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# Comparative Politics and Public Finance

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We propose a model with micropolitical foundations to contrast different political regimes. Compared to a parliamentary regime, the institutions of a presidential-congressional regime produce fewer incentives for legislative cohesion but more separation of powers. These differences are reflected in the size and composition of government spending. A parliamentary regime has redistribution toward a majority, less underprovision of public goods, and more rents to politicians; a presidential-congressional regime has redistribution toward powerful minorities, more underprovision of public goods, but less rents to politicians. The size of government is smaller under a presidential regime. This last prediction is consistent with cross-country data.

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## I. Introduction

The level and composition of government spending display enormous variation, both over time and across countries. In a sample of 17 industrialized democracies, average government expenditure as a fraction of gross domestic product grew from about 12 percent in 1913 to about 45 percent in 1990, but the 1990 level ranged from about 32 percent in Japan to about 59 percent in Sweden (Tanzi and Schuknecht 1995, 1997). Furthermore, while the average GDP share of transfers and subsidies grew very rapidly, from about 8 percent in 1960 to about 23 percent in 1990, government consumption increased only from about 12 percent to 17 percent, whereas public investment was almost flat; the cross-country variation is also considerable in these dimensions. In a broader sample of 54 democracies, the cross-country variation in the size and scope of government is even greater (see Sec. VI below).

It is fair to say that the economics profession has failed to convincingly explain these first-order differences. Research in traditional public finance does not ask the question since its policy analysis is mostly normative and abstracts from the underlying political institutions. Research in traditional public choice and, more recently, in political economics does attempt to explain actual policy outcomes. So far, however, it has come up with only fragmented explanations for the growth, size, and scope of government.<sup>1</sup>

In our view, a successful positive theory of public finance in a democracy should rest on appropriate micropolitical foundations, analyzing the incentives for collective policy decisions entailed by different political regimes. In this paper, we try to take a step toward building such micropolitical foundations. More specifically, we try to demonstrate how key differences between real-world political regimes can create systematic differences in collective decisions on taxation, redistribution, public-good provision, and rent seeking.

We build on three basic assumptions: (1) *No benevolent actors*: All agents, including politicians, are motivated by their own selfish objectives. (2) *No direct democracy*: Citizens delegate policy decisions to their political agents. Although delegation should ideally be endogenously derived, we take the prevalence of representative democracy as a starting point, which reflects either specialization in acquiring competence and information or the practical difficulty of using direct democracy in all policy decisions. (3) *No outside enforcement*: Political candidates cannot commit to policy platforms ahead of the elections. Elected political

<sup>1</sup> See Dixit (1996), Persson and Tabellini (1999a, 2000), and the contributions in Mueller (1997) for recent surveys of positive modeling of public finance in political economics and public choice.

offices, whether executive or legislative, carry important powers that are always partially—sometimes even greatly—unchecked. Unbiased enforcement of electoral promises is therefore not feasible and is not observed in the real world. Together with nonbenevolence and delegation, no enforcement implies an agency problem between voters and their representatives.

These three assumptions appear in many existing positive models of policy making. But the three are seldom explicitly combined, and their full implications are rarely studied. The traditional public-choice school comes close in its emphasis of the agency problem (see, e.g., Brennan and Buchanan 1980). It is not very formal in specifying the underlying assumptions, however, and sometimes neglects the role of elections and other political institutions in disciplining political agents. Moral hazard models of elections (Barro 1973; Ferejohn 1986), on the other hand, study how elections may discipline political representatives, but they do not study different institutions and impose restrictions on available policies. Median-voter models sometimes refer to policy choice under direct democracy (Meltzer and Richard 1981). A more convincing interpretation of these models, however, is that they capture the outcome of electoral competition between two office-motivated politicians who can commit to state-contingent electoral promises (Downs 1957), thus implicitly violating the assumption of no outside enforcement. Likewise, models of lobbying and electoral competition among selfish candidates under probabilistic voting assume that some political actors—lobbies, politicians, or both—can undertake explicit commitments (Lindbeck and Weibull 1987; Grossman and Helpman 1994, 1996; Dixit and Londregan 1996). Models of partisan politics remove the commitment assumption but typically consider ideological policy makers with altruistic objective functions (Alesina 1988; Alesina and Rosenthal 1996). Recent models of representative democracy (Besley and Coate 1997) essentially rely on the same three basic assumptions but impose restrictions on what policy can do, thereby ruling out the agency problem.

We build a model of public spending under alternative political institutions that incorporates the three basic assumptions. In our model, the political process must determine a level of taxation, as well as an allocation of tax revenues to public goods, redistribution among voters, and rents for politicians. Thus three conflicts of interest emerge: policy makers may abuse their power in office and capture public funds for their own benefit at the voters' expense; different groups of voters disagree on the allocation of tax revenues; and the political representatives, each pursuing their own career and personal interests, disagree over the distribution of current and future rents.

These conflicts of interest are resolved in different ways under different constitutions. The reason is that, under our basic assumptions,

a political constitution is like an *incomplete contract*. A constitution can specify an allocation of decision-making authority only to specific groups or individuals: who makes policy proposals; who can approve, amend, or veto them; and who appoints the representatives exercising this authority.<sup>2</sup> Given the three-dimensional conflict in our policy problem, the outcome hinges on how and by whom these authorities are exercised. We illustrate this general point by contrasting two main types of democracies: presidential-congressional and parliamentary regimes. In doing so, we concentrate on two important features of these regimes—separation of powers and legislative cohesion—and ask how they shape public finance outcomes.

*Separation of powers* in some form is a feature of all modern democracies. Since Locke, Montesquieu, and the founding fathers of the American Constitution, it is common to consider such separation as limiting abuse and increasing accountability of elected policy makers. Persson, Roland, and Tabellini (1997) show formally that conflicts of interest between different politicians can indeed be exploited by the voters in order to reduce the agency problem. But this requires that the constitution allocate the rights to propose and veto legislation across different representatives so as to create the right checks and balances.

*Legislative cohesion* refers to disciplined voting by members of a governing coalition. The pioneering work of Diermeier and Feddersen (1998) shows that legislative cohesion arises when it is costly for a majority coalition to break up, for instance, because it loses valuable agenda-setting powers associated with participation in the coalition. The extent to which a political regime displays legislative cohesion thus largely depends on the rights laid down by the constitution concerning the formation and dissolution of governments.

A *presidential-congressional* regime of the U.S. type has *more* separation of powers but *less* legislative cohesion than a parliamentary regime of the European type. Direct election of both the executive and the legislature makes each branch of government directly accountable to the voters. This diminishes the opportunities for collusion between the branches of government and can even create outright conflicts between them, as in the case of “divided government.” Moreover, the proposal powers over legislation typically reside with powerful congressional committees, and different committees hold power over different policy dimensions. Hence powers are separated not only between the executive and legislature but also within the legislature. As a result, legislative majorities often change from issue to issue. In particular, no stable

<sup>2</sup> This is in close parallel to incomplete contract theory as applied to the governance of firms (see Hart 1995), which deals with the consequences for firm decisions of the precise allocation of decision-making authority to different stakeholders, such as owners, managers, and creditors.

congressional majority is needed to support the executive since he is directly elected for an entire election period and cannot be voted down by congress.

In a *parliamentary* regime, by contrast, the executive is only indirectly appointed by the voters and instead derives his or her power from the support by a majority coalition in the legislature. In addition, the agenda-setting powers over legislation are typically associated with ministerial portfolios, and the policy initiative thus belongs to the government coalition as long as it has the confidence of a majority in parliament. As a result, parliamentary regimes entail less separation of powers than congressional regimes, both between executive and legislature and between different legislators. Moreover, government crises can erupt during an election period as a result of the rights of initiating votes of confidence or nonconfidence, dissolving the government, or calling early elections. As Huber (1996) demonstrates, the power to associate a vote on a bill with a vote of confidence reduces the bargaining power of the coalition partners, who fear the negative consequences of a government crisis. The risk of losing valuable agenda-setting powers after a government crisis then gives a governing coalition strong incentives to form a stable legislative majority that does not shift from issue to issue, as shown by Diermeier and Feddersen (1998). Note that this argument goes beyond party discipline: cohesion *between* parties supporting coalition governments is typically much higher than cohesion *within* parties in the U.S. Congress.<sup>3</sup>

Our goal is to compare alternative political constitutions, representing the key features of each regime with a very stylized model of the policy process. In our modeling, we build on several earlier contributions. Specifically, the public-finance instruments are chosen in a sequence of simple legislative bargaining games, in the style of Baron and Ferejohn (1989); the extensive form of each game represents a specific constitutional procedure. This legislative bargaining is embedded in the same infinitely repeated electoral framework, where voters in each different district hold their legislator accountable for past performance in first-past-the-post elections, as in Ferejohn (1986). Separation of powers in presidential regimes is modeled as in Persson et al. (1997), namely, as an assignment of very sharp proposal rights over different policy dimensions to different politicians. Legislative cohesion in our model of

<sup>3</sup> Naturally, not all parliamentary regimes exhibit the same degree of legislative cohesion, because rules for government breakup and formation differ across countries (see Huber 1996; Baron 1998). Similarly, not all presidential regimes entail the same separation of powers: in the French fifth republic, agenda-setting powers rest within the government, which, in turn, is accountable to the legislature; in many Latin American countries, the legislatures have much weaker powers relative to the president than in the United States. See also Lijphart (1992) and Shugart and Carey (1992) for further discussion of these issues.

a parliamentary regime is obtained through a simplified version of the model formulated in Diermeier and Feddersen (1998) by assuming that the agenda-setting powers are reallocated if the legislative coalition breaks down.<sup>4</sup>

Our results suggest that the two political regimes are associated with very different policy outcomes. Separation of powers in the congressional regime produces a smaller government, with less waste and less redistribution but also inefficiently low spending on public goods. Intuitively, separation of powers enables the voters to discipline the politicians, and this reduces waste and moderates the tax burden. The sharp conflict of interest among politicians and voters, however, prevents them from internalizing all benefits of public-good provision. Legislative cohesion in the parliamentary regime, on the other hand, leads to a larger government, with more taxation and more waste, but also more spending on public goods and redistribution benefiting a broader group of voters. Intuitively, there is now more scope for collusion among politicians, which increases waste and taxation. But policy aims to please a majority group of voters, which increases public-good provision, calls for a more equal redistribution, and makes the majority support a high level of taxation.

These results could help explain some of the observed differences in patterns of spending and taxation among modern democracies. The evidence in Persson and Tabellini (1999*b*) suggests that, everything else equal, the size of government in presidential-congressional regimes is smaller than in parliamentary regimes by about 10 percent of GDP. There is less evidence of significant differences in the composition of public spending across regimes, but distinguishing empirically global from local public goods and redistribution is more difficult and necessitates further research.

From a normative point of view, our results point to a trade-off in institution design. A well-functioning presidential regime performs better in terms of accountability because it can cope well with the agency problem between voters and politicians. But a parliamentary regime is better for public-good provision because it solves the conflict between groups of voters more effectively.

In Section II, we first introduce the notation and present the basic policy problem. We then study in Section III the political equilibrium in a "simple legislature," which has neither separation of powers nor legislative cohesion. After these preliminaries, we derive our main results, first for a presidential-congressional regime with separation of

<sup>4</sup> Compared to the model in Diermeier and Feddersen (1998), our model is deterministic, and continuation values after a government crisis are obtained via a simpler continuation game.

powers (Sec. IV) and then for a parliamentary regime with legislative cohesion (Sec. V). In Section VI, we then briefly consider the evidence. Finally, in Section VII, we discuss prospective extensions.

