he spends the money and his popularity is affected. For simplicity, party B's popularity is given by

$$\delta = \tilde{\delta} + h \cdot (C_B - C_A),$$

where C_P represents the sum of the contributions received by party P, namely $C_P = \sum_J O^J \alpha^J C_P^J$, and h is a parameter measuring the campaign's effectiveness. Assume that $\tilde{\delta}$ is uniformly distributed with density on

$$\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right].$$

The timing is as follows. First, each voter observes σ^i and politicians announce their platforms. Second, groups fix their contributions simultaneously. Third, the popularity parameter is realized and the election takes place. Last, the winner's platform is implemented.

a. In each group, characterize the agent who is indifferent between voting for politician A and voting for politician B for given levels of contributions. Determine politician A's vote share as well as his probability of winning the election.

b. From an ex ante perspective, what is the objective function of each member in the group if the latter wants to finance politicians? Determine the optimal contribution per member in each group. Discuss.

c. Determine the platforms politicians select if all groups are willing to contribute (i.e., $O^J = 1$ for all J) or no group contributes (i.e., $O^J = 0$ for all J). What are the contributions in equilibrium? What happens if σ^i has the same distribution in all groups, namely $\phi^J = \phi$ for all J. Discuss.

d. Suppose now that some groups prefer not to finance politicians (i.e., there exists J such that $O^J = 0$). What are the politicians' platforms and which policy is finally implemented? Discuss. Which groups have the strongest incentives to become organized?

4 Agency

To what extent can political representatives exploit their political power to appropriate resources for themselves at the voters' expense? Can the voters discipline politicians just through the implicit incentives elections offer? And how does this depend on the economic and political environment? These are the questions addressed in this chapter.

The conflict of interest between voters and rent-seeking political representatives is an old theme of the public choice (Virginia) school and is perhaps most clearly spelled out in Brennan and Buchanan's (1980) model of the government as a malevolent revenue-maximizing Leviathan. According to the Chicago school, however, the forces of political competition can align politicians' and voters' interests, a point made most forcefully by Wittman (1989, 1995). This chapter picks up this theme by giving political candidates the ability and the incentives to extract rents, in the context of the public finance problem formulated in chapter 3. By a sequence of examples—different variations on this public finance problem—we show that elections generally serve to promote efficiency. But the extent to which rents are eliminated hinges on the assumptions about candidate attributes, enforceability, and information.

These agency issues are discussed in the mode of both preelection and postelection politics. We start in sections 4.1 and 4.2 with the model of electoral competition introduced in chapter 3, where candidates commit to policies ahead of the elections. A central question here is whether electoral competition induces the candidates to announce optimal policy platforms from the voters' viewpoint, or whether they instead announce policies with high taxes and low benefits, implying positive rents for themselves. The answer turns out to depend on the specific assumptions of how electoral competition takes place.

We drop the commitment assumption gradually in section 4.3, discussing the nonverifiability, nonobservability, and nonenforceability of electoral promises. The purpose is to gain some perspective on why it may be difficult for political candidates to commit themselves to a certain policy stance.

Sections 4.4 and 4.5 instead drop the commitment assumption completely, assuming that no electoral promises can be enforced. The political constitution is here viewed as an incomplete contract: politicians have complete discretion once in office, and all the voters can do is to oust them from office at the next elections. The central tension is still between policies that please the voters and rents appropriated by the politicians. But the role of elections is very different than in the first half of the chapter. We discuss two ways in which elections can discipline the incumbent. In the electoral accountability model of section 4.4, citizens vote retrospectively and deliberately punish bad behavior by removing misbehaving incumbents from office. In the career concern model of section 4.5, electoral incentives are more indirect. Economic performance signals the incumbent's competence, and voters reward competence with reappointment. This creates incentives to abstain from rent seeking, to appear more competent and increase the chances of reelection. Section 4.6 summarizes the main results and indicates some unresolved questions.

4.1 Efficient Electoral Competition

Since we want to focus on the agency problem, we add another possible use of tax revenues: government spending can also take the form of "rents" for politicians. Thus we write the government budget constraint as

$$\tau y = g + r, \tag{4.1}$$

where y is average income and r represents rents that benefit politicians but not the general citizen. As in chapter 3, however, r appears directly neither in the citizens' preferences nor in their budget constraint. We can conceptualize these rents in a variety of ways, from party finance to outright diversion of resources for private use in connection with the production of public goods. Whatever the interpretation, we assume that r is nonnegative and bounded: $0 \le r \le \bar{r}$. We start out by assuming that $\bar{r} = y$, that is, the only constraint on rents is the available tax base.

To give an incentive for rent seeking, we assume that the two political candidates value both the (exogenous) ego-rents, R, discussed in chapter 3 and the (endogenous) rents, r, introduced here. Thus, we write the objective function of candidate P as

$$\mathsf{E}(v_P) = p_P(R + \gamma r), \tag{4.2}$$

where E denotes the expectations operator, with expectations taken over the election outcome. The parameter γ measures the transaction costs associated with rent appropriation. We assume throughout that $0 \le \gamma \le 1$. The higher is γ, the lower are the transaction costs for rent appropriation. Transparency of the budget or administrative procedures may be important determinants of these transaction costs, but they are not part of the analysis, and hence γ is exogenously given. Otherwise, the economic model is the same as in chapter 3.

We start with the same political model as in section 3.3. That is, the income distribution $F(\cdot)$ is continuous; candidates have no ideological attributes, and are identical in all respects. The timing of events is as follows: (1) Platforms $\mathbf{q}_A = (g_A, r_A)$, $\mathbf{q}_B = (g_B, r_B)$ are announced. (2) Elections are held. (3) The winner's platform is implemented. It is most realistic to think about the candidates announcing a platform with a tax rate, as well as a level of government spending. Higher taxes than necessary then implies some rents lost in the process of public production. It is clearer analytically, however, to discuss the results in terms of g and r. Section 4.3 discusses more closely the assumption that candidates can commit to any platform.

How do voters evaluate the platforms? Using (4.1), we can now write the policy preferences of citizen i as

$$W^i(q) = (y - (g + r))\frac{y^i}{y} + H(g).$$

Though defined over two dimensions, these preferences clearly satisfy the intermediate-preference property, definition 4 of chapter 2. All voters agree that rents are a waste, whereas the conflict over spending remains as before. Repeating the argument of optimal voting behavior in section 3.3 and appealing to the intermediate-preference property, we can write candidate A's probability of winning as

$$p_A = \begin{cases} 0 & \text{if} \quad W^m(\mathbf{q}_A) < W^m(\mathbf{q}_B) \\ \frac{1}{2} & \text{if} \quad W^m(\mathbf{q}_A) = W^m(\mathbf{q}_B) \\ 1 & \text{if} \quad W^m(\mathbf{q}_A) > W^m(\mathbf{q}_B). \end{cases}$$

That is to say, the voter with median income is still pivotal in the election.

Applying the same kind of separation argument as in section 3.3, we conclude that the unique equilibrium has both candidates announcing the median voter's preferred policy:

$$g_A = g_B = g^m = H_g^{-1}(y^m/y)$$
$$r_A = r_B = r^m = 0.$$

Why can the candidates not get away with a platform involving positive rents? Assume, to the contrary, that both have announced the pivotal voter's desired spending g^m and positive rents, $r' > 0$. But then any of the candidates can increase his probability of winning from $\frac{1}{2}$ to 1 by instead offering rents $r' - \varepsilon$ (and thus lower taxes) to the voters. Furthermore, this deviation is profitable, as long as the exogenous rents R are larger than $2\varepsilon - \gamma r'$. As ε could be made arbitrarily small, the argument is valid for any positive value of r'. Intuitively, there is a "Bertrand competition" for the exogenous rents R. This competition becomes so stiff that it drives the endogenous rents r to zero.

Here, the Chicago school claim is clearly correct, despite a conflict of interest among the voters over the size of government. The equilibrium is efficient from the voters' point of view (i.e., it entails no waste), because the prize for winning the elections keeps politicians honest. The positive implications for taxes and spending are identical to those derived and discussed in section 3.3.

4.2 Inefficient Electoral Competition

To see how positive equilibrium rents may remain in electoral competition, let us return to the probabilistic voting model of section 3.4. Our argument in this section is related to the recent work by Polo (1998) and by J. Svensson (1997).

We thus assume that the income distribution is discrete among three groups J. Candidates have ideological attributes in addition to their platforms and voters have prefefences over these attributes. To highlight the implications for rents in the most transparent way, we

assume the distribution of voters' ideological bias to be the same in all groups, making the number of swing voters identical: $\phi^J = \phi$ for all J.

In analogy with (3.10) and given $\phi^J = \phi$ for all J, we can derive candidate A's probability of winning as

$$p_A = \frac{1}{2} + \psi[W(g_A, r_A) - W(g_B, r_B)], \tag{4.3}$$

where $W = \sum_J \alpha^J W^J$. Thus, the group-specific parts of preferences over spending and taxes average out, as all groups are equally attractive targets for the candidates.

Faced with this election probability, candidate A sets policy to maximize expected rents in (4.2) and so does candidate B, with $p_B = (1 - p_A)$. By symmetry, both candidates face the same problem and choose the same platforms, in the same way as in section 3.3. But what platforms do they choose? Consider the first-order condition for g_A:

$$\frac{\partial[\mathsf{E}(v_A)]}{\partial g_A} = (R + \gamma r_A)\frac{\partial p_A}{\partial g_A} = (R + \gamma r_A)\psi W_g(g_A, r_A) = 0.$$

As $W_{gr} = 0$, spending on public goods is socially optimal (i.e., it satisfies $W_g = 0$), whatever the level of r.

It is tempting to conjecture that optimality extends to rent extraction, but that conjecture turns out to be incorrect. To see why, note that by (4.3) candidate A's election probability is affected by a marginal increase in his rents—an increase in taxes with spending held constant—according to

$$\frac{\partial p_A}{\partial r_A} = \psi W_r = -\psi. \tag{4.4}$$

Although a platform with higher rents is attractive in itself, it also decreases the probability of election, creating a trade-off for the candidate. But unlike in the previous section, a marginal increase in rents does not imply discrete jumps in the probability of winning. Using (4.4), the first-order condition for r_A, evaluated at $q_A = q_B$, is

$$\frac{\partial[\mathsf{E}(v_A)]}{\partial r_A} = (R + \gamma r_A)\frac{\partial p_A}{\partial r_A} + p_A\gamma = -(R + \gamma r_A)\psi + \frac{1}{2}\gamma \leq 0 \quad [r_A \geq 0],$$

where the second equality exploits the fact that $p_A = \frac{1}{2}$ in equilibrium. The second row states the complementary slackness condition for r. Thus equilibrium rents are

$$r = \max\left[0, \frac{1}{2\psi} - \frac{R}{\gamma}\right]. \tag{4.5}$$

Why are rents not always competed away, as in the median-voter model? Because the two candidates are no longer perfect substitutes for all voters, and hence the policy platforms do not entirely determine the electoral outcome. Swing voters in each group do indeed

consider the candidates perfect substitutes and punish a rent-seeking candidate by immediately shifting their vote. But other voters do not, because of their ideological preferences. The uncertain outcome of relative popularity means that the identity of swing voters is not known. This creates electoral uncertainty, which weakens electoral competition, as candidate A's probability of winning falls only at the finite rate ψ for a marginal increase in rents. The lower is this rate—that is, the more uncertain is the election outcome (a lower ψ)—the larger is the scope for seeking rents, as stated in (4.5). Similarly, a lower exogenous value of holding office (a lower R) or lower transaction costs (a higher γ) promote high endogenous rents. As further discussed by Polo (1998) and in problem 1 of this chapter, the crux of generating positive rents is thus the uncertainty about the electoral outcome, as captured by the uncertainty about δ.

In this probabilistic voting model, equilibrium public goods are optimally provided. But equilibrium rents may be positive, implying that the voters pay more than the optimal amount of taxes. It is plausible to associate the rents with inefficiency in the production of public goods. In this interpretation, observed spending becomes higher than optimal. 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 instability, on the other. The empirical validity of this interesting prediction remains to be investigated. Alesina, Easterly, and Baqir (1997) provide some evidence of a positive correlation between the size of government and ethnic and linguistic fractionalization, however, which might be consistent with this theoretical model.

Of course, the whole argument in this section takes the political candidates' attributes as given. But with some entry barriers into politics, rents might not disappear even if candidate identity were to be endogenously determined. Moreover, if the distribution of relative popularity is not perfectly symmetric, as assumed here, policy convergence is lost, and the relatively more popular candidate can typically afford to grab bigger rents in equilibrium. Both results are discussed in Polo 1998. Moreover, problem 1 of this chapter deals formally with rents in lopsided elections.

4.3 Enforceability, Verifiability, and Observability

So far in this chapter, we have assumed that candidates can make binding commitments to electoral platforms. They have no discretion to seek rents after the election, even though they have strong incentives for this. In this section, we illustrate how postelection discretion may arise and its implications for policy. The discussion borrows some general insights and some terminology of modern contract theory (see in particular Hart 1995 and Tirole 1999).

Since voter and candidate heterogeneity are unrelated to the argument here, we assume that income distribution is degenerate, with $y^i = y$ for all i, and that the two candidates have no ideological attributes and are identical in all respects. To highlight the crucial role of information, however, we introduce a new variable: the cost of transforming private output into public goods. We denote this relative cost by θ and assume that it is a random variable. The government budget constraint can now be written as

$$\tau y = \theta g + r. \tag{4.6}$$

A higher value of θ means that public goods have become more costly. The new sequence of events is as follows: (1) Candidates announce their platforms. (2) Elections are held. (3) θ is realized. (4) The winner sets policy.

The cost of providing public goods is thus not fully known at the electoral stage. As an example, think about g as representing the provision of external or internal security to the citizens. In this case, the state of the international or national environment could easily shift so as to make it more or less costly to provide the same level of security. What the voters would like from each candidate is thus a *state-contingent* policy platform. This presents a problem in that it may be quite difficult to observe, verify, or even describe the state. Obviously, the efficient supply of public goods $g^*(\theta) \equiv H_g^{-1}(\theta)$ is decreasing in θ. We assume parameters are such that the associated level of efficient taxes

$$\tau^*(\theta) = \frac{\theta g^*(\theta)}{y}$$

is increasing in θ.[1] For simplicity, we start by assuming that θ can take on only two values, one low and one high, such that $\theta \in \{\underline{\theta}, \overline{\theta}\}$.

4.3.1 Enforceable and Verifiable Promises

Consider first the case in which an independent and benevolent judiciary is available. This third party can *enforce* promises made in the campaign after the elections. We thus assume that a politician who attempts to break his campaign promises can be stopped (by a large penalty), provided that the promises are (describable and) verifiable. To begin with, suppose that θ is indeed not only observable, but also verifiable. Then candidates are able to make binding commitments to state-contingent policy platforms $[g_P(\theta), r_P(\theta)]$. Candidates still maximize the objective in (4.2), augmented by the uncertainty over θ. Voters prefer the candidate whose platform gives them the highest expected utility $\mathsf{E}_\theta[W(g(\theta), r(\theta); \theta)]$, where E_θ denotes expectations taken over θ. Therefore, candidate A's probability of

1. This assumption requires the marginal utility of public goods, H_g, not to be too flat.

winning is

$$p_A = \begin{cases} 0 & \text{if } \mathsf{E}_\theta[W(g_A(\theta), r_A(\theta); \theta)] < \mathsf{E}_\theta[W(g_B(\theta), r_B(\theta); \theta)] \\ \frac{1}{2} & \text{if } \mathsf{E}_\theta[W(g_A(\theta), r_A(\theta); \theta)] = \mathsf{E}_\theta[W(g_B(\theta), r_B(\theta); \theta)] \\ 1 & \text{if } \mathsf{E}_\theta[W(g_A(\theta), r_A(\theta); \theta)] > \mathsf{E}_\theta[W(g_A(\theta), r_B(\theta); \theta)]. \end{cases} \tag{4.7}$$

Given this probability and $p_B = 1 - p_A$, the two candidates face the same sharp incentives as in section 3.2. That is, whoever moves closer to the state-contingent policy the voters desire discontinuously increases his probability of winning. The outcome must thus be optimal with

$$g_A(\theta) = g_B(\theta) = g^*(\theta)$$
$$r_A(\theta) = r_B(\theta) = 0.$$

In this case, each candidate is thus able to offer the voters a "complete enforceable contract." The competition between the candidates over the exogenous awards from winning makes them both offer the best contract in the set of possible contracts. The combination of enforceability, verifiability, and electoral competition is thus sufficient to ensure implementation of the efficient state-contingent policy.

