Legislative Spending Bias, Fragmentation of Fiscal Power and Electoral Accountability*

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Abstract

This paper argues that legislative incentives to overspend are not confined to local public good provision, but also plague non-targetable (global) public good provision, such as public safety and public health. The channel for the second type of spending is different from the common pool logic, however. To identify this channel I model fragmentation of fiscal power in a political agency setup with legislative bargaining. First, legislators lack common pool incentives when benefits cannot be targeted. Second, fragmentation of agenda power in the legislature weakens voters' control over agenda setters by reducing the value of their office – weak *external accountability*. This allows the government to initiate public projects with high unwarranted costs. Third, a check on their behavior is a larger number of ordinary legislators, creating *internal accountability*. I estimate the effects of fragmentation on budget performance by exploiting a state-mandated reorganization of Kentucky county governments at the end of the 1970s that substantially enhanced the power of the office of county executive. I present difference-in-differences estimates using a 1962-1997 panel that contains counties in the neighboring state of West Virginia as the control group. The results indicate that the centralization of executive power has led to significant reductions in several categories of county revenues as well as spending and in improvements in both budget balance and indebtedness position.

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1 Introduction

In recent years economists have begun to recognize political institutions as prime determinants of fiscal policy outcomes. One aspect of the institutional environment that was soon to be accepted as central was the degree of fragmentation of the budget process. Fragmentation can have two meanings: first, it can be said to occur when there are many players involved in budget decisions; second, it can mean that the decisionmaking process in which the budget players interact diffuses political power. Observers of fiscal policymaking now largely agree that the fragmentation of the budgetary process tends to result in poor fiscal performance, for instance by leading to inefficiently large government programs or unsustainable deficits and public debt.

The standard argument advanced by political economists to explain this association is that fragmentation, as opposed to centralization, creates a common pool problem.[1] To the extent that political actors can make independent claims on the common pool of fiscal revenues they take the full credit of additional spending benefiting significant constituencies, but bear only a fraction of its cost since the entire electorate must contribute towards the total cost. In the aggregate then, absent any cooperation among decisionmakers, this type of coordination failure results in large and persistent budget deficits. The outcome is also inefficient in the sense that all players involved would choose to spend less if they internalized the true costs of their actions.

A version of the common pool argument appears in the political and legal debate over the organization of the U.S. federal budget process as regards transfers to designated groups. There are two ways to award benefits to a favored group. The first is to leave the matter to the Appropriations Committee of the House which can decide on a tax break to be recorded in the tax code. The other is to delegate the decision to one of the specialized committees of the U.S. Congress which can draft a spending bill that either taps the general revenue pool or creates a special revenue source. For instance, agricultural subsidies are determined by the Agriculture Committee, a veterans' benefit is established by the Veterans Committee and so on. This latter approach was advocated by Surrey (1970) on the grounds that it gives better incentives to committee members to acquire sector-specific information that can ultimately improve decisionmaking. The tax subsidies camp (Zelinsky 1993) argues that transfers to designated groups should be handled by a single appropriations committee

[1] The first statement of the common pool argument in the context of fiscal policy was in Tullock (1959). It was later formalized by Weingast, Shepsle and Johnsen (1981) who base it on the assumption that legislative decisionmaking operates under a norm of legislative universalism, or mutual support. Recent papers that use a similar common pool argument in specific applications include Chari and Cole (1993a, 1993b), Chari, Jones and Marimon (1997), Hallerberg and von Hagen (1999) and Velasco (1999).

because such a centralized body is less likely to be captured by special interests due to the greater variety and number of its competing constituencies.[2]

The common pool explanation for the effects of fragmentation has several limitations (Alesina and Perotti 1999). Our paper will address two of these. First, formal theories based on the common pool logic do not model how this type of political behavior actually translates into policy outcomes within a legislature, a decisionmaking body that is majoritarian in nature. In these theories legislators' individual spending choices aggregate into an outcome by virtue of an assumed norm of legislative universalism, whereby each legislator supports his colleague's spending bill today in expectation that the colleague would do the same in return next time around. While this assumption has solid empirical grounds in the case of the U.S. Congress it is not clear why it might obtain in other polities. Thus, the lack of an explicit voting game that endogenizes this kind of mutual support makes these theories less appealing. The second limitation is more empirical in nature. Common pool models do not seem able to fully account for the recent developments in the fiscal policies of industrialized countries where we have witnessed a shift away from geographically targetable categories of spending, like pork barrel programs, to broad-based transfer programs, a shift that was accompanied by *declining*, rather than improved, fiscal discipline.