**II. A Basic Model of Public Finance**

Consider a society with three distinct groups of citizens, denoted by  $i = 1, 2, 3$ . We shall consider these groups as distinguished by their geographical location. Other interpretations are possible but less natural. Three groups are the minimum number for looking at interesting legislative bargaining under majority rule, but we could carry out the analysis with more than three groups at the cost of more cumbersome algebra. Each group has a large number of identical members: formally, we assume that each group has a continuum of voters with unit mass. Time is measured discretely: a typical time period is denoted by  $t$ . We consider an infinite horizon.

Preferences of a member of group  $i$  in an arbitrary starting period  $j$  are given by

$$u_j^i = \sum_{t=j}^{\infty} \delta^{(t-j)} U^i(\mathbf{q}_t), \tag{1}$$

where  $\delta < 1$  is a discount factor,  $\mathbf{q}_t$  is a vector of policies at  $t$  (to be defined below), and  $U^i$  is the utility function per period. This function is assumed to be quasi-linear in the consumption of private and public goods:

$$U^i(\mathbf{q}_t) = c_t^i + H(g_t) = 1 - \tau_t + r_t^i + H(g_t), \tag{2}$$

where  $\tau_t$  is a common tax rate,  $r_t^i$  is a transfer payment to group  $i$ , and  $g_t$  is the supply of Samuelsonian public goods evaluated by all voters with the same concave and monotonically increasing function  $H(g_t)$ . We assume that these goods are valuable to citizens, in the sense that  $H_g(0) > 1$ .

We define the public policy vector  $\mathbf{q}$  as

$$\mathbf{q}_t = [\tau_t, g_t, \{r_t^i\}, \{s_t^i\}],$$

where all components are constrained to be nonnegative. In an economic model, it would be necessary to distinguish only the net government transfer to each group  $r_t^i - \tau_t$ . But in the political models to be considered below, it is of crucial importance to distinguish the two components, particularly when different politicians have agenda-setting rights over taxes and spending. The component  $\{s_t^i\}$  captures the possible diversion of resources by politicians. As discussed in Persson et al. (1997), we can think of  $\{s_t^i\}$  as the financing of political parties, as out-

right diversion, or as an allocation of resources benefiting the private agenda of the legislators but not the citizens. These diversions benefit some politicians more than others: thus  $s_i^l$  denotes the diversion benefiting legislator  $l$ , but no other legislator. From the viewpoint of the citizens, these rents for the legislators represent pure waste. It is natural to think that this diversion takes place in connection with public-goods production,  $g_t$ .<sup>5</sup> This association between resource diversion and public-good provision will play a role below, with reference to the allocation of agenda-setting rights over the various policy instruments.

The public policy vector in period  $t$  must satisfy the government budget constraint

$$3\tau_t = \sum_i r_t^i + \sum_l s_t^l + g_t \equiv r_t + s_t + g_t \quad (3)$$

where  $r_t$  and  $s_t$  in the rightmost expression denote aggregate redistributive expenditures and aggregate waste.

To make the public finance problem more interesting, we could extend the model with some private choices distorted by taxation. This would make our results quantitatively, but not qualitatively, different. Note, however, that the micropolitical problem inherent in this formulation is quite general: it involves activities benefiting every citizen ( $g_t$  and  $-\tau_t$ ), benefiting some citizens but not others,  $\{r_t^i\}$ , and benefiting some politicians but not others,  $\{s_t^l\}$ . As we shall see, the trade-off on each different margin of policy choice plays a nontrivial role in shaping the results.

Which public policy would a Pigovian social planner—of the traditional public finance school—choose in this setting? Suppose that the planner had a symmetric social welfare function, defined over the utility of the three groups of voters. First of all, the planner would choose to set  $s_t^l = 0$ . Moreover, with quasi-linear utility, nondistortionary taxes, and a symmetric social welfare function, optimal redistributive expenditure is determined only up to the same present value for each group. It is thus always efficient to have  $r_t^i = 0$ ; if taxes were even slightly distortionary, any positive redistribution would strictly decrease welfare. Even without distortionary taxation, any *unequal* redistribution within any period  $t$  across symmetric regions with homogeneous voters would also strictly decrease welfare if the utility of private consumption was concave. A Pigovian planner would thus set  $g_t$  in any period  $t$  so as to maximize

<sup>5</sup> Tanzi and Davoodi (1997) and Mauro (1998) provide empirical evidence consistent with this hypothesis: within OECD countries, as well as in a larger sample, various forms of corruption are indeed strongly associated with expenditure on public projects and infrastructures or with purchases of intermediate goods.

$$\sum_i U^i(\mathbf{q}_i) = 3[1 - \tau_i + H(g_i)] = 3\left[1 - \frac{g_i}{3} + H(g_i)\right],$$

yielding the first-order condition  $3H_g = 1$ . The first-best policy is thus to supply the public good up to the point at which its marginal aggregate benefit is equal to its marginal social cost and to raise no more revenue than necessary to finance this optimal public-goods provision.

Which public policy would a Leviathan policy maker—of the traditional public choice school—choose? In the absence of any other constraints, the power to generate personal rents would push taxes in any given period toward their maximum,  $\tau_i = 1$ ; diversion toward its maximum,  $s_i = 3$ ; and public goods and redistribution toward their minimum,  $g_i = r_i = 0$ . Whereas the Leviathan and Pigovian policy makers might agree on the extent of redistribution to voters, they would strongly disagree on the other aspects of public finance. In the paper, however, we leave both the benevolent and the malevolent caricature of the almighty policy maker aside. Instead, we ask what predictions we might get from more structural models of democratic policy choice, within specific political institutions.

### III. A Simple Legislature

We first study a hypothetical political institution labeled a “simple legislature.” The simple legislature lacks important characteristics of modern political regimes. Unlike a U.S.-style presidential-congressional regime, it does not entail a clear separation of powers within the legislature or between the executive and the legislature. Neither does it entail, as in a parliamentary regime, institutions creating a cohesive majority in parliament on which the government can count to pass legislative proposals. We mainly use this section to illustrate, in a simple setting, three fundamental political failures: underprovision of public goods, wasteful allocation of tax revenues, and redistribution toward a powerful minority. This sets a point of departure for later sections, where we show the effect of separation of powers and legislative cohesion on these three political failures.

In the simple legislature, each region  $i$  coincides with a voting district and is represented by exactly one legislator, so that  $i = l = 1, 2, 3$ . Separate elections under plurality rule take place in each of these voting districts. In period  $j$ , the incumbent legislator  $l$  has preferences over outcomes, given by

$$v_j^l = \sum_{t=j}^{\infty} \delta^{(t-j)} V^l(\mathbf{q}_i) D_t^l, \quad (4)$$

where the utility per period is simply

$$V^l(\mathbf{q}_t) = s_t^l \quad (5)$$

and  $D_t^l$  is a dummy variable, equal to unity, if legislator  $l$  holds office in period  $t$  and zero otherwise. As in Persson et al. (1997), the politicians' payoffs are exclusively defined over the rents they endogenously derive from holding office and making policy decisions.<sup>6</sup> This does not imply that legislators act only in their own interest. As legislators value holding office and as voters will hold them accountable for their performance by retrospective voting, the threat of being ousted from office, in fact, makes legislators close to perfect delegates for their constituencies.<sup>7</sup>

At the end of each time period, each region holds an election; the candidate with the largest number of votes wins. The incumbent runs against a single opponent, who is drawn at random from a large set of candidates. Candidates are not inherently different in their competence or in any other attributes: each candidate has exactly the same preferences as the incumbent, once in office. An incumbent who is not reelected can never return.

In period  $t$ , the incumbent legislators elected to the simple legislature at the end of period  $t - 1$  decide on public policy in a very simple legislative bargaining game in the style of Baron and Ferejohn (1989). Specifically, this legislative bargaining in period  $t$  is embedded in the sequence of events illustrated in figure 1:

1. Nature randomly selects an agenda setter  $a$  among the three legislators.
2. Voters formulate their reelection strategies, which become publicly known.
3. Legislator  $a$  proposes a public policy  $\mathbf{q}_t$ .
4. The legislature votes on the proposal. If a majority (at least two legislators) support the proposal, it is implemented. If not, a default

<sup>6</sup> Formally, we can think of the rents  $s_t^l$  as adding to the legislators' consumption. The linear expression in (5) is then consistent with legislators' having linear utility of consumption, as the voters have. The legislators' utility function would coincide with the utility function of voters in (2) if we added the concave utility of public goods; we omit this term, however, to simplify the analysis. As discussed in Persson and Tabellini (1999a), it would be straightforward to add exogenous benefits from holding office as an additional motive for reelection and transaction costs in the diversion technology, so that politicians capture only a fraction of the resources diverted from voters.

<sup>7</sup> This framework, adapted from Ferejohn (1986), may appear special to some readers. We believe that many of our general results on comparative politics are likely to survive under a variety of assumptions about the motivation of politicians. As demonstrated in Persson (1998) and Persson and Tabellini (1999a), similar results emanate from a legislative bargaining framework, whether interest groups lobby finance-motivated legislators or prospectively elect outcome-motivated legislators rather than retrospectively reelect office-motivated legislators, as in this model.

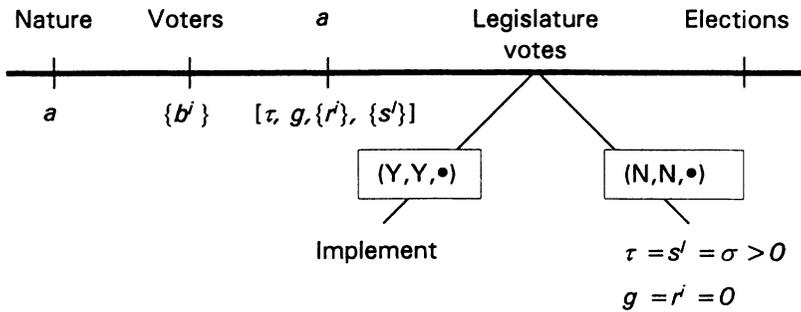


FIG. 1

policy is implemented, with  $\tau = s^l = \sigma > 0$  and  $g = r^i = 0$ .<sup>8</sup>  
 5. Elections are held.

Once the policy has been implemented, and before the elections, voters observe the outcome of the legislative decision and all elements in the policy vector. Note that, in line with the assumption of *no outside enforcement* mentioned in the Introduction, legislators cannot commit to a policy for the next period before the election. This lack of commitment creates contractual incompleteness. Voters can punish politicians only by not reelecting them. The discretionary powers enjoyed by politicians between elections, however, make it impossible for voters to insist on having  $s^l_i = 0$  for all  $l$  in equilibrium. As shown by Persson and Tabellini (1999a), if legislators could commit to a policy before elections, electoral competition between the incumbent and the opponent in each district would force them to set  $s^l_i = 0$ . Thus the rents extracted by politicians in equilibrium are a direct result of the contractual incompleteness of the political constitution.<sup>9</sup>

Given the infinite horizon, there are many sequentially rational equilibria. Throughout the paper, we restrict our attention to equilibria in which voters from the same constituency coordinate their strategies but voters across constituencies do not cooperate. Cooperation across con-

<sup>8</sup> All qualitative results are valid if one assumes that the default diversion value  $\sigma$  is equal to zero. In the analysis, we keep  $\sigma > 0$  since it allows us to better understand the effect of the default diversion.