4.3.2 Enforceable Nonverifiable Promises

Suppose, as in the previous subsection, that the judiciary can enforce electoral promises after the election. But now the state θ, even though observable to the voters and the judiciary, is *nonverifiable*. Obviously, this makes it impossible to enforce state-contingent platforms. As a result, verifiable platforms have to take the form of a non-state-contingent pair $[g_P, \tau_P]$ (it is more instructive, at this point, to consider announcements of taxes rather than rents). Voters still prefer the candidate promising them the highest expected utility, so p_A is given by (4.7) if we replace state-contingent platforms with simple platforms. But now the candidates' postelection incentives come into play. Suppose the elected candidate faces the state $\theta = \underline{\theta}$, in which public goods are cheap. He can always claim the contrary, that is, that they are expensive, $\theta = \overline{\theta}$. Moreover, the winner always has an incentive to misreport precisely in this way; as the expensive state is associated with higher taxes and lower spending, he can pocket the difference in the form of rents.

From this argument, it follows that the best the voters can hope for is an optimal policy in the expensive state. Competition between the candidates in credible policy promises indeed leads them to converge to platforms with precisely that property:

$$g_A = g_B = g^*(\overline{\theta})$$
$$\tau_A = \tau_B = \overline{\theta} g^*(\overline{\theta})/y.$$

Equilibrium policy thus eliminates rents in the expensive state, $r(\overline{\theta}) = 0$. If it did not, one of the candidates could raise his vote share for sure by raising the voters' expected welfare. Although the voters would like a higher level of spending and a lower level of taxes in the cheap state, the candidates cannot credibly make such a state-contingent promise. Promising higher constant spending than $g^*(\overline{\theta})$ or lower constant taxes than $\overline{\theta} g^*(\overline{\theta})/y$ is also not credible, as such a policy would not be affordable in the expensive state. It follows that taxes must remain high and spending low in the cheap state. The elected candidate captures the difference as rents for himself. Formally, by the government budget constraint, we have

$$r(\theta) = (\overline{\theta} - \theta) g^*(\overline{\theta}).$$

The normative implications are clear. When candidates can only enter into "incomplete contracts" with the voters, delegating decision making to elected representatives means giving up real decision-making power. The elected candidate exploits this power to claim equilibrium rents when circumstances so allow. A positive implication is that public activities, the costs of which are hard to verify or describe, leave more scope for rent seeking. If defense is such an activity, "peace dividends" may not take the form of lower spending but instead show up in maintained spending levels and more inefficiency. Clearly, the scope for rent seeking is larger for a larger range of uncertainty regarding θ. This suggests that countries with more volatile political environments should have higher and more wasteful spending, ceteris paribus. It also follows that rent-seeking politicians may have an incentive to make public activities nontransparent so as to increase the scope for diversion.

Methodologically, we learn that full commitment to electoral platforms is a very strong assumption, if the politicians' postelection incentives are not in line with their preelection promises. We will encounter a similar point in chapter 5 on partisan politicians. In chapter 3, this tension did not arise because candidates did not care about the policy being implemented.

4.3.3 Nonenforceable Promises

Up to this point in the section, we have assumed that any ex post verifiable promises by politicians can indeed be enforced. That is a strong assumption, particularly since elected politicians appoint members of the judiciary and are capable of altering the legal code, making enforcement harder. If no outside enforcement (or other checks and balances) is present, the equilibrium in this model is disastrous for the voters. Preelection policy promises have no credibility whatsoever, and any elected candidate follows a "Leviathan policy," in which voters are fully taxed and no public goods are delivered in both states of the world:

$$g(\theta) = 0, \quad \tau(\theta) = 1, \quad r(\theta) = y. \tag{4.8}$$

An obvious counterargument is that a politician who engaged in such diversive behavior would completely ruin his reputation and never be reelected. The same critique may be levied against the equilibrium under nonverifiability to the extent that voters observe θ—even though they cannot verify it—so that they realize what is going on. This counterargument certainly has some force, but note well what it implies: "never reelect" must mean that citizens vote not in a *forward-looking,* but in a *backward-looking* way. We have, of course, forced them to look forward by the timing assumed in the policy games, so far. An alternative modeling assumption, necessary to make sense of the reputational argument, would be to study repeated, perhaps infinitely repeated, elections. In the next section, we use an even simpler setting to illustrate how elections may enforce discipline on elected incumbents, even when politicians are unable to commit. But such discipline does indeed require backward-looking voting behavior.

4.4 Electoral Accountability

To illustrate the prospective role of elections as a disciplining device, we adapt our simple static policy example so as to illustrate the basic insight from fully intertemporal models of electoral accountability. These have their roots in the work by Barro (1973) and Ferejohn (1986).

4.4.1 Rents from Incumbent Power

We change the model's timing to focus on the behavior of elected incumbents with full discretion: implicitly we are assuming nonenforcement (or nonverifiability), along the lines of the last subsection. Specifically, we assume that (1) θ is realized and observed by everybody. We now allow for a continuous realization of θ. (2) Voters set a reservation utility for reelecting the incumbent (see below). (3) The incumbent policymaker freely sets policy, $\mathbf{q}_I$. (4) Elections are held in which the voters choose between the incumbent and an opponent. The opponent running against the incumbent is identical in all respects from the viewpoint of the voters. Thus the only reason for not reappointing the incumbent is to punish him ex post, and since the opponent is identical it is indeed (weakly) optimal for the voters to carry out this punishment.

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

$$\mathsf{E}(v_I) = \gamma r + p_I R. \tag{4.9}$$

The new formulation reflects the incumbent policymaker's full discretion over current rents r. At stake in the election are future rents, R, which should now be interpreted as the expected present value of holding office from the next period and on. In a full intertemporal setting the model would thus partly or fully determine R: see problem 2 of this chapter for an example.[2]

We assume that the voters coordinate on the same retrospective voting strategy, punishing the incumbent for bad behavior and rewarding him for good behavior. This voting strategy boils down to setting the reelection probability p_I as follows:

$$p_I = \begin{cases} 1 & \text{if} \quad W(g(\theta), r(\theta)) \geq \varpi(\theta) \\ 0 & \text{otherwise,} \end{cases} \tag{4.10}$$

where the voters' reservation utility $\varpi(\theta)$ is conditioned on the realized (and observable) state.

This voting strategy creates a trade-off for the incumbent. When setting policy at stage (3), he really has two alternatives. One is to please the voters to earn reelection. In this case he maximizes his rents subject to the constraint of generating $p_I = 1$. Solving this problem, using the definition of $W(\cdot)$ and the government budget constraint (4.6), the optimally chosen rents become

$$r(\theta) = y - \varpi(\theta) + H(g^*(\theta)) - \theta g^*(\theta). \tag{4.11}$$

In other words, the incumbent satisfies the voters' demands by choosing state-contingent spending in an optimal way and by giving them exactly the utility they require to effect his reelection, namely $W(g(\theta), r(\theta)) = \varpi(\theta)$. He keeps any remaining tax revenue as rents for himself. The incumbent's second alternative is not to satisfy the voters, thus foregoing reelection. When deviating, the best policy is to follow the Leviathan-like policy in (4.8), earning current rents corresponding to $r = y$. The incumbent prefers pleasing the voters if

$$\gamma r(\theta) + R \geq \gamma y. \tag{4.12}$$

In other words, as long as he is better off with moderate current rents plus future exogenous rents earned through reelection, he does not exploit his discretion fully.

Obviously, the voters prefer that rents be as small as possible. Suppose they are able to coordinate not only on the same retrospective voting strategy, but also on the optimal

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

strategy. Then the voters' best choice is to set $\varpi(\theta)$ so as to satisfy (4.12) with equality in all states of the world. This strategy implies rents given by

$$r(\theta) = \text{Max}\left[0,\ y - \frac{R}{\gamma}\right] \equiv r^*,$$

for all realizations of θ. Suppose that giving up r^* leaves enough revenue for the optimal supply of public goods in every state θ, specifically,

$$\theta g^*(\theta) \leq \frac{R}{\gamma}, \quad \text{for all } \theta. \tag{4.13}$$

To achieve this level of equilibrium rents, by (4.11) the voters' reservation utility must be

$$\varpi(\theta) = y - \theta g^*(\theta) + H(g^*(\theta)) - r^*. \tag{4.14}$$

Voters thus obtain the optimal level of public goods in every state. But they have to give up some rents to avoid triggering a short-run transgression on the part of the incumbent. Note that in this equilibrium, the voters' utility is state contingent, whereas equilibrium rents are the same irrespective of the state of the world.

What determines equilibrium rents? Some implications are similar to those in section 4.2. As in that case, higher intrinsic value of public office (higher R) or higher rent extraction costs (lower γ) keep equilibrium rents down. But in the present case rents are higher if the tax base is higher (y higher). This reflects the different source of rents in the current model, namely the incumbent's discretion to use his current powers to extract maximum rents from the voters. A larger available tax base makes this discretion more threatening, and the voters have to renounce larger rents.

4.4.2 Rents from Asymmetric Information

Suppose now that the voters do not observe the realization of θ at stage (1). In this case, the properties of equilibrium are reversed: equilibrium rents are state dependent, whereas voters' reservation utility is not. In the favorable (low θ) states, the elected incumbent can collect additional informational rents by delivering public goods efficiently but raising taxes and collecting high rents as if θ were high, when θ is in fact low. Since the voters do not observe θ, the best they can do is to choose a non-state-contingent cutoff level for their utility:

$$p_I = 1 \quad \text{iff} \quad w \geq \varpi.$$

Faced with such a cutoff rule, the incumbent chooses just to satisfy the voters in order to gain reelection, when this is cheap enough to do, namely when θ is low. But when θ is

high, satisfying the voters becomes too expensive relative to exploiting his discretionary short-run power. Thus each level of ϖ implies a critical state θ^*, below which the incumbent just satisfies his reelection constraint with equality and uses his informational advantage to collect additional rents, and above which he accepts electoral defeat and uses his discretion to make a maximum diversion. In other words, policy is set such that

$$w = \begin{cases} \varpi(\theta^*) & \text{for} \quad \theta \leq \theta^* \\ 0 & \text{for} \quad \theta > \theta^*, \end{cases} \tag{4.15}$$

with $\varpi(\theta^*)$ defined as in (4.14).

What is the best voting rule for the voters? Given the one-to-one relation between ϖ and θ^*, we can treat the choice of ϖ as a choice of θ^*. By (4.15), voters' expected utility can be written as a function of θ^*, namely

$$E(w) = \int_{\underline{\theta}}^{\theta^*} \varpi(\theta^*)\, dF(\theta) + \int_{\theta^*}^{\overline{\theta}} 0 \cdot dF(\theta) = F(\theta^*)\varpi(\theta^*),$$

where F is the c.d.f. for θ. Voters thus face a trade-off. They can insist on a higher utility by raising their cutoff ϖ. But then they get their cutoff utility less often, as it becomes more tempting for the incumbent to disregard the reelection constraint. Formally

$$\frac{d\theta^*}{d\varpi} = \frac{1}{\varpi_\theta(\theta^*)} < 0,$$

as the envelope theorem implies that

$$\varpi_\theta(\theta^*) = -\frac{g^*(\theta^*)}{y} < 0.$$

Requiring a higher cutoff level of utility implies a higher value of θ^* such that the incumbent will behave myopically more often. The optimal cutoff thus has to satisfy the first-order condition

$$\frac{\varpi_\theta(\theta^*)}{\varpi(\theta^*)} = -\frac{f(\theta^*)}{F(\theta^*)},$$

which uniquely pins down θ^*, if we assume that the "hazard rate" on the right-hand side is monotonically decreasing.

Clearly, the voters are worse off when θ is nonobservable than when it is merely nonverifiable. The supply of public goods is lower for high realizations of θ:

$$g = \begin{cases} 0 < g^*(\theta) & \text{for} \quad \theta > \theta^* \\ g^*(\theta) & \text{for} \quad \theta \leq \theta^*. \end{cases}$$

Furthermore, we obtain equilibrium rents by inserting the constant $\varpi(\theta^*)$ in (4.11) and (4.14) and exploiting the definition of socially optimal taxes $\tau^*(\theta)$:

$$r(\theta) = \begin{cases} y > r^* & \text{for } \theta > \theta^* \\ r^* + (\tau^*(\theta^*) - \tau^*(\theta))y + H(g^*(\theta)) - H(g^*(\theta^*)) \geq r^* & \text{for } \theta \leq \theta^*. \end{cases} \tag{4.16}$$

Thus rents are higher under asymmetric information for all realizations of θ except θ^* (recall that $\tau^*(\cdot)$ is increasing in θ and $g^*(\cdot)$ decreasing). When public goods are cheap the incumbent satisfies the voters' demands in the cheapest possible way and pockets the remainder for himself.[3]

This model of elections and economic performance will be extended in two directions in part 3. In chapter 9 we add conflict between the voters by allowing the incumbent policymaker also to target redistributive transfers to specific voters or groups of voters. In this case, the equilibria discussed above break down and the incumbent can appropriate more rents. Voters become engaged in a Bertrand competition over the allocation of the transfers and thus bid their reservation utilities down, though not all the way down to zero. In chapters 9 and 10 we also add conflict between several politicians who share office and bargain among each other over policy, as in a legislature. Under appropriate institutions, the resulting checks and balances allow the voters to reduce both types of rents discussed in this sections.

4.5 Career Concerns

So far in the chapter, we have discussed two roles of elections: to select among alternative economic policies (sections 4.1 and 4.2) and to hold incumbents accountable ex post for bad behavior (section 4.4). In this section we discuss a third role of elections, namely to select the most competent or talented politician. When elections have this role, politicians have an additional incentive to perform well before the elections: incumbents refrain from rent seeking because they want to appear talented to the voters. Thus elections continue to create incentives for good behavior. But now voters look back at economic performance not because they want to punish rent extraction per se, but because past

3. The result above relies on voters' formulating their reelection rule in terms of *utility*. As voters are assumed to observe g and τ, even though they do not observe θ, they can in fact do better by also conditioning their reelection on policy. In this case, the incumbent would optimally deliver a policy with public goods and taxes both constant at the level associated with the cutoff state $g(\theta) = g^*(\theta^*)$, $\tau(\theta) = \tau^*(\theta^*) = \frac{\theta g^*(\theta^*)}{y}$ for $\theta \leq \theta^*$. In this case, rents would be lower than in (4.16), $r(\theta) = r^* + (\theta^* - \theta)g^*(\theta^*) \geq r^*$, but still higher than in the case where θ is observable.

performance might reliably signal future competence. The agency model we exploit was originally formulated by Holmström (1982) to describe how *career concerns* shape the incentives of managers inside an organization. We show how to adapt this model to a political setup.

This role of elections suggests an important difference between policy choices made shortly before elections and policy choices made early on in the legislature. When elections are imminent, the incentives to appear competent and to perform well are stronger. This leads to a theory of electoral cycles, as in the pioneering work of Rogoff and Sibert (1988) and Rogoff (1990). In preelectoral periods, incumbents perform better by abstaining from rent extraction or attempt to signal their competence through specific policy decisions. This kind of preelectoral strategic behavior may enhance or reduce the voters' welfare: voters benefit from smaller rent extraction, but the policy distortions introduced if policies are signals of competence may harm them.

4.5.1 A Simplified Two-Period Model

Consider a two-period version of the same model as before but with the following simplifications. Taxes are fixed at $\bar{\tau}$ and the government budget must be balanced in both periods. Preferences of the voters in period $t = 1, 2$ are

$$w_t = y(1 - \bar{\tau}) + \alpha g_t,$$

where $\alpha \geq 1$ is an exogenous parameter and y denotes income. With taxes fixed, the voters' only concern is to have the highest possible quantity of public goods in each period. To simplify the analysis, the voters' marginal utility from public consumption is assumed constant, an assumption that makes voters risk-neutral with regard to the kind of uncertainty discussed here.

