J(\overline{\mathbf{g}}) = H(g^J) - H(\overline{g}^J) - \sum_I \frac{N^I}{N}(g^I - \overline{g}^I) \geq 0 \ . \tag{8.1}$$

Consider next the proposal stage (ii). Here, the agenda setter maximizes her own pay-off, given by (7.3), subject to the government budget constraint, the "incentive

[39] We do not model the criteria for selecting the agenda setter. In real world democracies this choice presumably reflects electoral outcomes. But very few papers have tried to model this formally; see, however, McKelvey and Riezman (1991) and the discussion at the end of subsection 11.2.

compatibility constraints" (8.1) holding for a majority coalition $\mathcal{M}$, including at least $\frac{\mathcal{J}-1}{2}$ other legislators, and the non-negativity constraints $g^J \geq 0$ for all J. Eliminating the multipliers from the Kuhn-Tucker conditions to this problem and manipulating the solution, we can write the following conditions describing the equilibrium proposal, denoted with a ^{B} superscript:

$$\begin{aligned} H_g(g^{J,B}) &= \frac{N^J}{N}\frac{1}{1-\sum_{I\in\mathcal{M}}\frac{N^I}{N}\frac{1}{H_g(g^{I,B})}} \quad J=a \\ g^{J,B} &= 0, \quad J\notin\mathcal{M} \qquad (8.2) \\ H(g^{J,B})-H(\overline{g}^J) &= \sum_{I\in\mathcal{M}}\frac{N^I}{N}(g^{I,B}-\overline{g}^I), \quad J\neq a, J\in\mathcal{M} \qquad (8.3) \\ &| \quad \mathcal{M}\ | = \frac{\mathcal{J}-1}{2}. \end{aligned}$$

To understand this equilibrium, consider the incentives of a. To get support from other legislators, a must spend costly tax revenue in their districts. We can consider a's problem in two stages. In the first stage, she minimizes the tax rate τ necessary for obtaining support for every value of g^a, implying an increasing function $T(g^a)$. The cost-minimization stage basically involves minimizing the term $\sum_{I\in\mathcal{M}}\frac{N^I}{N}\frac{1}{H_g(g^I)}$ in the denominator of the first right-hand side expression in (8.3). Given this "cost function", she then simply maximizes $H(g^a)+y-T(g^a)$ in the second stage, with respect to g^a. This has several consequences.

(1) A version of Riker's (1962) so-called size principle will hold: a chooses a *minimum winning coalition*, $\mathcal{M}$, which is composed of $\frac{\mathcal{J}-1}{2}$ other legislators. All districts outside the winning coalition get no spending at all, even though they bear the cost of taxes.

(2) For the members of $\mathcal{M}$, a spends only as much as necessary to get their vote (i.e., to satisfy (8.1) with equality), leaving them as well off as with the default policy.

(3) The minimum winning coalition is composed of those legislators whose support is cheapest to obtain. These are the legislators with the lowest default payoffs, $\overline{g}^J$. A weak status quo position may thus be to the advantage of a legislator and her district. Even though a district with a weak position gets less public goods, when its legislator is part of $\mathcal{M}$, the chance of being part of the majority is higher, the weaker is that position. In a richer model where legislators also differ in the relative weight attached to private versus public consumption, the majority would include the legislators who care *more* about public consumption, since their vote

is cheaper to buy—this point is once more discussed in section 11. Finally, ceteris paribus, size—or rather misrepresentation in the districting—matters. As their legislator still has one vote, it is cheaper for a to please districts with a smaller number of voters. They are thus more likely to be included in the majority.

(4) The resulting allocation is asymmetric and suboptimal compared to the utilitarian benchmark. Districts not in $\mathcal{M}$, certainly get less (namely zero) spending than in the utilitarian optimum. Whether the members of the majority get more or less, depends on parameters and on the shape of $H(\cdot)$. As long as the default allocations $\overline{g}^J$ of the majority districts are not too high, however, they will typically get less: $g^{J,B} < g^*$ for $J \neq a, J \in \mathcal{M}$. Under these circumstances, district a certainly gets more: $g^{a,B} > g^*$. To show this formally, rewrite the first row of (8.3) as:

$$H_g(g^{a,B})1- = -\frac{\lambda_{\mathcal{N}} + \sum_{I\in\mathcal{M}} \frac{N^I}{N}(1 - \frac{1}{H_g(g^{I,B})})}{1 - \sum_{I\in\mathcal{M}} \frac{N^I}{N}\frac{1}{H_g(g^{I,B})}} ,$$

where the left-hand side is the expression defining the utilitarian optimum. Thus, the right-hand side measures the deviation from the efficiency benchmark. Note that the first term in the numerator, $\lambda_{\mathcal{N}} \equiv \sum_{I\notin\mathcal{M}} \frac{N^I}{N}$, is the population share of the districts not belonging to the majority. As the second term in the numerator is also positive, given $H_g(g^{J,B})-1 > 0$ for $J \in \mathcal{M}$, overprovision to district a follows. Furthermore, the overprovision to a is larger, the smaller is the population share of the majority (i e the larger is $\lambda_{\mathcal{N}}$.), as this reduces the cost of expanding g^a while compensating the legislators in the majority. The asymmetry also depends on the default positions; the lower is the average value of $\overline{g}^J$, the more powerful is the agenda setter. Since $\overline{g}^J$ refers to the status quo if the new legislation is voted down, this suggest that we should observe more asymmetric benefits for certain types of government programs. Specifically, infrastructure projects—where the natural status quo is no projects—should be more asymmetrically distributed across groups than entitlement programs—where the natural status quo is the existing policy (and where beneficiaries are probably also more evenly distributed across voting districts).

(5) Finally, whether the model predicts aggregate overspending or not, depends on parameters and on the concavity of $H(\cdot)$, and there is no presumption that the bias goes either way.[40] But this model contains two useful lessons for the design

[40]The flatter is H_g, the more likely is over-spending. Consider the special case, when $\mathcal{J} = 3$, such that the majority $\mathcal{M}$ consists of a single legislator m. Furthermore assume that $\overline{g}^J = 0$

of budgetary procedures. First, aggregate spending is more likely to be low, the smaller are the default outcomes in $\overline{\mathbf{g}}$. If the status quo entails little spending, as with zero-base budgeting, the strong agenda-setting powers of one legislator discipline all the others. Second, suppose that different legislators differ in their valuation of public vs. private spending, and that agenda-setting power is given to a legislator who spends little for his constituency or—thinking of bargaining within government—to a minister without portfolio, such as the finance or Treasury minister. Then, the agenda setter does not expand his preferred public good, and concentration of proposal power delivers small aggregate spending.

The political science literature has discussed other reasons for conferring strong agenda-setting powers on some legislators, besides control of aggregate spending. All legislatures necessarily display some division of labor across issues, due to the need to split the work load, as well as the varying background of legislators. Giving control over certain issues to some individuals provides incentives to invest in issue-specific competence and information gathering. In the US congress, for instance, this specialization and control is manifested in powerful standing committees with considerable agenda-setting powers over the issues under their jurisdiction.[41] Standing committees are also found in parliamentary systems, although in such systems the ministries have many of the corresponding agenda-setting tasks. The model thus captures something important: real-world legislatures are organized in a way that makes some representatives more powerful than others over certain issues, a power which influences the allocation of spending.

8.3. Extensions

Power associated with proposal rights is, however, modified and diluted in several ways by the procedures adopted in real-world legislatures. One mechanism is the amendment right of other legislators, another is separation of proposal powers: different legislators have agenda-setting rights over different policy dimensions. We briefly discuss these in turn.

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and $H(g^J) = \alpha[\ln(g^J)]$. We then get $g^a = 3\alpha - e$, $g^m = e$, and thus $G = 3\alpha = G^*$. Thus the allocation of spending is distorted with $g^a > g^m$, if $\alpha > \frac{2e}{3}$ and $g^m > g^*$, if $\alpha < e$ (where e is the base of the natural logarithm). But the aggregate level of spending coincides with the utilitarian optimum.

[41] An informational view on legislative organization, including the rationale for vesting agenda-setting powers with legislators and committees, has been emphasized by some political scientists; which is well exposed in Krehbiel (1991).

Amendment rights Instead of the closed rule analyzed earlier, assume now an open rule, according to which the initial proposal can be amended by some other legislator. It is common practice to pitch an offered amendment against the initial proposal in a vote, and then to either allow a new round of amendments to the winning proposal, or else pitch the winning proposal against a default policy. Including such amendment rights in the model above diminishes the gains that a could expect from equilibrium policy. As the amendment right allows the amender to tilt the proposal in her own favor, albeit at the cost of legislative delay, any initial proposal must make a majority of the legislators better off, not only relative to the default outcome but also relative to their continuation value from further bargaining. Baron and Ferejohn (1989) and Baron (1993) demonstrate that equilibrium policy generally entails more equally distributed benefits under open rule than under closed rule. Although the precise results depend on the details of the amendment procedure, equilibria may, in some cases, come close to implementing the efficient solution. These models have an infinite horizon, however, and to simplify, the size of government is exogenously given. As far as we know, no theoretical result exists on how amendment rights shape aggregate spending.

A related model is due to Lockwood (1998), who adapts previous results by McKelvey (1986) and Ferejohn, Fiorina and McKelvey (1987) to a setting similar to ours. The legislature must choose how many projects of a given size to activate. Different projects benefit different legislators, and can have externalities on other districts. Financing is shared among all districts. Legislative rules are as follows. First, each legislator makes a proposal. These proposals are then randomly ordered into an agenda, and are voted on sequentially. Finally, the winning proposal is voted against the status quo. This procedure insures that an equilibrium exists and is unique, even if there is no Condorcet winner. If externalities are weak or negative, only a bare majority of the projects are funded; these are the projects with the lowest cost. If externalities are strongly positive, on the other hand, a larger number of projects is funded. Moreover, which projects are funded reflects the costs and the externalities, but not the intensity of preferences of individual legislators with regard to their favorite projects. Thus, this procedure does not guarantee an egalitarian outcome, but it reduces the importance of particularistic political preferences.

Separation of budgetary powers Many existing legislatures split the budgetary procedures into two stages: first, aggregate spending is determined, to be

followed by allocative decisions. It is often argued that this two-stage budgeting insulates the decision on aggregate spending from the special interest politics that disrupts incentives, and that this leads to better aggregate decisions.[42] We now investigate whether this is true in our simple model.

For simplicity, assume that $\mathcal{J} = 3$, and that all groups are of equal size: $N^J = \frac{N}{3}$. Suppose that the budgetary procedure involves two stages. In the first stage the legislature decides on overall spending G, or—equivalently—on the common tax rate $\tau = \frac{G}{3}$. This decision is taken by a single majority under a closed rule, after a proposal by agenda-setting legislator a_τ. A defeated proposal results in default aggregate spending, $\overline{G}$. In the second stage, a different agenda-setter, $a_g \neq a_\tau$, makes an allocation proposal, subject to $\sum_J g^J = G$, with G given from the first stage. If this proposal is defeated, the first-stage budget is split according to a simple sharing rule $\overline{g}^J = \frac{1}{3}G$, where the assumption of equal sharing is made for simplicity. The status quo for aggregate spending in the second stage is the *equilibrium* outcome from the first stage.

The second-stage equilibrium is simple. To get the necessary majority, agenda-setter a_g must propose to spend enough in one of the other districts, say m_g, to just exceed the status-quo outcome: $g^{m_g} = \frac{1}{3}G$. She spends nothing in the minority district, n_g, and allocates the remaining budget to her own district: $g^{a_g} = \frac{2}{3}G$. As the total budget and the tax rate are already fixed, taxes do not enter the allocation decision. The allocation distortion remains, but we are now mostly interested in the level of spending.

The first-stage outcome depends on who makes the proposal and whether the composition of the second-stage majority is known. Suppose first that the first-stage proposal is made by a member of the future majority, and that her identity is known. Thus we have: $a_\tau = m_g \neq a_g$. The optimal level of G for the first-stage proposer then solves $\arg\max[H(g^{m_g}) - \frac{1}{3}G] = \arg\max[H(\frac{1}{3}G) - \frac{1}{3}G]$, and satisfies:

$$G^{m_g} = 3H_g^{-1}(1) \ .$$

Thus G^{m_g} coincides with our benchmark optimum G^*. The intuition is simple: at the first stage, m_g internalizes the full benefits to her own district of aggregate spending, and these are equal to a third of the social benefits. As she also internalizes a third of the social costs (her district's share of the tax bill), she faces the right marginal incentives when it comes to aggregate spending.[43] If the future

[42] See, for instance, Von Hagen (1998).

[43] Naturally, the allocative distortion remains, and thus nothing insures that G^* is still optimal, given that allocative distortion.

majority composition is indeed known, G^* always collects a majority against $\overline{G}$. Interestingly, if $G^* > \overline{G}$, a_g supports this because she wants as high a revenue as possible to allocate at the second stage. A stable majority thus suggests the two parts of the budget. If instead the status quo involves aggregate "overspending" $G^* < \overline{G}$, a_τ instead gets support of n_g, the minority legislator at the next stage, who has an obvious incentive to keep aggregate spending and taxes down.

In parliamentary systems, there is indeed a presumption that majorities are predictable; which is discussed in more detail in Part III. But without further institutional detail, nothing pins down the model pins down the second-stage majority.Therefore, consider an alternative case, where $a_\tau \neq a_g$, but a_τ is only part of the future majority with 50% probability. In this case, the optimal level of G, from the point of view of a_τ, solves $\arg\max[\frac{1}{2}H(\frac{1}{3}G) - \frac{1}{3}G]$, namely

$$G^n = 3H_g^{-1}(2) \ .$$

Clearly, $G^n < G^{m_g} = G^*$. When the first-stage proposer is not certain of being a "residual claimant" on the second-stage budget, she has a stronger interest in keeping down the size of the budget. A similar point is repeatedly encountered in Part III, where we deal at length with institutional design questions. The desirability of such separation of powers in the political system is perhaps not obvious in the present setting. But separation of powers can unambiguously play to the voters' advantage, once we introduce agency problems.

We conclude this section with a general remark. Most of the work in the legislative bargaining literature is quite partial in that it takes the preferences of the legislature as given. Where do the outcome-oriented preferences of legislators come from? Legislators' behavior may also be influenced by other motives, such as a desire to raise funds, to get re-elected, or to use political power for their own private agenda creating an agency problem vis-a-vis the voters. If lobbies and voters understand these motives and how the legislative process works, would they not adapt their behavior to influence the policy outcome? To answer questions of this kind, we must obviously leave partial models behind and study interactions between different aspects in the political process. Section 11 gives different examples of such interactions, whereas Part III deals with agency problems. But first, we turn to the partial models of lobbying and voting.