<sup>9</sup> Persson and Tabellini (1999a, 1999b), following Svensson (1997) and Polo (1998), discuss a setting with probabilistic voting, where endogenous rents from office are not dissipated by electoral competition, even if candidates can make binding commitments before the elections. This happens because alternative political candidates are not perfect substitutes for each other, so that the probability of winning the election does not discontinuously jump to zero for the candidate announcing marginally higher rents for herself.

stituencies with opposing interests on redistribution is not supported by the institutions analyzed and would be supported only by reputational concerns ignored by us. Coordination inside a constituency is more reasonable since all these voters are identical. Such coordination could be supported by the existence of alternative candidates campaigning on the policy that is in the best interest of the constituency. Throughout the paper, we also assume that all players (voters and politicians) are restricted to using strategies that condition their actions in period  $t$  on observable payoff-relevant information in period  $t$  only, and not on outcomes in any earlier period. This is a reasonable restriction if we assume that voters cannot commit to intertemporal reelection rules across periods. The restriction will effectively make the equilibrium outcome stationary, and we drop time subscripts when there is no risk of confusion.

We assume that voters in each district adopt simple retrospective voting rules that are conditional on whether or not their representative was the agenda setter in period  $t$ . Since we assume that voters in each district coordinate on the voting rule, this implies that

$$D_{t+1}^i = 1 \quad \text{if } U^i(\mathbf{q}_t) \geq b_i^i, \quad i = l,$$

for  $i = a$  and  $i \neq a$  at  $t$ . Finally, we assume that voters in all regions simultaneously set their “reservation utilities”  $b_i^i$  in a utility-maximizing fashion.<sup>10</sup> While voters cooperate within districts, they thus play Nash against all other districts (see the definition of equilibrium below). The vector of these reservation utilities,  $\mathbf{b}_r$ , is thus known to politicians when the policy proposal is made, and it is not altered by the voters in the course of period  $t$ . Owing to this feature, legislators will act in the interest of their constituencies. Allowing voters to condition directly on the policy instruments or on the vote of the politicians would not change any of the results.

Our assumption about the time at which voters formulate their strategies deserves some discussion. The timing means that the voters form their expectations and their demands on politicians once they know the institutional role of their representative at the beginning of the policy formation process. That is, voters want to hold their representative accountable for her deeds in the course of the legislative process. Allowing voters to reoptimize just before the election date would not change the results: as discussed below, the voting rule is *ex post* optimal for the voters since the incumbent and the opponent are identical in the eyes

<sup>10</sup> Retrospective voting conditional on economic outcomes has empirical support; see Lewis-Beck (1988) for general evidence. More specifically, Levitt and Snyder (1997) demonstrate how U.S. federal dollars spent in a House district have a strong impact on the vote share of the incumbent (they also show, however, that direct transfers—the specific policy instrument of redistributive spending in our model—do not affect this vote share).

of the voters. Under a different timing, however, there would be many other equilibria besides the one discussed here. Thus our timing assumption really amounts to a selection criterion: among the possible equilibria emerging if voters do not commit to a voting rule, we select the only one that survives under the timing spelled out above. If legislators and candidates were inherently different in their competence or other attributes, however, the timing assumption would be more critical, since the equilibrium voting rule would no longer be ex post optimal.<sup>11</sup>

An equilibrium of this game is defined as follows (the  $L$  superscript stands for the simple legislature).

DEFINITION 1. An equilibrium of the simple legislature is a vector of policies  $\mathbf{q}_i^L(\mathbf{b}_i)$  and a vector of reservation utilities  $\mathbf{b}_i^L$ , such that, in any period  $t$ , when all players take as given the equilibrium outcomes of periods  $t + k$ ,  $k \geq 1$ :

- I. for any given  $\mathbf{b}_a$ , at least one legislator  $i \neq a$  weakly prefers  $\mathbf{q}_i^L(\mathbf{b}_i)$  to the default outcome;
- II. for any given  $\mathbf{b}_a$ , the agenda-setting legislator  $a$  prefers  $\mathbf{q}_i^L(\mathbf{b}_i)$  to any other policy satisfying part I;
- III. the reservation utilities  $b_i^{iL}$  are optimal for the voters in each district  $i$ , when one takes into account that policies in the current period are set according to  $\mathbf{q}_i^L(\mathbf{b}_i)$  and takes as given the reservation utilities in other regions  $b_i^{iL}$  and the identity of the agenda setter.

A unique and stationary equilibrium satisfies these conditions. Its properties are summarized in the following proposition.

PROPOSITION 1. In the equilibrium of the simple legislature,

$$\tau^L = 1;$$

$$s^L = 3 \frac{1 - \delta}{1 - (\delta/3)};$$

$$g^L = \min \left[ \hat{g}, \frac{2\delta}{1 - (\delta/3)} \right],$$

where  $\hat{g}$  is such that  $H_g(\hat{g}) = 1 > \frac{1}{3}$ ;

$$r^{aL} = \frac{2\delta}{1 - (\delta/3)} - g^L \geq 0, \quad r^{iL} = 0 \text{ for } i \neq a;$$

<sup>11</sup> Banks and Sundaram (1993, 1996) formulate retrospective voting models with heterogeneity among candidate types together with asymmetric information over types.

$$b^{aL} = H(g^L) - g^L + \frac{2\delta}{1 - (\delta/3)}, \quad b^{iL} = H(g^L) \text{ for } i \neq a.$$

All politicians are reelected.

Thus, in equilibrium, taxes are maximal, public goods are underprovided relative to the social optimum, some redistribution goes to a minority of voters (unless the public good is very valuable, in which case there is no redistribution at all), and the legislators appropriate positive rents from office.

To understand how the model works, it is useful to prove this proposition in steps. Consider districts  $m, n \neq a$ . We start with the following lemma.

LEMMA 1. In equilibrium,  $r^m = r^n = 0$ .

*Proof.* Note that any equilibrium entails a minimum winning coalition: that is, the equilibrium proposal is approved by only one other legislator besides the agenda setter. To get the support of the third legislator, the agenda setter would have to spend resources either on her or on her district. But these resources are better used to increase  $s^a$ . Hence, if legislator  $n$ , say, is excluded from the winning coalition, then  $s^n = r^n = 0$ . By the same logic, the district included in the winning coalition is the one whose vote is the cheapest to buy. As all legislators have the same default payoffs, which district is cheapest to buy depends only on the reservation utilities,  $b^n$  and  $b^m$ , demanded by the voters. Realizing this, the voters in districts  $m$  and  $n$  have an incentive to underbid each other up to the point at which  $r^m = r^n = 0$ , that is, up to the point at which  $b^m = b^n = 1 - \tau + H(g)$ . Q.E.D.

In other words, the voters become engaged in a "Bertrand competition" game for the redistributive favors of the agenda setter. The utility of voters in district  $m$  is discontinuous in the reservation value  $b^m$ , at the point at which  $b^m = b^n$ , unless  $r^m = 0$ . The same argument holds for voters in  $n$ . Hence the only equilibrium is at the corner at which  $r^m = r^n = 0$ .

Next, define  $W$  as the expected equilibrium continuation value for each legislator at the start of each period, before nature has selected the agenda setter. Then we have the following lemma.

LEMMA 2. In equilibrium,  $s \geq 3 - 2\delta W$  and all legislators are reappointed.

*Proof.* Consider the optimal behavior of the agenda setter, and let  $m$  be the other legislator supporting her proposal. Then if  $a$  seeks reappointment, she will never offer more to  $m$  than

$$s^m = \sigma - \delta W, \tag{6}$$

since this is what would leave  $m$  indifferent between voting yes and being

reappointed, and voting no, getting the default payoff  $\sigma$ , and then losing the election.<sup>12</sup>

Suppose instead that  $a$  does not seek reappointment and makes a proposal that would lead to a loss of office for all legislators, under the given voting rules. In this case, she has to offer at least  $\sigma$  to  $m$  to win approval of her proposal. Because she does not care about pleasing her voters, the agenda setter can appropriate all available resources, setting  $g = r = 0$  and  $\tau = 1$ . Thus  $a$  will seek reappointment if and only if

$$s^a + \delta W \geq 3 - \sigma. \tag{7}$$

The left-hand side of (7) denotes the lifetime utility of the agenda setter if she makes a proposal consistent with reappointment, under the given voting rule. The right-hand side is her maximal payoff, given that she does not seek reappointment and has to pay  $\sigma$  to  $m$ .

By (6) and (7), legislators  $a$  and  $m$  will implement a policy leading to their reappointment if and only if

$$s = s^m + s^a \geq 3 - 2\delta W. \tag{8}$$

The optimal voting rule can never be more demanding: if the legislators were induced to forgo reappointment, they would appropriate all resources and leave the voters with low utility. Hence, the optimal voting rule must satisfy (8), and both the agenda setter and the legislator supporting the proposal are reelected. The reservation utility of voters in districts  $m$  and  $n$  is the same since both districts receive zero transfers (by lemma 1). As these voters pay the same  $\tau$  and enjoy the same level of  $g$ , legislator  $n$  will also be reelected. Q.E.D.

Note that (8) is an incentive-compatibility condition on the overall diversion of resources. Note also that legislator  $a$  is the “residual claimant” on resources in period  $t$  for given reelection strategies. It is thus optimal for her not only to minimize the payment to legislator  $m$  but also to satisfy the reelection constraints of voters in districts  $a$  and  $m$  with equality, appropriating any remaining resources for herself. If consistent with her own reelection, she would thus like to set  $\tau = 1$ .

We are now ready to prove proposition 1.

*Proof of proposition 1.* Consider legislator  $a$ . As  $r^a = r$  by lemma 1, the policy maximizing the utility of voters in district  $a$  is the solution to

$$\max [r + 1 - \tau + H(g)],$$

subject to the government budget constraint, equation (3), and the

<sup>12</sup> To simplify the analysis, we assume that the parameters are such that in equilibrium  $\sigma \geq \delta W$ , to ensure that the nonnegativity constraint on  $s^m$  is satisfied; otherwise, the qualitative results would hold, but the algebra would differ slightly. Given the equilibrium expression for  $W$  derived below, this assumption can also be stated as  $\sigma \geq \delta/[1 - (\delta/3)]$ .

incentive constraint on legislators  $a$  and  $m$ , equation (8). Combining (3) and (8), we can write these constraints as

$$3(\tau - 1) + 2\delta W \geq r + g. \quad (9)$$

The solution to this optimization problem implies  $\tau = 1$ ,  $g = \min [H_g^{-1}(1), 2\delta W]$ ,  $r = 2\delta W - g$ , and  $s = 3 - 2\delta W$ . Finally, by lemma 2, all legislators are reappointed in equilibrium. We thus have

$$W = \frac{s}{3} + \delta W. \quad (10)$$

Solving for  $W$  yields  $W = 1/[1 - (\delta/3)]$ . Inserting the result in the expressions above yields the equilibrium policies of proposition 1. Inserting these policies in the voters' utility functions yields the equilibrium reservation utilities. By requiring the voting strategies to maximize the utility of the representative voter in each district in any period, we are guaranteeing that the equilibrium is sequentially rational. As voters simultaneously choose their reelection strategies, no voter has any incentive to change her vote, given the optimal behavior by other voters and of legislators, if she considers herself pivotal.<sup>13</sup> Q.E.D.

This outcome is related to an equilibrium in the last section of Ferejohn (1986), where a single policy maker gets away with massive rents when voters directly compete for her favors. In the simple legislature considered here, voters compete across, but not within, districts since, by assumption, redistribution takes place only across districts. Therefore, the voters in the agenda setter's region can still discipline the agenda setter and keep rents to a minimum. This is done by adopting a reelection rule that keeps politicians indifferent between diverting as much as possible today but losing office and diverting only a small amount today but holding on to office and continuing to reap rents in the future.

If  $r > 0$ , voters in region  $a$  obtain net redistribution to their district at the expense of voters in other districts. Therefore, they prefer their representative to set taxes at their maximum:  $\tau = 1$ . There is an underprovision of public goods since the agenda setter effectively sets policy so as to maximize the utility of voters in district  $a$  only. She therefore trades off redistribution to region  $a$  and public-goods provision one for one—and hence sets  $H_g(g) = 1$ .