A first contribution of this paper is to propose an alternative way of thinking about the relationship between institutional fragmentation and fiscal performance that deals with these two limitations, and thus complements the common pool approach. We argue that while the previous literature's emphasis on distributive conflict may illuminate certain aspects of fiscal behavior, an equally important consideration is the conflict of interest between voters and their representatives in government. We therefore suggest an electoral accountability theory of legislative spending based on voters' ability to control wasteful spending by means of the democratic electoral mechanism. In our model the extent of voter control is enhanced when fiscal power is concentrated in fewer hands.

In order to isolate the agency problem between voters and representatives we model the provision of a public good by a legislative body whose members are elected from identical electoral districts. The policy outcome is decided through legislative bargaining: an agenda setter makes a proposal which is implemented if it receives the support of a majority of members. Legislators have the technology to divert some of the tax revenue for their own consumption. Voters can control the outcome of the legislative game in two ways: first through influencing the proposals that are

[2] This latter argument was formalized in a common pool model by Dharmapala (1999), where the two institutions are modeled in a legislative bargaining framework.

submitted to the floor (electoral control), and second, through influencing voting on the proposals that make it to the floor (legislative control). Electoral control is tighter the more power is wielded by the agenda setter, because this makes reelection more attractive to the setter compared to pursuing rents single-mindedly. On the other hand, legislative control is enhanced the more power is held by ordinary legislators since the prospect of reelection makes them more willing to oppose wasteful spending proposals. There is then a tradeoff between the degrees of electoral vs. legislative control that voters can exert. We show that electoral control has a first-order effect on legislative outcomes and thus the optimal institution is to concentrate power in the hands of a single legislator.

The second contribution of this paper is to provide new empirical evidence on the effect of government fragmentation on fiscal discipline. The existing empirical literature is mostly based on U.S. data from the federal or state level and uses cross-sectional or panel data structures. The general approach is to construct indices measuring the fragmentation of the budgetary process and then estimate their correlation with observable fiscal outcomes. These studies generally find that institutions that centralize decisionmaking authority are associated with smaller budget deficits and quicker fiscal adjustments to adverse shocks.[3] Although legislature size still plays an important role, as in the common pool literature, its effect is conditioned by the distribution of agenda power in the legislature. I find more nuanced effects of legislature size that may explain some of the conflicting empirical evidence on the Law of 1/n.

There is also a small literature that compares fiscal outcomes across forms of U.S. county government. The point of these papers is to detect whether recent moves to reform these governments have had any impact on policymaking. The traditional form of county government in the U.S. has been the commission form in which all members of the legislative body (the commission) share executive power. The commission form of county government is still dominant today despite the reorganizations that took place in the twentieth century towards relegating power to a single individual who is either appointed by the legislature (this form is known as county administrator) or elected by residents (this form is known as county executive). Interestingly these studies find either that commission governments spend less among all forms of government or that there are no significant differences. Thus this set of results seem to contradict the studies based on data from

[3] Relevant papers in the cross-county literature include Roubini and Sachs (1989a, 1989b), von Hagen and Harden (1994), Alesina, Hausmann, Hommes and Stein (1999), Hallerberg and von Hagen (1999), Kontopoulos and Perotti (1999), and Bradbury and Crain (2001). For state-level studies, see Alt and Lowry (1994), Poterba (1994), Bayoumi and Eichengreen (1995), Gilligan and Matsusaka (1995, 2001), Crain and Muris (1995) and Bohn and Inman (1996), among others. Baqir (2002) studies the effect of districting on government spending using city-level data from the US.

other levels of government.[4]

A well known limitation of the cross-sectional, and to some extent the panel research design as well, is the potential endogeneity of political institutions with respect to fiscal outcomes. It may well be that political entities that experience fiscal weaknesses actually choose to adopt one political structure over another. To avoid this problem we employ a difference-in-differences approach that exploits an exogenous reorganization of Kentucky county governments brought about by several decisions of the Kentucky General Assembly at the end of the 1970s. These measures substantially strengthened the office of the county executive especially in the area of budget drafting and administration. Using five-year data over 1962-1997 on 120 Kentucky counties and a control group of 55 West Virginia counties we find strong evidence that, when other relevant demographic and economic factors are controlled for, concentration of executive power is associated with significant reductions in the aggregate size of the budget per capita, several categories of revenues per capita and well as budget deficits and public debt per capita.[5] The smallest effect is 2.1 percent annual reduction in revenues and expenditures per capita while the largest is 8.3 percent reduction in total debt per capita.