Politicians' only choice in this model is whether to use the given tax revenues to provide public goods, pleasing the voters, or to appropriate rents for themselves. The government budget constraint is

$$g_t = \eta(\bar{\tau}y - r_t), \tag{4.17}$$

where η is a variable reflecting the politician's *competence* in providing the public good. A higher value of η corresponds to a more competent politician, as the same resources yield a higher utility flow to the voters. Thus η is formally identical to $\frac{1}{\theta}$ in the previous section, except for the interpretation. There θ referred to exogenous events affecting the relative cost of public goods. Here η is instead a feature of the particular politician in office. We assume that competence is a permanent feature: a politician with competence η in period 1 retains that level of competence in period 2 as well. Finally, we let η be a random variable with

uniform distribution over

$$\left[1 - \frac{1}{2\xi}, 1 + \frac{1}{2\xi}\right].$$

Thus, its expected value is 1, and its density is ξ. The range of this distribution is such that, irrespective of the realization of η, a nontrivial choice between rents and the public good is always possible. If a politician with competence η is removed from office, a new politician is appointed, whose competence is drawn at random from the same distribution.

As before rents are constrained to be nonnegative. But we now assume that their upper bound is binding at a level below the available tax revenue $r_t \leq \bar{r} < \bar{\tau}y$. As we shall see, this assumption gives the voters a motive to maintain competent incumbents in office. The objective of the period 1 incumbent politician is

$$v_I = r_1 + p_I\beta(R + r_2), \tag{4.18}$$

where $0 < \beta < 1$ is a discount factor and p_I is the probability that the incumbent is reelected. The quantity r_t denotes rents grabbed in period t, and R denotes the exogenous rents from winning the elections. In terms of the previous notation, we thus simplify by setting $\gamma = 1$.[4]

Policy commitments are not possible ahead of the elections. Specifically, the timing of events is as follows: (1) An incumbent politician is in office in period 1 and chooses rents for that period, r_1, without knowing his own competence η. (2) The value of η is realized and public-good provision g_1 is residually determined so as to satisfy (4.17). Voters observe their own utility but neither η nor r_1. (3) Elections are held. If the incumbent wins, his competence remains η. If he loses, an opponent is appointed with competence drawn at random from the same distribution. (4) Period 2 rents r_2 are set, and public goods are residually determined, again so as to satisfy (4.17).

Under this timing, period 2 politicians have no incentive to behave well: they always appropriate maximum rents, $r_2 = \bar{r}$, implying public spending at $g_2 = \eta(\bar{\tau}y - \bar{r})$. Voters are clearly better off with more a competent (high η) politician, as this gives them higher period 2 utility. They thus use the elections to reappoint competent politicians and oust incompetent ones, taking into account their observed utility in period 1 and knowing that the opponent's expected value at the elections is $\mathsf{E}(\eta) = 1$. We now describe how this occurs and how it shapes politicians' incentives in period 1. As in earlier sections, each incumbent politician perceives a trade-off between current rents and the probability of winning the elections, but the economic mechanism implicit in this trade-off is different.

4. It may be argued that a politician's competence in providing benefits for the voters is (positively) correlated with his competence in extracting rents for himself. The model could capture this possibility, by reintroducing a random γ, correlated with η.

Equilibrium Behavior How is the incumbent's probability of victory at the elections affected by period 1 actions? To answer, we need to describe optimal voting behavior. Consider the voters' information at the time of the elections. They know that the incumbent maximizes (4.18). Let $\tilde{r}_1$ denote the solution to the incumbent's optimization problem in period 1 (yet to be derived). Note that $\tilde{r}_1$ does not depend on η, since competence is yet unknown to the politician. At the time of the elections, voters know g_1 and $\bar{\tau}$ and can compute $\tilde{r}_1$. Hence, by (4.17), the voters can form an estimate of incumbent competence, say $\tilde{\eta}$, as

$$\tilde{\eta} = \frac{g_1}{\bar{\tau}y - \tilde{r}_1}. \tag{4.19}$$

The voters' behavior is then simple to describe: the incumbent is reappointed only if his estimated competence exceeds his opponent's expected competence:

$$\tilde{p}_I = \begin{cases} 1 & \text{iff } \tilde{\eta} \geq \mathsf{E}(\eta) = 1 \\ 0 & \text{otherwise.} \end{cases}$$

We can now compute the probability of winning the elections, as perceived by the incumbent in period 1, when choosing rents. By assumption, he does not yet know his own competence. His probability of reelection p_I is therefore given by $\text{Prob}[\tilde{p}_I = 1] = \text{Prob}[\tilde{\eta} \geq 1]$. The incumbent sets r_1, knowing that g_1 is residually determined from the government budget constraint:

$$g_1 = \eta(\bar{\tau}y - r_1). \tag{4.20}$$

Combining (4.20) and (4.19), the event $\tilde{\eta} \geq 1$ is thus equivalent to the event

$$\eta \geq \frac{\bar{\tau}y - \tilde{r}_1}{\bar{\tau}y - r_1}. \tag{4.21}$$

From the point of view of the incumbent politician, therefore, the probability of winning the elections, p_I, is the probability that (4.21) is satisfied. Under our assumption that the distribution of η is uniform, this probability can be written as

$$p_I = \frac{1}{2} + \xi\left[1 - \frac{\bar{\tau}y - \tilde{r}_1}{\bar{\tau}y - r_1}\right] \tag{4.22}$$

The incumbent thus maximizes (4.18) subject to (4.22) by choice of r_1. The resulting first-order condition is

$$1 - \frac{\xi(\bar{\tau}y - \tilde{r}_1)}{(\bar{\tau}y - r_1)^2}\beta(R + \bar{r}) = 0. \tag{4.23}$$

In equilibrium, politicians' optimal choice must be consistent with the voters' conjectures about those choices: $r_1 = \tilde{r}_1$. Thus, solving (4.23) for r_1, we obtain equilibrium rents in the first period:

$$r_1 = \bar{\tau}y - \xi\beta(R + \bar{r}). \tag{4.24}$$

Given that $r_1 = \tilde{r}_1$, it follows from (4.22) that in equilibrium, the probability of winning is $p_I = \frac{1}{2}$. This is consistent with our assumption that the incumbent does not know his own competence when setting period 1 policy.

We may also note a similarity between the present accountability mechanism and that in the previous section. As there, voters assess their own welfare in the period just before the elections and reappoint an incumbent who delivers sufficiently high welfare. By inserting (4.24) in the government budget constraint, the voters realize that in equilibrium, $g_1 = G(\eta) \equiv \xi\beta(R + \bar{r})\eta$. Thus they reappoint the incumbent if $g_1 \geq \xi\beta(R + \bar{r})$ and oust him from office otherwise. Equivalently, we can express the voting rule in terms of the voters' reservation utility in period 1, just as in (4.10):

$$\tilde{p}_I = \begin{cases} 1 & \text{iff } w_1 = y(1 - \bar{\tau}) + \alpha G(\eta) \geq \varpi \\ 0 & \text{otherwise,} \end{cases}$$

where now $\varpi = y(1 - \bar{\tau}) + \alpha\xi\beta(R + \bar{r})$. But here this behavior by the voters does not reflect a deliberate attempt to punish an incumbent who cheated them. Rather, it reflects their inference about the incumbent's competence and their forward-looking behavior, taking into account the implications for next-period welfare. Nevertheless, this voting rule disciplines incumbent politicians to some extent. And as shown in (4.24), equilibrium rents are lower the narrower is the range of uncertainty (the higher is the density ξ) and the larger is the value of winning the elections (as captured by the term $\beta(R + \bar{r})$).

So far we have made the strong assumption that the incumbent politician does not know his own competence when setting policy in period 1. What happens when the incumbent learns his competence before setting policy in period 1, but the timing is otherwise the same? Under such asymmetric information, performance can still reveal the incumbent's competence, but things become more complicated. Voters really have to deal with an adverse selection problem, in which policy can be used as a deliberate signal of competence. Problem 4 of this chapter deals with this case, which was first studied by Rogoff and Sibert (1988) in the context of political business cycles in monetary policy. We turn to that specific topic in chapter 16 but hint at the general idea of electoral cycles in the next subsection.

4.5.2 Electoral Cycles

The model described above suggests that the incentives for an incumbent to appear competent (and hence to perform well) are stronger just ahead of the elections. It can thus easily be extended to a model of electoral business cycles. We briefly discuss such an extension in this subsection.

Here the horizon is infinite, and elections are held at the end of every *other* period. The policy instruments are as in the previous subsection: there is no debt, and taxes are fixed at $\bar{\tau}$, such that (4.17) still gives the government budget constraint. But now η_t is a moving average of shocks to competence in the current and immediately preceding period:

$$\eta_t = \mu_t + \mu_{t-1}, \tag{4.25}$$

where μ_t continues to be distributed as in the previous subsection, with mean 1 and density ξ, and it is serially uncorrelated. Thus competence changes over time, but slowly. If a policymaker was competent yesterday, he retains some of his competence today, though some may depend on new factors. This assumption is plausible, in that circumstances change over time and a policymaker who was competent in some tasks need not remain so when the tasks change.

As in the previous subsections, we assume that policy decisions in each period t are made before knowing the realization of μ_t. The realization of μ_{t-1} is known to everyone (policymaker and voters) in period t. As above, information is thus symmetric between the voters and the incumbent. This is equivalent to assuming that the initial value μ_0 is known and that g_{t-1} is publicly observed in period t, because then the realization of μ_{t-1} can be inferred from the government budget constraint and knowledge of equilibrium rents.

Under these assumptions, the equilibrium is straightforward. In off-election periods, the incumbent faces no incentive to behave well, and rents are maximal: $r_t = \bar{r}$. Even though his performance in the current period t reveals the incumbent's μ_t, the voters do not care about it, as elections take place only in period $t+1$. At that point, voters will look ahead at period $t+2$. By (4.25), $\mathsf{E}(\eta_{t+2} \mid g_{t+1}) = 1 + \mu_{t+1}$. Hence knowledge of μ_t is irrelevant for the svoters.

In on-election periods, on the other hand, things are different. When period $t+1$ comes, policy choices indeed reveal the realized value of μ_{t+1}, as shown by $\mathsf{E}(\eta_{t+2} \mid g_{t+1}) = 1 + \mu_{t+1}$. Policy choices thus determine the election outcome. Hence, during on-election periods, policy choices are shaped by exactly the same incentives as in the previous subsection, and equilibrium rents are given by (4.24). Thus the model predicts that performance improves just before the elections: wasteful spending decreases and the quality of public consumption improves. Moreover, competent incumbents who are able to please the voters are reappointed, whereas incompetent ones are ousted from office. In this simple model, the incumbent's incentive to appear competent induces better policy performance. Thus the voters are better off during on-election periods, or to put it in terms of institution design, the voters are better off if elections are held every period.

The incentive to appear competent, however, could very well induce policy distortions that reduce the voters' welfare. To see how this could happen, let's rewrite the government budget constraint as

$$g_t = \eta_t(\bar{\tau} y + s_t),$$

where now there are no endogenous rents r, and the new variable s_t denotes "seignorage," or more generally a hidden and distorting tax the voters observe and pay only after the elections. Politicians maximize the voters' welfare but also care about the probability of winning, because they value the exogenous rents from office, R.[5] They set s_t at the start of the period, knowing μ_{t-1}, and then μ_t is realized. Writing down these assumptions explicitly and solving for the equilibrium yields the result that the equilibrium policy is optimal for the voters during off-election periods but not just ahead of the elections. Problem 3 of this chapter deals explicitly with this extension, but it is worth stating the intuition for the results. During on-election periods the incumbent still wants to appear competent. To do so, he must increase public consumption, but now this implies increasing seignorage above the socially optimal level.

The two versions of electoral cycles thus have different implications for the voters. With endogenous rents, the incumbent trades off decreased rents for himself against a higher probability of winning the next election. Elections are thus good for the voters. With seignorage, the incumbent trades off additional policy distortions for the voters (about whom he cares) against a higher probability of winning. In this sense, elections reduce the voters' welfare. Yet elections still serve a useful purpose: namely, to select the best candidate for office. Hence it does not immediately follow that election dates ought to be very far apart, despite the induced policy distortions.

We will encounter the career concern model in different parts of the book, building on the basic ideas developed in this section. In chapter 9, we use it to discuss alternative electoral systems, contrasting local and national elections, and majoritarian and proportional elections. As already mentioned, we also use it in chapter 16 to analyze an electoral cycle that induces policy distortions with regard to monetary policy.

4.6 Discussion

In this chapter, we laid out a new set of tools for modeling political equilibria. Substantively, however, the chapter revolved around a fundamental question in political theory: to

5. When politicians also care about the voters' welfare, besides their own rents, we can relax the assumption that $\bar{\tau}$ is exogenously fixed. We made this assumption in the previous subsection because the equilibrium value of τ is indeterminate unless it is exogenously fixed. But with politicians who also care about the voters, a well-defined optimality condition pins down the value of τ.

what extent can elections solve the agency problem between the citizens and their elected representatives? We hinted at some prospective answers in very different models of politics.

In the preelection model of politics studied in sections 4.1 and 4.2, the answer depends on whether the voters perceive the two competing candidates as good substitutes. In the Downsian model with identical candidates, endogenous rents from office are entirely dissipated. When instead intrinsic differences remain between the candidates, so that economic policy is not the only determinant of elections, rents remain in equilibrium. We use this model again in chapter 8, when we ask how serious the agency problem is under different electoral rules. In the two postelection models of politics studied in sections 4.4 and 4.5, elections also discipline the politicians and limit rent extraction but through an entirely different mechanism, namely by making reappointment conditional on good economic performance. This kind of retrospective voting punishes the incumbent—directly or indirectly—for his bad behavior but still leaves him with positive rents. We use similar postelection models of politics extensively in chapters 9 and 10 to address a number of questions in comparative politics, including how different electoral rules and different political regimes handle the agency problem.

All these models capture important aspects of reality, but they are not without problems. The preelection model of politics stretches things too far by assuming credible commitments to policy platforms in the electoral campaign. As we have seen in section 4.3, this assumption—if taken literally—requires unrealistic assumptions about enforcement and information. Still, the promises in the electoral campaign are not irrelevant, perhaps because of reputational concerns.

The electoral accountability model (of section 4.4) does away with the commitment assumption. But voters are ex post indifferent between reappointing or not reappointing a misbehaving incumbent. This makes the equilibrium fragile by opening the door for multiple equilibria. Furthermore, the voting rule breaks down if the incumbent and his opponent differ in some important respect, say because they have different competence, different seniority, or different ideologies. Again, reputational concerns on the part of voters might restore these equilibria: they may realize that ex post deviation from ex ante optimal voting rules would destroy the incumbent's future incentives, or the voting rule may be interpreted as a sociological norm of behavior, which is logically consistent and self-enforcing. But reliance on such reputational arguments makes the multiple equilibrium problem even worse, particularly when the principals are a large number of uncoordinated voters.

The career concern model (of section 4.5) does not suffer from this fragility but has other deficiencies. With conflicts of interest among the voters themselves, having a competent government may be a small concern for individual voters or groups, whose primary concern is to make sure that policy is set according to their own interests, rather

than to those of some other group of voters. Indirect electoral rewards based on estimates of competence may therefore be implausible in situations involving the most acute conflict of interest among the voters. It is perhaps no coincidence that this career concern model of politics has been fruitfully applied to monetary policy or to macroeconomic policy, in which the presumption of a low-dimensional conflict among voters might be most appropriate.

From a strict realism point of view, electoral promises are not binding, and policy is formed once in office. But equally clearly, what happens in the course of the electoral campaign has some relevance for the election outcome as well as for subsequent policy choices. The chapter thus points to a very interesting question, namely how to combine models of pre- and postelection politics. Austen-Smith and Banks (1989) have made an interesting attempt at progress on this difficult question, considering a two-period model of moral hazard. Even though information is symmetric, equilibria exist where the voters' strategy of reelecting the incumbent depends on the observed policy outcome relative to the platform upon which the incumbent was initially elected. This "reputational" mechanism disciplines the incumbent and creates an incumbency effect despite all politicians being identical. With asymmetric information, announcements could also play a role in information transmission, as in the standard models of regulatory agencies, starting with Baron and Myerson (1982) and Sappington (1982). Harrington (1993) indeed studies a model in which there is no agency problem but voters are asymmetrically informed about politicians' intended policies. This model has equilibria in which politicians find it optimal to reveal information truthfully to voters about their type (intended policies), as this enhances their chances of reelection. Moreover, if elected, politicians stick to their electoral campaign promises. We shall return to the difficult question of how to bridge pre- and postelection models of politics, particularly in the concluding chapter of the book.