Note also that the interests of voters in district  $a$  and their legislator are aligned in some dimensions, but not in others. Both want maximal

<sup>13</sup> As remarked above, the voting rule is ex post (weakly) optimal since the incumbent and the opponent are identical in each district. Hence, even without the assumption that voters are committed to their voting rule, the equilibrium would still be sequentially rational (though many other equilibria would also exist).

taxes. But both the voters and the legislator want to keep the revenue to themselves: voters wishing to expand  $r^a$  and the legislator wishing to expand  $s^a$ . Holding their legislator accountable for performance, the voters can limit the waste as long as they respect the incentive constraint (9).

This simple model illustrates a form of legislation that Thomas Jefferson called “elective despotism” in his *Notes on North Virginia* (cited by James Madison in Federalist Paper 48 [(1788) 1987, p. 310]):

All the powers of government, legislative, executive, and judiciary, result to the legislative body. The concentrating these in the same hands is precisely the definition of despotic government. It will be no alleviation that these powers will be exercised by a plurality of hands, and not by a single one. One hundred and seventy-three despots would surely be as oppressive as one.... An elective despotism is not what we fought for.

In our model, only the voters from one of three regions can secure redistribution toward their region, whereas the other voters get nothing. Voters of the non-agenda-setting regions cannot discipline their representatives to ask for more equitable redistribution because they compete with each other to be included in the majority.

In summary, this simple legislative model displays three “political failures,” each being defined as a departure from the socially optimal policy: some spending is wasteful ( $s^L > 0$ ), public goods are underprovided ( $g^L < H_g^{-1}(\frac{1}{3})$ ), and a politically powerful minority receives any equilibrium redistribution ( $r^{al} \geq 0$ ). We now ask what form these three political failures take under alternative—and more realistic—political constitutions.

#### IV. A Presidential-Congressional Regime

In this section, we modify the previous model by introducing separation of proposal powers within the legislature. By giving different legislators sharp agenda-setting rights over different dimensions of policy, we can approximate the agenda-setting powers of the powerful standing committees in legislatures, such as the U.S. Congress. Decisions are made sequentially on different policy dimensions, subject to a budget constraint, where later proposals are bound by decisions made at an earlier stage. That is, Congress votes directly on each separate proposal. This procedure with different agenda setters leads to separation of powers. The reason is that the agenda setter is a different politician at each stage, accountable to a different group of voters. The political regime therefore captures some features of a presidential regime, like that of

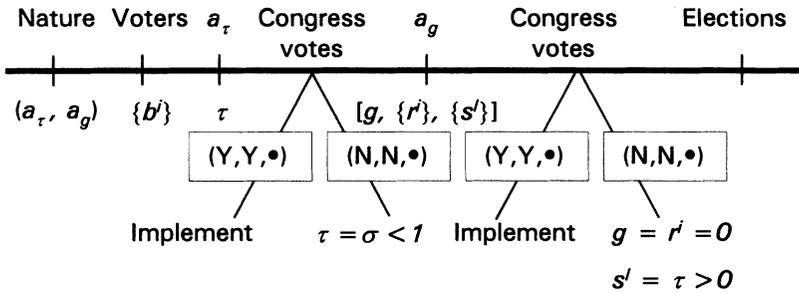


FIG. 2

the United States. The direct election of the executive makes it unnecessary to form a stable majority to support a cabinet. Nothing then constrains the kind of coalitions that can be formed. In other words, incentives for legislative cohesion—the focus of the next section—are absent.

For simplicity, in the model of this section, we mainly focus on two-stage decision making inside Congress, with one stage for taxes and the other stage for allocation of spending. At the end, we comment on how the results would change with separation of agenda-setting powers between the president and Congress and with separation of proposal powers in the allocation of expenditures as well.

Voters use the same kind of retrospective voting rules for their congressional representatives as in (6), conditioning their reservation utilities on whether their representative is the agenda setter for the allocation of spending ( $i = a_g$ ), for taxes ( $i = a_\tau$ ), or for neither ( $i = n$ ):

$$D_{t+1}^i = 1 \quad \text{if } U^i(\mathbf{q}_t) \geq b^i, \quad i = l \text{ at } t. \tag{11}$$

The extensive form of the game in a typical period is illustrated in figure 2. Specifically, we consider the following sequence of events:

1. Nature randomly selects two different agenda setters among the incumbent legislators, one for taxes and one for the allocation of public spending,  $a_\tau$  and  $a_g$ , respectively.
2. Voters set reservation utilities for their voting rule,  $b^i$ .
3. Agenda setter  $a_\tau$  proposes a tax rate,  $\tau$ .
4. Congress votes. If at least two legislators are in favor of the proposal, the policy is implemented. Otherwise, a default tax rate  $\tau = \sigma < 1$  is enacted.
5. Agenda setter  $a_g$  proposes  $[g, \{s^i\}, \{r^i\}]$  subject to the budget constraint  $r + s + g \leq 3\tau$ .

6. Congress votes. If at least two legislators are in favor, the policy is implemented. Otherwise, a default policy, with  $g = 0$ ,  $r^i = 0$ , and  $s^i = \tau$ , is put in place.
7. Elections are held.

Note that the sequence of decisions matters also outside of equilibrium. Whatever the outcome of the decision over taxes, that outcome is binding at subsequent stages, even if there is disagreement over the allocation of spending (see the default outcome at stage 6). This feature is critical for the result stated below. At stage 5, legislator  $a_g$  attempts to form the coalition that is best for her. If  $a_g$  is indifferent between the other two, we assume that they have the same probability of being included in the winning coalition. The reason why we must spell out how coalitions are formed in the last stage of legislative bargaining is that legislators are forward-looking. Hence, their behavior in stages 3 and 4 depends on their expectations of what happens in subsequent stages—in particular, on whether they expect to be part of the winning coalitions later on. Below, we discuss the consequences of making alternative assumptions about coalition formation.

An equilibrium is defined as in Section III, except that here, the optimality conditions for policy proposals and for voting by the legislators must hold at each node of the game, for any given voting rules and decisions at earlier nodes in the same period, and when one takes into account equilibrium behavior at subsequent nodes of the same period. A precise definition is stated in the Appendix.

The stationary equilibrium is unique.<sup>14</sup> Its features are summarized in the following proposition (a *C* superscript stands for presidential-congressional regime).

**PROPOSITION 2.** In the equilibrium of the presidential-congressional regime,

$$\tau^C = \frac{1 - (\delta/3)}{1 + (2\delta/3)} < 1;$$

$$s^C = 3 \frac{1 - \delta}{1 + (2\delta/3)} < s^L;$$

$$g^C = \min \left[ \hat{g}, \frac{2\delta}{1 + (2\delta/3)} \right] \leq g^L,$$

<sup>14</sup> Persson and Tabellini (2000, chap. 10) study a simplified version of this model in which rents in the default policy at stage 6 do not depend on the tax rate from stage 4. In this case there are multiple equilibria, but each of them shares the qualitative properties with the unique equilibrium of the present model.

where  $\hat{g}$  is such that  $H_g(\hat{g}) = 1 > \frac{1}{3}$ ;

$$r^{a^c} = \frac{2\delta}{1 + (2\delta/3)} - g^c \leq r^{a^L}, \quad r^{i^c} = 0 \text{ for } i \neq a;$$

$$b^{a^c} = H(g^c) - g^c + \frac{2\delta}{1 + (2\delta/3)}, \quad b^{i^c} = H(g^c) \text{ for } i \neq a.$$

All politicians are reelected.

*Proof.* To prove this proposition, begin at stages 5 and 6 of the game. Here, the agenda setter  $a_g$  takes  $\tau$  as given. By the same argument as in the proof of lemma 2, incentive compatibility implies that she must get at least

$$s^{a_g} \geq 2\tau - \delta W \tag{12}$$

and that she offers

$$s^{m_g} = \tau - \delta W \tag{13}$$

to her junior coalition partner in order to win approval. Thus total diversion in equilibrium must be at least

$$s \geq 3\tau - 2\delta W. \tag{14}$$

Together with the budget constraint, (14) implies that voters cannot get more public goods and redistribution than

$$r + g \leq 2\delta W. \tag{15}$$

Repeating the same steps as in the proof of lemma 1, one can show that, in equilibrium, all  $r$  (if any) is distributed to the district of  $a_g$ . That is,  $r^a = r$ . As in Section III, the voters of  $i \neq a_g$  become involved in a Bertrand competition. If voters in one district demand more than voters in the other, they are left in the minority and get no transfers at all. Moreover, if one district demands a utility level requiring positive transfers, for any given tax rate, the voters in the other district will underbid them by an infinitesimal amount to become included in the winning coalition. Thus the only equilibrium is one in which the voters of  $i \neq a_g$  demand no transfers at all from their representatives.

Given this property of the equilibrium, what are the optimal amounts of  $r$  and  $g$  from the point of view of the voters in district  $i = a_g$ ? These voters take  $\tau$  as given and face the constraint in (15). Thus, from their point of view, the optimal allocation between  $g$  and  $r$  maximizes  $r + H(g)$  subject to (15). This gives  $g = \min [H_g^{-1}(1), 2\delta W]$ ,  $r = 2\delta W - g$ , and  $s = 3\tau - 2\delta W$ .

Next, consider stages 3 and 4. By assumption,  $a_\tau \neq a_g$ , implying that neither  $a_\tau$  nor the voters she represents are direct residual claimants of

higher taxes. Thus the optimal voting rule requires  $a_r$  to set taxes as low as possible, given the following incentive-compatibility condition.

LEMMA 3. In the equilibrium of the presidential-congressional regime,  $\tau^c \geq 1 - \delta W$ .

*Proof of lemma 3.* Under our stated assumptions, there is no difference, from the point of view of legislator  $a_g$ , between the two legislators  $i \neq a_g$  at stage 5. Therefore,  $a_r$  will be included as a junior partner in the minimum winning coalition at stage 5, with probability one-half, in the equilibrium subgame or in an out-of-equilibrium subgame. Hence, for  $a_r$  to go along with the equilibrium, she must receive a payoff of

$$\frac{s^m}{2} + \delta W \geq v^d. \tag{16}$$

The left-hand side of (16) is the equilibrium continuation value for  $a_r$  when making a proposal  $\tau$  consistent with equilibrium. In this case,  $a_r$  receives  $s^m$  with probability one-half (the probability of being in the winning coalition at stage 5) and is reappointed with certainty. On the right-hand side of (16),  $v^d$  denotes the expected utility of  $a_r$  in a disequilibrium history, that is, after a proposal of  $\tau$  that is inconsistent with the reservation utility required by the voters and after approval of this disequilibrium proposal. What is the highest possible value of  $v^d$ ? Suppose that  $a_r$  proposed a tax rate  $\tau^d > \tau^c$ . It is easy to see that profitable deviations from the equilibrium must occur toward higher tax rates, never toward lower ones. Such proposals would always be approved by  $a_g$ , who is the residual claimant of higher taxes. Moreover, the agenda setter at the next stage,  $a_g$ , would always continue along the disequilibrium, proposing  $g = r = 0$  and  $s^a = 2\tau^d$  and leaving her junior coalition partner with  $s^m = \tau^d$ . All legislators are then thrown out of office once elections are held.<sup>15</sup> It follows that the optimal deviation for  $a_r$  would be to set  $\tau^d = 1$ . Taking into account that  $a_r$  is included in the winning coalition of stage 5 with probability one-half, we have  $v^d = \frac{1}{2}$ . By (13) and (16), therefore,  $\tau^c \geq 1 - \delta W$ . Q.E.D.