8.4. Notes on the literature

The formal literature on extensive form games of collective choice dates back to the pioneering work of Shepsle (1979) on "structure induced equilibria" and Romer

and Rosenthal (1979) on agenda setting powers. Models of legislative bargaining were first formulated by Baron and Ferejohn (1989) in an infinite horizon cake splitting problem, and applied to the provision of local public goods by Baron (1991) and (1993). A different extensive form game, allowing for amendments in a particular way, was studied by McKelvey (1986) and Ferejohn, Fiorina and Mckelvey (1987); its applications to public finance are yet to be explored; the only paper so far is a recent one by Lockwood (1998).

Sequential budgeting has been studied in different settings. Von Hagen (1998) discusses it in a more comprehensive analysis of budgetary procedures. Persson, Roland and Tabellini (1997) discuss the benefits of two-stage budgeting coupled with strong agenda-setting powers in a model of agency. Their point is dealt with again in Part III. Ferejohn and Krehbiel (1987) analyze a median voter model with sequential voting in different dimensions, and argue that two-stage budgeting may fail to deliver the alleged benefits; but their set-up does not entail a common pool problem.

Finally, a large empirical literature compares alternative budgetary institutions across political systems. It has dealt with European countries (von Hagen (1992), von Hagen and Harden (1994)), Latin America (Alesina et al. (1996), Inter-American Development Bank (1997)), and the US states (Alesina and Bayoumi (1996), Poterba (1994), Bohn and Inman (1996)). This literature indicates that specific procedures are associated with smaller budget deficits. The correlation with the size or composition of spending has not been much discussed.

9. Lobbying

Our next model of policymaking focuses on the influence or lobbying activities of interest groups. Policy decisions are here assumed to be centralized in the hands of a semi-benevolent government. But the government can be influenced by organized interest groups. How does this influence activity modify the allocation and level of government spending? Which groups are likely to be favored? Recent rational-choice oriented analyses have focused either on the incentives for lobbies to gather information and provide it to the policymakers, or else on their influence-seeking activities. In the latter tradition, Grossman and Helpman (1994, 1995) and several others have adapted the common-agency model of Bernheim and Whinston (1986) to something of a work-horse model of lobbying, which has been used for studying trade policy, commodity taxation and other policies. Here, we follow Persson (1998) in applying the common agency model to the study of

group-specific government spending.[44]

9.1. A simple lobbying model

As Olson (1965) noted a long time ago, influence activities entail a free-rider problem: all members of a group benefit, irrespective of whether or not they contribute to the lobbying. Some groups are successful in overcoming this free rider problem, others are not. We follow the literature by not modelling how this take place, and just assume that a subset $\mathcal{L}$ of groups are organized to influence public-goods allocation in their favor. Thus, we study a policy game with two stages. (i) Each lobby J non-cooperatively and simultaneously presents their common agent, "the government", with a per capita contribution schedule $C^J(\mathbf{g})$, giving a binding promise of payment, conditional on the chosen policy. The objective of the lobby is to maximize the *net* welfare of its members, namely $N^J(W^J(\mathbf{g})-C^J(\mathbf{g}))$, where $W^J(\mathbf{g})$ denotes the welfare from the economic policies, as defined in (7.3). (ii) The government sets $\mathbf{g}$ so as to maximize a weighted sum of social welfare and contributions:

$$W(\mathbf{g}) = \eta \sum_J N^J W^J(\mathbf{g}) + (1-\eta) \sum_{J \in \mathcal{L}} N^J C^J(\mathbf{g}) \ , \tag{9.1}$$

where η, $0 \leq \eta \leq 1$, is a measure of the government's benevolence.

An equilibrium of the game is a Subgame perfect Nash equilibrium in the contribution schedules and the chosen policy vector. Following the literature, we shall confine ourselves to equilibria in (globally) truthful contribution schedules, namely those satisfying:

$$C^J(\mathbf{g}) = Max[W^J(\mathbf{g}) - b^J, 0] \ , \tag{9.2}$$

where b^J is a constant set optimally by the lobby.[45]

[44] Persson and Tabellini (1994c) study local public goods provision in a common agency model, but impose unappealing restrictions on the strategies used by interest groups.

[45] A truthful contribution schedule has the property that $\frac{\partial C^J(\mathbf{g})}{\partial g^I} = \frac{\partial W^J(\mathbf{g})}{\partial g^I}$ for any I and everywhere. That is, the slope of the contribution schedule in any direction is equal to the true marginal benefit of the policy in that direction for lobby J. See Grossman and Helpman (1994) and Dixit, Grossman and Helpman (1997) for further details and for a discussion of the restriction to truthful strategies in common agency games.

9.2. Political equilibrium

To derive an equilibrium in truthful strategies, its property of being jointly Pareto optimal for the government and all lobbies can be exploited. The equilibrium vector $\mathbf{g}$ will therefore maximize the sum of the net welfare of the organized lobbies $\sum_{J\in\mathcal{L}} N^J(W^J(\mathbf{g}) - C^J(\mathbf{g}))$ and the government objective $W(\mathbf{g})$, component by component. Using the definitions above, it is thus as if the optimal policy maximizes the weighted sum:

$$\eta \sum_{J\notin\mathcal{L}} N^J W^J(\mathbf{g}) + \sum_{J\in\mathcal{L}} N^J W^J(\mathbf{g}), \tag{9.3}$$

where aggregate welfare for the non-organized groups is defined in the same way as in (7.3). In other words, the equilibrium coincides with the solution to a planning problem, where the non-organized groups are underweighted relative to the organized groups, to an extent that depends on the government's benevolence. The first-order conditions to (9.3), defining the equilibrium allocation, denoted with an ^{L} superscript, can be re-written as:

$$\begin{aligned} H_g(g^{J,L}) - 1 &= (1-\lambda_{\mathcal{L}})(1-\eta) \leq 0, \quad J \in \mathcal{L} \\ H_g(g^{J,L}) - 1 &= \lambda_{\mathcal{L}}(\eta - 1)/\eta \geq 0, \quad J \notin \mathcal{L}, \end{aligned} \tag{9.4}$$

where $\lambda_{\mathcal{L}} = \sum_{J\in\mathcal{L}} \frac{N^J}{N}$ is the share of the population organized in a lobby. The left-hand side of (9.4) is the expression defining the utilitarian optimum, so the right-hand side measures the deviation from the optimum benchmark. Several results are apparent.

(1) As is evident from (9.4), the equilibrium can be socially optimal: $\mathbf{g}^L = \mathbf{g}^*$. Unsurprisingly, this happens when $\eta = 1$, so that the government is completely benevolent and does not value contributions at all, or when $\lambda_{\mathcal{L}} = 0$, with no contributing groups to worry about. But it also happens when $\lambda_{\mathcal{L}} = 1$, when everyone belongs to a lobby. Stated otherwise, suboptimal policies are only enacted due to incomplete participation in lobbying. The reason is that each group has a strong incentive to lobby, not only for large g^J, for itself, but also for low provision to other groups, to pay lower taxes. When all groups are organized, they offset each other's influence. Since they reveal their marginal preferences to the government by their truthful contributions, the true marginal social cost is correctly internalized in the policy decision.

(2) Generally, however, public consumption is misallocated: organized groups get more and unorganized groups less than the optimal amount. Intuitively, overprovision to the organized lobbying groups is larger if the government values contributions more (η is smaller) and hence pays more attention to the preferences expressed by the lobbies. If $\eta \to 0$, the government only cares about contributions, and provision to the unorganized groups also goes to zero. The overprovision is also larger, the lower is the share of the organized groups (the lower is $\lambda_{\mathcal{L}}$), as the lobbies—and indirectly the government—then internalize a smaller share of the social marginal costs. Note, however, that only the combined size of the organized lobbies influences the outcome; large and small organized groups obtain as much support per capita. Clearly, our implicit assumption that all members of each group belong to the lobby is driving this result.

(3) There is no presumption of aggregate overprovision. While there is certainly overprovision to the organized groups, there is under-provision to the non-organized ones. Not only do the preferences of the non-organized receive a smaller weight in the policy decision, but the tax burden of provision to non-organized groups is internalized by organized groups, which communicate this to the government. In a richer model, with individual heterogeneity over the preferences for private versus public consumption, it is plausible that lobbies would consist of individuals with a high preference for the public good. The reason is that they have a higher stake on the policy outcome, and, hence, are more likely to overcome the free rider problem of getting organized. The intuition why consumers are under-represented in lobbying is familiar from games over trade policy. In this event, it is easy to show that lobbying results in aggregate overspending compared to the normative benchmark.

Finally, this model can easily be adapted to also include the choice over a global public good, which benefits all groups in the same way. In this case, it easily shown that the provision of this public good is not distorted by lobbying. Intuitively, lobbying induces the government to underweigh the welfare of unorganized individuals. But these individuals are affected by the national public good just like anyone else, both as tax payers and as beneficiaries. With enough symmetry, neglecting their welfare does not distort the policy choice. The general lesson is that lobbying distorts policy, which has a different impact on different groups, as in our case of local public goods.

The common agency model of lobbying aggregates the influence activities of many interest groups into a policy decision, in an elegant and simple way. It also sheds light on how the pattern of organization across groups shapes the policy

outcome. But the model leaves some crucial issues aside. On the one hand, one lacks a precise model of the process whereby groups get politically organized and others not. This is a difficult question, to which there is still no satisfactory answer. The asymmetries driving the misallocation of public goods must thus be assumed, or defended on empirical grounds, rather than explained. On the other hand, the "government" and the process of policy choice is still a black box. If the lobbying model captures what goes on between elections, what exactly does the objective function in (9.1) capture? It is really impossible to answer this question without a structural model of policy choice. Following Grossman and Helpman (1996b), we embed a lobbying into the electoral framework of the next section in subsection 11.1, and show that the parameter η can then be derived from more structural assumptions. In subsection 11.3, we also combine lobbying and legislative bargaining.

9.3. Notes on the literature

Austen-Smith (1997) gives a recent survey of the literature on lobbying, while Mueller (1989) surveys the older literature. An influential branch of the literature, not discussed here, approaches lobbying as strategic transmission of asymmetrically held information; see Potters and van Winden (1992) and Austen-Smith and Wright (1992). Grossman and Helpman (1994)) were the first to use Bernheim and Winston's (1986) common agency approach to model lobbying in the case of trade policy. Dixit (1996) applies the same approach to commodity taxation, showing why the well known Diamond-Mirrlees production efficiency prescription would amost surely be violated in political equlibrium. Aidt (1998) adopts it in analyzing environmental taxes. Dixit, Grossman and Helpman (1997) contains a general discussion of the common agency approach with applications to public finance. Boylan (1995) points to the similarities between this approach and the literature on auctions.]

10. Electoral competition

We have seen how the ability of interest groups to get organized into lobbies and be represented by powerful legislators gives them an edge in the struggle for policy benefits. But some groups may also have particular attributes, in their role as voters, which make them an attractive target for office-motivated politicians. Our last partial model of centralized policymaking and special-interest politics

therefore focuses on electoral competition. There is no lobbying, no legislative bargaining, and no separation of decisions on spending and taxes. Policy decisions are made by two competing candidates who maximize the probability of winning the election. They make binding promises of policy favors to interest groups ahead of the elections. Unlike in Part I, the two candidates are not identical, and different voters have "ideological preferences" for one or the other. At the time of elections, these ideological preferences are traded off against the announced economic policy benefits. When announcing policy favors, the candidates take into account which groups are more likely to be swayed. The question we ask is which groups the most influence on electoral promises.

The modeling in this section follows Lindbeck and Weibull (1987), and subsequently, Dixit and Londregan (1996), who modified the probabilistic voting model of Enelow and Hinich (1982) and others from a spatial setting to redistribution among groups. In this section, we adapt their models—which both deal with direct income redistribution out of a given budget—to our policy problem with group-specific public consumption out of an endogenous pool of tax revenue.

10.1. A simple model of electoral competition

Consider the model of section 7, but add two office-motivated political parties $P = L, R$. Before the election, both parties non-cooperatively commit themselves to specific policy platforms, $\mathbf{g}_L$ and $\mathbf{g}_R$. Parties also differ in another dimension, unrelated to the announced economic policies—we shall refer to this dimension as "ideology", although it could also involve other features, such as the personal characteristics of the party's leadership. This ideological dimension is a permanent attribute of each party, in the sense that it cannot be changed at will during the electoral campaign.

This ideological difference among parties is reflected in the voters' preferences: each voter has an "ideological bias" for or against party L. Specifically, member i of group J has the extended utility function:

$$v^{iJ} = \kappa^J W^J(\mathbf{g}) + (\sigma^i + \theta) D^L \ , \tag{10.1}$$

where D^L takes a value of unity if party L wins the election and zero otherwise. Further, σ^i is an *individual-specific* parameter, κ^J is a *group-specific* parameter, and θ is a random variable capturing the party preferences of the *whole population*. Thus, individuals are distinguished by two features: the group they belong to, indexed by J, and their individual party bias, σ^i. Individuals with $\sigma^i > 0$ (< 0)

have a bias in favor of (against) party L, which is stronger the greater is σ^i (in absolute value). Individual party bias is distributed within each group according to a uniform distribution on the interval $[-\frac{1}{2s^J}, \frac{1}{2s^J}]$. That is, the distribution of σ^i for all i belonging to group J has density s^J. Thus, each group has members inherently biased towards each of the parties, even though the distribution of party bias differs across groups. Moreover, groups also differ in the strength of their ideological motives; the larger is the parameter κ^J, the more all the individuals in J care about economic well-being relative to ideology. Finally, the random variable θ captures the average popularity of party L in the population as a whole. We assume that θ has a uniform distribution on $[-\frac{1}{2h}, \frac{1}{2h}]$. The realization of θ is unknown to the parties when announcing their policy platforms, so that the election outcome is uncertain from their point of view.

Equations (7.3) and (10.1) imply that voters in group J supporting party R all have: $\sigma^i < \kappa^J[W^J(\mathbf{g}_R) - W^J(\mathbf{g}_L)] - \theta$. Let us identify the "swing voter " in group J as the voter who—given the parties' platforms—is indifferent between the two parties. We denote these voters' party bias as $\sigma^J(\mathbf{g}_R, \mathbf{g}_L, \theta)$, defined by:

$$\sigma^J(\mathbf{g}_R, \mathbf{g}_L, \theta) \equiv \kappa^J[W^J(\mathbf{g}_R) - W^J(\mathbf{g}_L)] - \theta \ . \tag{10.2}$$

Swing voters toss a coin when deciding how to vote.