4.7 Notes on the Literature

Brennan and Buchanan (1980) formulate the hypothesis of a Leviathan government attempting to maximize revenue for its own private agenda. A similar idea lies behind Niskanen's (1971) model of a budget-maximizing bureau, although the bureau interacts with the government rather than the voters. Breton (1974) assumes that the party holding government acts as monopolist but is constrained by the prospective entry of the opposition. Stigler (1972) and Becker (1983) suggest the idea that political competition may bring about optimal outcomes for the voters, even though these authors do not propose this as a general theory of government. Wittman (1989, 1995), in particular, has pushed the idea of the generally efficiency-enhancing effects of political competition. In a series of interesting

papers, Grossman (1991, 1994, 1999) and Grossman and Kim (1996a, 1996b) focus on the agency problem in nondemocratic societies (or more generally, those in which agency is controlled through means other than elections). Laffont (1999) provides an extensive analysis of political incentive problems in regulation from the perspective of principal-agent theory. Shleifer and Vishny (1999) discuss corruption in a variety of public policy settings.

Our model of rent extraction, electoral competition, and probabilistic voting in section 4.2 is closely related to that in Polo 1998, which builds further on ideas in Grillo and Polo 1993. J. Svensson (1997) also studies a probabilistic voting model with forward-looking voters, in which electoral competition may discipline rent seeking. But in his model the rents are sought by bureaucrats who may or may not get bailed out by the politicians elected by the voters.

The discussion about commitment in section 4.3 borrows general ideas and some terminology from the theory of incomplete contracts. This theory is summarized in Hart 1995 and discussed by Tirole (1999).

The electoral accountability model of section 4.4 goes back to Barro (1973). Ferejohn (1986) extended it and studied subgame-perfect equilibria, rather than Nash equilibria. Ferejohn's infinite-horizon, incomplete-information model has exogenous rents from office and the incumbent politician minimizing effort. Persson, Roland, and Tabellini (1997) adapt that model to outright rent extraction. As discussed in the text, Austen-Smith and Banks (1989) study electoral accountability in a setting where voters adopt retrospective voting strategies that are conditioned on the difference between the incumbent's performance and his initial policy platform. Banks and Sundaram (1993) study a setting where the voters trying to hold a politician accountable face not only moral hazard, but also adverse selection problems. Banks and Sundaram (1996) add term limits and allow for more general voting strategies.

The career concern model of section 4.5 draws on Holmström 1982. Dewatripont, Jewitt, and Tirole (1999a, 1999b) discuss and extend the literature on agency and career concerns, with particular attention to alternative assumptions on information. Their approach is promising and has not been applied to politics, to our knowledge. Note, however, that the career concern model applied to a firm or an organization typically assumes that managers maximize the expected value of their competence (corresponding to $\tilde{\eta}$ in the model of section 4.5). Assuming, as we have done, that an incumbent politician maximizes his probability of reelection (and thus the probability that $\tilde{\eta}$ is above a certain threshold) is quite different, and hence the results do not immediately generalize.

A large theoretical and empirical literature on electoral or political business cycles goes back to Nordhaus 1975 and Lindbeck 1976. The first paper to study electoral cycles with rational voters and office-motivated politicians was by Rogoff and Sibert (1988), who

studied a model of adverse selection with exogenous rents in which politicians care about both winning and voters' welfare. Chapter 16 further reviews the literature on electoral cycles in monetary policy.

4.8 Problems

1. Political rents in lopsided elections

This question deals with issues analyzed in Polo 1998. There are two political candidates (A and B) each proposing a level of taxes τ and a level of spending on public goods g. The public good g is financed through proportional income taxes. The candidates can, however, also use public funds for private consumption. The amount diverted to private consumption is denoted r. A continuum of citizens of measure one, indexed by i, all have the same income 1. The government's budget constraint is thus $\tau = g + r$. The citizens' preferences over private consumption, c, and a public good, g, are described by

$$u^i = c^i + H(g),$$

$c^i = (1 - \tau)$. Citizen i will vote for candidate A if

$$(1 - g_A - r_A) + H(g_A) > (1 - g_B - r_B) + H(g_B) + \sigma^i + \delta.$$

Parameters σ^i and δ describe the individual's preference in favor of party B and are distributed uniformly on

$$\left[-\frac{1}{2\phi}, \frac{1}{2\phi}\right]$$

and

$$\left[-\frac{1}{2\varphi}, \frac{1}{2\varphi}\right],$$

respectively. Political candidates care only about their private consumption, r, and their utilities are r if they win the election and zero otherwise.

a. First, consider the case in which the candidates know that the value of δ is zero. Solve for the equilibrium levels of taxes and rents.

b. Now consider the case in which the candidates know that the value of δ is greater than zero. Solve for the equilibrium levels of taxes and rents.

c. Now consider the case in which the candidates do not know the value of δ, but they know that its expected value is zero. Solve for the equilibrium levels of taxes and rents.

d. Finally, consider the case in which the candidates do not know the value of δ, and δ is uniformly distributed on

$$\left[\alpha - \frac{1}{2\varphi}, \alpha + \frac{1}{2\varphi}\right],$$

that is, one candidate may have a competitive advantage. Solve for the equilibrium levels of taxes and rents as well as the equilibrium probabilities of winning the election. Are expected rents higher in this equilibrium than in the equilibrium without advantages for either candidate? It is not necessary to specify the conditions for existence of equilibrium.

2. Rents with endogenous value of being in office

Consider the model in section 4.4. An incumbent politician proposes a level of spending on public goods, g, and a level of private rents for himself, r. The public good g is financed through proportional income taxes. A continuum of citizens of measure one, indexed by i, all have the same income y. The government's budget constraint is $\tau y = \theta g + r$, where θ is a parameter measuring the cost of providing public goods. Citizen i's preferences over private consumption c^i and a public good g are described by

$$u^i = c^i + H(g),$$

where $c^i = y(1 - \tau)$. The incumbent's utility consists only of consumption of the rents, $u = \gamma r$. The following game is repeated an infinite number of periods. (1) θ_t is realized and observed by everybody. (2) Voters set a reservation utility for reelecting the incumbent. (3) The incumbent sets the policy variables, r_t and g_t. (4) Elections are held in which the voters choose between the incumbent and an opponent with the same characteristics as the incumbent. A politician maximizes

$$\sum_{t=0}^{\infty} \beta^t p_t \gamma r_t,$$

where β^t is the subjective discount factor and p_t is the probability of the incumbent's being in office at period t. Assume that a politician who is voted out of office cannot be reelected.

The incumbent at period 0 maximizes

$$\gamma r_0 + \beta p_1 R_{I,1},$$

where $R_{I,1}$ is the value of being an incumbent in period 1. The voters coordinate on the same retrospective voting strategy, voting for the incumbent if their utility is higher than or equal to $\varpi_t(\theta_t)$.

a. Solve for the optimal voting strategy $\varpi_t(\theta_t)$.

b. Suppose that term limits are imposed that do not allow the incumbent to stay in office more than three periods. How will this affect the voters' ability to discipline the incumbent?

c. Now suppose that there are two parties to which the candidates may belong. As before, the politician may stay in office for a maximum of three terms. Assume that the voters use the rule to vote for a candidate belonging to the same party as the incumbent if and only if rents are below some specific level. Suppose further that a new party candidate may bribe the incumbent not to keep rents too high in his third term. What is the new equilibrium level of rents?

3. Electoral cycles with seignorage

Assume the following model of electoral cycles with seignorage. Let us write the government budget constraint as

$$g_t = \eta_t(\bar{\tau} y + s_t),$$

where $\bar{\tau}$ denotes fixed taxes, η_t denotes the incumbent's competency level, there are no endogenous rents r, and the variable s_t denotes "seignorage" or, more generally, a hidden and distorting tax observed and paid by the voters only after the elections. Therefore, voters' welfare is

$$w_t = y - \bar{\tau} - s_t - V(s_t) + \alpha g_t,$$

where $V(\cdot)$ is a convex function capturing the distortions of seignorage. As is common in these models, the politician's competency, η_t, is determined by

$$\eta_t = \mu_t + \mu_{t-1},$$

where μ_t is uniformly distributed with mean 1 and density ξ and is serially uncorrelated. Politicians maximize voters' welfare and reelection rents according to

$$E(w_t \mid \mu_{t-1}) + p_t R,$$

where p_t is the probability of reelection.

The stage game at time t is given by: The politician chooses s_t, given μ_{t-1} and without observing μ_t. Nature determines μ_t. Voters observe g_t only. If t is an on-election period voters reelect the incumbent politician or elect a new contender, drawn from the same distribution. If t is an off-election period, we move to the election period. The stage game is infinitely repeated.

a. Show that in off-election periods, the incumbent sets s_t optimally.

b. Find the equilibrium seignorage in on-election periods. Show that they are larger than off-election seignorage (the social optimum level).

c. Perform comparative statics with respect to the effects of the exogenous spoils of office R, the sensitivity of reelection probability ξ, and the total taxes available $\bar{\tau}$.

4. Equilibrium selection in the adverse selection model

Assume the following two-period model with adverse selection. In this model a politician knows his competence level when deciding on the rents he extracts. Specifically, suppose taxes are fixed at $\bar{\tau}$. Voters' preferences in period $t = 1, 2$ are

$$w_t = y(1 - \bar{\tau}) + \alpha g_t,$$

where $\alpha \geq 1$ is an exogenous parameter and $y = 1$ denotes income. Politicians' only choice is whether to use the given tax revenues to provide public goods, thus pleasing the voters, or to appropriate rents for themselves. The government budget constraint must be balanced in each period and is given by

$$g_t = \eta(\bar{\tau} y - r_t),$$

where η is a variable reflecting the politician's competence in providing the public good. The variable η can take on one of two values, $\frac{1}{\theta}$ and $\frac{1}{\lambda\theta}$, with equal probability, where $\lambda < 1$. A politician with competence η in period 1 also retains that level of competence in period 2. If the politician is not reelected, a contender is chosen with competence η^c, with $\frac{1}{\theta} < \eta^c < \frac{1}{\lambda\theta}$. Rents are constrained to be nonnegative. Assume the upper bound of rents to be binding at a level below the available tax revenue $r_t \leq \bar{r} < \bar{\tau} y$. The objective of the period 1 incumbent politician is

$$r_1 + p_I \beta(r_2 + R),$$

where $0 < \beta < 1$ is a discount factor and p_I is the probability that the incumbent is reelected. The quantity r_t denotes rents grabbed in period t, and R denotes the exogenous rents from winning the elections.

Policy commitments are not possible ahead of the elections. Specifically, the timing of events is as follows: (1) An incumbent politician is in office in period 1 and chooses rents for that period, r_1, knowing his own competence η. (2) The value of the public good provision g_1 is residually determined. Voters observe their own utility, but neither η nor r_1. (3) Elections are held. If the incumbent wins, his competence remains η. If he loses, an opponent is appointed with competence η^c. (4) Period 2 rents, r_2, are set, and the game ends.

a. Assume that if the politician's strategies do not reveal his level of competency, voters are not willing to reelect him. Show that pooling equilibria exist but do not survive the elimination of weakly dominated actions refinement.

b. Assume now that even if the politician's strategies do not reveal his level of competency, voters are nonetheless willing to reelect him. Show that pooling equilibria exist and survive the intuitive criterion.

5. Challenger selection procedure

In the same model as in problem 4, now assume that at the election stage a contender is drawn with competency η^c from a distribution of levels of competency $\frac{1}{\theta} - \varepsilon$ and $\frac{1}{\lambda\theta} + \varepsilon$ with equal probability (ε small). Observing η^c, voters then compare the contender's competency to the incumbent's expected competency and choose the candidate with the higher competency level. In case of a tie, the new candidate is chosen. The prior belief about the contender is that he has the levels of competency $\frac{1}{\theta}$ and $\frac{1}{\lambda\theta}$ with equal probability.

a. Write the expression for the incumbent's probability of winning.

b. Find a separating equilibrium in this model.

c. Show that pooling equilibria exist, but that they do not survive the intuitive criterion.

payment of s/d per period, where d is the average duration of the unemployment spell. With long unemployment spells, this payment per period thus becomes smaller. Given the hiring rate ϑ, the expected duration of the unemployment spell is $\frac{1}{\vartheta}$. Use the model specified in the previous problem, but include this feature.

a. Compute the equilibrium tax and show that it is decreasing in the hiring rate, and decreasing in the firing rate.

b. Assume that the unemployment rate is $u = 0.06$, that the discount factor is $\beta = \frac{4}{5}$ and that the severance payment is $s = \frac{4}{5}$. By plotting the unemployment benefit as a function of the firing rate, show that an increase in both firing and hiring rates, keeping unemployment constant, may decrease the unemployment benefit. Discuss the results.

c. Now suppose that the firing rate is constant at $\varphi = 0.05$, whereas unemployment may vary. Show that the unemployment benefit is lower when the hiring rate is high and unemployment is low.

d. It has been argued that higher unemployment benefits will make unemployed workers more reluctant to accept job offers. Assume, for this reason, that higher unemployment benefits make hiring more difficult, so that hiring is decreasing in the level of benefits. More precisely, assume that

$$\vartheta = \frac{1}{15f}.$$

Show that there are two equilibria: one where unemployment is high, the unemployment benefit is high, and duration is long, and another where unemployment is low, unemployment benefits are low, and duration is long. Explain the equilibria.

7 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 not only 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 agricultural policy. Virtually all democracies provide generous support for their farmers through trade policies, direct subsidies, and various other programs. Several explanations have been suggested for this phenomenon. Many of these stress that farmers have more homogenous economic interests than other groups and therefore find it easier to get organized. Others emphasize that farmers are less ideologically biased than other groups 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. Because of their higher stakes, beneficiaries of various programs are more likely to get politically organized. They can thus influence political outcomes, 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, Shepsle, and Johnsen (1981), Becker (1983, 1985) and several others. Mueller 1989 and 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 on some groups rather than others or that entail systematic biases in aggregate spending. In this part, we survey some of these recent contributions.

As discussed in part 1, multidimensional policies mean that we must specify the institutional details of the policy process to predict which groups will be most powerful in the struggle for benefits. 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 micropolitical foundations, however, relying instead on nonderived 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 the chapter.[1] This example is simple; yet, it highlights

1. The treatment in this chapter extends a survey along similar lines in Persson 1998.

the more general phenomenon of concentrated benefits and dispersed costs in a transparent way. Thus we study a society in which the government uses a common pool of tax revenues to finance an array of publicly provided goods, the benefits of which are completely concentrated in well-defined groups. Two underlying questions motivate the analysis. The first and most important concerns the allocation among groups: which groups are politically powerful, and how is this related to political institutions? The other concerns aggregate outcomes: what effect do alternative institutions have on the overall size of government?

In section 7.1, 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 of these sections studies a specific feature of the political process in detail.

In section 7.2, we work with a legislative bargaining model, developed by researchers in U.S. congressional politics, to study decision-making rules and budgetary procedures. As mentioned already in chapters 2 and 5, political power here reflects the assignment of agenda-setting or amendment rights and the sequencing of decisions. Institutions centralizing decision-making power by conferring strong proposal rights and limiting amendments induce a small size of government but distort the allocation of benefits in favor of whoever holds such powers.

In section 7.3, we use a model of lobbying as common agency, developed by researchers in trade policy, to study the influence activities of organized interest groups. As mentioned in chapter 3, lobbying models direct attention to campaign contributions and the organizational pattern of interest groups. Groups organized as a lobby influence final allocations disproportionately, which generally makes them suboptimal. 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 7.4, we move to a model of electoral competition, developed by public economists, to study the electoral platforms chosen by two vote-maximizing parties. This is a version of the probabilistic voting model introduced in chapter 3, in which voters trade off their predetermined ideological party preferences against economic policy platforms. Political power here reflects the distribution of voters' ideological preferences across groups; more-powerful groups include a large number of swing voters who are mobile across parties because they do not care about ideology. To win the elections, both parties direct economic benefits toward these nonideological voters.

Although these approaches yield useful insights, each still gives only a partial answer to the question of which groups are the most powerful. A formal integration of the different approaches is only beginning to take shape. Section 7.5 discusses some existing results. We start by studying the interaction between elections and lobbying, along the lines introduced in chapter 3: office-seeking politicians use 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. Strategic delegation is a feature of the equilibrium. 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. These interactions yield surprising results that sometimes modify the insights obtained from partial models in important ways.[2]

Overall, the results in this chapter move us far away from simple median-voter outcomes. Politics is much more than simple vote counting. To understand the political determinants of policy, we must pay attention to many fine details of the political process, and thus we move closer to the world of postelection politics introduced in part 1. But the research surveyed here is mainly theoretical. For us to gain a more complete understanding of the relative importance of each of these details, the research needs to become better integrated with empirical work.