As we continue the proof of proposition 2, suppose for now that

$$1 - \delta W > \frac{2}{3} \delta W. \tag{17}$$

By (15), a tax rate  $\tau^c = 1 - \delta W$  is then high enough to finance the maximum incentive-compatible amount of public goods. The optimal

<sup>15</sup> Faced with a tax rate  $\tau^d > \tau^c$ , the next agenda setter  $a_g$  could seek reappointment by setting  $r^a = r^c + \tau^d - \tau^c$ , thereby neutralizing the effects of the previous deviation on her voters. But it is easy to see that  $a_g$  would always prefer to exploit the high taxes to her advantage and forgo reappointment. The intuitive reason is that, in equilibrium,  $a_g$  must be indifferent about seeking reappointment or not. Hence, a higher tax rate provides more opportunities for diversion and tilts the balance in favor of no reappointment.

voting rule for the voters of  $a_r$  makes her propose

$$\tau^C = 1 - \delta W. \quad (18)$$

Such a proposal is always approved by the third legislator,  $i \neq a_g, a_r$ . By voting no, she causes  $\tau = \sigma$ . If  $\sigma < 1 - \delta W$ , this is self-defeating since all legislators are residual claimants (in expected value) of higher tax rates. If  $\sigma > 1 - \delta W$ , voting no, given the equilibrium election strategy of voters, implies that all legislators are thrown out of office. But given  $\sigma < 1$ , this yields a lower utility than approving the proposed tax rate, by the same argument as above.

We can now easily complete the proof of proposition 2. As in Section III,  $W$  is defined by (10). Inserting (18) in the previous expressions, using (10), and solving for  $\tau$ ,  $s$ ,  $g$ , and  $r$ , we can verify that (17) is always satisfied, and we obtain the equilibrium values stated in the proposition. Q.E.D.

It is interesting to compare this outcome with that in the simple legislature. The presidential-congressional regime raises less taxes, spends less on redistribution, and entails less waste of resources. The overall amount of public goods is the same, or smaller in the case of a corner solution.

What is the intuition for these results? The underprovision of public goods occurs for the same reason as in the simple legislature. Competition between districts for shares in the distributive pie drives all equilibrium transfers toward a single district. The voters in that district, therefore, optimally trade off public goods against redistribution one for one, and severe underprovision of public goods remains.

Because the voters in district  $a_g$  are the residual claimants on tax revenue not spent on public goods, in the same way as in the simple legislature, the majority of voters would like to constrain redistributive spending. The voters in district  $a_r$  belong to this majority and constrain redistribution by not reelecting  $a_r$  unless she keeps taxes at the minimum needed to finance the optimal level of public goods. These checks and balances limit the "elective despotism" of the minority present in the simple legislature.

Finally, the lower waste occurs because the agenda setter controlling diversion, namely  $a_g$ , now has access to less revenue. The maximum threat she can impose on the voters, by diverting all available resources, is thus smaller and the incentive-compatibility constraint faced by the voters becomes less severe. Taxes cannot go below a lower bound, however, since the legislator proposing taxes has some chance of getting a share in the prospective rents created by a diversive Leviathan-style proposal with maximal taxes. The general intuition for this result is the same as in Persson et al. (1997). When decision-making authority is split between different policy makers, who are still required to make joint

decisions, voters can exploit the conflict of interest among policy makers and hold them more closely accountable.

Would the results change with an alternative bundling of decision-making rights, over different policy dimensions? What is crucial is the separation of decisions over the *size* and the *allocation* of the budget. A finer separation of decisions among different legislators would not make much difference, as long as the decision on taxes is kept separate from decisions on allocation. In a previous version (available on request), we split the allocation stage into a redistribution stage, with decisions made on  $\{r^i\}$ , and a public-goods stage, with decisions made on  $[g, \{s^i\}]$ . Thus each legislator was assumed to have agenda-setting power on a separate dimension of public finance, perhaps in a closer approximation of the U.S. committee system. The results are very similar to those stated above. One interesting difference is that no proposal with positive redistribution can get equilibrium support in Congress, so that in equilibrium,  $r = 0$ . The reason is that the non-agenda-setting legislators at the redistribution stage do not benefit (directly or indirectly) from  $r > 0$  and would rather have the tax revenue spent on rents for themselves. If, however, the decision on taxes is combined with allocative decisions, we return to the equilibrium of the simple legislature. In particular, combining the decision on  $(\tau, g, s)$  and separating it from that on  $r$  would make it impossible for voters to enforce  $\tau < 1$ , since the agenda-setting legislator for  $\tau$  would be the residual claimant of higher taxes. Similarly, combining the decision on  $(\tau, r)$ , while keeping it separate from that on  $(g, s)$ , would also break the equilibrium since the voters of the legislator in charge of proposing the size of the budget would want maximal tax revenues.

The results would also change if the separation of powers was diluted by substantial amendment rights to policy proposals or if collusive deals could be struck between the legislators. This is why sequential decision making is important; it implies that collusive agreements cannot be enforced. Initial promises made by  $a_g$  to  $a_r$ , conditional on  $a_r$  setting a high tax rate, are not credible because  $a_g$  has all the bargaining power once taxes are decided. Under the reasonable assumption that contracts between legislators cannot be written or enforced by third parties, enforcement of such collusive deals would have to rely solely on reputational forces.

We rule out collusion by our assumption that both legislators are included in the winning coalition at stages 5 and 6 with equal probability. Relaxing this assumption and allowing for a joint deviation between  $a_g$  and  $a_r$  would break the equilibrium described above. Indeed, if  $a_r$  is included with probability one in the majority coalition by  $a_g$ , then she will be a fully residual claimant at the margin on any proposed increase

in the tax rate.<sup>16</sup> Therefore, voters cannot discipline her to keep the tax rate down. The fact that collusion can break the separation of powers equilibrium points to a deeper difference between the parliamentary and the presidential-congressional regimes: trying to introduce a sequential budgetary procedure in a parliamentary regime will not create the checks and balance effect of proposition 2. Indeed, legislative cohesion is an endogenous outcome that sustains collusion (cooperation) because of the basic institutions in a parliamentary regime, as we shall see in the next section.

Finally, we could easily allow the legislator proposing the size of the budget to be elected on a national ballot rather than in a district. He would then be accountable to the whole electorate, as a president or a state governor. The results would be very similar to those of proposition 2. The majority of voters, not benefiting from subsequent redistribution, would hold him accountable to propose low taxes in order to discipline subsequent agenda setters.<sup>17</sup> This yields a stronger and more collusion-proof separation of powers than the one discussed in proposition 2 since the elected president will never be part of the coalition at the allocation stage. Voters can thus discipline him to propose a low tax rate since he is not a residual claimant on tax revenue.<sup>18</sup> A president with only veto powers but no proposal rights over taxes, however, would not be able to affect the size of government. In equilibrium, he would be compensated with some rents so as not to exercise his veto power; without effective proposal rights, he would not be able to impose a small budget on the other legislators.

## V. A Parliamentary Regime

In this section, we consider a modification of the simple legislative game different from that in Section III, which is designed to capture the essentials of a parliamentary regime. At the outset of each period, nature picks *two* legislators as members of a majority coalition constituting the "government." One of these "ministers" prepares a budget proposal on

<sup>16</sup> If  $\gamma$  is the probability that  $a_i$  is included in the coalition by  $a_g$  at the allocation stage, then (18) would become  $\tau^c = 1 - [(1 - \gamma)/\gamma]\delta W < 1$  as long as  $\gamma < 1$  but  $\tau^c = 1$  for  $\gamma = 1$ .

<sup>17</sup> Persson et al. (1997) discuss the checks and balances associated with sequential budgeting in a presidential system. Chari, Jones, and Marimon (1997) obtain a related result in a setting with prospective voters and outcome-oriented politicians: by endogenously electing a "fiscally conservative" president, voters collectively manage to control the overspending of a congress, to which every district finds it individually optimal to elect a "maximally spendthrift" representative.

<sup>18</sup> The incentive constraint is then such that the two legislators other than  $a_g$  must be convinced to vote in favor of  $\tau^c$ , proposed by the president. It can be shown that when each of these has an equal probability of being included in the coalition at the allocation stage, eq. (18) becomes  $\tau^c = \sigma - \delta W$ , which for  $\sigma < 1$  is smaller than in (18).

behalf of the government. The proposal then goes to parliament for a vote. In this vote, each coalition partner has a veto right. The veto can be thought of as a vote of confidence on the government. If the veto is exercised, a government crisis follows. To simplify the analysis, we assume that if there is a government crisis, a new agenda setter is picked at random and the decision-making process reverts to the same rules as in the simple legislature of Section III. This may be a plausible assumption in parliamentary regimes without a constructive vote of no confidence.<sup>19</sup> In any event, the assumption captures the basic cost of triggering a government crisis in a parliamentary regime, namely the prospective loss of valuable proposal powers associated with ministerial portfolios. Examining public finance under alternative rules for government breakup, as in Baron (1998), is an interesting issue for further work.

The specific game examined in each period is illustrated in figure 3. It consists of the following stages:

1. Nature randomly selects two coalition partners (ministers) among the incumbent legislators; one becomes the agenda setter for public finance decisions,  $a$ , and the other her junior partner,  $m$ .
2. Voters set reservation utilities for their voting rule,  $\{b^i\}$ .
3. Agenda setter  $a$  proposes  $[\tau_a, \{r_a^i\}, g_a, \{s_a^i\}]$ :  $r_a + g_a + s_a \leq 3\tau_a$ .
4. The junior coalition partner can veto the joint proposal from stage 3. If approved, the proposal is implemented and the game goes to stage 9. If not, the government falls and the game goes on to stage 5'.
- 5'. Nature randomly selects a new agenda setter  $a'$  among the three legislators.
- 6'. Voters reformulate their reelection strategies, conditional on the status of their representative after the government crisis.
- 7'. The agenda setter  $a'$  proposes an entire allocation  $\mathbf{q}_{a'}$ .
- 8'. Parliament votes on this proposal. If approved by at least two legislators,  $\mathbf{q}_{a'}$  is implemented. If not, the legislative bargaining ends and a default outcome with  $\tau = s^i = \sigma$  and  $g = r^i = 0$  is implemented.
9. Elections are held.

Before we continue, it is worthwhile to discuss the formulation of this game and relate it to the previous ones. In comparison with the simple legislature of Section III, the junior coalition partner has a preassigned veto right. Exercising this veto triggers a government crisis (i.e., a new game in which agenda-setting powers are reallocated) instead of a status quo outcome. This veto right gives the junior coalition partner and the

<sup>19</sup> Huber (1996) uses the same shortcut to approximate the consequences of a vote of confidence procedure on government decisions in a parliamentary system.