10.2. Political equilibrium

The two parties simultaneously and non-cooperatively choose their platforms, so as to maximize the probability of winning the election.[46] To specify the party objectives, first note that the distributional assumptions allow us to write the vote share of party R as:

$$\pi^R = \sum_J \frac{N^J}{N} s^J [\sigma^J(\mathbf{g}_R, \mathbf{g}_L, \theta) + \frac{1}{2s^J}] \ .$$

By definition of σ^J in (10.2) and the assumption that θ is uniformly distributed with density h, its probability of winning can be written as:

$$p^R = \ \text{Prob}[\pi^R \geq \frac{1}{2}] = \frac{1}{2} + h \left[\sum_J \frac{N^J}{N} \frac{s^J}{s} \kappa^J [W^J(\mathbf{g}_R) - W^J(\mathbf{g}_L)] \right], \tag{10.3}$$

[46] The Nash equilibrium obtained if parties maximize their vote share is identical (see Lindbeck and Weibull (1987) and Dixit and Londregan (1996)). In this case, the random variable θ could be omitted from the model.

where $s \equiv \sum \frac{N^j}{N} s^J$ is the average density of party bias across groups. Party R sets its platform so as to maximize this expression, subject to the budget constraint. As the probability of winning for party L is given by $1 - p^R$, as $\mathbf{g}_L$ affects p^R symmetrically but with the opposite sign as $\mathbf{g}_R$, and as the two parties face the same budget constraint, they face the same decision problem. Specifically, this optimization problem does not include any party-specific variables. It should thus come as no surprise that a Nash equilibrium involves identical policy platforms $\mathbf{g}_L = \mathbf{g}_R$. By (10.2), this implies $\sigma^J(\mathbf{g}_R, \mathbf{g}_L, \theta) = -\theta$. As the expected value of θ is zero, each party is doing its best to capture the votes of the ideologically neutral voters in each group, namely those with $\sigma^i = 0$.

In view of this, the first-order conditions determining the allocation of equilibrium spending across groups can be written as:

$$\frac{N^J}{N}\frac{s^J}{s}\kappa^J H_g(g^J) - \frac{N^J}{N}\sum_I \frac{N^I}{N}\frac{s^I}{s}\kappa^I = 0 \ . \tag{10.4}$$

The equilibrium thus entails a generalized Hotelling-type result. Despite the multi-dimensional policy space, the two parties converge on the same platforms. The intuition for this is simple: the parties compete for the same voters and thus are both trying to buy the electoral support from the same marginal voters in each group. Furthermore, they have the same technology for converting money into expected votes. As a result, the distribution of voters' preferences alone that decides the unique equilibrium election outcome.

To characterize equilibrium spending, $\mathbf{g}^E$, it is useful to rewrite (10.4) as:

$$H_g(g^{J,E}) - 1 = \frac{\sum_{I \neq J} \frac{N^I}{N} s^I \kappa^I - s^J \kappa^J}{s^J \kappa^J}. \tag{10.5}$$

As in the previous two sections, deviations from the utilitarian optimum are determined by the expression on the right-hand side of the equation. A number of insights emerge.

(1) In a politically homogenous society, where the ideological bias is the same across groups—i.e., the densities s^J and the parameters κ^J coincide for all J—electoral competition implements the utilitarian optimum: $\mathbf{g}^E = \mathbf{g}^*$. This is intuitive: as both parties try to buy expected votes by influencing the voters' marginal utility, their marginal incentives are identical to those emanating from a utilitarian objective, if each group is identical as concerns how easily their vote can be swayed. This result is well-known from the literature on probabilistic voting in a spatial setting; it was first demonstrated by Coughlin and Nitzan (1981).

(2) The political clout of a specific group J is conveniently summarized by the term $s^J\kappa^J$. If this term is higher than the weighted average of the other groups, the right-hand side of (10.5) is negative, implying $g^{J,E} > g^*$. The term s^J measures the density of ideologically neutral voters, that is, of voters who only care about economic policies. These are the most mobile voters, and both parties want to please them. The larger is the density of these "swing-voters" within group J, the greater is the expenditure directed towards this group. The parameter κ^J instead reflects to what extent voters in group i care about economic well being as opposed to ideology. Groups who care less about ideology (i.e. groups with a greater κ^J) are favored, since their voters are more mobile. If these features characterize middle-class voters particularly well, the model thus confirms what Stigler (1970) minted as "Director's Law", namely that redistributive policies will generally favor the middle class. Conversely, groups caring a great deal about ideology and groups with few swing voters lose out, because buying a large number of expected votes in those groups is too expensive.[47]

(3) Group size does not play a role in determining political clout. On the one hand, a large group has many voters and is therefore an attractive target for vote buying. On the other hand, it is more expensive to pay for the votes of a large group. As the expression in (10.4) shows, these two effects cancel each other out. Note, however, that we have assumed that parties maximize the probability of winning, taken over the whole population. Thus, we can consider this an implicit assumption of an electoral system with strict proportional representation.

(4) There is no first-order bias in total spending relative to the utilitarian optimum. As (10.5) shows, some groups get more while others get less. The effect on total spending depends in a complicated way on the interplay between political clout, relative group size, and the concavity of the $H(\cdot)$ function. Intuitively, spending is entirely "supply determined" by the two political parties. The presence of a latent common pool problem with incentives to expand spending at the group level does not influence the outcome, as each party—in its attempt to buy votes from all groups—properly internalizes the aggregate budget constraint.

The analysis can be extended and modified in a number of directions. In the papers by Lindbeck and Weibull (1987) and Dixit and Londregan (1996), direct income transfers support the private consumption of each group. Poorer groups

[47] A more general formulation of the model would have the idiosyncratic parameters σ^i distributed according to general group specific c.d.f $S^J(\cdot)$, with different means. In this case, the relevant density would be $s^J(0)$ and groups with an ideological bias (a mean far from 0) would lose out, as they would have few ideologically neutral voters.

systematically obtain more support, ceteris paribus, as their marginal utility of income in higher (as it would be for a benevolent planner). The same would apply here with a concave utility of private consumption; poor voters would be more hurt by common taxes and need to be compensated with more public consumption. Strömberg (1998) lets groups differ in their turnout rates, denoted as t^J. The political clout of group J in the model above becomes $t^J s^J \kappa^J$. Groups with higher turnout rates would thus get more support. The "transaction costs" in buying votes may also differ systematically across groups. If these costs or the uncertainties in vote buying are lower among the groups belonging to the party's core supporters (because transfers can be more precisely targeted), this may become a counterweight to a strong party bias and rationalize so-called "machine politics", where parties give more favors to their traditional support groups, as discussed in the model by Cox and McCubbins (1986). Dixit and Londregan (1998) study a more general model where parties and voters also have some ideological concerns about income distribution. This allows them to endogenously derive the result that groups composed of middle-class voters are likely to have most electoral clout.

The model certainly highlights important aspects of how special interests may be favored by parties in their election campaigns. But it also leaves out important aspects of policy making. For one, there is no interest group activity; each group is just a target for the politicians, and their members just cast their vote like everybody else. For another, the assumption of binding electoral promises is dubious; many policy decisions are made between elections in the running of business by the incumbent government and its administration. Part III discusses at length how electoral competition is played out through retrospective voting, in this case.

10.3. Notes on the literature

The probabilistic voting approach was developed in the spatial voting model to guarantee existence of equlibrium in situations, such as a multi-dimensional policy space, when a Condorcet winner fails to exist; see Coughlin (1992) for an overview of probablistic voting and Osborne (1995) for an overview of spatial voting theory. An adaption of this framework to redistribution among multiple interest groups was made by Lindbeck and Weibull (1987) and their approach was extended by Dixit and Londregan (1996). These papers, and the other papers mentioned in the text, identify a priori the set of interest groups and the group affiliation of each voter. A general treatment of redistribution among ex ante identical

voters, resulting from electoral competition between political candidates—without additional attributes—can be found in Myerson (1993), who derives an equlibrium where each candidate selects a randomized redistribution strategy.

11. Interactions in the political process

So far, we have studied three different models of special-interest politics, each focusing on a separate aspect of political activity. Real-world politics, however, involves a great deal of interaction between these activities. If lobbies or voters understand how decisions are made in the legislature, they will adapt their lobbying behavior or their candidate preferences accordingly. And if electoral platforms systematically favor certain organized groups, they will adapt their campaign contributions accordingly. In the absence of a "grand unified theory"of special interest politics—a structural model simultaneously encompassing legislation, lobbying and elections—we devote the remainder of this part to the analysis of three simpler, pairwise, forms of interaction.

11.1. Lobbying and elections

The previous model of lobbying is most straightforwardly interpreted as a model of "bribes" to the government. In practice, however, most lobbying takes the form of campaign contributions, either in cash or "in kind", through actions affecting the electoral outcome. We now combine the lobbying model of Section 9 with the voting model of Section 10, to illustrate how electorally motivated lobbying may influence policy. The central conclusion is that the insights gained in those two sections survive, and carry over to this more general model. Equilibrium policy is influenced by *both* the lobbying activity and the voters' attributes: organized groups, and groups with more swing voters, are over-represented in the political process. Moreover, additional insights are gained about what determines the effectiveness of the lobbies and the size of equilibrium contributions. The analysis is a variant on that in Beneddsen (1998), who in turn extends and simplifies earlier work by Baron (1994) and Grossman and Helpman (1996b).[48]

Consider the same model as in Sections 9 and 11, but with some simplifications. Two vote maximizing parties, L and R, set policy platforms $\mathbf{g}_L$ and $\mathbf{g}_R$ respectively, in advance of the elections. As before, these parties differ in some

[48] Riezman and Wilson (1997) study restrictions on contributions in a setting where competing political candidates instead "sell" policies to different interest groups.

"ideological" dimensions. We now assume that all groups are of equal size normalized to unity, such that $\frac{N^J}{N} = \frac{1}{\mathcal{J}}$, and place the same weight on economic outcomes versus ideology, also normalized to unity, $\kappa^J = 1$. Voters in group J still have preferences:

$$v^{iJ} = W^J(\mathbf{g}) + (\sigma^i + \theta)D^L, \tag{11.1}$$

but now θ is given by

$$\theta = \tilde{\theta} + \phi(C_L - C_R) \ .$$

Thus, the average popularity of party L has two components. The term $\tilde{\theta}$ is a random variable, as previously, uniformly distributed on $[-\frac{1}{2h}, \frac{1}{2h}]$. But the overall relative popularity of the two parties is now also influenced by the campaign contributions received by parties L and R, C_L and C_R, respectively. Specifically, voters are biased in favor of the party receiving more contributions, with $\phi > 0$ being a parameter capturing the sensitivity to the difference in campaign spending.[49] This has more than one interpretation: C_L might measure advertising expenditures or media exposure of the leaders of party L, but it might also refer to support actions in favor of L, or against her electoral opponent.[50] As in Section 10, σ^i is distributed according to group-specific distributions uniform on $\left[-\frac{1}{2s^J}, \frac{1}{2s^J}\right]$ with density s^J.

By the same logic as previously, the indifferent voter in group J is an individual with preference parameter:

$$\sigma^J \equiv W^J(\mathbf{g}_R) - W^J(\mathbf{g}_L) + \phi(C_R - C_L) - \widetilde{\theta} \ . \tag{11.2}$$

Thus, the identity of this swing voter is affected by campaign spending. All voters in group J with $\sigma^i > \sigma^J$ prefer party L, all those with $\sigma^i < \sigma^J$ prefer R. Following the same approach as in Section 10, we can derive the probability of winning for party R, as:

$$p^R = \frac{1}{2} + h\left[\frac{1}{\mathcal{J}}\left[\sum_J \frac{s^J}{s}(W^J(\mathbf{g}_R) - W^J(\mathbf{g}_L)\right] + \phi(C_R - C_L)\right]. \tag{11.3}$$

[49] Allowing ϕ to differ across groups or indivduals does not matter for the results, since only the average value of ϕ (across groups and individuals) enters the equilibrium expressions. Note that $\phi > 1$ is allowed.

[50] Grossman and Helpman (1996b) suggest a slightly different interpretation, which leads to a similar formulation as (11.2) Some voters are fully informed and uninfluenced by campaign contributions. Other voters are uninformed about economic policy platforms, and respond exclusively to campaign contributions. The overall effectiveness of campaign contributions in swaying voters is then related to the frequency of uninformed voters in the population.

A subset $\mathcal{L}$ of the groups are organized in lobbies. As in section 9, $\lambda_{\mathcal{L}}$ denotes the organized fraction of the population organized. Lobby J maximizes the expected utility derived from economic policy, net the per capita cost of paying the contributions, namely:

$$[p^R W^J(\mathbf{g}_R) + (1 - p^R) W^J(\mathbf{g}_L) - (C^J)^2/2] \ , \tag{11.4}$$

where $C^J = C_L^J + C_R^J$ is the total campaign contribution by lobby J to both parties, and where C_L^J and C_R^J are constrained to be non-negative. Note that, unlike in section 2, the cost of lobbying is taken to be a convex function of C^J, the last term on the right hand side of (11.4).[51] In a richer model, this could reflect increasing marginal costs of enticing potential contributors with different willingness to give, where the lobby would naturally start by tapping those members of the group from whom collecting is easiest. Alternatively, if C represents contributions in kind, such as work in the campaign, the convexity may represent increasing disutility of effort. Whatever the interpretation, the total contributions received by party R are $C_R = \sum_{i \in \mathcal{L}} C_R^J$, and, similarly, for party L.

The timing of events is as follows: (i) Both parties simultaneously announce policy platforms. (ii) Having observed these announcements, all lobbies simultaneously set their campaign contributions. (iii) Elections are held. Stages (i) and (ii) are thus reversed relative to Section 9, where the lobbies instead moved first by setting contingent contribution schedules. The present timing assumption considerably simplifies the analysis and might also be more plausible. It portrays lobbying as an activity attempting to influence the electoral process, given the promises made by the parties. Note, however, that lobbying still influences policy formation, as parties anticipate how the lobbies will adapt their contributions to the parties' policy promises. Intuitively, each party wants to win the election; and one way of winning is to announce a platform appealing to the lobbies, and let the lobbies help garner electoral support by raising money or working for the party.[52]

We are now ready to characterize the equilibrium. The electoral outcome at stage (iii) has already been discussed. Consider the optimization problem faced by the lobbies at stage (ii), for given policy platforms announced at stage (i).