7.1 A Model of Local Public Goods

Consider a society with $\mathcal{J}$ distinct groups of identical individuals. Group $J = 1, \ldots, \mathcal{J}$ 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

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

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 that 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 equal 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

2. An important omission from our discussion of special-interest politics is an examination of bureaucratic behavior and its interaction with other parts of the political process. Economists have recently built structural models of the interaction between interest groups and the bureaucracy to study regulatory capture (Laffont and Tirole 1993) and political scientists have studied the legislature's control of bureaucracy (McCubbins, Noll, and Weingast 1987).

be interpreted in a number of ways: groups can be defined by their preferences, occupation, age or other personal attributes, or geographical location.

7.1.1 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:

$$H_g(g^*) - 1 = 0. \tag{7.2}$$

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

This allocation could easily be implemented if group-specific lump sum taxes, τ^J, financed each of the group-specific goods, 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. 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 a tax system so that the taxpayers' financing of a group-specific good precisely coincides with the beneficiaries. For instance, these 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. We therefore retain the stark but simplifying assumption that all publicly provided goods are 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 setup, individuals have distorted incentives, and there is sharp disagreement over policy, because the groups share the cost of financing the public good. Hence beneficiaries of a particular public good would like to overspend on that good, since they share the cost of providing this good with others. Conversely, every group wishes to reduce spending on public goods of which they are not the beneficiaries, since they internalize no benefit from them but must nonetheless share the cost of providing them.

Adding externalities, so that the local public good g^J also affects the utility of groups other than J, adds other considerations (these are discussed by Besley and Coate 1998a), but the incentive problems discussed in this chapter remain. Even if full decentralization were feasible, it would not deliver the social optimum, as the externalities would not be internalized. And under full centralization, the incentive problems due to cost sharing would still be relevant as long as different groups preferred different combinations of public goods. For simplicity, we thus neglect externalities.

7.1.2 The Basic Common-Pool Problem

To illustrate the incentive problems that arise from centralized financing, we start with a simple decision-making procedure. Each group decides freely on the supply of each public good, whereas the tax rate is residually determined. 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 $\mathbf{g}^D$ (the D superscript 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

$$H_g(g^{J,D}) - 1 = \frac{N^J}{N} - 1. \tag{7.4}$$

Since the right-hand side of (7.4) is negative, all groups overspend compared to the social optimum defined by (7.2): $g^{J,D} > g^*$ for all J. Furthermore, 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, in which 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 such spending is 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, whereas financing remains centralized. Moreover, the incentive problem does not disappear even under fully centralized decisions on spending, as each group still

seeks to influence the central government to satisfy its own interests. Concentration of benefits and dispersion of costs imply that with centralized spending, each group retains a political incentive to demand overprovision of goods to its own group and underprovision to the other groups so as to avoid paying high taxes. Which groups will be most politically powerful in taking advantage of this opportunity depends both on group attributes and on political and budgetary institutions. The remaining sections discuss how the different groups' policy preferences are aggregated to an equilibrium policy in alternative institutional settings.

7.2 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. As we will further discuss in chapter 13, 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.[3] Less attention has been devoted to the implications for the size of government of alternative budgetary procedures, with a few exceptions noted below. This is an unfortunate oversight, as one of the underlying problems that "stricter" budgetary procedures are supposed to solve, namely the common-pool problem, also distorts the level of spending.

As noted in the previous section, the common-pool 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 $(\mathbf{g}, \tau)$ 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. This section's model purports to describe decision making in a legislature, and its rules capture stylized features of the budget process. We pick up the legislative bargaining approach introduced in chapters 2 and 5. As mentioned before, this approach follows the work by Baron and Ferejohn (1989), whose legislative bargaining framework has become a workhorse model for analyses of the U.S. Congress and other legislatures. We ask how bargaining power is determined inside the legislature and how alternative procedures shape aggregate spending.[4]

3. In the United States, a procedure similar to giving such power to the Treasury is to require all spending proposals to be channeled through one committee; see Cogan 1994.

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

7.2.1 A Simple Legislative Bargaining Model

In the model of this section, groups are distinguished by their geographical location. Each location is represented by one member of the legislature who is an outcome-motivated 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 U.S. 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: (1) One of the representatives, $J = a$, is chosen to be the agenda setter. (2) Representative a makes a policy proposal, $\mathbf{g}$. (3) 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*—that is, proposals cannot be amended—with only one round of proposals. Amendments and multiple rounds, with proposal rights alternating between legislators, are discussed below.[5]

7.2.2 Political Equilibrium

Consider first the choices by legislators $J \neq a$ at the voting stage (3). Clearly, any legislator will approve only proposals $\mathbf{g}$ that, 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

$$W^J(\mathbf{g}) - W^J(\overline{\mathbf{g}}) = H(g^J) - H(\overline{g}^J) - \sum_I \frac{N^I}{N}(g^I - \overline{g}^I) \geq 0. \tag{7.5}$$

Consider next the proposal stage (2). Here the agenda setter maximizes her own payoff, given by (7.3), subject to the government budget constraint, the "incentive compatibility constraints" (7.5) holding for a majority coalition $\mathcal{M}$, including at least $\frac{\mathcal{J}-1}{2}$ other legislators, and the nonnegativity constraints $g^J \geq 0$ for all J. Eliminating the multipliers from the Kuhn-Tucker conditions to this problem and manipulating the solution, we

5. We do not model the criteria for selecting the agenda setter. A large political science literature on congressional politics has addressed this question. Not many papers have tried to model this formally, however. Two important papers are Austen-Smith and Banks 1988 and McKelvey and Riezman 1991, which relate agenda-setting power to electoral outcomes and seniority, respectively (see also problem 4 of this chapter and the discussion at the end of section 7.2.2).

can write the following conditions describing the equilibrium proposal, denoted with a ^{B} superscript:[6]

$$\begin{aligned} H_g(g^{J,B}) &= \frac{N^J}{N}\frac{1}{1-\sum_{I\in\mathcal{M}}\frac{N^I}{N}\frac{1}{H_g(g^{I,B})}}, \quad J=a \\ g^{J,B} &= 0, \quad J\notin\mathcal{M} \\ H(g^{J,B})-H(\overline{g}^J) &= \sum_{I\in\mathcal{M}}\frac{N^I}{N}(g^{I,B}-\overline{g}^I), \quad J\neq a, J\in\mathcal{M} \\ |\mathcal{M}| &= \frac{\mathcal{J}-1}{2}. \end{aligned} \tag{7.6}$$

To understand this equilibrium, consider a's incentives. 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 right-hand side of the first equation in (7.6). 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, some of which were present already in the simpler settings of example 5 in chapter 2 and of section 5.4.

1. A version of Riker's (1962) so-called size principle will hold: a chooses a minimum winning coalition, $\mathcal{M}$, 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 (7.5) 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, $\overline{g}^J$, and

6. The first-order conditions for this problem imply

$$H_g(g^a)-\frac{N^a}{N}-\frac{N^a}{N}\sum_{J\in\mathcal{M}}\mu^J=0$$

$$-\frac{N^J}{N}+\mu^J H_g(g^J)-\frac{N^J}{N}\sum_{I\in\mathcal{M}}\mu^I=0 \quad \text{for} \quad J\in\mathcal{M},$$

where μ^J is the Lagrange multiplier associated with the incentive constraint (2.5). These conditions imply that

$$\mu^J=\frac{H_g(g^a)N^J}{H_g(g^J)N^a}.$$

representing the smallest districts, that is, those with the smallest N^J. A weak status quo position may thus be to the advantage of a legislator and her district, contrary to what happens in two-player Nash bargaining. 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 its position. In a richer model, in which 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 again discussed in section 7.5. District size matters because the status quo payoffs are defined in terms of per capita public goods. Hence smaller districts are cheaper to please, and they are thus more likely to be included in the majority (recall that each legislator has one vote irrespective of district size).

4. The resulting allocation is asymmetric and socially suboptimal, given 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 majority districts' default allocations $\overline{g}^J$ are not too high, however, they will typically get less than the optimum: $g^{J,B}<g^*$ 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 equation of (7.6) as:

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

where the left-hand side is the expression defining the utilitarian optimum. Thus the right-hand side measures the deviation from the normative 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 majority's population share (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 suggests that we should observe more asymmetric benefits for certain types of government programs. Specifically, infrastructure projects—for which the natural status quo is no projects—should be more asymmetrically distributed across groups than entitlement programs—for which the natural status quo is the existing policy (and of which the beneficiaries are probably also more evenly distributed across voting districts).

5. Finally, whether the model predicts aggregate overspending depends on parameters and on the concavity of $H(\cdot)$, and there is no presumption that the bias goes either way.[7] But this model contains two useful lessons for the design 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, one legislator's strong agenda-setting powers discipline all the others (though this also leaves more room for the agenda setter to spend more for himself). Second, suppose that different legislators differ in their valuation of public versus 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, because of the need to split the workload as well as the varying background of legislators. Giving control over certain issues to some individuals provides incentives for them to invest in issue-specific competence and information gathering. In the U.S. Congress, for instance, this specialization and control is manifested in powerful standing committees with considerable agenda-setting powers over the issues under their jurisdiction.[8] Parliamentary systems also have standing committees, 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 that influences the allocation of spending.

7.2.3 Extensions

The procedures adopted in real-world legislatures modify and dilute power associated with proposal rights in several ways. One mechanism by which this occurs is the amendment right of other legislators; another is separation of proposal powers: different legislators have

7. The flatter is H_g, the more likely is overspending. Consider the special case in which $\mathcal{J}=3$, such that the majority $\mathcal{M}$ consists of a single legislator m. Furthermore, assume that $\overline{g}^J=0$ 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.

8. An informational view on legislative organization, including the rationale for vesting agenda-setting powers with legislators and committees, has been emphasized in the political science literature; see in particular Krehbiel 1991.

agenda-setting rights over different policy dimensions. We briefly discuss each of these in turn.

Amendment Rights Instead of the closed rule analyzed earlier, assume now an open rule, according to which some other legislator can amend the initial proposal. It is common practice to pitch an offered amendment against the initial proposal in a vote, and then either to allow a new round of amendments to the winning proposal or 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. Because 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 relative to the default outcome, but relative to their continuation value from further bargaining. The simple bargaining game of section 5.4 introduced such continuation values. 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. Problems 1 and 2 of this chapter illustrate different examples of legislative bargaining under an open rule with an infinite horizon. Problem 2 in particular allows for an endogenous budget.

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 impose 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 on against the status quo. This procedure ensures 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 are 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.[9] The intuitive reasoning is that two-stage budgeting makes it possible to confer agenda-setting powers over different decisions to different legislators. This dilutes the agenda setter's power without reintroducing a common-pool problem. 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, for simplicity normalized to unity. Thus, $N^J=1$ and $N=3$. 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 $\overline{g}^J = \frac{1}{3}G$, in which 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: $g^{m_g}=\frac{1}{3}G$. He spends nothing in the minority district, n_g, and allocates the remaining budget to his own district: $g^{a_g}=\frac{2}{3}G$. Because 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 somebody who knows that she is a member of the second-stage majority. Thus we have $a_\tau = m_g \neq a_g$. The optimal level of G for the first-stage proposer then solves $\max[H(g^{m_g}) - \frac{1}{3}G] = \max[H(\frac{1}{3}G) - \frac{1}{3}G]$, 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 of aggregate spending to her own district, and these are equal to a third of the social benefits. Because 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.[10] If the future majority composition is indeed known, G^* always collects a majority against $\overline{G}$. Interestingly, if $G^* > \overline{G}$, a_g supports G^* because she wants

9. See, for instance, von Hagen 1998 and Kontopoulos and Perotti 1997, 1999.

10. Naturally, the allocative distortion remains, and thus nothing ensures that G^* is still socially optimal, given that allocative distortion.

as high a revenue as possible to allocate at the second stage. A stable majority thus suggests the two parts of the budget. If the status quo instead involves aggregate "overspending" $G^* < \overline{G}$, a_τ instead gets the 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; this is discussed in more detail in part 3 on comparative politics. But without further institutional detail, nothing in the model pins down the second-stage majority. Therefore, consider an alternative case in which $a_\tau \neq a_g$, but a_τ is part of the future majority with only 50% probability. In this case, the optimal level of G, from the point of view of a_τ, solves $\max[\frac{1}{2}H(\frac{1}{3}G) - \frac{1}{3}G]$, 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. We will repeatedly encounter a similar point in part 3, in which 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 legislature's preferences as given. Where do legislators' outcome-oriented preferences come from? As discussed in chapters 3 and 4, motives different from those of the voters, such as a desire to raise funds, to get reelected, or to use political power for their own private agenda, may influence legislators' behavior, creating an agency problem vis-à-vis the voters. If lobbies and voters understand these motives and how the legislative process works, do they not adapt their behavior to influence the policy outcome? To answer such questions, we must obviously leave partial models behind and study interactions among different aspects in the political process. Having dealt with partial models of lobbying and voting, we turn to such interactions in section 7.5. Part 3 deals further with agency issues—as formally introduced in chapter 4—and their dependence on the political institutions.

7.3 Lobbying

Our next model of policymaking focuses on the influence or lobbying activities of interest groups. Policy decisions are assumed to be centralized in the hands of a semibenevolent 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 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 workhorse 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 study group-specific government spending.[11]

This model of lobbying differs in two respects from the one introduced in chapter 3. On the one hand, there are no elections. The lobbies attempt to influence policy formulation directly, rather than the election outcome given some policy proposals, as in chapter 3. On the other hand, we assume that lobbies can commit to provide contributions (or "bribes") contingent on future policies before the government has made any policy choice. Because of this timing and the assumptions about the government motivation, the present model of lobbying is more of a "black box." As shown in section 7.5, however, both models of lobbying lead to essentially the same results.

7.3.1 A Simple Lobbying Model

As Olson (1965) noted long ago, influence activities entail a free-rider problem: all members of a group benefit, irrespective of whether they contribute to the lobbying. Some groups successfully overcome this free-rider problem, others do not. We follow the literature by not modeling how this takes 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: (1) Every lobby J noncooperatively and simultaneously presents its 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 lobby's objective is to maximize its members' net welfare, 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). (2) The government sets $\mathbf{g}$ so as to maximize a weighted sum of social welfare and contributions:

$$W(\mathbf{g}) = \eta \sum_J N^J W^J(\mathbf{g}) + (1-\eta) \sum_{J\in\mathcal{L}} N^J C^J(\mathbf{g}), \tag{7.7}$$

where η, $0 \le \eta \le 1$, 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. For simplicity, we shall confine ourselves to

11. Persson and Tabellini (1994d) study local public-goods provision in a common-agency model but impose unappealing restrictions on the strategies used by interest groups.

equilibria in (globally) truthful contribution schedules, namely those satisfying

$$C^J(\mathbf{g}) = \max[W^J(\mathbf{g}) - b^J, 0], \tag{7.8}$$

where b^J is a constant the lobby sets optimally.[12]

7.3.2 Political Equilibrium

To derive an equilibrium in truthful strategies, we can exploit the fact that allocations in such equilibria must be jointly Pareto optimal for the government and all the lobbies. The equilibrium vector $\mathbf{g}$ therefore maximizes 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 equilibrium policy maximizes the weighted sum

$$\eta \sum_{J\notin\mathcal{L}} N^J W^J(\mathbf{g}) + \sum_{J\in\mathcal{L}} N^J W^J(\mathbf{g}), \tag{7.9}$$

where aggregate welfare for the nonorganized groups is defined in the same way as in (7.3) (see problem 3 of this chapter for an explicit derivation of this result). In other words, the equilibrium coincides with the solution to a planning problem in which the nonorganized groups are underweighted relative to the organized groups to an extent that depends on the government's benevolence. The first-order conditions to (7.9) define the equilibrium allocation, denoted with an L superscript:

$$\begin{aligned} H_g(g^{J,L}) - 1 &= -(1-\lambda_{\mathcal{L}})(1-\eta) \le 0, \quad J \in \mathcal{L} \\ H_g(g^{J,L}) - 1 &= \lambda_{\mathcal{L}}(1-\eta)/\eta \ge 0, \quad J \notin \mathcal{L}, \end{aligned} \tag{7.10}$$

where

$$0 \le \lambda_{\mathcal{L}} = \sum_{J\in\mathcal{L}} \frac{N^J}{N} \le 1$$

is the share of the population organized in a lobby. The left-hand side of (7.10) is the expression defining the utilitarian optimum, so the right-hand side measures the deviation

12. A globally 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. The literature has typically dealt with *locally* truthful strategies, in which this property holds only at the equilibrium point. See Grossman and Helpman 1994 and Dixit, Grossman, and Helpman 1997 as well as problem 3 of this chapter for further details and for a thorough discussion of the restriction to truthful strategies in common-agency games.

from the optimum benchmark. Several results are apparent, some of which were anticipated already in the lobbying model of chapter 3.