The paper is organized as follows. In the next section we present a model of public good provision by a legislative body whose activity is monitored by a homogenous electorate and derive its testable implications. Section three presents the data, the empirical strategy and the estimation results. Section four concludes. Proofs of the theoretical implications of the model are presented in an appendix.

2 Theoretical Framework

The setup is based on Ferejohn's (1986) model of retrospective electoral control of a single-member government. We adapt it in order to allow for the possibility of policymaking by a multi-member representative body. The idea behind Ferejohn's model is to determine the extent to which voters can restrain incumbent politicians from misrepresenting their interests; voters do that by exploiting the politician's desire to get reelected.

[4] Most studies in this literature are cross-sectional, for instance Schneider and Park (1989), DeSantis and Renner (1994), Park (1996). A few other use a pooled cross-section time series data structure, among them Benton (2002) and Morgan and Kickham (1999).

[5] This analysis can be also viewed as a direct test of the model. Arguably spending at the county level is less targetable than at the federal or state level, and thus the opportunities for distributive politics, and the resulting common pool effects, are more limited. In fact, the most important categories of spending at the county level are global public goods such as education, health and public welfare.

2.1 The policymaking environment

Consider a voting population divided into n electoral districts, where n is odd and $n \geq 3$. In each district there is a measure one of voters each of which is endowed with a unit of income. The government is composed of n legislators, each representing one of the n electoral districts; it makes policy by majority rule. In every period t the government has the technology necessary to produce a public good g_t and has to decide whether to supply it ($g_t = 1$) or not ($g_t = 0$). The cost of provision in period t, denoted θ_t, where $0 < \theta_t < n$, can be financed through uniform taxation. Let τ_t denote the rate at which taxes are levied in period t, $0 \leq \tau_t \leq 1$. Apart from using tax revenue to cover the warranted cost of the public good the government can divert part of the tax receipts for private consumption, or rents. Let x_i denote the rents appropriated by legislator i for his own benefit, where $i = 1, 2, ..., n$. Then, in period t the government's budget constraint is:

$$\theta_t g_t + \sum_{i=1}^{n} x_{it} \leq n\tau_t \tag{1}$$

for $t = 1, 2, ...$

Voters' preferences over policy alternatives can be represented by the utility function:

$$\sum_{t=1}^{\infty} \delta^{t-1} \left[1 - \tau_t + H\left(g_t\right)\right] \tag{2}$$

where δ is a time discount factor, $0 \leq \delta < 1$, and H is the utility derived from consuming the public good. We assume that the public good is valuable to voters in the sense that, absent unwarranted costs, voters would all agree that producing the public good is desirable. Formally the assumption is:

$$H(1) > \frac{\theta_t}{n}, \text{ for } t = 1, 2, ... \tag{3}$$

which says that the benefit from the public good exceeds the individual cost of supplying it. Note that voters are identical in all respects except for their district. We thus abstract from policy effects that arise from voter heterogeneity, such as distributional conflict, in order to explore variation in fiscal outcomes generated exclusively by the conflict of interest between voters and their representatives as it plays out in different institutional environments.[6]

Incumbents' preferences over policy alternatives can be represented by the following utility

[6] Alternatively one can think of voting outcomes as being dictated by the decisive voters of each electoral district.

functions:

$$\sum_{t=s}^{\infty} \delta^{t-1} \left(x_{it} + \rho_{it} R \right), \text{ for } i = 1, 2, ..., n \tag{4}$$

where δ is the time discount factor introduced above, x_{it} is the rent extracted by incumbent i in period t, ρ_{it} is the probability that in period t incumbent i is reelected by his constituents, and R is a positive ego rent from winning reelection to a new term in office; s is the period when the representative was first elected to office.