[51] With linear cost functions for C^J, the reaction functions of the lobbies would not be continuous in the policy platforms, in this set-up.

[52] Grossman and Helpman (1996b) instead consider a set-up where the lobbies move first, and derive rather similar results.

Maximization of (11.4) with respect to C_R^J and C_L^J, subject to (11.3), yields[53]:

$$C_R^J = Max\left[0, \phi s(W^J(\mathbf{g}_R) - W^J(\mathbf{g}_L))\right] \ . \tag{11.5}$$

$$e_L^J = -Min[0, \phi s W^J(\mathbf{g}_R) - W^J(\mathbf{g}_L)]$$

By (11.5) each lobby campaigns only in favor of a single party, and does not campaign at all if the two parties announce identical platforms. This feature of the model is quite sensible—the lobbies want to influence the voters, not the parties—and it is consistent with some available evidence suggesting that lobbies seldom spend for both candidates in elections.[54] Summing this expression across all lobbies in $\mathcal{L}$, we get:

$$C_R - C_L = s\phi \sum_{J \in \mathcal{L}} \left[W^J(\mathbf{g}_R) - W^J(\mathbf{g}_L)\right] \ . \tag{11.6}$$

That is, campaign spending goes to the party is, on average, more successful in pleasing the lobbies.

Let us now turn to the party-optimization problem. Here, maximizing the vote share and the probability of winning amount to the same thing. By (11.3), (11.2) and (11.6), party R's objective function can then be written:

$$Max \ \frac{1}{\mathcal{J}} \left[\sum_J \frac{s^J}{s} \left[W^J(\mathbf{g}_R) - W^J(\mathbf{g}_L)\right] + \gamma \sum_{J \in \mathcal{L}} \left[W^J(\mathbf{g}_R) - W^J(\mathbf{g}_L)\right] \right], \tag{11.7}$$

where $\gamma = s\phi^2\mathcal{J} > 0$ is an extra weight on the lobbies' utility, related to how effective campaign spending is in influencing the voters: the more influential it is, the greater is the weight on the lobbies utilities. Note the similarity with the assumed reduced-form objective of the government in the common agency model in Section 9; in that case, the organized lobbies also get an additional weight in the objective of the policymaker. Thus, γ in the present model closely corresponds to $(1 - \eta)$ in Section 9.

By the same logic, party L solves an identical problem. Hence, like in Section 10, both parties announce the same policies: $\mathbf{g}_R = \mathbf{g}_L$, which then imply that

[53] To derive (11.5), note that by (11.3) we have: $\frac{\partial p^R}{\partial C_R^J} = s\phi = -\frac{\partial p^L}{\partial C_L^J}$; also recall that contributions are non-negative.

[54] For U.S evidence on this point, see Poole and Romer (1985).

equilibrium campaign spending is zero—cf. (11.6).[55] This does not mean that the presence of the lobbies is irrelevant, on the contrary: out of equilibrium, they do spend on the party who pleases them most, and this induces both parties to tilt public policy in their favor. Specifically, taking the first-order conditions of problem (11.7) and rewriting them, we can define the equilibrium allocation by the following expressions :

$$\begin{aligned} H_g(g^J) - 1 &= \frac{1}{s^J}\left[s - s^J + s\gamma\lambda_{\mathcal{L}}\right] \quad \text{if } J \notin \mathcal{L} \\ H_g(g^J) - 1 &= \frac{1}{s^J + \gamma s}\left[s - s^J - s\gamma(1-\lambda_{\mathcal{L}})\right] \quad \text{if } J \in \mathcal{L}\ . \end{aligned} \tag{11.8}$$

That is, g^J is overprovided, relative to the social optimum, if there are many swing voters in J (s^J is larger than s, the average of the other groups), precisely as in Section 10. If group J is organized as a lobby, there is also overprovision, and the lobbying effect is stronger, the higher is γ, i.e. the more effective are campaign contributions in influencing the voters. Also, a smaller fraction of lobbies among the groups, a smaller $\lambda_{\mathcal{L}}$, increases the overprovision for the lobbies, but decreases the underprovision for the unorganized groups, as in Section 9.

The model can easily be generalized to introduce other attributes of the voters. As noted above, Grossman and Helpman (1996b) and Baron (1994) distinguish between *informed* and *uninformed* voters. The former are fully informed and completely unaffected by campaign contributions, like the voters in section 10. The uninformed, on the other hand, are completely unaffected by economic policies, and their preferences only respond to campaign spending by the parties—namely their preferences are just given by the contributions term $\phi(C_R - C_L)$. Let groups also differ by the share of informed and uninformed voters, besides the density s^J, and let δ^J denote the share of informed voters in group J. Then, repeating the same steps as above, it can be shown that parameter δ^J influences the allocation, in the same way as s^J in expression (11.8). That is, groups with a larger share of informed voters are better treated by the parties, since they are more responsive to economic policies. Stated otherwise, voter mobility, one of the key determinants of the equilibrium allocation in the voting model, can either reflect a small weight given to ideology within the group (or small electoral turnout), or equivalently, a small share of uninformed voters.

[55] Grossman and Helpman (1996b), with their different timing assumption, get a different result: in their model, there is non-convergence in party platforms, and equilibrium contributions are positive.

This discussion naturally suggests two questions: How do voters obtain their information? And why are some voters informed while others are not? An obvious answer to the first question is that voters obtain their information from the media. Strömberg (1998) sets up a formal model of politics and the media to address the second question. He shows that the interaction between electoral competition (modeled as in Section 10) and competition between profit maximizing media provides an answer to the second question. Optimal behavior by the media tend to bias the information—and hence also the policy outcome—towards groups that are attractive for advertisers.

To summarize, the model in this section provides a richer set of determinants of success in special-interest politics compared to the partial models in sections 9 and 10. But there are no surprises, and the results combine our earlier findings. As we shall see in the next two sections, however, this is not always the outcome of interactions between different types of political activity.

11.2. Elections and legislative bargaining

To study the interaction between elections and legislation, we add an election stage at the beginning of the legislative bargaining game above. In district-wide elections, forward-looking voters appoint a representative for the coming legislative session. As we shall see, this gives rise to strategic delegation, similar to that already encountered in the citizen-candidate model of subsection 6.3, Part I. As in that subsection, we now assume that candidates are *outcome motivated*: they care about the policy enacted once in office, and different candidates have different views on what is the optimal policy. The modeling here follows the recent study by Chari, Jones and Marimon (1997) quite closely.

Consider a four-stage game, where the last three stages are identical to the game in Section 8. In the first stage, every district simultaneously elects a representative by plurality rule. We assume that in each district, voters can choose among candidates with heterogeneous preferences for private versus public consumption. Specifically, a candidate of type α for district J has preferences:

$$W^{J,\alpha} = c^J + \alpha H(g^J). \tag{11.9}$$

That is, candidates with high values of α care a great deal about publicly provided goods. Candidates are outcome motivated, in the sense that once elected, they act so as to maximize (11.9), and their type (ideology) is not an object of choice for the candidate himself. Candidates are thus characterized by their utility function (11.9), or, more compactly, by their preference parameter α.

For simplicity, we also make the following symmetry assumptions: (i) In all districts there is a continuum of candidates to choose from, with values of α in the same range $[\alpha^L, \alpha^U]$ for all districts. (ii) We continue to assume that *voters* are all identical within each district, and have preferences as in (11.9), but with $\alpha = 1$. Adding voter heterogeneity—with voter preferences distributed over the same range $[\alpha^L, \alpha^U]$ as candidates—is straightforward and does not change the results. (iii) All districts have the same size, namely $\frac{N^J}{N} = \frac{1}{\mathcal{J}}$ for all J. (iv) The default allocation is symmetric, namely $\overline{g}^J = 0$ for all J, implying $\overline{\tau} = 0$. (v) Every representative has the same probability, $\frac{1}{\mathcal{J}}$, to be picked as the agenda setter.

Again we look for a Subgame perfect Nash equilibrium. Consider first the legislative bargaining stages. By (iii), (iv) and the results in Section 8, it is easily shown that the chosen agenda setter will pick the $\frac{\mathcal{J}-1}{2}$ representatives with the highest values of α as members of the majority coalition, $\mathcal{M}$. The reason is that they are easiest to please, because they value public consumption a lot—i.e., their incentive constraints (8.1) are the easiest to relax. At the elections stage, voters realize this. Recall that voters in district J get compensated by some public goods for the taxes they pay only if their candidate is part of the majority, whereas they get no compensation if their candidate finds himself in the opposition. Hence, all districts have an incentive to elect a candidate with a value of α higher than that of the other districts, since that would make them part of the majority with certainty. This pushes all districts to a corner: under a mild condition on preferences, all districts elect the most spendthrift candidate, type α^U, in equilibrium. With this constellation of representatives, the voters in each district have a fifty-fifty chance of being included in the winning coalition. If any district appointed a "smaller spender"—a candidate with a lower α—this chance would drop to zero, thus bringing about a discontinuous expected welfare loss.[56] [57]

[56] Some conditions are needed to insure that this is an equilibrium, since electing a spendthrift candidate, the voters might also incur a cost: in the event that he is appointed agenda setter, a spendthrift ends up spending more than is optimal for his voters. This (expected) cost thus needs to be sufficiently smaller than the benefit, due to a discretely higher probability of being included in the majority. With a large enough number of districts, the probability of becoming agenda setter is sufficiently small, and this condition is satisfied.

[57] The model could be extended to an entry stage, where candidates sort themselves out as in the citizen candidate model of Section 5. Suppose that voters too are heterogneous and have the same preferences as the candidates, (11.9). Applying Proposition 2 (and Corollary 1) in Besley and Coate (1997), this equilibrium would, in fact, be sustainable in an extended "citizen-candidate" model with an initial entry stage, where every voter in each district could enter as a

Thus, we have another instance of strategic delegation: voters in each district elect a big spender. The reason is that unless they act in this way, they are left in the opposition. Clearly, this voting equilibrium makes the allocation more biased towards overspending for the agenda setter—since she also has a high α, on top of her better bargaining power—and diminishes the differences between districts inside and outside the majority.

As Chari, Marimon and Jones (1997) point out, this equilibrium is broadly consistent with opinions often expressed by American voters. Typically, they are quite disconcerted with the composition and actions of Congress as a whole but, at the same time, pleased with their own representative; the strong incumbency advantage of serving legislators in congressional elections also bear testimony of this. In the equilibrium studied, voters in any district Jwould indeed have a higher expected utility if all other districts had representatives with $\alpha < \alpha^U$, but the voters in J could maintain the identity of their own representative.

The model is obviously very stylized, but still teaches us a lesson: it is not enough to look at the apparent bargaining powers that different legislators derive from a particular set of legislative rules, as these powers are endogenously modified in the interaction with their principals, the voters. Introducing elections thus pushes the legislative bargaining solution towards a more extreme outcome and not towards a more balanced one, as might have been the first guess. The same point will reappear, even more forcefully, in the next sub-section.

Nevertheless, the model neglects important aspects of the interactions between elections and legislative bargaining. Specifically, there is no connection between the election outcome and the proposal rights in the legislature. In reality, the allocation of these proposal rights are determined by the party affiliation and the seniority of legislators and can be revised by each elected congress. In a remarkable paper, McKelvey and Riezman (1991) study these aspects in a dynamic game involving infinitely repeated elections in multiple districts, where each newly elected congress can set its own seniority rules before engaging in legislative bargaining over a fixed budget. McKelvey and Riezman show that seniority rights in agenda setting and a strong electoral incumbency advantage of senior legislators jointly emerge as a stationary equilibrium outcome. Interestingly, the endogenous seniority rights apply only to the initial proposal. If proposal rights in multi-round

candidate, at a cost. The candidate with α^U optimally running and winning as an (unopposed) candidate in each district would be an equilibrium, if the entry cost was low enough and the default outcome bad enough (g^J valuable enough). See Coate (1997) for a full-fledged analysis of legislative bargaining and elections in a citizen-candidate model.

bargaining were to be given in the order of decreasing seniority, senior legislators would be at a disadvantage in the legislative bargaining. As they would have higher continuation values in each legislative session, it would be more expensive to bring them into the majority, in the same way as the vote of low α legislators are more expensive in the model of this subsection.

11.3. Lobbying and legislative bargaining

We now set voters aside and consider how influence activities by interest groups interact with legislative bargaining. Research on this topic is still very scant.[58] Our analysis draws on Helpman and Persson (1998).

With a structural model of government decision-making, in place of a single policymaker, we must now take a stance on who lobbies whom. We restrict each interest group to make contributions only to a single congressman, "their own". This kind of fixed association is arbitrary but has some empirical support: campaign contributions in the US tends to go to representatives from the same district as the donor, or to a member of the committee holding jurisdiction of regulation or grants applying to the donor group. For Europe there is much less systematic information about political contributions, but in some countries, there are very tight relations between interest groups, like trade unions and agricultural lobbies, and specific political parties.[59]

Legislators still play the same legislative bargaining game. We retain symmetry assumptions (iii) and (iv) of the previous subsection. In addition, we also abstract from asymmetries in the organization across groups and assume that all groups are organized in lobbies: $\mid \mathcal{L} \mid = \mathcal{J}$ in the notation of Section 9. The policy game is as in Section 8, but with an additional contributions stage. The timing is as follows. First, Nature selects a legislator, $J = a$, to be the agenda setter. Then contribution schedules are simultaneously announced by the lobbies and observed by all legislators.[60] Finally, the agenda setter formulates a take it

[58] One antecedent is Groseclose and Snyder (1996) who study a game where two lobbies buy votes from legislators about to decide on a public project. Interestingly, they show that when votes are bought sequentially, the prediction of a minimum winning coalition may fail.

[59] Mueller (1989, ch 11) gives references to the empirical literature on campaign contributions in the U.S.) See Liebert (1995) for a discussion of lobbying in European parliamntary democracies.

[60] With the opposite timing (contributions made first), it would be natural to assume that contributions were made contingent on the status of the legislator (agenda setter, or not). The results would be identical to the case considered in the text.

or leave it proposal, and the legislature votes on this. If the proposal is defeated, the default policy is as in the previous subsection: $\overline{\mathbf{g}} = \mathbf{0}$, $\overline{\tau} = 0$. We assume that legislators only care about the contributions they get.