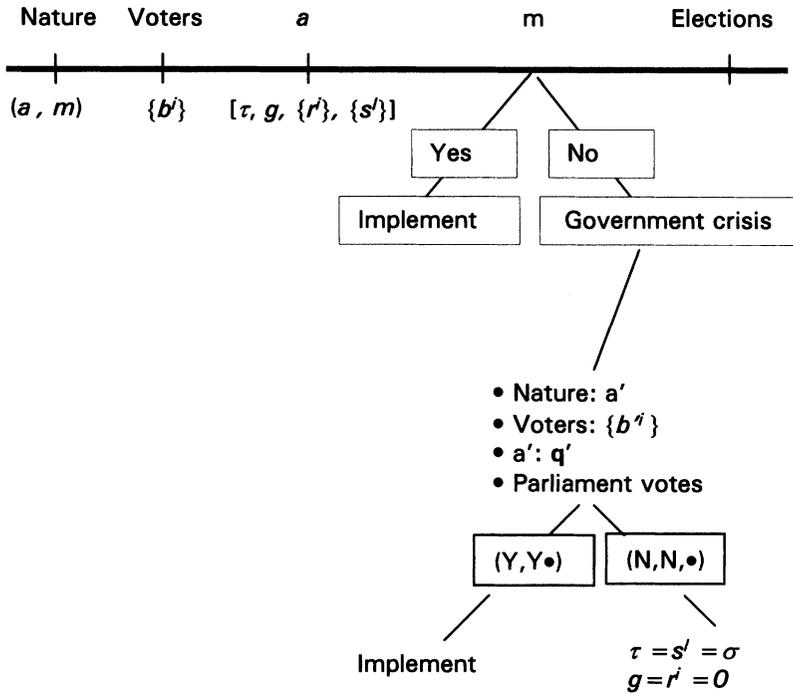


FIG. 3

voters she represents more bargaining power and induces legislative cohesion. In comparison with the presidential-congressional regime, voting over different policy dimensions is not sequential. Hence there are no checks and balances and no effective separation of powers. Note that *sequential proposals* within government would not add any effective separation of powers. As long as a veto at the last proposal stage triggers a government crisis, it would undo previous proposals since the budgetary process would have to start over again at stage 5'. This is in accordance with the rules of a parliamentary democracy. In a previous version of the paper, we indeed considered two- and three-stage budget preparations within government, with separate ministers making sequential proposals. The results are identical.

The previous version also expanded the legislative bargaining by adding an initial government formation stage, where nature selects a "prime minister," who in turn chooses a government partner and optimally allocates the agenda-setting powers between herself and the other politician. In equilibrium, the prime minister always keeps the valuable

spending portfolio to herself since that determines who gets higher rents in equilibrium.<sup>20</sup>

The other building blocks of the game remain the same as before. Thus legislators have the same objective functions as in Section III. Elections take place in each district at the end of each period. Voters in each district coordinate on utility-maximizing retrospective voting strategies, conditioning reelection on the position of their representative: whether he is outside the government, which position he has if inside the government ( $l = a, m, n$ ), and whether or not he is the agenda setter given that a breakdown of government has occurred ( $l = a', l \neq a'$ ):

$$D_{i+1}^i = 1 \quad \text{if } U^i(\mathbf{q}_i) \geq b^i, \quad i = l. \tag{19}$$

An equilibrium is defined as in previous sections (a precise definition can be found in the Appendix).

The equilibrium features are summarized in the following proposition (the  $P$  superscript stands for parliamentary regime), which is formally proved in the Appendix.

PROPOSITION 3. In the parliamentary regime, there is a continuum of equilibria such that

$$\tau^P = 1 = \tau^L > \tau^C;$$

$$s^P = 3 \frac{1 - \delta}{1 - (\delta/3)} = s^L > s^C, \quad s^{aP} = \frac{2}{3}s^P, \quad s^{mP} = \frac{1}{3}s^P;$$

$\bar{g} \geq g^P > g^C$ , with  $\bar{g}$  defined by  $H_g(\bar{g}) = \frac{1}{2}$ ;

$$r^P = \frac{2\delta}{1 - (\delta/3)} - g^P \geq 0;$$

$r^{iP} \geq 0$  if  $i = a, m$ ; and  $r^{iP} = 0$  if  $i = n$ . If  $r^{iP} > 0$  for  $i = a, m$ , then  $g^P = \bar{g}$ ,  $b^{iP} = H(g^P) + r^{iP}$ ,

$$b^{a'P} = H(g') - g' + \frac{2\delta}{1 - (\delta/3)},$$

and  $b' = H(g')$ , with

$$g' = \min \left\{ \hat{g}, \frac{2\delta}{1 - (\delta/3)} \right\}.$$

All politicians are reelected and a government crisis never occurs.

<sup>20</sup> Laver and Shepsle (1996) provide an exhaustive treatment of a considerably richer formal model of government formation. But in their formal analysis, they ignore both the electoral stage and the treatment of government proposals in parliament.

The key to understanding the features of this equilibrium is the veto right enjoyed by both coalition partners. Under the assumed timing, this veto right allows voters in the districts of  $a$  and  $m$  to demand a high share of redistribution without fear of being excluded from the coalition. In other words, bilateral monopoly replaces Bertrand competition in the determination of the redistributive budget. In equilibrium, the requests of voters in the majority districts must be mutually compatible. The reservation utilities  $b^a$  and  $b^m$  can be considered as the threat points in intragovernment bargaining, where the ministers act on behalf of their constituencies in order to earn reelection. For consistency, a higher  $b^a$  is associated with a lower  $b^m$  in equilibrium, and vice versa. But this can happen in many ways. Hence the multiplicity of equilibria.

These multiple equilibria thus have nothing to do with the infinite-horizon folk theorem (we have ruled out such a multiplicity by the restriction to "historyless" strategies). Instead, they are multiple Nash equilibria in the game between voters in the different districts. They are closely related to the multiple equilibria in delegation games with observable contracts, analyzed by Fershtman, Judd, and Kalai (1991). Here, the voting strategies play the role of observable contracts.

The equilibria in the parliamentary regime thus typically entail redistribution toward a majority, unlike the simple legislature and the presidential-congressional regime, where any redistribution instead goes to a minority.

We also find a higher provision of public goods associated with this majority-oriented redistribution. Why? The equilibrium policy must be jointly optimal for the voters represented in the governing coalition, given that it satisfies the incentive constraint for rents. Hence, the benefit of the public good for two out of three districts is internalized. If the nonnegativity constraints on  $r^i$  do not bind, for  $i = a, m$ , public goods must be jointly optimal for the two groups of voters in the majority. Then we have  $g^p = \bar{g}$ , where  $2H_g(\bar{g}) = 1$ . Public-good provision falls short of this level only if the nonnegativity constraint on  $r^i$  binds, either for  $i = a_g$  or for  $i = a_r$ . For instance, this can happen if  $b^m$  or  $b^a$  is set exactly at  $E(u')$ . In that case, the only way of transferring utility from one group of voters to the other is to reduce spending on the public good, while at the same time increasing the transfer to the favored group. As long as the interregional transfers after a government crisis  $r^i$  are strictly positive, however, the level of public goods must still be strictly higher than in the simple legislature—and thus also higher than in the presidential-congressional regime—because voters' utilities must be at least as large as  $E(u')$ . No transfers to region  $m$  or  $a$  must then be compensated by a higher level of public goods. Public goods at the first-best level with  $3H_g = 1$  can never be an equilibrium, however.

The threat of going through a government crisis, followed by a simple

legislative game with no additional constraints, enables the legislators to appropriate as much rents as in the simple legislature, irrespective of the equilibrium tax rate. But the bargaining power of the junior partner implies that rents are more equally distributed within the majority. In comparison with the presidential-congressional regime, the lack of separation of powers implies more scope for collusion among the coalition partners. This means that politicians earn more rents in the parliamentary regime.

Equilibrium taxes are also higher than in the presidential-congressional regime. Not only do the legislators in the governing coalition have a strong selfish interest in high taxes. But now a majority of the voters, namely the voters in districts  $a$  and  $m$ , also benefit from redistribution at the expense of the minority. The majority voters thus have a strong incentive to induce their elected representatives to maximize tax revenues.

Alternative assumptions on what would happen after a government crisis would not affect our qualitative results but would change the continuation value for individual legislators or for voters, which would mainly affect the bargaining power of individual coalition partners over  $s$ .

Let us close the theoretical part of the paper by a brief discussion of normative issues. Since we have a characterization of the equilibria in the presidential-congressional and in the parliamentary regimes, it is tempting to ask which is better for the voters. Using the equilibrium allocation in propositions 2 and 3 as well as in equations (2) and (3), we can compute the ex ante expected utility of a voter in any of the three districts, in each of the two regimes. Straightforward calculations give the following expected utility difference between the parliamentary and presidential-congressional regimes:

$$E(u^{i^P}) - E(u^{i^C}) = \frac{1}{1 - \delta} \left( [H(g^P) - \frac{1}{3}g^P] - [H(g^C) - \frac{1}{3}g^C] - \frac{\delta(1 - \delta)}{[1 - (\delta/3)][1 + (2\delta/3)]} \right). \quad (20)$$

The first term inside the large parentheses captures the welfare effect of higher public-goods provision and its financing under the parliamentary regime. It is always positive since the expression  $H(g) - \frac{1}{3}g$  is maximized at the socially optimal level (cf. Sec. II) and since  $g^P > g^C$ . The second term captures the welfare effect of the higher waste (and higher associated taxes) under the parliamentary regime. It is always negative. Loosely speaking, the parliamentary regime is thus better for the voters if public goods are very valuable (so that  $g^P$  is considerably

higher than  $g^c$ ) or if the political agency problem is small (as  $\delta$  approaches unity).<sup>21</sup>

Even though we do not want to get into the difficult question about endogenous institutional choice in this paper, this result points toward the conditions under which we may observe the two regimes. Note, however, that the tension between a Pigovian and a Leviathan approach appears at the level of institutional choice as well. As rents in our model are always higher in the parliamentary regime, that regime would always be preferred by the legislators (the expected utility difference for a legislator would just be the negative of the second term in eq. [20]). The outcome of a referendum and a vote in the legislature on institutional reform might thus be very different. This, in turn, suggests that it may be unwise to delegate constitutional reforms to the same elected political representatives that are supposed to choose public policy within the reformed constitution. Constitutional reforms in the true interest of the voters are more likely to be carried out by a constitutional assembly elected for that specific purpose.

## VI. Some Evidence

The theory developed in the previous sections generates clear predictions on how the level and composition of government spending depend on the political regime. Are such predictions supported by empirical evidence? We report here a preliminary answer, drawing on a more extensive empirical analysis by Persson and Tabellini (1999*b*) based on data from 54 democracies.<sup>22</sup>

According to the theory, countries should be classified on the basis of two criteria: (i) whether they have institutions inducing *legislative cohesion* and (ii) whether there is *effective separation of powers* between different political actors, with regard to decisions over the size and composition of spending. Our primary source for classifying countries along these dimensions is Shugart and Carey (1992, chap. 8). With regard to legislative cohesion, we consider rules for government formation and government termination, as well as rules for the dissolution

<sup>21</sup> Aghion and Bolton (1998) provide another example of a normative comparison between alternative political constitutions. They compare alternative required majorities to change the status quo and show that contractual incompleteness can give rise to an ex ante preference for a majority rule and, more generally, for decision-making rules weaker than unanimity. Even though they focus on contractual incompleteness, they consider a model of direct democracy in which agency problems between voters and politicians do not arise.

<sup>22</sup> We classify a country as a democracy if it scores between 1 and 5 according to the Gastil (1987) index of political rights, on average, over the period 1985–90. This selection criterion picks out 64 countries; for 10 of them, however, data on fiscal outcomes or necessary control variables are not available.

of the assembly. Countries in which cabinet survival depends on the support of a majority in the legislature, parliament has strong rights of censure over the government, or a directly elected president has little influence over government formation or dismissal are ranked as having stronger legislative cohesion. With regard to separation of powers, we consider whether or not there is a directly elected president, and, if so, we rank his veto rights (in all policy dimensions) and his rights of initiative over the budget; the stronger these presidential rights, the more effective separation of powers is likely to be.