While legislators share voting power equally, some of them may have exclusive proposal power over certain policy jurisdictions. Formally we assume that among the n members of the legislature m of them, where $1 \leq m \leq n$, hold agenda-setting positions in the sense that they have the exclusive authority to initiate the supply and financing of public projects in their particular policy jurisdictions. These proposals are then submitted to the full legislature for a vote. For instance, in the U.S. federal government every policy issue falls under the jurisdiction of a single, separately organized, congressional committee (agriculture, defense, energy, veterans etc.) whose role is to draft bills that initiate or resolve policy issues in their jurisdiction; this bill is then submitted to the floor of Congress for a vote. Bills that are approved with the required number of votes on the floor become law and are implemented by executive agencies.

We model the political process as a legislative bargaining game in the spirit of Baron and Ferejohn (1989).[7] The model is an infinite repetition of the following stage game. First, a policy issue is randomly assigned to be resolved by one of the m policy jurisdictions of the legislature; in other words, one of the m legislators holding a portfolio is selected at random, with probability $\frac{1}{m}$ to act as the agenda setter. The designated setter makes a policy proposal. A proposal consists of an amount of tax revenue to be raised and a recommendation of whether the public good should be supplied or not; the setter may also use part of the tax revenue for his own benefit or to buy support for his proposed legislation. These amounts are, however, subject to the government budget constraint in equation (1).

Second, ordinary legislators observe the policy proposal and vote on it up or down. If the proposal does not receive a majority of votes in the legislature then there is no revenue raised for

[7] The basic legislative bargaining framework underlies several applications such as pork barrel politics (Baron 1991), legislative seniority (McKelvey and Riezman 1992), split-ticket voting in national elections (Chari, Jones and Marimon 1997), coalitional cohesion (Diermeier and Feddersen 1998), tax expenditures (Dharmapala 1999), collective choice (Banks and Duggan 2000), comparative public finance (Persson, Roland and Tabellini 2000), special interest politics (Helpman and Persson 2001, Bennedsen and Feldman 2002), federalism (Lockwood 1998), and intergovernmental transfers (Knight 2002).

this particular project and no public good production.[8]

Third, voters observe whether the government decided to supply the public good and, if so, its cost θ_t. Voters also observe the roll call and on the basis of their information decide whether to reelect their incumbent representative. If an incumbent is not reelected he is replaced by a challenger with utility function given by (4). Ousted representatives cannot run for office again.

2.2 Equilibrium

A first basic observation is that this game features multiple subgame perfect equilibria.[9] We refine the set of equilibria by restricting attention to stationary strategies, that is strategies that are identical in games that are structurally equivalent. Intuitively, we consider only strategies that do not depend on the history of play beyond the most recent stage game. We also confine analysis to voting strategies that are not weakly dominated, following standard arguments.[10]

The following proposition states the model's prediction for equilibrium behavior.

Proposition 1 *The stationary subgame perfect equilibrium that maximizes voter welfare is given by the following strategy profile. The agenda setter of the period proposes a tax rate equal to:*

$$\tau^* = \frac{1}{n}\left(\theta_t + x_a^*\right),$$

extracts rents for himself in the amount

$$x_a^* = \begin{cases} \frac{(1-\delta)n - \frac{n+1}{2}R}{(1-\delta)+\frac{\delta}{m}} & \text{if } m \leq \frac{n+1}{2} \\ \frac{(1-\delta)n - \frac{n+1}{2}R}{(1-\delta)+\left(m-\frac{n-1}{2}\right)\frac{\delta}{m}} & \text{if } m > \frac{n+1}{2} \end{cases}$$

and recommends the provision of the public good ($g_t = 1$).

Legislator i with proposal powers approves the agenda setter's proposal if and only if:

$$g_t = 1 \text{ and } x_{at} \leq x_a^*$$

[8] The assumption of a zero reversion budget is not necessary but seems appropriate in the context of discretionary spending projects which must be approved anew each fiscal year. By contrast, mandatory spending projects can be inherited from previous legislatures or fiscal years.

[9] A particular folk theorem in this context would state that if players are sufficienty patient (δ sufficiently large) any policy outcome can be supported by an appropriate profile of voter punishments.