1. As is evident from (7.10), 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 enacted only because of 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 policy decision correctly internalizes the true marginal social cost.

2. Public consumption is generally misallocated, however: organized groups get more and unorganized groups less than the optimal amount. Intuitively, the amount of 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 the lobbies have expressed. If $\eta \to 0$, the government cares only about contributions, and provision to the unorganized groups also goes to zero. The amount of overprovision is also larger, the lower is the share of the organized groups (the lower is $\lambda_{\mathcal{L}}$), because 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. Although there is certainly overprovision to organized groups, there is underprovision to nonorganized ones. Not only do the preferences of the nonorganized receive a smaller weight in the policy decision, but the tax burden of provision to nonorganized 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, lobbies might plausibly consist of individuals with a high preference for the public good, who have a higher stake on the policy outcome and hence are more likely to overcome the free-rider problem of getting organized. The intuition as to why consumers are underrepresented in lobbying is familiar from games over trade policy. In this event, it is easily shown that lobbying results in aggregate overspending compared to the normative benchmark.

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

The common-agency model of lobbying elegantly and simply aggregates the influence activities of many interest groups into a policy decision. It also sheds light on how the pattern of organization across groups shapes the policy outcome. The model leaves some crucial issues aside, however. The major problem is that we lack a precise model of the process whereby some 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. An interesting conjecture is that groups are organized and solve their free-rider problem also thanks to government policy. Just as public policy confers monopoly privileges on some economic actors, it can also preserve and promote organized groups, from whom politicians then draw political or economic benefits. A prime example of this idea are the laws regulating trade union activities and representation in many industrial countries. Such legislation can help trade unions organize political activities, which in turn helps left-wing parties gather support at the time of elections.[13]

A second issue is that the "government" and the process of policy choice is still a black box. If the lobbying model captures what takes place between elections, what exactly does the objective function in (7.7) capture? And how can lobbies commit to a contingent contribution schedule before policy is set? It is really impossible to answer these questions without a structural model of policy choice. In the last section of the chapter, we follow the approach of chapter 3, embedding a lobbying model into the electoral framework suggested in the next section (see also Grossman and Helpman 1996). We then show that the parameter η can be interpreted as reflecting more-structural assumptions. In the last section, we also open the black box in another way, namely by combining lobbying and legislative bargaining.

7.4 Electoral Competition

We have seen how interest groups' ability to organize into lobbies and be represented by powerful legislators gives them an edge in the struggle for policy benefits. Some groups, however, may also have particular attributes, in their role as voters, that make them an

13. Mulligan and Sala-i-Martin (1999b) provide a formal example of this idea with regard to early retirement legislation, which they argue has the effect of freeing up more time for political activities by the elderly.

attractive target for office-motivated politicians. Our last partial model of centralized policymaking and special-interest politics therefore focuses on electoral competition. In this model, there is no lobbying, no legislative bargaining, and no separation of decisions on spending and taxes. Instead, we adapt the probabilistic voting model introduced in chapter 3 to our policy problem with group-specific public consumption out of an endogenous pool of tax revenue. Here we draw on the modeling of Lindbeck and Weibull (1987) and Dixit and Londregan (1996). Two competing candidates who maximize their probability of winning the election thus make policy decisions. They make binding promises of policy favors to interest groups ahead of the elections. When announcing policy favors, the candidates take into account which groups are more likely to be swayed. The question we ask is which groups have the greatest influence on electoral promises.

7.4.1 A Simple Model of Electoral Competition

Consider the model of section 7.1, but add two office-motivated political parties, $P = A$, B. Before the election, both parties noncooperatively commit themselves to specific policy platforms, $\mathbf{g}_A$ and $\mathbf{g}_B$. Parties also differ in another dimension, unrelated to the announced economic policies. As before, we 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.

As in chapter 3, voters' preferences reflect this ideological difference among parties: each voter has an "ideological bias" for or against party B. Specifically, member i of group J has the extended utility function

$$w^{iJ} = \kappa^J W^J(\mathbf{g}) + (\sigma^{iJ} + \delta) D_B, \tag{7.11}$$

where D_B takes a value of unity if party B wins the election and zero otherwise. Further, σ^{iJ} is an individual-specific parameter, κ^J is a group-specific parameter, and δ is a random variable capturing the party preferences of the whole population. Thus two features distinguish individuals: the group to which they belong, indexed by J, and their individual party bias, σ^{iJ}. Individuals with $\sigma^{iJ} > 0$ (< 0) have a bias in favor of (against) party B, which is stronger the greater is σ^{iJ} (in absolute value). Individual party bias is distributed within each group according to a uniform distribution on the interval

$$\left[-\frac{1}{2\phi^J}, \frac{1}{2\phi^J}\right].$$

That is, the distribution of σ^{iJ} for all i belonging to group J has density ϕ^J. Thus each group has members inherently biased toward both parties and on average neutral, but 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 δ captures party B's average popularity in the population as a whole. We assume that δ has a uniform distribution on $[-\frac{1}{2\psi}, \frac{1}{2\psi}]$. The realization of δ 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 (7.11) imply that voters in group J supporting party A all have $\sigma^{iJ} < \kappa^J[W^J(\mathbf{g}_A) - W^J(\mathbf{g}_B)] - \delta$. Let us identify the swing voters in group J as the voter who, given the parties' platforms, is indifferent between the two parties. We denote swing voters' party bias as $\sigma^J(\mathbf{g}_A, \mathbf{g}_B, \delta)$, defined by

$$\sigma^J(\mathbf{g}_A, \mathbf{g}_B, \delta) \equiv \kappa^J[W^J(\mathbf{g}_A) - W^J(\mathbf{g}_B)] - \delta. \tag{7.12}$$

Swing voters toss a coin when deciding how to vote.

7.4.2 Political Equilibrium

The two parties simultaneously and noncooperatively choose their platforms so as to maximize the probability of winning the election.[14] To specify the party objectives, first note that the distributional assumptions allow us to write party A's vote share as

$$\pi_A = \sum_J \frac{N^J}{N} \phi^J \left[\sigma^J(\mathbf{g}_A, \mathbf{g}_B, \delta) + \frac{1}{2\phi^J}\right].$$

As in chapter 3, by definition of σ^J in (7.12) and the assumption that δ is uniformly distributed with density ψ, party A's probability of winning can be written as

$$p_A = \text{Prob}\left[\pi_A \geq \frac{1}{2}\right] = \frac{1}{2} + \frac{\psi}{\phi}\left[\sum_J \frac{N^J}{N} \phi^J \kappa^J [W^J(\mathbf{g}_A) - W^J(\mathbf{g}_B)]\right], \tag{7.13}$$

where $\phi \equiv \sum \frac{N^J}{N} \phi^J$ is the average density of party bias across groups. Party A sets its platform so as to maximize this expression, subject to the budget constraint. As in chapter 3, we get a convergence result. Party B's probability of winning is given by $1 - p_A$, but $\mathbf{g}_B$ affects p_A in the same way as it does $\mathbf{g}_A$, although with the opposite sign. Because the two parties face the same budget constraint, they effectively face the same decision problem. Specifically, this optimization problem does not include any party-specific variables. Furthermore, the problem is concave by our distributional assumptions and the concavity of $W^J(\cdot)$. It should thus come as no surprise that a Nash equilibrium involves identical policy platforms,

14. 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 δ can be omitted from the model.

$\mathbf{g}_B = \mathbf{g}_A$. By (7.12), this implies $\sigma^J(\mathbf{g}_A, \mathbf{g}_B, \delta) = -\delta$. Because the expected value of δ is zero, each party is doing its best to capture the votes of the ideologically neutral swing 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

$$\frac{N^J}{N}\frac{\phi^J}{\phi}\kappa^J H_g(g^J) - \frac{N^J}{N}\sum_I \frac{N^I}{N}\frac{\phi^I}{\phi}\kappa^I = 0. \tag{7.14}$$

The equilibrium thus entails a generalized Hotelling-type result. Despite the multidimensional policy space, the two parties converge on the same platforms. The intuition for this is simple: the parties compete for the same voters and are thus 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 decides the unique equilibrium election outcome.

To characterize equilibrium spending, $\mathbf{g}^E$, it is useful to rewrite (7.14) as

$$H_g(g^{J,E}) - 1 = \frac{\sum_I \frac{N^I}{N}\phi^I\kappa^I - \phi^J\kappa^J}{\phi^J\kappa^J}. \tag{7.15}$$

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

1. As in chapter 3, electoral competition implements the utilitarian optimum, $\mathbf{g}^E = \mathbf{g}^*$, in a politically homogenous society (that is, a society in which the ideological bias is the same across groups, such that the densities ϕ^J and the parameters κ^J coincide for all J). This is intuitive: because both parties try to buy expected votes by influencing the voters' marginal utility, they have marginal incentives identical to those emanating from a utilitarian objective, if each group is identical as concerns how easily its 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. As in chapter 3, the term $\phi^J\kappa^J$ conveniently summarizes the political clout of a specific group J. If this term is higher than the weighted average of all groups, the right-hand side of (7.15) is negative, implying $g^{J,E} > g^*$. The term ϕ^J measures the density of ideologically neutral voters, that is, of voters who care only about economic policies. These are the most mobile voters, and both parties want to please them. The greater is the density of these swing voters within group J, the greater is the expenditure directed toward this group. The parameter κ^J, in contrast, reflects to what extent voters in group J care about economic well-being as opposed to ideology. Groups that 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 generally favor the middle class. Inversely, 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.[15]

3. Group size plays no 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 (7.15) shows, these two effects cancel each other out. Note, however, that we have assumed that parties maximize their probability of winning taken over the whole population. Thus we can consider this an implicit assumption of an electoral system with strict proportional representation. Chapter 8 considers alternative electoral rules in a similar model.

4. Total spending has no first-order bias relative to the utilitarian optimum. As (7.15) shows, some groups get more and 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, since 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 papers by Lindbeck and Weibull (1987) and Dixit and Londregan (1996), direct income transfers support each group's private consumption. Poorer groups systematically obtain more support, ceteris paribus, since their marginal utility of income is higher (as it would be for a benevolent planner). The same would apply here with a concave utility of private consumption; common taxes would hurt poor voters necessitating compensation with greater public consumption. Strömberg (1998b) lets groups differ in their turnout rates, denoted as t^J. The political clout of group J in the model above becomes $t^J\phi^J\kappa^J$. 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, in which parties give more favors to their traditional support groups, as discussed in the model by Cox and McCubbins (1986). Dixit and Londregan (1998a) study a more general model in which parties and voters also have

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

some ideological concerns about income distribution, which allows them to derive endogenously the result that groups composed of middle-class voters are likely to have the most electoral clout.

The model in this section certainly highlights important aspects of how parties may favor special interests 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. And as discussed in chapters 3 and 4, the assumption of binding electoral promises is dubious; in the running of business, the incumbent government and its administration make many policy decisions between elections. Part 3 discusses at length how electoral competition is played out, through retrospective voting in this case.

7.5 Interactions

So far this chapter has 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 separate aspects. 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, those groups will also 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 the chapter to the analysis of three pairwise forms of interaction.

7.5.1 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. To illustrate how electorally motivated lobbying may influence policy, we now combine the lobbying and voting models from this chapter. The resulting model in the present multidimensional problem is the same as the model used in the one-dimensional problem of section 3.5, with the central conclusion that the insights gained in that section survive and carry over to this more general model. Both the lobbying activity and the voters' attributes influence equilibrium policy: organized groups and groups with more swing voters are overrepresented in the political process. Moreover, additional insights are gained about how the lobbies' effectiveness and the size of equilibrium contributions are determined. The analysis is a

variant on that in Bennedsen 1998, which in turn extends and simplifies earlier work by Baron (1994) and Grossman and Helpman (1996).[16]

We thus combine the models of sections 7.3 and 7.4 but make some simplifications. Two vote-maximizing parties, B and A, set policy platforms $\mathbf{g}_B$ and $\mathbf{g}_A$, respectively, in advance of the elections. As before, these parties differ in some 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

$$w^{iJ} = W^J(\mathbf{g}) + (\sigma^{iJ} + \delta)D^B, \tag{7.16}$$

but now δ is given by

$$\delta = \widetilde{\delta} + h(C_B - C_A).$$

Thus, party B's average popularity has two components. The term $\widetilde{\delta}$ is a random variable, as previously, uniformly distributed on $[-\frac{1}{2\psi}, \frac{1}{2\psi}]$. But the total campaign contributions received by parties B and A, C_B and C_A, respectively, also now influence the two parties' overall relative popularity. Specifically, voters are biased in favor of the party receiving more contributions, with $h > 0$ being a parameter capturing the sensitivity to the difference in campaign spending.[17] This has more than one interpretation: C_B might measure advertising expenditures or media exposure of party B's leaders, but it might also refer to support actions in favor of party B's candidate or against her electoral opponent.[18] As in section 7.4, σ^{iJ} is distributed according to group-specific distributions uniform on

$$\left[-\frac{1}{2\phi^J}, \frac{1}{2\phi^J}\right]$$

with density ϕ^J.

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

$$\sigma^J \equiv W^J(\mathbf{g}_A) - W^J(\mathbf{g}_B) + h(C_A - C_B) - \widetilde{\delta}. \tag{7.17}$$

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

17. Allowing h to differ across groups or individuals does not matter for the results, since only the average value of h (across groups and individuals) enters the equilibrium expressions. Note that $h > 1$ is allowed.

18. Grossman and Helpman (1996) suggest a slightly different interpretation that leads to a similar formulation. 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.

Thus campaign spending affects the identity of this swing voter. All voters in group J with $\sigma^{iJ} > \sigma^J$ prefer party B; all those with $\sigma^{iJ} < \sigma^J$ prefer A. Following the same approach as in section 7.4, we can derive the probability of winning for party A as

$$p_A = \frac{1}{2} + \psi\left[\frac{1}{\mathcal{J}}\left[\sum_J \frac{\phi^J}{\phi}(W^J(\mathbf{g}_A) - W^J(\mathbf{g}_B))\right] + h(C_A - C_B)\right]. \tag{7.18}$$

A subset $\mathcal{L}$ of the groups is organized into lobbies. As in section 7.3, $\lambda_{\mathcal{L}}$ denotes the fraction of the population organized. Lobby J maximizes the expected utility derived from economic policy, net of the per capita cost of its contributions, namely

$$p_A W^J(\mathbf{g}_A) + (1 - p_A)W^J(\mathbf{g}_B) - (C^J)^2/2, \tag{7.19}$$

where $C^J = C_B^J + C_A^J$ is the per member campaign contribution by lobby J to both parties, and C_B^J and C_A^J are constrained to be nonnegative. As each group has a share $1/\mathcal{J}$ of the population, the total contributions received by party P are

$$C_P = \frac{1}{\mathcal{J}}\sum_{J\in\mathcal{L}} C_P^J.$$

Unlike in section 7.3, the cost of lobbying is taken to be a convex function of C^J, the last term in (7.19).[19] As mentioned in chapter 3, this could reflect increasing marginal costs of enticing potential contributors with different willingness to give, in which case 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.

The timing of events is as follows: (1) Both parties simultaneously announce policy platforms. (2) Having observed these announcements, all lobbies simultaneously set their campaign contributions. (3) Elections are held. Stages (1) and (2) are thus reversed relative to section 7.3, in which the lobbies instead moved first by setting contingent contribution schedules. The present timing assumption considerably simplifies the analysis and may 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, since 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.[20]

19. With linear cost functions for C^J, the lobbies' reaction functions would not be continuous in the policy platforms in this setup.

20. Grossman and Helpman (1996) instead consider a setup in which the lobbies move first, and they derive rather similar results.