Combining these two dimensions, we classified countries in two groups, as parliamentary or presidential-congressional regimes. The two groups have roughly the same size (30 parliamentary and 24 presidential-congressional regimes). A detailed list is provided in table 1. Regimes coded as parliamentary induce legislative cohesion but have weak separation of powers. Countries without a directly elected president end up in the parliamentary regime. The one exception is Switzerland, which is included among the presidential-congressional regimes, since the cabinet—even though chosen by the Assembly—has a life of its own; survival does not depend on majority support in the Assembly. Among the parliamentary regimes, however, we have included a number of countries with a directly elected president, such as France, Finland, and Portugal. In these countries, the rules for government formation and dissolution imply considerable legislative cohesion. Recent periods of “cohabitation” illustrate that the majority in the French National Assembly really has more power than the elected president (see, e.g., Pierce 1991). Besides the United States, many presidential regimes are found in Latin America.

Clearly, it is very difficult to pigeonhole the observed variety of political institutions along a single dimension, and our classification probably entails some arbitrary decisions. The classification is supported by the in-depth investigation of Shugart and Carey (1992), however, and it is based on criteria that have no connection with the observed fiscal policies. Of the two criteria identified by the theory, institutions producing legislative cohesion and separation of budgetary powers, we are probably weighing the former more than the latter. While the idea of legislative cohesion is in line with earlier research by political scientists and is probably accurately captured in our classification, the notion of separation of budgetary powers has been studied by economists such as Hallerberg and Von Hagen (1999) but has received scant attention by researchers in comparative politics. Further research is required to develop precise measures of separation of powers corresponding to the theory developed in this paper.

Let us now turn to observed fiscal policy in these two country groups. Here we mainly focus on size of government. According to the theory,

TABLE 1  
SIZES OF GOVERNMENTS

| PARLIAMENTARY REGIME |              |                 | PRESIDENTIAL REGIME |              |                 |
|----------------------|--------------|-----------------|---------------------|--------------|-----------------|
| Country              | Size<br>(1)  | Residual<br>(2) | Country             | Size<br>(1)  | Residual<br>(2) |
| United Kingdom       | 37.81        | -1.09           | United States       | 24.04        | -1.94           |
| Austria              | 39.23        | -2.99           | Switzerland         | 24.20        | -15.58          |
| Belgium              | 50.03        | 5.94            | Argentina           | 10.12        | -9.09           |
| Denmark              | 40.49        | -1.59           | Bolivia             | 13.67        | -4.13           |
| France               | 43.26        | 8.36            | Brazil              | 30.47        | 17.91           |
| West Germany         | 30.47        | -10.66          | Chile               | 20.67        | -6.99           |
| Italy                | 48.43        | 13.26           | Colombia            | 13.99        | -6.20           |
| Luxembourg           | 46.89        | -.52            | Costa Rica          | 24.98        | -1.27           |
| Netherlands          | 52.95        | 11.80           | Dominican Republic  | 14.77        | -8.71           |
| Norway               | 44.16        | -.63            | Ecuador             | 14.19        | -7.26           |
| Sweden               | 43.17        | -2.49           | El Salvador         | 11.19        | -9.16           |
| Canada               | 23.14        | -6.06           | Guatemala           | 10.63        | -6.40           |
| Japan                | 16.12        | -10.01          | Mexico              | 21.07        | 3.31            |
| Finland              | 34.17        | -1.03           | Nicaragua           | 31.03        | 8.32            |
| Greece               | 51.54        | 13.74           | Paraguay            | 10.96        | -14.27          |
| Iceland              | 33.14        | -1.85           | Peru                | 12.43        | -2.10           |
| Ireland              | 41.68        | 1.70            | Uruguay             | 26.95        | -5.39           |
| Malta                | 41.26        | .11             | Venezuela           | 23.01        | -.38            |
| Portugal             | 43.37        | 4.42            | Egypt               | 33.35        | 8.19            |
| Spain                | 33.89        | 2.77            | Sri Lanka           | 29.30        | 5.09            |
| Australia            | 26.59        | -1.48           | Korean Republic     | 16.03        | -9.72           |
| New Zealand          | 41.62        | 9.53            | Nepal               | 17.56        | 3.35            |
| Barbados             | 33.41        | -3.64           | Philippines         | 18.50        | -1.42           |
| Trinidad and Tobago  | 33.47        | 7.75            | Gambia              | 23.48        | -1.93           |
| Cyprus               | 29.82        | -7.81           |                     |              |                 |
| Israel               | 47.98        | 15.71           |                     |              |                 |
| India                | 17.41        | 6.58            |                     |              |                 |
| Malaysia             | 28.18        | .24             |                     |              |                 |
| Botswana             | 32.60        | 5.97            |                     |              |                 |
| Papua New Guinea     | 32.56        | 9.72            |                     |              |                 |
| <b>Average</b>       | <b>37.29</b> | <b>2.19</b>     |                     | <b>19.86</b> | <b>-2.74</b>    |

NOTE.—Data on government size refer to total expenditures by the central government on average between 1988 and 1992. Residuals for government size have been generated by the following (ordinary least squares) regression estimated on the full sample:

$$\text{SIZE} = -14.08(-.73) + .02(.01) \times \text{INCOME} + 8.01(4.23) \\ \times \text{OPEN} + 152.9(3.51) \times \text{OLD} - .06(-1.24) \times \text{ETHNO}$$

(*t*-statistics are in parentheses). Adjusted  $R^2 = .57$ . Data sources are in the Appendix.

legislative cohesion and lack of separation of powers in parliamentary regimes promote a larger government. For each of the 54 democracies in our sample, we measure the size of government by the average total spending of central government, as a function of GDP, over five years, centered on 1990. Data sources and definitions are described in the Appendix.

Table 1 reports the data on size of government. The difference in the size of government is striking. As can be seen from the final row of

the table, on average and with nothing else controlled for, parliamentary regimes spend 17–18 percentage points of GDP more than congressional-presidential regimes. Some of these differences in the size of government may be due to other economic and social variables, unrelated to the political regime. To control for these other determinants, we have estimated a regression of the size of government on the following variables: the log of per capita income (INCOME), the log of openness (OPEN), the share of the population above 65 years of age (OLD), and a measure of ethnolinguistic fractionalization (ETHNO) (the Appendix gives precise definitions). As discussed in Persson and Tabellini (1999*b*), these variables have been included as determinants of the size of government in various earlier cross-country studies (e.g., Cameron 1978; Goode 1984; Easterly and Levine 1997; Rodrik 1998).

Column 2 of each section of the table contains the estimated residuals of this regression (any measure of political regime is omitted from the specification). Some of the observed differences disappear, but important differences remain across regimes: the average of the residuals is +2.19 among the parliamentary regimes and -2.74 among the presidential systems. This difference across regimes is confirmed by a regression that, in addition to the socioeconomic control variables, also includes a dummy variable taking a value of one for countries classified as presidential and zero otherwise (PRES): the estimated coefficient on this variable is -10.0, with a *t*-statistic (corrected for heteroscedasticity) of -3.6. Thus when we control for other determinants of fiscal policy, spending by a central government is 10 percentage points of GDP lower in presidential-congressional regimes. Persson and Tabellini (1999*b*) do some sensitivity analysis, measuring spending in general rather than by central government, enlarging the set of economic controls, and adding dummy variables that group countries according to their geographic location or their degree of industrial development. They also control for the electoral rule. The estimated coefficient on PRES remains stable and highly significant, suggesting that the results are very robust.

The theory in this paper also has implications concerning other fiscal policy variables, in particular public-good provision and wasteful government spending or outright corruption. Both are harder to measure than the size of government. Persson and Tabellini (1999*b*) consider a measure of public-good provision, defined as the sum of spending by a central government on transportation, education, and order and safety. In some specifications, public spending on health services is also included. This is clearly an imperfect measure of spending on pure public goods since it also includes local public goods and redistribution in kind. Here, the evidence is much weaker. The two groups of countries spend, on average, the same amounts (as a percentage of GDP) on these items. When we control for other economic, social, and political vari-

ables, the dummy variable PRES has a negative estimated coefficient, as expected, but it is not statistically different from zero.

Thus the evidence suggests that the size of government is strongly affected by the constitutional features studied in this paper, as predicted by the theory. Whether the lack of robust evidence regarding public-good provision is due to poor measurement or to a real failure of the theory remains to be investigated more carefully. Other predictions of the theory, concerning wasteful spending (or, more generally, corruption) and the shape of redistributive programs, also lend themselves to empirical analysis. The encouraging results obtained for the size of government suggest that such an empirical investigation is worthwhile and might further enhance our understanding of the determinants of fiscal policy choices.

## VII. Concluding Remarks

Before sketching possible extensions of our analysis, we consider a possible criticism of such a research program. It is related to the uneasiness sometimes expressed over game-theoretic research in the modern literature on industrial organization. Will our results not be extremely sensitive to the particular extensive-form game, and could we not "prove anything" by picking the right form? One answer is self-evident: one should derive and report results under different assumptions, as we have done at the end of Sections IV and V. Another answer is that empirical regularities found in real-world constitutions, rather than the researcher's imagination, should govern the assumptions. The precise features of actual constitutions are very well documented, and their essence can often be well captured by varying the rules of an extensive-form game. Indeed, one can argue that comparative politics is an area in which the scope for empirically guided applications of game theory is much greater than in industrial organization.

We thus believe that the analysis in this paper can be productively extended in different directions. One would be to introduce (in the model of Sec. IV) a president and contrast a line-item veto with a veto on the entire budget. The line-item veto might allow the president to better discipline congress but may also make the president a more direct prey to special interests. Another direction would be to consider alternative rules for government breakup observed in parliamentary regimes around the world and ask how they would alter the trade-offs in public finance (in the model of Sec. V). The results in Baron (1998) suggest that different rules would fundamentally redistribute the bargaining powers among the members of the governing coalition. A third extension, motivated by both presidential regimes in Latin America and parliamentary regimes in Europe, would be to consider electoral regimes

with proportional representation. In the model, proportional representation could be captured by studying one district and three representatives elected in that district. This is likely to introduce competition among voters within districts, along the lines of Ferejohn (1986) and Persson and Tabellini (2000). It would also be desirable (but difficult) to introduce political parties. They could be modeled as long-lasting coalitions of politicians that allocate agenda-setting powers taking electoral outcomes into account. With appropriate individual heterogeneity within each district, these parties could then seek the support of voters across districts. Recent work by Morelli (1998) is an example of how these difficult questions might be tackled in a more abstract framework.

Finally, our analysis suggests difficult—but fascinating—questions regarding the design of political institutions. They include normative questions about the optimal choice of political system and positive questions about how to explain observed political reforms.