Group J presents its congressional representative with a truthful contribution schedule, which offers

$$C^J(\mathbf{g}) = \begin{array}{ll} Max[W^J(\mathbf{g}) - b^J, 0] & \text{if } g \text{ is supported by } J \\ 0 \quad \text{otherwise} , & \end{array} \tag{11.10}$$

where the zero contribution if a policy $\mathbf{g}$ is not supported by legislator J can be shown to be an optimal strategy.[61] As in section 9, we can think of b^J as reservation utilities of group J. Representatives maximize the value of their contributions, and hence want these reservation values to be as low as possible. As in Section 9, interest groups maximize their utility net of their contributions. Thus, they want the reservation utilities in (11.10) to be as high as possible.

Consider first the agenda setter's problem, for given contribution schedules. She wants to maximize:

$$C^a(\mathbf{g}) = Max[W^a(\mathbf{g}) - b^a, 0] = Max[H(g^a) + y - \frac{1}{\mathcal{J}}(\sum_I g^I) - b^a, 0], \tag{11.11}$$

subject to the incentive compatibility constraints that legislators in $\mathcal{M}$ are better off than with the default outcome:

$$W^J(\mathbf{g}) - b^J = H(g^J) + y - \frac{1}{\mathcal{J}}(\sum_I g^I) - b^J \geq 0 \quad \text{for} \quad J \in \mathcal{M} \tag{11.12}$$

(recall that contributions are 0, if the proposal is voted down). Again, a finds it optimal to collect a minimum winning coalition, i.e. to include only $\frac{\mathcal{J}-1}{2}$ additional members in $\mathcal{M}$. It is easily shown that $Max[W^a(\mathbf{g})]$ is decreasing in all b^J , $J \in \mathcal{M}$. The agenda setter wants to satisfy (11.12) with equality for all members of the majority, as this maximizes her own district's utility and, hence, the contribution to herself. Thus, she picks the representatives with the lowest values of b^J as her coalition partners, setting $g^J = 0$ for everyone else, as in Section 10.

Now let us return to the contribution stage, and consider the optimal contributions for group J, for $J \neq a$. Clearly, group J is better off if its representative

[61] Helpman and Persson (1998) show that indeed equilibrium contributions pay zero in the event that a legislator does not support a proposal. They also relax the assumption that legislators only care about money and show that the qualitative results are not affected, if legislators also care about the welfare of their district.

is included in the majority, as long as that gives at least a tiny piece of public goods.[62] This sets up a fierce "Bertrand competition" among the interest groups. As only legislators with the lowest reservation utilities are included in $\mathcal{M}$, the only equilibrium has every group J setting its reservation utility at the lowest possible level, namely $b^J = y - \frac{1}{\mathcal{J}}(\sum_{I\in\mathcal{M}} g^I)$. Returning to the agenda setter's problem in (11.11)-(11.12), we then find that the optimal solution satisfies:

$$\begin{aligned} H_g(g^a) &= \frac{1}{\mathcal{J}} \\ g^J &= 0, \quad \text{all } J \neq a. \end{aligned} \tag{11.13}$$

Group a implements this choice at the lowest cost, namely zero, by setting its reservation utility $b^a = H(g^a) + y - \frac{g^a}{\mathcal{J}}$.

A useful way of thinking about this equilibrium is to rely on the same intuition as in the previous subsection. Each interest group badly wants to avoid that his representative be left in the minority, so that it only pays taxes but receive no public good. To avoid this outcome, each group reduces its reservation utility, so as to make the vote of her representative cheaper to buy. As all interest groups have the same objective, this competition drives equilibrium public goods down to zero for every district. Obviously, the district of the agenda setter is the beneficiary. The logic is similar to that in Dixit, Grossman and Helpman (1997), who study a general common agency model, and show that competition between the interest groups allows the single government to implement its preferred solution. But here, the benefit goes to one powerful district, not to a semi-benevolent government.

Note that also in this case, politicians collect no contributions in equilibrium. Clearly, this does not provide a safe ground for concluding that influence activities are unimportant, as some commentators like Tullock (1988) have suggested. Note also that in equilibrium, every legislator is willing to vote for the proposal (at least they do not have any incentive to vote against it). Thus, despite the force of minimum-winning coalitions outside of equilibrium, the equilibrium majority is more than minimal. The model is thus consistent with a stylized fact, underlying the literature on "universalism" in the US Congress, namely that distributive bills often pass with broad majorities. But the universalism literature has weak micropolitical underpinnings (it is hard to model as the outcome of an extensive form game), and universalism is often accounted for by referring to a "norm

[62] If the representative is not included in the majority, the utility of group J is $W^J(\mathbf{g} \mid J \notin \mathcal{M}) = y - \frac{1}{\mathcal{J}}(\sum_{I\in\mathcal{M}} g^I)$, whereas the utility when she is included is $W^J(\mathbf{g} \mid J \in \mathcal{M}) = H(g^J) + y - \frac{1}{\mathcal{J}}(\sum_{I\in\mathcal{M}} g^I)$.

of deference" ("you scratch my back and I scratch yours"). In our setting we could imagine a sequence of legislative sessions, where different representatives (approximating different committees) take turns as agenda setters. The outcome after these sessions would coincide with a universalist allocation, like the one in Weingast, Shepsle and Johnsen (1981).

Note also that the results obtained in this section are *not* a convex combination of the results in the "partial" models studied above. Specifically, the distribution of benefits is more skewed than in the legislative bargaining model of Section 8, even though the lobbying model of Section 9 predicted a very even distribution of benefits (with all groups organized and symmetric as we have assumed in this section, the common agency model predicts equal b^J for all J).

These results illustrate, with additional force, the general point made in the previous subsection: optimal private behavior alters the bargaining powers inherent in legislative procedures. Here, they amplify the misallocation of public goods by a legislature where agenda setting powers are conferred upon individual members or committees. Naturally, the simple structure of this game gives rise to an extreme outcome. Real world legislatures have introduced various safeguards against such extreme outcomes. Some of these have already been discussed in Section 8 and some others will be discussed in Part III. We thus want to give further emphasis to the general logic than to specific results.

11.4. Notes on the literature

Our model of the interaction between elections and lobbying in subsection 11.1 draws on Baron (1994), Grossman and Helpman (1996b) and Beneddsen (1998). Besley and Coate (1996) study lobbying and elections in a citizen-candidate model, Riezman and Wilson (1997) study legal redistributions or contributions in a setting where policymakers compete for the support of different lobbies. An early contribution on the interaction between lobbying and elections is Austen-Smith (1987).

The interaction between elections and legislative behavior is naturally of first-order importance in political economics. There is not much formal work combining an extensive form legislative games with elections and rational voters, which might be due the difficulty of these issues. Austen-Smith and Banks (1988) and Baron (1993) are among the few that have studied the interaction between voting and government formation in a three-party setting. McKelvey and Riezman (1991) study the interactions between voting and legislative bargaining and show

how a seniority system may emerge endogenously in a sequence of congressional elections. Subsection 11.2 draws on Chari, Marimon and Jones (1997). Coate (1997) demonstrates that the strategic delegation equilibrium considered by these authors is consistent with endogenous entry in a citizen-candidate model.

Work on the interdependencies between lobbying and legislation, assuming rational behavior of interest groups and legislators, is even more scarce. Denzau and Munger (1986) study a reduced-form model where interest groups give contributions to legislators who choose effort on different legislative activities so as to maximize expected votes. Groseclose and Snyder (1996) study a game where two lobbies buy votes from legislators who will take a decision on a public project. Subsection 11.3 draws on Helpman and Persson (1998).

Part III
Comparative politics

We often take it as given that democratic countries are representative, rather than direct, democracies. Yet, at a deeper level, the rationale and the implications for the delegation of *control rights* to elected office holders, rather than the delegation of mere administration, are not well understood. We may broadly consider the underlying reasons for delegation to be costly acquisitions of information. Unless the preferences of the citizens and their elected leaders are completely aligned, however, delegation of political control rights creates a principal-agent problem between the voters and their elected representatives. To minimize the adverse consequences of this agency problem then becomes one important role of the constitution.

The principal-agent relationship between voters and representatives entails some special features not always present in the agency problems typically studied by economists. First, voters are constrained to offer implicit rewards, through reappointment at elections, rather than explicit monetary incentives. Second, and more important, unbiased enforcement of detailed political contracts between politicians and voters at large may be problematic or impossible. Politics is the source of supreme authority: a constitutional court would lose its legitimacy if it had to rule on detailed policy issues, and the appointment of unbiased judges could be difficult if their deliberations had a direct impact on the electoral success of one or the other of the political contenders. Third, an explicit contract between

political representatives and voters may be unfeasible due to the complexity of the issues and the number of parties involved. Whatever the reasons, in the real world, we do not observe complete constitutional contracts between voters and representatives. Political constitutions are typical examples of *incomplete contracts:* they allocate control rights over policymaking to different individuals or groups, in the same way as incomplete contracts allocate control rights to different stakeholders—such as equity holders, debtors, and managers—in a firm (Hart (1995)). The study of comparative politics then becomes an investigation of how government policy decisions are shaped by the specific assignment of the proposal, amendment, veto and gate-keeping rights by the political regime, as well as the specific assignments of appointment rights by the electoral rule.

In this last part of the chapter, we discuss how this incomplete contract perspective can be applied to public finance, paying particular attention to the agency-incentive problems. We are not interested in finding the optimal allocation of control rights, but rather in understanding the consequences of alternative forms of incomplete contracts for policy choices. Comparative politics, that is, the comparison of alternative political constitutions, thus amounts to a comparison of alternative allocations of control rights over policy decisions. Even though the language is somewhat different—and the precise rationale for the delegation is rarely spelled out—such an agency and incomplete contract approach is really at the core of the public-choice tradition, stemming from the seminal work of Buchanan and Tullock (1962); again, Mueller (1989), (1997) survey the earlier literature. As in Part II, the more recent contributions are more explicit in spelling out specific constitutional details, and have gone further in assuming rationality by political actors.

We introduce the political agency problem in Section 12: elected representatives choose the supply of public goods and taxation, but can divert resources from the voters at large. All voters are alike and always unanimous. Thus, throughout the section, we exclusively focus on the conflict of interest between politicians and voters at large. In subsection 12.1, we start by asking whether the agency problem disappears if politicians can enter into binding and detailed commitments over economic policy. A finding which might be surprising is that agency rents are not necessarily dissipated, even in such an ideal environment. In particular, if competing political candidates with identical electoral platforms remain different in the eyes of the voters, at least in a probabilistic sense, rent dissipation is incomplete, and politicians can get away with some rents. Subsection 12.2 turns to an incomplete contract set-up, where binding electoral commitments cannot

be enforced and policy is chosen discretionally, once in office. Adapting the arguments in Barro (1973) and Ferejohn (1986), we show that elections take on a new role: rather than selecting the best policy platform, elections create incentives for office-seeking politicians to behave in the voters' interest. But elections are not the only means of preventing abuse of power. As the founding fathers of the US constitution understood long ago, appropriate allocation of control rights - appropriate checks and balances - are also important. Following Persson, Roland and Tabellini (1997), we illustrate how to analyze these fundamental issues in political theory in subsection 12.3. The main result is that "separation of powers", that is a specific allocation of proposal and veto rights, reduces equilibrium rents captured by politicians. The reason is that separation of powers creates a conflict of interest between elected officials. This is exploited by the voters, in order to limit the abuse resulting from contract incompleteness or asymmetric information.

In section 13, we continue to assume that electoral promises cannot be enforced, but we drop the assumption that voters are unanimous. Now, policy can redistribute among voters, and different groups of voters seek to exploit the policymaking process to their advantage. As in section 12, politicians can extract rents, so that there is a conflict between voters at large and politicians, as well as among the politicians competing for these rents. We thus have a complicated multi-principal, multi-agent problem with conflicts in three dimensions: between voters and politicians, among voters, and among politicians. Drawing on recent work by Diermeier and Feddersen (1998) and Persson, Roland and Tabellini (1998a), we contrast some stylized constitutional features of presidential and parliamentary democracies. The assignment of control rights over legislation differs across these two regimes, which leads to very different equilibrium policy choices. This approach is only in its infancy and we are still very far from a systematic knowledge of how different constitutional features shape fiscal policy choices. Given the challenges for positive public finance listed at the outset of the chapter, however, the comparative politics approach holds very high promises and suggests a rich agenda for future research.

The issues discussed in this last part suggest many interesting institution-design questions, both positive and normative. How should constitutions be designed? Why do we observe the existing constitutions in different countries in the Western world? Are the theoretical predictions associating constitutional form and policy choice consistent with cross-country and time-series evidence mentioned in the General Introduction? At the current state of knowledge we have few, let alone satisfactory, answers, to such fundamental questions. But we add a

few brief remarks on how one might think about them in the last section of the chapter.

12. Agency costs and checks and balances

To analyze agency problems between voters and politicians in as simple and stark form as possible, we disregard all conflicts of interest between different groups of voters. Thus, there are no redistributive instruments and all voters share the same preferences, namely:

$$u = c + H(g) = y - \tau + H(g),$$

The notation is as before, with g now denoting a public good benefitting all voters. Population size is N and the government collects total tax revenue $N\tau$, which is used in the production of the public good. This production process allows politicians in office to appropriate some rents or squander some resources, r. These rents benefit politicians at the voters' expense. We thus write the budget constraint

$$g = N\tau - r,$$

where the size of r is also a policy choice. For example, we may think of r as a direct diversion of resources for private gain, as non-cost effective defense purchases benefitting the office holder or his friends, or as building a bridge in the wrong place for most voters, but in the right place for a small group of benefactors. Due to unmodeled transaction costs, politicians only appropriate a fraction γ, $0 < \gamma < 1$, of the resources r diverted from the provision of the public good, the rest is wasted. The size of these transaction costs could be determined by the transparency of the policy making process, or by other institutional features relating to the execution of the budget, but here we just treat it as a parameter. Finally, we restrict g, τ and r to be non-negative.

Clearly, without the agency problem, the optimal policy from the viewpoint of the voters would always set $r = 0$ and have public goods fulfill the Samuelson criterion:

$$NH_g(g) = 1. \tag{12.1}$$

We now ask how far elections can go in enforcing this allocation.