We are now ready to characterize the equilibrium. The electoral outcome at stage (3) has already been discussed. Consider the optimization problem the lobbies face at stage (2) for given policy platforms announced at stage (1). Maximization of (7.19) with respect to C_A^J and C_B^J, subject to (7.18), yields:[21]

$$\begin{aligned} C_A^J &= \text{Max}\left[0, \frac{h\psi}{\mathcal{J}}(W^J(\mathbf{g}_A) - W^J(\mathbf{g}_B))\right] \\ C_B^J &= -\text{Min}\left[0, \frac{h\psi}{\mathcal{J}}(W^J(\mathbf{g}_A) - W^J(\mathbf{g}_B))\right]. \end{aligned} \tag{7.20}$$

By (7.20), 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.[22] Summing this expression across all lobbies in $\mathcal{L}$, we get

$$C_A - C_B = \frac{h\psi}{\mathcal{J}^2}\sum_{J\in\mathcal{L}}[W^J(\mathbf{g}_A) - W^J(\mathbf{g}_B)]. \tag{7.21}$$

That is, campaign spending goes to the party that, on average, is 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 (7.18), (7.19), and (7.21), party A's objective function can then be written as

$$\max \frac{\psi}{\mathcal{J}}\left[\sum_J \frac{\phi^J}{\phi}[W^J(\mathbf{g}_A) - W^J(\mathbf{g}_B)] + \gamma\sum_{J\in\mathcal{L}}[W^J(\mathbf{g}_A) - W^J(\mathbf{g}_B)]\right], \tag{7.22}$$

where $\gamma = \psi h^2/\mathcal{J} > 0$ is an extra weight on the lobbies' utility related to how effectively campaign spending influences the voters: the more influential it is, the greater is the weight on the lobbies' utilities. Note the similarity to the assumed reduced-form objective of the government in the common-agency model in section 7.3; in that case, the organized lobbies also get an additional weight in the policymaker's objective. Thus, γ in the present model closely corresponds to $(1 - \eta)$ in section 7.3.

21. To derive (7.20), note that by (7.18) we have:

$$\frac{\partial p^R}{\partial C_R^J} = \frac{h\psi}{\mathcal{J}} = -\frac{\partial p^L}{\partial C_L^J};$$

also recall that contributions are nonnegative.

22. For U.S. evidence on this point, see Poole and Romer 1985.

By the same logic, party B solves an identical problem. Hence, as in section 7.4, both parties announce the same policies, $\mathbf{g}_A = \mathbf{g}_B$, which then implies that equilibrium campaign spending is zero: see (7.21).[23] This does not mean that the presence of the lobbies is irrelevant; on the contrary: out of equilibrium, they do spend on the party that pleases them most, and this induces both parties to tilt public policy in their favor. Specifically, taking the first-order conditions of problem (7.22) and rewriting them, we can define the equilibrium allocation by the following expressions:

$$\begin{aligned} H_g(g^J) - 1 &= \frac{\phi}{\phi^J + \gamma\phi}\left[1 - \frac{\phi^J}{\phi} - \gamma(1 - \lambda_{\mathcal{L}})\right] \quad \text{if } J \in \mathcal{L} \\ H_g(g^J) - 1 &= \frac{\phi}{\phi^J}\left[1 - \frac{\phi^J}{\phi} + \gamma\lambda_{\mathcal{L}}\right] \quad \text{if } J \notin \mathcal{L}. \end{aligned} \tag{7.23}$$

That is, g^J is overprovided, relative to the social optimum, if there are many swing voters in J (ϕ^J is larger than ϕ, the average of the other groups), precisely as in section 7.4. If group J is organized as a lobby, there is also overprovision, and the lobbying effect is stronger the higher is γ, that is, 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 amount of overprovision for the lobbies but decreases the amount of underprovision for the unorganized groups, as in section 7.3. Thus, the lobbying and probabilistic voting models naturally complement each other, and the more general formulation preserves the insights gained when each is considered in isolation.

The model can easily be generalized to introduce other attributes of the voters. As noted above, Grossman and Helpman (1996) 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 7.4. The uninformed, on the other hand, are completely unaffected by economic policies, and their preferences respond only to campaign spending by the parties: namely, their preferences are simply given by the contributions term $h(C_A - C_B)$. Let groups also differ in their share of informed and uninformed voters, besides the density ϕ^J, and let α^J denote the share of informed voters in group J. Then repeating the same steps as above, it can be shown that parameter α^J influences the allocation in the same way as ϕ^J in expression (7.23). That is, the parties treat groups with a larger share of informed voters better, since those voters are more responsive to economic policies. Stated otherwise, voters' responsiveness, one of the key determinants of the equilibrium allocation in the voting model, can reflect either a small weight given to ideology within the group (or small electoral turnout), or equivalently, a small share of uninformed voters.

23. Grossman and Helpman (1996), with their different timing assumption, get a different result: in their model, party platforms do not converge, and equilibrium contributions are positive.

This discussion naturally suggests two questions: How do voters obtain their information? And why are some voters informed whereas others are not? An obvious answer to the first question is that voters obtain their information from the media. Strömberg (1998a) 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 7.4) and competition between profit-maximizing media provides an answer to the second question. Optimal behavior by the media tends to bias the information, and hence also the policy outcome, toward groups that are attractive to advertisers.

To summarize, the model in this subsection provides a richer set of determinants of success in special-interest politics compared to the partial models in sections 7.3 and 7.4. There are no surprises, however, and the results combine our earlier findings. As we shall see in the next two subsections, however, this is not always the outcome of interactions between two different types of political activity.

7.5.2 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 discussed above. In district-wide elections, forward-looking voters appoint a representative for the coming legislative session, which, as we shall see, gives rise to strategic delegation. To make that point, we now assume that candidates for office are outcome-motivated. As in chapter 5, 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 in which the last three stages are identical to the game in section 7.2. 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

$$W^{J,\alpha} = c^J + \alpha H(g^J). \tag{7.24}$$

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 (7.24), and their type (ideology) is not an object of choice for the candidate himself. Candidates are thus characterized by their utility function (7.24), or more compactly, by their preference parameter α.

For simplicity, we also make the following symmetry assumptions: (1) In all districts, there is a continuum of candidates from which to choose, with values of α in the same range

$[\alpha^L, \alpha^U]$ for all districts. (2) We continue to assume that voters are all identical within each district and have preferences as in (7.24), but with $\alpha = 1$. Adding voter heterogeneity, with voter preferences distributed over the same range $[\alpha^L, \alpha^U]$ as candidates, would not change the results. (3) All districts have the same size, namely $\frac{N^J}{N} = \frac{1}{J}$ for all J. (4) The default allocation is symmetric, namely $\overline{g}^J = 0$ for all J, implying $\overline{\tau} = 0$. (5) Every representative has the same probability, $\frac{1}{J}$, of being chosen as the agenda setter.

Once more, we look for a subgame-perfect Nash equilibrium. Consider first the legislative bargaining stages. By (3), (4), and the results in section 7.2, it is easily shown that the chosen agenda setter will pick the $\frac{J-1}{2}$ representatives with the highest values of α as members of the majority coalition, $\mathcal{M}$. These representatives are easiest to please, because they value public consumption a lot and the status quo has $\overline{g}^J = 0$ (i.e., their incentive constraints (7.5) are the easiest to relax). At the elections stage, voters realize this. Recall that voters in district J get compensated with some public goods for the taxes they pay only if the candidate they elect is part of the majority, whereas they get no compensation if the candidate they elect 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 candidates the other districts elect, since that would with certainty make him part of the majority. This pushes all districts into 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.[24]

Thus we have an instance of strategic delegation: voters in each district elect a big spender, because unless they act in this way, they are left in the opposition. Clearly, this voting equilibrium makes the allocation more biased toward overspending on the part of 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.

24. Some conditions are needed to ensure that this is an equilibrium, since by 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 the voters who elect him. This (expected) cost thus needs to be sufficiently smaller than the potential benefit, due to a discretely higher probability of his being included in the majority, to make it worthwhile to vote for him. With a large enough number of districts, the probability of his becoming agenda setter is sufficiently small, and this condition is satisfied.

The model could be extended to an entry stage in which candidates sort themselves out as in the citizen-candidate model of chapter 5. Suppose that voters too are heterogeneous and have the same preferences as the candidates (7.24). 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, in which every voter in each district could enter as a 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.

As Chari, Jones, and Marimon (1997) point out, this equilibrium is broadly consistent with opinions often expressed by U.S. voters, who typically are quite disconcerted with the composition and actions of Congress as a whole but, at the same time, are pleased with their own representative; the strong incumbency advantage of legislators serving in congressional elections also bears testimony of this. In the equilibrium studied, voters in any district J would 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 it still teaches us a lesson: it is important to look beyond 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 toward a more extreme outcome rather than toward a more balanced one, as might have been the first guess. The same point will reappear, even more forcefully, in the next subsection.

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 party affiliation and seniority of legislators determines the allocation of these proposal rights, which 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 in which 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 multiround bargaining were to be given in the order of decreasing seniority, senior legislators would be at a disadvantage in the legislative bargaining. Because 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 that the vote of low-α legislators is more expensive in model of this subsection.

Another important and related contribution is by Austen-Smith and Banks (1988), who discuss how government formation, in a parliament with three parties, affects an election in which voters anticipate the outcome of the government formation game. Problem 4 of this chapter summarizes some of the points in that paper.

7.5.3 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. One antecedent is

Snyder 1991, which studies how lobbies interact with legislators in the context of a spatial voting model. A central insight from the paper is that lobbies will focus their contributions on the "marginal" legislators, those who are close to indifferent between a policy proposal (favorable to the lobbies) and the status quo.[25] Our analysis in this subsection 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 making contributions only to a single congressman, "their own." This kind of fixed association is arbitrary but has some empirical support: campaign contributions in the United States tend 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. There is much less systematic information about political contributions in Europe, but in some countries there are very tight relations between interest groups, like trade unions and agricultural lobbies, and specific political parties.

Legislators still play the same legislative bargaining game as in section 7.2. We retain the symmetry assumptions (3) and (4) 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: $|\mathcal{L}| = \mathcal{J}$, in the notation of section 7.3. The policy game is as in section 7.2 but with an additional contributions stage. The timing is as follows. (1) Nature selects a legislator, $J = a$, to be the agenda setter. (2) Contribution schedules are simultaneously announced by the lobbies and observed by all legislators.[26] (3) Finally, the agenda setter formulates a take-it-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 care only about the contributions they receive.[27]

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

$$C^J(\mathbf{g}) = \begin{cases} \max\left[W^J(\mathbf{g}) - b^J, 0\right] & \text{if } J \text{ supports } \mathbf{g} \\ 0 & \text{otherwise,} \end{cases} \tag{7.25}$$

where the zero contribution if legislator J does not support a policy $\mathbf{g}$ can be shown to be

25. Another antecedent is Groseclose and Snyder 1996, which studies a game where two lobbies buy votes from legislators about to decide on a public project. Interestingly, Groseclose and Snyder show that when votes are bought sequentially, the prediction of a minimum winning coalition may fail.

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

27. Problem 5 of this chapter discusses alternative assumptions about the rules of legislative bargaining and about the candidates' motivations.

an optimal strategy.[28] As in section 7.3, we can think of b^J as the reservation utilities of group J. Representatives maximize the value of their contributions and hence want these reservation values to be as low as possible. And as in section 7.3, interest groups maximize their utility net of their contributions. Thus they want the reservation utilities in (7.25) to be as high as possible.

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

$$C^a(\mathbf{g}) = \text{Max}\left[W^a(\mathbf{g}) - b^a, 0\right] = \text{Max}\left[H(g^a) + y - \frac{1}{\mathcal{J}}\left(\sum_I g^I\right) - b^a, 0\right], \tag{7.26}$$

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

$$W^J(\mathbf{g}) - b^J = H(g^J) + y - \frac{1}{\mathcal{J}}\left(\sum_I g^I\right) - b^J \geq 0 \quad \text{for} \quad J \in \mathcal{M} \tag{7.27}$$

(recall that contributions are 0, if the proposal is voted down). Again, a finds it optimal to collect a minimum winning coalition, that is, to include only $\frac{\mathcal{J}-1}{2}$ additional members in $\mathcal{M}$. It is easily shown that $\text{Max}\left[W^a(\mathbf{g})\right]$ is decreasing in all b^J, $J \in \mathcal{M}$. The agenda setter wants to satisfy (7.27) with equality for all members of the majority, because 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 7.2.

Now let us return to the contribution stage and consider the optimal contributions for group J, $J \neq a$. Clearly, group J is better off if its representative is included in the majority, as long as that gives the group at least a tiny piece of public goods.[29] This sets up a fierce Bertrand competition among the interest groups. Because $\mathcal{M}$ includes only legislators with the lowest reservation utilities, the only equilibrium has every group J setting its reservation utility at the lowest possible level, namely

$$b^J = y - \frac{1}{\mathcal{J}}\left(\sum_{I \in \mathcal{M}} g^I\right).$$

Returning to the agenda setter's problem in (7.26)–(7.27), we then find that the optimal

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

29. If the representative is not included in the majority, group J's utility is $W^J(\mathbf{g} \mid J \notin \mathcal{M}) = y - \frac{1}{\mathcal{J}}\left(\sum_{I \in \mathcal{M}} g^I\right)$, whereas the utility if she is included is $W^J(\mathbf{g} \mid J \in \mathcal{M}) = H(g^J) + y - \frac{1}{\mathcal{J}}\left(\sum_{I \in \mathcal{M}} g^I\right)$.

solution satisfies

$$H_g(g^a) = \frac{1}{\mathcal{J}} \qquad g^J = 0, \quad \text{all } J \neq a. \tag{7.28}$$

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 having its representative be left in the minority, so that it only pays taxes but receives no public good. To avoid this outcome, each group reduces its reservation utility to make the vote of its representative cheaper to buy. Because all interest groups have the same objective, this competition drives equilibrium public goods down to zero for every district. Obviously, the agenda setter's district is the beneficiary. The logic is similar to that in Dixit, Grossman, and Helpman 1997, which studies a general common-agency model and shows that competition between the interest groups allows the single government to implement its preferred solution. Here, however, the benefit goes to one powerful district, not to a semibenevolent 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 have no 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 U.S. 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 of deference" ("you scratch my back and I scratch yours"). In our setting we could imagine a sequence of legislative sessions in which 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 7.2, even though the lobbying model of section 7.3 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 it amplifies the misallocation of public goods by a legislature in which 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. Section 7.2 discussed some of these safeguards, and part 3 will discuss others. We thus want to give more emphasis to the general logic than to specific results.

7.6 Discussion

This chapter studied a multidimensional policy problem. When redistribution can be narrowly targeted toward specific groups, economic policy confers concentrated benefits to a few, with the costs dispersed among many. We asked what determines the allocation of benefits among groups and the overall size of such redistributive programs. Our answers have emphasized a variety of political mechanisms, each focusing on a particular aspect of policy formation. Legislative bargaining models focus on the institutional position of the representatives of different groups and on the specific legislative procedures involved. Lobbying models stress different groups' ability to solve a free-rider problem and organize as an active pressure group. Electoral competition models draw the attention to the ideological attitudes of a group's members and their responsiveness to policy favors.

Each of these models, although identifying specific determinants of the policy choices, also raises new questions. The model of legislative bargaining entails a detailed set of assumptions about the rules for approving legislation. The detail is crucial, and changing the extensive form of the game can lead to radically different results. Think for instance about the role of the status quo payoffs. If unanimity is required, as in two-person Nash bargaining, increasing a player's status quo payoff increases his bargaining power. But in the majoritarian legislative bargaining of section 7.2, the opposite happens: a player with a higher status quo payoff is more likely to be left out of the winning coalition and has no bargaining power at all. Similar remarks apply to the distinction between open and closed rules, to the procedure for selecting the agenda setter, to the sequencing of decisions when more than one policy dimension is involved, and so on. A countless variety of possible detailed assumptions can be made about the extensive form of these games. Which assumptions are more reasonable and appropriate given the policy issues or the countries involved? How can we avoid the risk of arbitrary or convenient assumptions with little counterpart in real-world legislatures? These are still open questions, and to be more confident in this approach we need careful empirical and applied research. In this regard, Peltzman (1992), Levitt and Poterba (1994), and Lowry, Alt, and Ferree (1998) offer interesting empirical results with reference to U.S. states.