### Appendix

#### A. *Definition of Equilibrium in the Presidential-Congressional Regime*

DEFINITION 2. An equilibrium of the presidential-congressional regime is a vector of policies

$$\mathbf{q}_t^C(\mathbf{b}_t) = [\tau_t^C(\mathbf{b}_t), g_t^C(\tau_t^C(\mathbf{b}_t), \mathbf{b}_t), \{s_t^{iC}(\tau_t^C(\mathbf{b}_t), \mathbf{b}_t)\}, \{\tau_t^{iC}(\tau_t^C(\mathbf{b}_t), \mathbf{b}_t)\}]$$

and a vector of reservation utilities  $\mathbf{b}_t^C$  such that, in any period  $t$ , with all players taking as given the expected equilibrium outcomes of periods  $t + k$ ,  $k \geq 1$ :

- I. for any given  $\mathbf{b}_p$  at stage 4, at least one legislator  $i \neq a_t$  weakly prefers accepting rather than rejecting proposal  $\tau_t^C$ , given the expected equilibrium proposals and decisions at stages 5 and 6;
- II. for any given  $\mathbf{b}_p$   $a_t$  prefers proposing  $\tau_t^C$  to any other  $\tau_t$  satisfying condition I, given the expected equilibrium proposals and decisions at stages 5 and 6;
- III. for any given  $\mathbf{b}_t$  and  $\tau_p$  at stage 6, at least one legislator  $i \neq a_g$  weakly prefers accepting rather than rejecting the proposal

$$g_t^C(\tau_t(\mathbf{b}_t), \mathbf{b}_t), \{s_t^{iC}(\tau_t(\mathbf{b}_t), \mathbf{b}_t)\}, \{\tau_t^{iC}(\tau_t(\mathbf{b}_t), \mathbf{b}_t)\};$$

- IV. for any given  $\mathbf{b}_t$  and  $\tau_p$  at stage 5,  $a_g$  prefers the proposal

$$g_t^C(\tau_t(\mathbf{b}_t), \mathbf{b}_t), \{s_t^{iC}(\tau_t(\mathbf{b}_t), \mathbf{b}_t)\}, \{\tau_t^{iC}(\tau_t(\mathbf{b}_t), \mathbf{b}_t)\}$$

- to any other proposal satisfying condition III and the budget constraint;
- V. the reservation utilities  $b_t^{iC}$  are optimal for the voters, in each district  $i$ , when one takes into account that policies in the current period will be set according to  $\mathbf{q}_t^C(\mathbf{b}_t)$  and takes as given the reservation utilities in other regions  $b_t^{i^*C}$  as well as the identity of  $a_t$ ,  $a_g$

*B. Definition of Equilibrium in the Parliamentary Regime*

DEFINITION 3. An equilibrium of the parliamentary regime is defined by

$$\mathbf{q}_i^p(\mathbf{b}_i) = [\tau_i^p(\mathbf{b}_i), \{r_i^{ip}(\mathbf{b}_i)\}, g_i^p(\mathbf{b}_i), \{s_i^{ip}(\mathbf{b}_i)\}]$$

and the reservation utilities  $\mathbf{b}_i^p$  and  $\mathbf{b}_i^{p'}$  such that, in any period  $t$ , given the expected equilibrium outcomes of periods  $t + k$ ,  $k \geq 1$ :

- I. for any given vectors  $\mathbf{b}_i$  and given the proposal made at stage 3, at stage 4, the junior partner of the coalition optimally chooses whether to accept or reject these proposals, given the expected reservation utilities  $b_i^p$  and the expected policy outcome in stages 5'–8';
- II. the reservation utilities  $b_i^{ip'}$  are optimal for the voters in each district  $i$  after a government crisis at stage 4, when one takes into account that policies will be set according to  $\mathbf{q}_i^p(\mathbf{b}_i^{p'})$  as in the simple legislature equilibrium and takes as given the reservation utilities in other regions  $b_i^{-ip'}$ ;
- III. for any given  $\mathbf{b}_i$  and  $\mathbf{b}_i^{p'}$ , the agenda setter in the coalition prefers

$$\mathbf{q}_i^p(\mathbf{b}_i) = [\tau_i^p(\mathbf{b}_i), \{r_i^{ip}(\mathbf{b}_i)\}, g_i^p(\mathbf{b}_i), \{s_i^{ip}(\mathbf{b}_i)\}],$$

given conditions I and II and the government budget constraint;

- IV. the reservation utilities  $b_i^{ip}$  are optimal for the voters, in each district  $i$ , when one takes into account that policies in the current period will be set according to  $\mathbf{q}_i^p(\mathbf{b}_i^p)$ , takes as given expected  $\mathbf{b}_i^{p'}$  and the fact that policies will be set according to  $\mathbf{q}_i^p(\mathbf{b}_i^{p'})$  after a government crisis at stage 4, and also takes as given the reservation utilities in other regions  $b_i^{-ip}$ .

*C. Proof of Proposition 3*

Equilibrium rents are given in the following lemma.

LEMMA 4. In all equilibria of the parliamentary regime,

$$s^p = 3 \frac{1 - \delta}{1 - (\delta/3)} = s^L,$$

distributed as  $s^{ap} = \frac{2}{3}s^p$  and  $s^{mp} = \frac{1}{3}s^p$ .

*Proof.* The equilibrium is solved by backward induction, starting from the last stages of the game and moving forward. Suppose first that a government crisis materializes, so that we reach the subgame consisting of stages 5'–8'. By an argument analogous to that in Section III, it is easily shown that  $g' = \min(\hat{g}, 2\delta W)$ ,  $\tau' = 1$ ,  $r' = 2\delta W - g'$ , and  $s' = 3 - 2\delta W$ . Note, however, that  $W$  is the equilibrium value of holding office in the parliamentary regime, not in the simple legislature. Thus the expected continuation value of reaching this subgame (where all legislators are reelected) for all legislators is

$$E(v') = \frac{1}{3}s' + \delta W, \tag{A1}$$

and the expected (one-period) continuation payoff for voters in each district is

$$E(u') = H(g') + \frac{1}{3}r' = H(g') + \frac{1}{3}(2\delta W - g'). \tag{A2}$$

To construct the equilibrium, note first that at stage 4,  $m$  will veto any proposal that does not give her the same value as after a government breakup. An accepted

proposal, yielding reelection, must thus satisfy  $s^m + \delta W \geq E(v')$ . As  $a$  will not pay more than necessary for support, this means  $s^n = r^n = 0$  and, by (A1),  $s^m = \frac{1}{3}s'$ . Voters will not be able to push the total equilibrium payoff for legislators below what they get after a government crisis, which, in turn, implies the following incentive constraint:

$$\begin{aligned} s &\geq s' = 3 - 2\delta W, \\ s^a &= s - s^m \geq \frac{2}{3}s'. \end{aligned} \tag{A3}$$

Clearly, in equilibrium the voters will not leave excess rents to the legislators, and all the weak inequalities above will hold as equalities.

To conclude the argument, we solve for  $W$  from

$$W(1 - \delta) = \frac{1}{3}s = \frac{1}{3}s' = 1 - \frac{2\delta}{3}W,$$

which yields

$$W = \frac{1}{1 - (\delta/3)}. \tag{A4}$$

Substituting the implied value of  $2\delta W$  into the expressions for  $s$ , one easily derives the equilibrium expressions for  $s'$  in lemma 4 and proposition 3. Q.E.D.

When equilibrium rents are inserted in the government budget constraint, the remaining policy instruments must satisfy

$$g + r = 2\delta W + 3(\tau - 1) \equiv \frac{2\delta}{1 - (\delta/3)} + 3(\tau - 1), \tag{A5}$$

where the identity follows from (A4).

Here there are no other incentive constraints to worry about. The worst threat the coalition partners could impose on voters, even if they were to collude, would be to set  $\tau = 1$  and  $r = g = 0$ . But that threat is already entailed in the value for  $s'$ . Hence,  $a$  will make a proposal consistent with her constituency's achieving the required level of utility. A similar argument applies to the behavior of  $m$  at stage 4, when she decides whether to accept or reject the proposal of  $a$ .

To characterize the equilibrium policy, we must therefore pin down the equilibrium reservation utilities required by the voters in the governing coalition,  $b^a$  and  $b^m$ . Clearly, these two reservation levels must be mutually consistent under the relevant constraints. Specifically, in equilibrium, the reservation utility  $b^a$  must be optimal for voters in district  $i = a$ , given the equilibrium value of  $b^m$ , and vice versa. But this requirement is satisfied by many pairs of  $(b^a, b^m)$ , since the voters' reservation utilities are chosen simultaneously, once a government is formed. Hence, there are multiple equilibria. We can rule out only policies that, from the point of view of the voters in the governing coalition, are dominated by the outcome in the simple legislature. The reason is that a disagreement inside the coalition can bring down the government. Knowing what they can get in expected value in the event of a crisis, voters of each member in the governing coalition must optimally demand at least this amount from their representatives. Hence, the equilibrium reservation utilities and the equilibrium policies must satisfy

$$b^i \equiv 1 - \tau + H(g) + r^i \geq E(u'), \quad i = a, m, \tag{A6}$$

where the right-hand side of (A6) is given by (A2).

The equilibrium policy can therefore be computed as the solution of the following optimization problem for the voters from the region of the agenda-setting minister, given any  $b^m$  such that  $b^a \equiv 1 - \tau + H(g) + r^a \geq E(u')$ :

$$\max_{g^a, r^m, \tau} [1 - \tau + H(g) + r^a] \quad (\text{A7})$$

subject to

$$1 - \tau + H(g) + r^m \geq b^m \geq H(g') + \frac{1}{3}r', \quad (\text{A8})$$

$$\tau \leq 1, \quad (\text{A9})$$

$$r^a \geq 0, \quad (\text{A10})$$

$$r^m \geq 0. \quad (\text{A11})$$

Replacing  $\tau$  by its expression from the budget constraint

$$\tau = \frac{g}{3} + \frac{r^a}{3} + \frac{r^m}{3} + 1 - \frac{2}{3}\delta W$$

and calling, respectively,  $\lambda$ ,  $\mu$ ,  $\nu^a$ , and  $\nu^m$  the multipliers of the constraints (A8)–(A11), one gets the following first-order conditions:

$$H_g(g^P)(1 + \lambda) = \frac{\mu}{3} + \frac{1}{3}(1 + \lambda),$$

$$1 - \frac{1}{3}(1 + \lambda) - \frac{\mu}{3} + \nu^a = 0,$$

and

$$-\frac{1}{3}(1 + \lambda) + \lambda - \frac{\mu}{3} + \nu^m = 0,$$

yielding

$$\lambda = 1 + \nu^a - \nu^m \quad (\text{A12})$$

and

$$H_g(g^P) = \frac{1 + \nu^a}{2 + \nu^a - \nu^m}. \quad (\text{A13})$$

If we had  $\tau < 1$ , then  $\mu = 0$  and

$$H_g(g^P) = \frac{1}{3} = \frac{1 + \nu^a}{2 + \nu^a - \nu^m},$$

from which we deduce that  $1 + 2\nu^a = -\nu^m$ , which is impossible. Therefore,  $\tau = 1$ . If  $\nu^m = \nu^a = 0$ , we get  $\lambda = 1$  and  $2H_g(g^P) = 1$ . If  $\nu^m = 0$ ,  $\frac{1}{2} < (1 + \nu^a)/(2 + \nu^a) < 1$ . If  $\nu^a = 0$ ,  $1/(2 - \nu^m) > \frac{1}{2}$ . In this last case, by (A8), with  $r^f > 0$ , we

must have  $H(g) > H(g')$ , where  $g' = g^c$ . Therefore, we must have  $g^p > g^c$ . With  $r' = 0$ , there is no surplus to be shared by the government coalition with respect to the expected continuation payoff after a crisis  $E(u')$ ; but then  $g^p = g' = 2\delta W = 2\delta/[1 - (\delta/3)]$ , which is then still larger than the relevant  $g^c = 2\delta/[1 + (\delta/3)]$ . Q.E.D.

#### D. Data Sources

SIZE : Total spending by the central government, as a percentage of GDP. Each country observation refers to the average of the period 1988–92. Sources: Government Finance Statistics, International Monetary Fund, and Inter-American Bank.

INCOME: Log of real per capita income in 1990. Source: Summers and Heston, Penn World Tables, Mark 5.6 (available on-line at [www.nber.org](http://www.nber.org)).

OPEN: Log of (exports plus imports over GDP) in 1990. Source: Summers and Heston, Penn World Tables, Mark 5.6 (available on-line at [www.nber.org](http://www.nber.org)).

OLD: Share of population above 65 years of age, in 1985. Sources: Barro and Lee, data set for a panel of 138 countries (available on-line at [www.nber.org](http://www.nber.org)), and United Nations Demographics Yearbook.

ETHNO: Index of ethnolinguistic fractionalization in 1960. Source: Mauro (1995).

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