12.1. Electoral competition

A natural idea is that electoral competition between office-motivated candidates would discipline these and limit rent extraction (Wittman (1989)). It turns out that this only holds under special circumstances, namely if: (a) binding electoral promises are feasible, and (b) the two candidates are identical and hence perfect substitutes in the eyes of the voters. Throughout this subsection, we retain the assumption of full commitment during the electoral campaign, and illustrate the role of perfect substitutability between the candidates. We thus assume the following timing: (i) Both candidates simultaneously announce a policy platform. (ii) Voters vote for the candidate who gives them the highest expected utility; if indifferent, they toss a coin. (iii) The policy platform of the winning candidate is implemented. Thus, we implicitly say that there is an independent and benevolent judiciary who can fully enforce the campaign promises of both candidates. This commitment assumption is dropped in the next subsection.

Consider first a Downsian setting, like in the major part of Part I: two *identical* office-motivated candidates (parties), $I = L, R$, compete for votes in nation wide-elections. They both maximize:

$$\mathsf{E}(v^I) = p^I(\gamma r + R). \tag{12.2}$$

where $\mathsf{E}(.)$ is the expectations operator taken over election outcomes, p^I is the probability that party I wins the election, and $R > 0$ is an exogenous benefit from holding office, to be considered as some basic salary plus any ego-rents and additional prestige associated with political leadership.

The solution is simple. Both candidates are driven to promise the efficient policy and to completely abstain from any diversion: $r = 0$. As the voters always elect the candidate with the most efficient policy platform, competition over the exogenous rents, R, drives the endogenous rents r to zero. In the unique equilibrium, both candidates resign any claim on r to preserve a chance to claim at least R. Here, the Chicago school claim is correct and the equilibrium is efficient. In this case, representative democracy works as a complete contract, and the delegation to an elected politician does not mean that voters have allocated control rights over policy in any meaningful sense.

Even with full commitment, efficiency breaks down if the two candidates are perceived as different over some dimension by the voters, and hence as imperfect susbstitutes. To illustrate this point, originally due to Polo (1998) and Svensson (1997a), consider the setting of a probabilistic voting model, as in section 10.

The two candidates now differ in some fixed ideological dimension. For simplicity, we continue to suppose that all voters are alike and evaluate these ideological party differences in the same way.[63] As in section 10, the voters' (aggregate) ideological preferences are unknown to both parties, when policy platforms are announced. Thus, from the parties' point of view, their average popularity is a random variable, $\widetilde{\theta}$. Using the same notation as previously, all voters prefer party R if $\widetilde{\theta} < W(g^R, r^R) - W(g^L, r^L)$, where $W(g^I, r^I) \equiv y - (g^I + r^I)/N + H(g^I)$ denotes the voters' indirect utility function, given the economic policy announced by party I. We continue to assume that $\widetilde{\theta}$ is uniformly distributed on $[-\frac{1}{2h}, \frac{1}{2h}]$. The perceived probability of winning for party R is thus:

$$p^R = \frac{1}{2} + h\left[W(g^R, r^R) - W(g^L, r^L)\right] \tag{12.3}$$

Faced with this election probability, candidate R sets policy to maximize expected overall rents in (12.2) and so does candidate L, with $p^L = (1 - p^R)$. By symmetry, both candidates choose the same platforms, exactly as in Section 10.

What does the equilibrium policy platform look like? It is straightforward to show that spending on public goods is always socially optimal.[64] But efficiency does not also extend to rent extraction. For this purpose, consider the first-order condition for r^R, subject to (12.3) and evaluated in equilibrium:

$$\begin{aligned} \frac{\partial[\mathsf{E}(v^R)]}{\partial r^R} &= (R + \gamma r^R)\frac{\partial p^R}{\partial r^R} + p^R\gamma = \\ -(R + \gamma r^R)\frac{h}{N} + \frac{1}{2}\gamma &\leqslant 0 \quad [r^R \geqslant 0] \ , \end{aligned}$$

where the second equality follows from $W_r = -1/N$ and $p^R = \frac{1}{2}$ in equilibrium. The second row states the complementary slackness condition for r. We can rewrite the latter as:

$$r = \ \text{Max}\ [0, \frac{N}{2h} - \frac{R}{\gamma}] \ . \tag{12.4}$$

[63] Voter heterogeneity does not change the results, though it adds other implications; see Polo (1998) and Persson and Tabellini (1999)

[64] Taking the first order condition of (12.2) for g^R, given(12.3), we get:

$$\frac{\partial[\mathsf{E}(v^R)]}{\partial g^R} = (R + \gamma r^R)\frac{\partial p^R}{\partial g^R} = (R + \gamma r^R)hW_g(g^R, r^R) = 0 \ .$$

As $W_{gr} = 0$, the spending on public goods is socially optimal, whatever the level of r.

Thus, equilibrium rents can be positive, which is more likely if the value of winning the election per se is low (i.e. R is low), transaction costs γ are low, or electoral uncertainty is high (h is low). Why are rents not competed away, as in the Downsian model? The reason is that the two candidates are no longer identical in the eyes of the voters, and hence, the election outcome does not only depend on the announced economic policy. Both candidates are not sure whether announcing bad economic policies would be punished by the voters. In the Downsian setting, if one candidate announced larger rents than his opponent; his probability of winning would discontinuously jump to 0. Electoral competition would then lead to full rent dissipation. Due to electoral uncertainty, the probability of winning here instead falls at the finite rate h for a marginal increase in rents. The more uncertain is the election outcome (the lower is h), the larger is the scope for rent seeking.

In this probabilistic voting model, equilibrium public goods are efficiently provided. But equilibrium rents may be positive, implying that voters pay more than the efficient amount of taxes. It is feasible to think of the rents as associated with inefficiency in the production of public goods. In this interpretation, observed spending becomes suboptimally high. The model thus implies that, ceteris paribus, we should observe an association between rents cum high and inefficient government spending, on the one hand, and ideological dispersion or electoral uncertainty, on the other.

12.2. Electoral accountability

Up to this point, we have assumed that any promise by politicians can indeed be enforced. This is a strong assumption, particularly as elected politicians appoint members of the judiciary and are capable of altering the legal code, thereby making enforcement harder. If no outside enforcement is possible, the model of the previous subsection yields a disastrous equilibrium for voters. Once in office, any elected candidate follows a "Leviathan policy", where voters are fully taxed and no public good is delivered: $g = 0, \quad \tau = y, \quad r = \gamma N y$.

An obvious counterargument is that a politician who engaged in such outrageous behavior would completely ruin her reputation and would never be re-elected. But note the implication; "never re-elect" must mean that voters now look *backwards*, not *forward.* That is, elections perform the role of a disciplining device, once policy has been chosen, rather than selecting among alternative policies, as assumed so far. Good policies are rewarded by re-appointment, bad

policies are punished by refusing re-election. In this subsection, we illustrate this alternative role of elections, following the original insights of Barro (1973) and Ferejohn (1986).

To study retrospective voting in our one-period model, we change the timing of events: (i) Voters set a reservation utility for re-electing the incumbent (see below). (ii) The incumbent policymaker freely sets policy; policy choices are observed by everybody. (iii) Elections are held, with the voters choosing between the incumbent and an opponent.

The different timing requires a reformulation of the incumbent's objective:

$$\mathsf{E}(v^I) = \gamma r + p^I R \ . \tag{12.5}$$

This reflects the incumbent policymaker's full discretion over current rents, r. What is at stake at the election are future rents, R, which now have the interpretation of the expected present value of holding office from the next period and onwards. Here, we continue to treat R as an exogenous parameter and neglect intertemporal discounting. But in a full intertemporal setting, R would be determined by the model.[65]

At the election stage, the voters perceive no ideological differences between the incumbent and the opponent: the two candidates are identical in the eyes of the voters, except for their past histories. We assume that voters coordinate on the same retrospective voting strategy, punishing the incumbent for bad behavior and rewarding her for good behavior. This voting strategy boils down to setting the re-election probability p_I as follows:

$$p_I = \begin{cases} 1 & \text{if} \quad W(g,r) \geq \varpi \\ 0 & \text{otherwise} \ , \end{cases} \tag{12.6}$$

where $W(g,r)$ is the voters' indirect utility from the observed policy defined in the previous subsection and ϖ is their reservation utility - below, we discuss how this is chosen.

This voting strategy creates a trade-off for the incumbent. When setting policy at stage (ii), she really has two alternatives. One option is to please the voters, giving them a policy which, under (12.6), is rewarded with re-election and the payoff R. In this case, the incumbent obviously wants to satisfy voters in the

[65] Ferejohn (1986) embeds a related one-period game in an infinite-horizon setting with exogenous benefits from office. Persson, Roland and Tabellini (1997) endogenize the future benefits from office R, as the expected present value of endogenous rents from office r in future periods.

cheapest possible way, which implies choosing an efficient policy and keeping any slack as rents γr for herself. The total payoff is $v = \gamma r + R$. The other option is to ignore re-election altogether and instead myopically maximize her rents in the manner of a Leviathan policymaker. This implies maximum taxation ($\tau = y$), no public good provision ($g = 0$) and maximal rents ($r = \gamma N y$). Therefore, the incentive constraint under which the incumbent finds it (weakly) optimal to please the voters is: $\gamma r + R \geq \gamma N y$. The voters cannot enforce lower rents than implied by this incentive constraint, but they clearly want it to be satisfied with equality. The minimum rent voters must collectively give up, in order not to trigger a myopic diversion, is thus:

$$r^* = Max \left[0, Ny - \frac{R}{\gamma}\right]. \tag{12.7}$$

>From the government budget constraint $g^* + r^* s\ Ny$ (the maximum τ is given by y). For g^* to be affordable in equilibrium, it follows from (12.7) that we need

$$g^* \leq \frac{R}{\gamma}, \tag{12.8}$$

a condition we assume to be satisfied. Under this condition, voters obtain the optimal level of public goods, but if the right-hand side of (12.7) is positive, they must give up some rents.

Some implications are similar to those in the previous subsection. As in that case, higher intrinsic value of public office (higher R) or higher rent-extraction costs (low γ) contribute to keeping equilibrium rents down. But rents are now higher if the tax base is higher (y higher). This reflects the different source of rents in the current set-up, namely the discretion resulting from contractual incompleteness. A larger available tax base makes this discretion more threatening and the voters must give up more rents.

If the game is infinitely repeated, there are additional implications Equilibrium rents also depend on the probability that, if ousted by the voters, a cheating politician can be re-elected in some future period. Interpreting such a probability as barriers to entry in the political arena, one gets the implication that higher barriers (i.e., a higher probability of re-entering political competition) weakens the disciplining role of elections and increases equilibrium rents. Ferejohn (1986) and Persson, Roland and Tabellini (1997) also consider a stochastic setting, where the voters' utility for a given policy is random - for instance, the cost of producing the public good, or its value, vary with the state of nature. If the policymaker

can observe the state of nature but the voters cannot, then she can exploit his information advantage by grabbing more rents. The equilibrium now has a bang-bang property: if the state of nature is favorable and the voters are easy to please, the incumbent seeks re-election; in unfavorable states of nature, on the other hand, pleasing the voters is too costly, and the incumbent grabs as much rents as possible knowing that she will then be ousted by the voters.

12.3. Separation of powers

Once we begin to ask how to discipline opportunistic politicians, it is natural to consider other features of political institutions serving this purpose. These are old questions: ideas about the importance of constitutional checks and balances to prevent the abuse of political powers go back at least to Montesqieu and Locke, and played an important role in the federalist debate preceding the adoption of the US constitution. The principle of separation of powers, in particular, is, to some degree, incorporated in all democratic constitutions of the Western world. In this subsection, we show how a specific allocation of proposal and veto powers across different office holders may indeed make politicians more accountable to the voters. The result, due to Persson, Roland and Tabellini (1997), is similar to that already discussed in section 8.2 with regard to overall spending. Here we adapt it to the example of this section, and show that sequential decision making and separation of powers also reduces equilibrium rents.

There are two political offices, the holders of which are both simultaneously subject to re-election. We can consider these offices in different ways: as two legislative chambers, or as the executive and the legislative branch of government. In line with the latter interpretation, we label them the Executive, X, and the Legislature, L. The general structure of the model is the same as in the past subsection. But the voters now choose retrospective voting strategies for X and L separately. Total rents from office are split between the two office-holders: $r^L + r^X = r$, and a specific policy decision must be made with regard to the allocation. Each incumbent office holder has an objective like (12.5)

$$\mathsf{E}(v^I) = \gamma r^I + p^I R^I,$$

except that I now refers to the office holders, $I = X, L$, rather than to competing parties, and R^I is the exogenous benefit of reappointment for the politician holding office I.

Consider a constitutional arrangement which, like in subsection 8.2, imposes sequential decision making and separates sharp proposal powers over two policy di-

mensions. Specifically, consider the following game. (i) Voters choose a retrospective voting rule. (ii) The incumbent X proposes a tax rate τ. (iii) If the incumbent L approves, then τ is implemented, otherwise a default tax rate $\tau = \bar{\tau} > 0$ is implemented. (iv) The incumbent L proposes a spending allocation $[g, r^L, r^X]$, subject to the tax rate from the prior stage: $g + r = N\tau$. (v) If X approves the proposal by L, it passes; if not, a default allocation $\bar{g} = \tau - \bar{r}^L - \bar{r}^X \geq 0,\ r^L = \bar{r}^L,\ r^X = \bar{r}^X$ is implemented. (vi) Voters observe g and τ. (vii) Elections are held where each incumbent runs against an identical opponent.[66]

Sticking to the main interpretation, this arrangement thus implies a specific separation of political powers between the president and Congress in a presidential democracy. But it could also be interpreted as a separation of powers between the members of different standing committees in a congressional setting, or between different ministries in a parliamentary setting. Its effect is to strengthen the voters' ability to hold politicians accountable, thereby limiting equilibrium rents. If the two politicians have strong enough re-election incentives (in the sense specified below), voters can actually achieve the optimal solution with $r = r^L = r^X = 0$ and $g = g^*$.

To see why, suppose that voters have indeed adopted a demanding voting rule, conditioning the re-election of both incumbents on receiving first-best utility:

$$\begin{aligned} p^I &= 1 \ for \ I = X, L \text{ iff} \\ W &\geq y - \frac{g^*}{N} + H(g^*). \end{aligned}$$

What are the incentives of the two office-holders at the expenditure decision stages (iv)-(v)? Their only chance of getting re-elected is if taxes have been set at the right level $\tau = g^*/N$ at the taxation stage (ii)-(iii). If so, L can either propose $r = 0, g = g^*$ and satisfy the voters, or else divert everything, setting $r = N\tau = g^*$. The former choice gives L the payoff R^L and X the payoff R^X. Full diversion requires giving X at least $\gamma\bar{r}^X$ —as X knows she will not be re-elected, she requires at least the default payoff not to veto a diversive proposal—making the net payoff of L equal $\gamma(g^* - \bar{r}^X)$. Clearly, L prefers pleasing the voters if:

$$g^* \leq \frac{R^L}{\gamma} + \bar{r}^X. \tag{12.9}$$

[66] Note that the rents in the second-stage default, $\bar{r}$ and $\bar{r}^L$, are fixed numbers and do not depend on the first-stage decision. This is essential for the results stated below. As discussed later, separation of powers is only helpful under appropriate budgetary procedures, and our formulation of the default outcome is an essential part of these procedures.