Similarly, the models of lobbying and probabilistic voting raise other long-standing questions: what determines a group's ability to be organized and politically active? And what

is the source of the voters' ideological preferences? An interesting idea is that politicians themselves try to foster and nurture these ideological preferences even when they contradict the voters' true economic interests, and likewise, that politicians use public policy to solve the free-rider problems of pressure groups in order to keep them politically active. Ideology can thus create a sense of party loyalty, and similarly, pressure groups help politicians to garner electoral support or even obtain economic benefits for themselves. Further exploring these issues, trying to make the voters' ideological preferences endogenous and studying the role of public policy in creating and preserving pressure groups seems a very fruitful, though difficult, area of research.

Which of the various approaches illustrated in this chapter is more appropriate, and under what circumstances? To some extent, the answer will have to await further empirical research assessing their relative ability to explain specific applied policies. Each approach identifies only a particular aspect of the political process, however, and it could be highly misleading to consider each of them in isolation. An important lesson of section 7.5 is precisely that integrating these partial political models leads to new and surprising results. The integration attempted in this chapter is incomplete, however. On the one hand, we have jumped back and forth relying on different assumptions about the politicians' motivation, the timing of events, and the forms of political participation. On the other hand, we have completely neglected the agency problem that is at the core of any political delegation. Part 3 tries to remedy these limitations: it formulates a more complete model of the political process that focuses explicitly on agency and relies as much as possible on a common set of assumptions.

7.7 Notes on the Literature

The model formulated in section 7.1 draws on Persson and Tabellini 1994d, whereas much of this chapter follows the survey by Persson (1998). Similar models 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 setup but assume that local public goods impose externalities on other groups. They contrast decentralized and centralized arrangements, pointing to a trade-off between two opposite incentive problems. Centralization makes it more likely that spillover effects are internalized, but cost sharing generates the incentive problems discussed throughout this chapter. 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 worse.

When there is a vertical hierarchy of decision makers, as with federal and local governments, the principal's lack of commitment may impose a "soft budget constraint" on the agent. Like common-pool problems, soft-budget-constraint problems may lead to overspending. Dewatripont and Maskin 1995 is the classical reference on soft budget constraints in a principal-agent setup. Qian and Roland (1998) and Bordignon, Manasse, and Tabellini (1997) have studied versions of this problem in local public finance. Maskin and Xu (1999) survey the literature on the soft budget constraint, with special emphasis on transitional economics.

The formal literature on extensive form games of collective choice dates back to the pioneering work of Shepsle (1979) on structure-induced equilibria and of Romer and Rosenthal (1979) on agenda-setting powers. Models of legislative bargaining were first formulated by Baron and Ferejohn (1989) and Epple and Riordan (1987) in an infinite-horizon pie-splitting problem and applied to the provision of local public goods by Baron (1991, 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). Shepsle 1989, Baron 1994, Myerson 1995, and Moser 1997 are good surveys of the formal theories of legislative politics.

Sequential budgeting has been studied in various settings. Von Hagen (1998) discusses it in a comprehensive analysis of budgetary procedures. Persson, Roland, and Tabellini (1997) assess 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 3. 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 setup does not entail a common-pool problem.

A large empirical literature compares alternative budgetary institutions across political systems, from European countries (von Hagen 1992, von Hagen and Harden 1994), to those in Latin America (Alesina, Hommes, et al. 1996, Inter-American Development Bank 1997), to those of U.S. 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 of alternative budgetary institutions with the size or composition of spending has been little discussed, except by Kontopoulos and Perotti (1997, 1999). See also the contributions in Poterba and von Hagen 1999.

Austen-Smith (1997) and Rodrik (1995) give a recent survey of the literature on lobbying, whereas Mueller (1989) surveys the older literature. An influential branch of the literature, not discussed here, approaches lobbying as the 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 Whinston's (1986) common-agency approach to model lobbying in the case of trade policy. Earlier contributions on lobbying include Denzau and Munger 1986, Magee, Brock, and Young 1989, and Rasmusen 1993.

Dixit (1996b) applies the common-agency approach to commodity taxation, showing why the well-known Diamond-Mirrlees production efficiency prescription would almost surely be violated in political equilibrium. Aidt (1998) adopts the common-agency approach in analyzing environmental taxes, and Rama and Tabellini (1998) analyze lobbying by trade unions and firms over both trade policy and a minimum wage policy. Lobbying in a model with politicians and bureaucrats is analyzed by Mazza and van Winden (1995). 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.

The amount of empirical literature on lobbying is still relatively small, though there is a much larger literature on campaign contributions in the United States (see Bronars and Lott 1995 and the survey in Mueller 1989, chap. 11). Liebert (1995) discusses lobbying in European parliamentary democracies. Recent empirical analyses include Goldbe and Maggi 1997, on campaign contributions and trade protection in the United States, and Alt et al. (1999), on lobbying for government subsidies by Norwegian firms. An interesting experimental study of lobbying is described by Potters and van Winden (1992).

As mentioned in chapter 2, the probabilistic voting approach was developed in the spatial voting model to guarantee the existence of equilibrium in situations, such as a multidimensional policy space, in which a Condorcet winner fails to exist; see Coughlin 1992 for an overview of probabilistic voting and Osborne (1995) for an overview of spatial voting theory. Lindbeck and Weibull (1987) adapted this framework to redistribution among multiple interest groups, and Dixit and Londregan (1996) extended their approach. 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 1993b, who derives an equilibrium in which each candidate selects a randomized redistribution strategy.

Strömberg (1998a) develops a model of parallel competition between political candidates and between profit-maximizing media. Strömberg (1998b) successfully applies this kind of model empirically to explain how New Deal spending was allocated across U.S. counties depending on the availability of radio receivers.

Our model of the interaction between elections and lobbying in section 7.5.1 draws on Baron 1994, Grossman and Helpman 1996, and Bennedsen 1998. Besley and Coate (1999) study lobbying and elections in a citizen-candidate model; Riezman and Wilson (1997) study legal redistributions or contributions in a setting in which 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. Little formal work combines extensive form legislative games with elections and rational voters, which might be due to 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. Section 7.5.2 draws on Chari, Jones, and Marimon 1997. Coate (1997) demonstrates that the strategic delegation equilibrium considered by Chari, Jones, and Marimon 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 in which interest groups give contributions to legislators who choose effort on different legislative activities so as to maximize expected votes. Snyder (1991) analyzes lobbies' contributions to a set of legislators who have different ideal points in a spatial voting model. Groseclose and Snyder (1996) study a game in which two lobbies buy votes from legislators who will make a decision on a public project. Section 7.5.3 draws on Helpman and Persson 1998.

7.8 Problems

1. Legislative bargaining with amendment rights

This problem is based on Baron and Ferejohn 1989. Consider a legislature with three members who must divide rents of size 1 among themselves. The consumption value of the rents to legislator i is $w^i(r) = r$. The rents are divided according to the following procedure. A member of the legislature is randomly selected to propose a division of rents. If a majority of the members in the legislature do not accept the proposition, then another member is randomly selected to make a new proposition. Each time a new proposition is made, the payoffs are discounted by a factor δ. The game continues until a proposition is accepted.

a. Compute the equilibrium with stationary (that is history-independent) strategies in this game.

b. Now consider what happens when amendments are allowed. First, one member of the legislative body has been selected to be the agenda setter and to propose an allocation of rents, r_1, that will be named the proposition on the floor. Then another member is randomly selected among the legislators other than the agenda setter. This other member can let the legislative body vote on implementing r_1. He may also propose an amended allocation r_2. In this case, there is a vote between r_1 and r_2. The winner becomes the proposition on the floor. Then a new member is randomly chosen. This other member can let the legislative body vote on implementing the proposition on the floor. He may also propose an amended

allocation, r_3. In this case, there is a vote between the proposition on the floor and r_3. The winner becomes the proposition on the floor. The process continues until an allocation is implemented. The members are assumed to have a common discount factor $\delta \in [0, 1]$. Every time the allocation is amended, the value of the payoffs is discounted by δ.

Consider stationary equilibria of the following form: the member proposing the allocation keeps a share y of the budget to himself and gives $1 - y$ to one other member and nothing to the remaining member. If a member is indifferent between a bill and an amendment, he will vote for the amendment. Compute the optimal stationary strategy y for the member proposing an allocation.

c. Now consider stationary equilibria of the following form: the member proposing the allocation keeps a share y of the budget to himself and gives $\frac{1-y}{2}$ to each of the two remaining members. Compute the optimal strategy y.

d. Discuss when it is optimal for the agenda setter to offer positive rents to only one other member (a minimum winning coalition, as in question (b)) and when it is optimal to offer rents to all members of the legislature (universalism, as in question (c)). Discuss how allowing amendments affects the agenda-setting power.

e. Suppose that there was a prior stage in which the legislative body chose by majority decision whether to use an open or a closed rule. Assume that it is known who would be the first agenda setter and who would be included in prospective coalitions. Which rule would prevail?

2. Budgetary powers and amendments rights in legislatures

Suppose that individuals receive utility from private consumption, c, and consumption of a publicly provided private good, g, described by the utility function $v = u(c) + g$. The public good is financed through a proportional income tax τ. There are three groups, each of size 1, and all individuals receive income 1. The budget constraint is thus $3\tau = g_1 + g_2 + g_3 = G$.

a. What is the socially optimal level of taxes?

b. Suppose now that a representative from one of the groups chooses taxes in the first stage. In the next stage, a representative from another group proposes an allocation of G. It is not known whether the agent setting taxes will receive positive allocation from this proposal. If the proposed allocation is not accepted, then one of the two other groups is randomly chosen to have its representative propose a new allocation. The discount rate is δ. Compute the level of taxes and the allocation of G. Are taxes too high or too low in equilibrium?

c. Now suppose that G is allocated using a rule with amendment rights, as described in question (b) of problem 1. Furthermore, assume that the discount rate is higher than 0.73,

so that only one group other than the agenda setter receives publicly provided services. It is not known whether the agent setting taxes will be included in the winning coalition. Compute the level of taxes and the allocation of G. Are taxes too high or too low in equilibrium?

d. Now suppose that G is allocated using a rule with amendment rights but that the discount rate is smaller than 0.73, so that there is a universalistic equilibrium where all groups receive publicly provided services. Compute the level of taxes and the allocation of G. Are taxes too high or too low in equilibrium?

e. Finally, assume that a_τ (the first-stage proposer) is elected by the members of all groups and thus cares about all groups. For example, imagine a president being elected in national election, and state representatives deciding over the state allocation of G. What level of taxes would be chosen under each rule?

3. Truthful strategies in the lobbying model

Consider the simple lobbying model of section 7.3.1. A subset L of groups are organized in lobbies. Each lobby j simultaneously and noncooperatively presents a contribution schedule, $C_j(\mathbf{g})$, to the incumbent. Each of the lobbies maximizes the net welfare of its members: $N_j(W_j(\mathbf{g}) - C_j(\mathbf{g}))$. The incumbent sets $\mathbf{g}$ to maximize the weighted sum of social welfare and contributions:

$$W(g) = \eta \sum_j N_j W_j(\mathbf{g}) + (1 - \eta) \sum_{j \in L} N_j C_j(\mathbf{g}),$$

where $\eta \in [0, 1]$.

a. Explain why an equilibrium must be jointly Pareto optimal for the government and the lobbies.

b. Now suppose that the lobbies set differentiable contribution schemes. Show that the truthful strategy

$$C_j(\mathbf{g}) = \max [W_j(\mathbf{g}) - b_j, 0]$$

satisfies the condition for an optimal strategy.

4. Coalition formation in a three-party legislature

This question is based on Austen-Smith and Banks 1988. Suppose that three parties in a parliament are indexed L, M, R, corresponding to "leftist," "middle," and "rightist," respectively. The parties set a policy $y \in [0, 1]$ and divide the exogenous rents of being in office, that is, they select a vector $\mathbf{r} = (r_L, r_M, r_R)$, subject to $r_L + r_M + r_R \leq \bar{r}$. The

parties have preferences over the policy described by utility function $u_k = r_k - (x_k - y)^2$, $k \in \{L, M, R\}$, where $x_L = 0$, $x_M = \frac{1}{2}$, and $x_R = 1$.

Prior to the parliamentary session, an election has been held, giving the parties vote shares $w_L > w_M > w_R$. As is often the case in practice, the largest party may propose a policy and an allocation of rents that is implemented if it receives support from a government coalition in the parliament. If the suggested policy is not accepted, then the second-largest party is asked to try to form a coalition. If the policy is again not accepted, then the smallest party is asked to form a coalition. If this fails, then all parties receive a payoff of 0.

a. Describe the equilibrium proposals. Explain why a large leftist party may wish to form a coalition with a small rightist party (or vice versa).

b. Now suppose that $w_L > w_R > w_M$. Compute the equilibrium outcome. Assume that M attempts to form a coalition with R in the last period (M is indifferent between coalition partners). Compute the party members' equilibrium utilities.

c. Assume that the members of the electorate have bliss points x_L, x_M, or x_R. Further, assume that there are more voters with bliss points x_L than with bliss points x_M and one more voter with bliss point x_M than with bliss point x_R. Could there be an equilibrium in which all voters vote for the party whose policy platform they most prefer?

d. An argument for having a proportional electoral system with more than two parties is that the legislature's composition, and therefore policy, in such a system better represents the voters' preferences than the first-past-the-post system with only two parties. Discuss this argument in the light of the answers to questions (a) through (c).

Remark. The analysis in this problem could be expanded, first by finding strategies that are optimal for the voters, given the mapping from electoral outcomes to policy outcomes in the legislature, and second by finding the three parties' optimal policy platforms, given the voters' strategies and the policy outcomes these induce. Austen-Smith and Banks 1988 gives an example of this type of full equilibrium.

5. Legislative bargaining and lobbying

Consider the following game of lobbying and legislative bargaining, which is a slight modification of that presented in section 7.5.3. A legislature has three members, who allocate a fixed set of public expenditures, G, to three electoral districts. The policy vector is thus $\mathbf{g} = (g_1, g_2, g_3)$, and $g_1 + g_2 + g_3 = G$. In each representative's electoral district, there is a lobby group lobbying this representative exclusively. The lobby group in district i has utility $g_i - C_i$, where C_i is the contribution paid to the representative. The legislators care only about the contributions they get from the lobbies.

Each legislative session takes the following form. First, Nature randomly selects an agenda setter. Then the lobby groups present their representative with a truthful contribution schedule: $C_i(\mathbf{g}) = \max[g_i - b_i, 0]$. These schedules are simultaneously announced and observed by all legislators. Finally, the agenda setter formulates a take-it-or-leave-it offer, and the legislature votes on this proposal. If the proposal is not accepted, then a new legislative session begins in which Nature randomly draws another agenda setter. For each legislative session, the payoffs are discounted by the discount factor δ.

a. Compute the policies, contributions, and payoffs in the stationary equilibrium.

b. Suppose that the legislators also care about the amount of public spending that benefits their electoral district. Compute the stationary equilibrium in the game as above, but assume that the legislators also care about public spending in their district and have the utilities $u_i = g_i + \eta C_i$.

c. Suppose the game is changed so that the legislature may amend the agenda setter's proposal. The legislative game is the same as in question (b) of problem 1, but now the lobby groups may set truthful contribution schedules during each session. More precisely, each legislative session now takes the following form. First, Nature randomly selects an agenda setter. Then the lobby groups present their representative with a truthful contribution schedule: $C^J(\mathbf{g}) = \max[g_i - b^J, 0]$. These schedules are simultaneously announced and observed by all legislators. The agenda setter proposes an allocation $\mathbf{g}_1$. Finally, Nature selects another member of the legislature, who can either let the legislative body vote on implementing $\mathbf{g}_1$ or make a new amended proposition $\mathbf{g}_2$, in which case there is a vote on whether to keep $\mathbf{g}_1$ or to accept the amended proposition $\mathbf{g}_2$. For each amendment, the payoffs are discounted by the discount factor δ.

Consider stationary equilibria of the following form: the member proposing the allocation keeps g_a to himself and gives $g_p = G - g_a$ to one other member and nothing to the remaining member. If a member is indifferent between a bill and an amendment, he will vote for the amendment. Compute the optimal stationary strategy, g_a, for the member proposing an allocation.

d. Now consider stationary equilibria of the following form: the member proposing the allocation keeps a share g_a of the budget to himself and gives $\frac{1-g_a}{2}$ to each of the two remaining members. Compute the optimal strategy g_a. Discuss when it is optimal for the agenda setter to offer positive rents to only one other member (a minimum winning coalition) and when it is optimal to offer rents to all members of the legislature (universalism). Discuss how allowing amendments and lobbying affects the agenda-setting power.