Does X have appropriate incentives to propose the right level of taxes at stage (ii)-(iii)? If she proposes $\tau = g^*$ and (12.9) holds, then L will please the voters and X gets R^X. If she sets any other tax rate, L (who then cannot please the voters anymore) proposes maximal diversion and, according to the argument above, X nets $\gamma\sigma^X$. Thus, it is better for X to go along with the voters, if

$$\bar{r}^X \leq \frac{R^X}{\gamma}. \tag{12.10}$$

Finally, it is always better for L to accept such a proposal, unless the default level of taxes is too high.[67]

If the value of office is high enough, in the sense that both (12.9) and (12.10) hold, the voters may thus credibly insist on the politicians delivering the unconstrained optimum. Adding these two conditions and using (12.8), a sufficient condition for full optimality is that the total value of office under separation of powers is at least as high as that without it: $R^L + R^X \geq R$. The agency problem of the previous section is thus completely eliminated, in the sense that equilibrium rents fall from r^* to zero.

Why does separation of powers strengthen accountability in this drastic way? The key is to deprive L, who controls the allocation of rents, of proposal power over the size of the budget. The agent with proposal rights over taxes, X, is *not* a residual claimant on tax revenue, as L captures any additional rents created by higher taxes. This removes the conflict of interest between X and the voters. The only means whereby X can earn re-election is to set taxes at the level desired by the voters. A single office-holder, instead, is always a full residual claimant on tax revenues; she can therefore threaten the voters with maximal diversion ($r = N\tau = Ny$); to avoid this Leviathan-like outcome, the voters must leave her some rents.

Note that separation of proposal powers is not enough in itself, however. It must be accompanied by appropriate checks and balances, also involving the allocation of amendment and veto rights. In this model, X only has veto rights, and is therefore nailed to its status quo payoff by the take-it or leave-it proposal by L in the last stage. This makes for a strong conflict of interest between X and L, that can be exploited by the voters. A more open bargaining procedure with amendment rights for X would make her a residual claimant on taxes and align

[67] After a veto, leading to the tax rate τ^S, L will always make a diversive proposal at the next stage, giving her a payoff of $\gamma(N\tau^S - \sigma^X)$. Thus a sufficient condition for L not to veto, given that the incentive compatibility condition above holds, is that $\tau^S \leq g^*/N$.

the interest of the politicians against the interest of the voters. In this case, the benefit of separation of powers would be lost. In fact, separation of powers could even be detrimental for the voters, if it creates a common pool problem among the two expected officials. This would happen if veto rights were removed and X and L could unilaterally determine how much to divert for themselves, r^X and r^L, with taxes or public consumption residually determined. Persson, Roland and Tabellini (1997) show that, in this case, equilibrium rents would be even higher than with a single policymaker. To put it differently, accountability can only work well if it is clear who is responsible for an observed abuse of power. The results in this section thus reinforce the general message anticipated in subsection 8.2, about the importance of appropriate budgetary procedures and the virtues of two-stage budgeting.

Separation of powers can also serve another purpose, namely to facilitate revelation of information to the voters. As discussed at the end of the previous subsection, private information enables politicians to earn informational rents in some states nature. But separation of powers creates a conflict over the allocation of these rents, which helps the voters. In general, informational rents are earned by whoever has proposal powers over the allocation of spending, as he becomes the residual claimant on additional resources. This implies, however, that the other politician has no incentive to lie. In general, as shown by Persson, Roland and Tabellini (1997), the weak office holder's interests are aligned with those of the voters, who can then hold the powerful office holder accountable. Giving sharp proposal rights creating a conflict of interest between office holders enables the voters to eliminate all informational rents.

More generally, political accountability is more easily achieved if the constitution unambiguously allocates certain control rights to certain political offices. Naturally, this presupposes that separation of powers can be enforced, and that office holders do not re-allocate these control rights in other ways, for instance through collusive agreements.

12.4. Notes on the literature

The question of whether electoral competition induces opportunistic politicians to pursue efficient policies is an old one. The optimistic "Chicago school" is well represented by Stigler (1972) and Wittman (1989). For a more pessimistic view representing the "Virginia School", see Buchanan and Tullock (1962).

The model of electoral competition in a probabilistic voting model (subsection

12.1) draws on Svensson (1997a), Polo (1998), and Persson and Tabellini (1999). These papers also discuss various comparative statics results, relating the size of equilibrium rents to political features such as the number of parties (Polo), the disagreement among voters (Svensson, Polo, Persson and Tabellini), the electoral system (Persson and Tabellini). Svensson (1997b) presents preliminary empirical evidence that electoral accountability works less well in politically polarized countries: such countries have higher government spending, but appears to have a less efficient public sector and lower growth. Mauro (1998) and Tanzi and Davoodi (1997) ask how corruption correlates with the composition of public spending in a large cross section of countries.

Electoral accountability was first discussed in a principal agent framework by Barro (1973) and then by Ferejohn (1986). Seabright (1996) stresses the incomplete contract view and discusses electoral accountability by comparing different degrees of centralization in a federation. The model of sections 12.2 and 12.3 draws on Persson, Roland and Tabellini (1997), who emphasize the benefits of separation of powers. Separation of powers has also been discussed by Laffont and Martimort (1998), with regard to regulation by supervisory agencies. Laffont (1998) provides an excellent survey of the recent literature on collusion with politically motivated agencies.

Finally, there is a very large literature on incomplete contracts; for surveys see Hart (1995) and Tirole (1998). Beyond the papers mentioned above, Aghion and Bolton (1998) also discuss how to view constitutions as examples of incomplete contracts.

13. Constitutional determinants of public finance

So far, we have deliberately simplified the voters' task of holding their political agents accountable, by assuming that policy cannot redistribute between voters. We now relax this assumption, and allow economic policy also to redistribute among groups of voters. We continue to assume that binding electoral promises are not enforceable, and that elected politicians have the discretion to choose policy through legislative bargaining. Thus, we study policy choice in a genuine multiple-principal-multiple-agent setting. We now have conflict of interests running in three dimensions: between voters and politicians at large, over the size of aggregate rents; among voters, over the distribution of income; and among politicians, over the distribution of rents. How does the equilibrium provision of public goods to voters and rents to politicians interact with equilibrium redistribution

across different groups of voters? And how do the control rights laid down by different constitutions shape equilibrium policy in this richer setting? To try to answer these fundamental and difficult questions, we compare the equilibria under alternative stylized constitutions. Our goal is to capture some stylized features of presidential-congressional and parliamentary systems, respectively. We merge the analysis of the previous section with the legislative bargaining approach of Section 8. Our stylized model of a presidential system, the defined responsibilities of politicians more clearly leading to more separation of powers. The stylized model of a parliamentary system, on the other hand, entails stronger incentives to form stable and broad coalitions. The presidential system therefore has more conflict among politicians as well as among voters. As we shall see, some earlier insights survive, but new results appear. It remains valid that separation of powers helps the voters control the agency problem: equilibrium rents are smaller in the presidential system. But more conflict also has costs, in that presidential system supply less public goods and more targeted redistribution compared to the parliamentary system. The section draws on Diermeier and Feddersen (1998) and Persson, Roland and Tabellini (1998a).

There are three groups of voters, $J = 1, 2, 3$, all of size (mass) unity. Groups coincide with electoral districts, and each is represented by a single legislator, $l = 1, 2, 3$. Voters in district J have preferences

$$w^J = c^J + H(g) = y - \tau + f^J + H(g), \tag{13.1}$$

where the notation is the same as previously, except for f^J which denotes a lump-sum transfer to voters in district J. Even though voters only care about their net taxes (transfers), $\tau - f^J$, it is still important to distinguish between τ and f^J, because the control rights over taxes and transfers are allocated to different politicians. As before, g denotes a general public good benefitting all voters.

We continue to assume that politicians can appropriate rents, and must choose how to allocate these through a legislative decision. Denoting by r^l the rents captured by legislator l, we write the government budget constraint as

$$3\tau = g + \sum_J f^J + \sum_l r^l = g + f + r, \tag{13.2}$$

where f denotes aggregate transfers. Items in the government budget constraint must all be non-negative.

Clearly, the social optimum for any symmetric (and strictly concave) social welfare function defined over the utility of voters, but not incorporating the rents

to politicians, is to eliminate rents setting $r^l = r = 0$, and to provide public gods in accordance with the Samuelson rule, $3H_g(g^*) = 1$. Net taxes $\tau - f^J$ should be equal across groups, implying $f^J = \frac{f}{3}$, even though optimal gross transfers are indeterminate. With a tiny bit of tax distortions, however, $f = 0$ becomes optimal.

But policy choice is delegated to politicians, not to a benevolent social planner. As before, we assume that legislators maximize the sum of the endogenous and (future) exogenous rents in office

$$v^l = \gamma r^l + p^l R,$$

where p^l is the probability that legislator l is reappointed. For simplicity, the exogenous rents from office, R, are assumed to be equal for all incumbent law makers. Voters hold the incumbent law-makers separately accountable through the adoption of retrospective voting strategies. The incumbent legislator runs against an identical opponent in elections, which are held in each district after policy choices have been made.

We now discuss two different assignments of control rights over economic policies.

13.1. Congressional system

In subsection 12.3, we illustrated the benefits of separation of power for holding politicians accountable. But what are the effects of separation of powers when there is also a conflict of interest between voters, and legislators must choose between a policy benefitting all voters (public good provision) or some groups only (as with redistribution) ? This is the question addressed in this subsection. It is motivated by the features of a congressional-presidential system like that of the US, which has considerable separation of powers: different congressional committees hold proposal powers over legislation in different policy dimensions, and the President has veto power. To capture these features, we study a two-stage budget procedure where the proposal powers on taxes and on the allocation of spending are allocated to two different legislators. We thus abstract from the president and his veto powers, but these could be introduced without changing the thrust of the main results. We could further split the proposal power over spending further, giving each of the three legislators some agenda-setting privileges, without changing the main results.

The policy game studied has the following timing. (i) Two different agenda-setters, a_τ and a_g, the "finance committee" and the "expenditure committee",

are appointed among the three legislators. (ii) Voters set the cut-off utilities ϖ^J in their re-election rules optimally, conditional on the status of their legislator. (iii) a_τ proposes a tax rate τ. (iv) Congress votes: if approved by a majority, the tax proposal becomes law; if not, the default tax rate is $\bar{\tau} > 0$. (v) a_g proposes $g, \{f^J\}$ and $\{r^l\}$ subject to $3\tau \geq g + f + r$. (vi) Congress votes: if rejected by a majority, the default allocation is $g = 0, f^J \equiv \tau - r^l \geq 0, r^l = \bar{r}^l$. (vii) Voters observe everything and elections are held.

As in subsection 12.3, there are thus two agenda setters. Policy decisions are made sequentially, first on the overall size of government and then on the allocation of spending. Not only are proposals sequential, but so are Congressional votes. Specifically, spending proposals in the second stage are constrained by the outcome of Congressional votes over tax revenues.

To understand the features of the equilibrium, we can draw on several results in previous sections.[68] In the last stage, the expenditure committee a_g just needs the support of one more legislator. Hence, as in Section 8, she seeks a minimum-winning coalition. Moreover, she seeks the support of the legislator who is "cheapest to buy", in the sense of demanding least for her constituency. Thus, voters in districts $J \neq a_g$ behave like the lobbies in section 11.2: they are engaged in a "Bertrand competition" for the spoils allocated by a_g. Given that they pay taxes anyway, they are better off getting some transfers, however small, rather than zero. Hence, not to be excluded from the majority coalition, they reduce their reservation utilities until their demand for redistribution are driven to zero. Any equilibrium thus has $f^J = 0$ if $J \neq a_g$.

This leaves a_g free to please her voters, for all redistributive transfers go to her district ($f^J = f$ if $J = a_g$). The public good is then traded off against redistribution, one for one. This leads to severe under-provision of the public good, since only one third of the social benefits are internalized. Specifically, in equilibrium[69]:

$$g = \widehat{g} \equiv H_g^{-1}(1).$$

What about equilibrium rents? As in subsection 12.3, the maximum threat legislator a_g can impose on the voters is to go for the maximum diversion, $r^d =$

[68] In the following, we just sketch the argument leading to the results. The reader is referred to Persson, Roland and Tabellini (1998a) for a formal derivation in a similar (but more complex) set-up.

[69] In deriving this expression, we need to assume that the non-negativity constraint on transfers to the voters in $J = a^g$ is not binding. It can be shown that this assumption can be stated as $\widehat{g} = H_g^{-1}(1) \leq \frac{R}{\gamma} + \bar{r}$.

3τ. Having bought the vote of one more law-maker, she would be left with a payoff of $\gamma(3\tau - \bar{r})$. Alternatively, she can satisfy the voters. Given that re-election is worth more than the default payoff to the other legislators and that her proposal is consistent with the cut-off utilities demanded by the voters in the other districts (i.e. a condition like (12.10) holds), a_g is not obliged to pay any of the other legislators off with a positive r^J. Thus, pleasing the voters gives her the net payoff of $\gamma r + R$. The incentive constraint on the minimum rents in stage (v) thus becomes:

$$r \geq Max[3\tau - \frac{R}{\gamma} - \bar{r},\ 0]. \tag{13.3}$$

Finally, what are the incentives for the taxation committee a_τ and the voters in the corresponding district at the taxation stage (iii)? As *voters* in district a_τ do not receive any transfers, they would like τ to be as low as possible, consistent with $\widehat{g}$ being financed. These interests are well aligned with those of *legislator* a_τ, for she is not a residual claimant on taxes, by our assumption—the sole residual claimants on additional revenue being legislator a_g or her voters. Voters in district a_τ will thus insist on the minimal tax rate, $\tau = \widehat{g}/3$, implying that $r = f = 0$. Assuming as above that $R > \gamma\bar{r}$, it is optimal for a_g to go along with $r = 0$ in equilibrium. Similarly, voters in district $J \neq a_g, a_\tau$ have no reason to demand higher taxes from their legislator. The equilibrium is thus supported by voting rules with cut-off utilities:

$$\varpi^J = y + H(\widehat{g}) - \frac{\widehat{g}}{3}$$

for all voters.[70]

We can summarize the properties of the congressional equilibrium as follows: First, taxes, rents and redistributive transfers are minimized: $\tau = \widehat{g}/3$ and $r = f = 0$. This follows from voters exploiting the separation of powers property of the congressional institution and from our assumption about the default outcome.[71] Second, public goods are severely underprovided: $H_g(\widehat{g}) = 1 > \frac{1}{3} = H_g(g^*)$. This is a direct consequence of the strong agenda-setting powers of a minority over the allocation of spending. Even with a larger amount of tax revenues, voters in the

[70] We cannot rule out the existence of other equilibria with the same amount of r and g, but some positive redistribution to voters in $i = a^g$.

[71] If the status quo outcome $\bar{r}^1$ is positively related to τ raised in the taxation stage, it becomes harder to discipline the politicians and, as a result, the equilibrium has $r > 0$ (see Persson, Roland, and Tabellini (1998a)).

district who control the politician enjoying those powers would prefer to direct the available resources towards themselves, rather than sharing them with everyone, through more public good provision. Anticipating this minoritarian orientation of redistributive transfers, voters in the district in charge of taxation keep tax revenues to the minimum necessary to provide the equilibrium amount of public goods.

13.2. Parliamentary system

A central feature of the Presidential-congressional political system described above is the non-stability of legislative coalitions: different coalitions are formed over different issues or at different points in time. This is at the core of the Bertrand competition result, where legislators having control rights over the spending proposal can pit one group of voters against another. In parliamentary systems, on the other hand, disagreement within the majority in the legislature is a more serious business, since it can lead to a government crisis. This creates an incentive for parliamentary coalitions to stick together—political scientists have labeled this feature of parliamentary systems "legislative cohesion". As a result, bargaining power is more evenly shared within the majority coalition. In our model, this is both good and bad for the voters. It is good, because it increases the equilibrium provision of public goods. It is bad because, by weakening separation of powers, it increases the equilibrium rents of politicians. We now formally derive these results in a simple extension of the previous model.

We continue to assume that two different legislators control the proposals on taxes and expenditures, respectively. No vote is taken, however, until both proposals have been made. It is therefore appropriate to identify these legislators with cabinet ministers and the proposal phase with the budget preparation inside the government. Both government coalition partners have veto power over the budget, and a veto triggers a government crisis. This assumption approximates having a vote of confidence attached to the government budget proposal. Obviously, this creates a strong incentive not to break up their coalition.

The new timing is: (i) Nature chooses a pair of representatives, who act as expenditure and finance ministers respectively: (a_g, a_τ). (ii) Voters set their reservation utilities conditional on the status of their legislators. (iii) The finance minister proposes a tax rate τ. (iv) The expenditure minister proposes expenditures $(g, \{f^J\}, \{r^J\})$, subject to the budget constraint and given the proposed tax rate. (v) Both members of government can veto the proposal. If neither of them

does, the proposal passes and subsequently, elections are held. (v') If at least one of them vetoes, the government breaks down and a default policy is implemented with $g' = \widehat{g},\ f' = 0,\ r' = 3y - (\frac{R}{\gamma} + \bar{r})$, $r^{l\prime} = r'/3$, $\tau' = g' + r'$, and with re-election guaranteed for each legislator.

The default policy in (v′) may appear strange at first sight. Its payoffs are designed to match the *expected* payoffs for both voters and politicians after a government crisis in a more complex setting, where a government crisis leads to a new subgame. In this subgame, "a caretaker government"—a single legislator—is picked at random, voters reformulate their re-election rules, the caretaker legislator makes the entire budget proposal, and this is approved or not by the legislature (see Persson, Roland and Tabellini (1998a)).[72] Not studying this subgame explicitly is, of course, a shortcut. But our assumption captures the essential feature, namely that the two government partners recognize that they have valuable agenda-setting powers inside the government and that a breakup is costly.

We now illustrate the equilibrium properties, referring the reader to Persson, Roland and Tabellini (1998a) for a formal derivation. In this parliamentary regime, bargaining power is more equally shared among the coalition partners than in the Presidential-Congressional regime. Hence, in this case, the final allocation splits welfare more equally among voters backing the majority coalition, as well as among their politicians. In particular, the equilibrium allocation of redistributive transfers and public goods must be jointly optimal for voters in the majority coalition. This generally leads to redistribution in favor of a majority, and the benefits of the public goods for the majority are internalized. That is, we have:

$$\begin{aligned} \widehat{f}^J &\geq 0, \quad J = a_\tau, a_g \\ \frac{1}{2} &\leq H_g(\widehat{g}) < 1, \end{aligned} \tag{13.4}$$

with $H_g(\widehat{g}) = \frac{1}{2}$ if $\widehat{f}^J > 0$ for both $J = a_\tau, a_g$.

The equilibrium allocation is not unique, however. Since voters set their reservation utilities simultaneously, welfare can be split among them in many different ways. That is, bilateral monopoly now replaces Bertrand competition in the redistribution game between voters. All equilibria satisfy (13.4). Hence, in all of these equilibria public-good provision is larger than in the Presidential system, and in most of them, redistributive transfers benefit a majority of voters.

[72] A richer model along the lines of Diermeier and Feddersen (1998) or Baron (1998) would have a new process of government formation following a crisis.

On the other hand, equilibrium rents are higher than in the congressional regime, because separation of powers is no longer effective. As in subsection 12.2, the government as a unified actor can impose the maximum threat of setting $\tau = y$ and $f = g = 0$, on the voters and forego re-election. To prevent this, voters must leave some rents to the governing coalition, at least to satisfy the joint incentive constraint: $r \geq 3y - 2R/\gamma$. Clearly, in equilibrium, the incentive constraint always binds, and equilibrium rents are: $\hat{r} = 3y - 2R/\gamma$. This expression is almost identical to (12.7) in subsection 12.2, except that here, the rents from office refer to two legislators rather than one. Aggregate rents are then split among legislators according to their bargaining power, which here reflects their veto rights.[73]

Finally, voters in the majority now benefit from higher taxes, at the expense of the minority. Both legislators in the coalition are also pleased to go along with high taxes. Thus, in equilibrium, a_τ proposes $\widehat{\tau} = y$ and a_g is pleased to accept it; voters in their districts are pleased as well.[74]

The parliamentary equilibrium is thus different from the congressional equilibrium of the previous subsection in several respects. First, rents are unambiguously higher, as their mutual veto rights give both politicians in the coalition some bargaining power. Hence, they are both residual claimants of higher taxes, and voters can no longer exploit the conflict of interests between the legislators to their own benefit. Second, voters in the districts behind the stable majority are also pleased to support higher taxes, as the members of this majority jointly gain at the expense of the remaining minority. This majoritarian redistribution makes it less costly to provide public goods than in the congressional-presidential regime, however, and underprovision is less severe.

From a positive point of view, the analysis implies that parliamentary systems lead to a larger size of government compared to regimes with effective separation of powers and weaker incentives for legislative cohesion, such as presidential systems.

[73] In particular, the finance minister will veto any proposal r^{a_τ} that does not give her at least as much as after a government crisis, namely $r'/3$. Note that politicians are re-elected in equilibrium as well as after the crisis.

[74] The parliamentary equilibrium is supported by the voting strategies

$$\begin{aligned} \varpi^{a_g} &= \widehat{f}^{a_g} + H(\widehat{g}) \\ \varpi^{a_\tau} &= 2\frac{R}{\gamma} - \widehat{f}^{a_g} - \widehat{g} + H(\widehat{g}). \end{aligned}$$

Clearly, as $\widehat{f}^{a_g}$ varies, so does the equilibrium utility of the two groups of voters, reflecting the multiplicity of equilibria.

Persson and Tabellini (1999) find strong empirical support for this prediction in a sample of more than 50 developed and developing democracies. Controlling for other variables, such as per capita income, the degree of openness of the economy, the age composition of the population, and other socio-economic variables, public spending is lower by about 10% of GDP in presidential regimes compared to parliamentary systems. Naturally, the theoretical models are very stylized, and it is a hard task to match the extensive forms of these games with observable institutional features. But the observed difference in spending between presidential and parliamentary systems is so large that the empirical result is likely to be robust to small errors in classifying regime types.

From a normative point of view, the analysis suggests a tradeoff in institution design. In both political regimes, equilibrium policy differs from the social optimum: the institutional features that generate legislative cohesion also increase the rents to politicians, while separation of proposal powers induces legislative competition, and this, in turn, leads to more severe under-provision of public goods. Which distortion is worse depends on the circumstances. The parliamentary system appears better for the voters if the underprovision problem is large (because public goods are very valuable), while the presidential system dominates if the political agency problem is highly relevant (because politicians face small transaction costs in rent extraction, or the punishment from losing the next election is small, for instance due to barriers to entry in the political arena).

13.3. Concluding Remarks

Sections 12 and 13 exemplify a number of interesting questions on how different allocations of political control rights shape equilibrium spending and taxation. A possible counterargument against such a research program in positive public finance is that it might involve a great deal of arbitrariness: "the possible combinations of control rights is infinite and you can prove anything with extensive-form game theory". While this may be a valid criticism against certain theories of industrial organization, we not find it too damaging here. The reason is that constitutional rules are very well established, both legally and historically. Different democracies display a rich variation in the delegation of political control. A wealth of historical, descriptive and legal studies documenting these differences already exists. In other words, the rules—for proposing, amending or vetoing policy proposals, for forming or dissolving governments, or for electing political representatives—defining a particular extensive-form game need not be arbitrary,

but can be given a solid empirical foundation.

Political scientists have done some analytical work, theoretical as well as empirical, on comparative politics. But that work is typically limited to consequences or correlations within the domain of the political system: certain electoral systems are found to be associated with a larger or smaller numbers of "effective parties", presidential systems are found to be more politically unstable than parliamentary systems, and so on. As already mentioned, there is also some work on economic policy, for example on the correlation between different budget processes, different electoral systems and the propensity to run budget deficits. What is lacking is a systematic investigation of how commonly adopted constitutional arrangements shape fiscal policy choices. This kind of investigation sets a very interesting agenda for future research. Aside from the general questions mentioned at the end of the previous section, this agenda also includes other more specific questions. Does the recently adopted presidential line-item veto in the US decrease or increase the equilibrium policy favors granted to special interests? What kind of electoral reform could address the lack of political accountability that seems evident in countries like Japan, Italy or Belgium? Over what policy issues are referenda more likely to be desirable, and when might they be counter-productive? And so on.

Suppose we find mappings, by theoretical and empirical work, between political institutions and policy choices. What do we make of such results? Can we use them for normative recommendation of institutional reform, as hinted at the end of the previous section? Perhaps yes, perhaps no. One view is that this is futile, because constitutions, like policy choices, are endogenous and not subject to easy manipulation. In other branches of economics, like contract theory, information economics, corporate governance, the working assumption is often that observed institutions are efficient. Some researchers have also taken this view of political institutions.

We are sympathetic to the general idea of efficiency-oriented reform, but sceptical to its being used as an overall approach for understanding existing political institutions. Constitutional reforms are rare, due to their large transaction costs they involve. Unanticipated historical events may require new institutions, no matter how well-meaning were the constitutional framers. There is also a second argument. In some rare circumstances—like the US constitutional convention—constitutional reform may have taken place under a veil of ignorance about the future beneficiaries of certain rules. But reform is more often marginal, and reformers are often disinterested framers internalizing the desires of the average

citizen. Rather, they tend to be active politicians who understand the conflicts of interests and participate in the political process after reform has taken place. In terms of our simple example in the previous section, suppose the agency problem dominates the underprovision of public goods from the point of view of the voters' welfare. Then, a constitutional assembly representing the voters at large would prefer a congressional system to limit political rents. But a constitutional choice made by politicians anticipating to be elected as representatives might instead prefer the parliamentary system. Thus, the agency problem re-appears at the level of constitutional choice.

13.4. Notes on the literature

A very large empirical literature by political scientists compares political systems and constitutions. Some recent classics include Bingham Powell (1982), Lijphart (1984), Taagepera and Shugart (1989), Shugart and Carey (1992), Cox (1997). Myerson (1995) surveys some of this literature.

Theoretical research on comparative politics in rational choice models is more scarce and more recent. Even more scarce is theoretical work combining comparative politics and economic policy analysis. Myerson (1993), (1998) and Lizzeri and Persico (1998) and Rivière (1998) focus on electoral law. Laver and Shepsle (1990), (1996) and Schofield (1993) have studied cabinet formation in a spatial setting and with no economic policy analysis. Tsebelis (1995) compares the role of veto rights in alternative political systems, while Huber (1996) studies the role of the motion of confidence in parliamentary systems.

The comparison between parliamentary and presidential-congressional systems in this section draws on Persson, Roland and Tabellini (1998a), (1998b) and Diermeier and Feddersen (1998); see also the work of Baron (1998) on legislative cohesion and government crisis. Breton (1991) also compares some features of parliamentary and congressional systems. Empirical evidence on size of government and public goods in presidential and parliamentary regimes, as well as on majoritian vs proportional electoral systems, is discussed in Persson and Tabellini (1999).

A number of papers have investigated the empirical correlation between political institutions and budget deficits. See, in particular, Roubini and Sachs (1989), Grilli, Masciandaro and Tabellini (1991), Edwards and Tabellini (1994), Alesina and Perotti (1995) and Hallerberg and Von Hagen (1997).

The idea that economic institutions can be studied within the framework of

contract theory, as optimal contractual arrangements, has been debated at length among economists, also contrasting complete and incomplete contracts. Coase (1960), Williamson (1985), Hart (1995), Tirole (1998) and Laffont (1998) express different views on this issue. Some researchers have also taken the view that political institutions can be studied as efficient arrangements. Wittman (1989, 1995) very explicitly applies this to the political system as a whole, while Krehbiel (1987), Krehbiel and Gilligan (1990) and Krehbiel (1991) take a similar approach in their information-based theory of the committee system. The idea that political institutions largely reflect the self-interest of politicians working within the system underlies another approach in the literature, which is common among rational-choice oriented political scientists. These insights go back a long time, but is clearly exposed by Mayhew (1974), Fiorina (1977), and Weingast and Marshall (1988).

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