[10] These assumptions are commonplace in the literature on bragaining in committees. For a rigorous definition of structurally equivalent subgames see Baron and Ferejohn (1989). On the issue of weakly dominated voting strategies see Austen-Smith and Banks (2005).

or

$$x_{it} \geq \frac{\frac{x_a^*}{m} + R}{1-\delta}.$$

Legislator i without proposal powers approves the agenda setter's proposal if and only if:

$$g_t = 1 \text{ and } x_{at} \leq x_a^*$$

or

$$x_{it} \geq \frac{R}{1-\delta}.$$

Voters in the agenda setter's district reelect the incumbent if and only if:

$$g_t = 1 \text{ and } \sum_{i=1}^{n} x_{it} \leq x_a^*.$$

Legislators without policy jurisdiction in period t are reelected if and only if:

$$g_t = 1 \text{ and } \sum_{i=1}^{n} x_{it} \leq x_a^* \text{ and vote Yes on the agenda setter's bill}$$

or

$$g_t = 0 \text{ or } \sum_{i=1}^{n} x_{it} > x_a^* \text{ and vote No on the agenda setter's bill.}$$

As in Ferejohn (1986) voters' equilibrium strategy is to hold their representative accountable retrospectively: they reelect the incumbent if and only if his behavior in the previous period was deemed sufficiently adequate. The best that voters can do is to raise the bar for their representative up to a point where the representative is indifferent between reelection and "defaulting" on voters, i.e. extracting the maximal revenue possible without providing any public good in return. Formally, if $\hat{x}_a$ denotes the value to the agenda setter of defaulting on voters then equilibrium rent extraction is:

$$x_a^* = \hat{x}_a - [R + \delta W(m,n)] \tag{5}$$

where $W(m,n)$ is the setter's equilibrium value of future terms in office. Note that this is also equal to total rent extraction by the legislature because in equilibrium the setter will provide the public good at a total cost that meets their constituents' threshold for reelection without having to buy support for passing his bill.

The expression for equilibrium extraction in equation (5) reveals that there are two instruments

that can be effective in reducing the rents associated with the provision of public projects. First, the larger the value of defaulting on voters $\hat{x}_a$ - this is the agenda setter's opportunity cost of pursuing reelection - the larger the rents voters have to put up with and still reelect the incumbent. The setter's opportunity cost is smaller the more expensive the support needed to pass a default bill. And second, the larger the value of preserving political office $W(m,n)$ the higher can voters raise the standard to which they can hold their incumbent accountable.

2.2.1 Comparative Statics

The model thus highlights two important mechanisms through which voters can control the outcome of the legislative process. One is direct. By subjecting the agenda setter to reelection voters can directly influence the proposals that are submitted to the floor of the assembly. We will refer to this first control mechanism as *electoral control*. The other is indirect. Since the other members of the legislature also face voters periodically voters can influence how legislators vote on the received proposals, thus inducing *legislative control* over the bills that make it to the floor. The point of the analysis to follow is to argue that the effectiveness of both of these mechanisms of control depends on the degree to which proposal power is diffused within the legislative body. The results are stated in the following proposition.

Proposition 2 *The equilibrium share of income diverted in rents by the legislature is a) minimized when there is a single executive position ($m = 1$), and b) increasing in the size of the legislature.*

The first part of this result implies that a higher degree of diffusion of fiscal power within the legislature should be associated with increasing costs of government programs. The increase in costs is a result of increased rent extraction by legislators endowed with the power to initiate government programs. Below we will see that this interpretation must be somewhat qualified because the relationship between fragmentation and rent extraction is not monotone. The second part of the claim says that more extensive fragmentation of the population into electoral districts has a detrimental effect on electoral accountability as it allows more rent extraction by the government. We explain each statement in turn.

Legislative bargaining under a closed rule makes the agenda setter's position very valuable because he is the residual claimant on the benefits to be distributed. Concentration of proposal power in fewer hands increases the value of the position ($W(m,n)$ in equation (5)) making the setter more likely to want to keep his seat at a lower cost for voters. In the terminology introduced

above we can say that electoral control is strengthened with more concentrated power. On the other hand, concentrating power also has effects on the setter's opportunity cost ($\hat{x}_a$ in equation (5)). In particular it increases this cost since the positions of the other legislators are weakened and this makes their support cheaper to buy for the setter.[11]

The two effects of concentrating power thus pull in opposite directions. As long as the number of executive positions is below a simple majority the first effect dominates; as the number of executive positions exceeds a simple majority the second effect starts to have bite and can actually reduce rents. However, it cannot dominate the first effect. We conclude that electoral control has a first-order effect on the bills that pass and therefore concentrating proposal power is the optimal institution.

The second part of proposition 2 says that accountability for public spending declines with the size of the legislature given a fixed number of executive positions. In light of the above discussion the intuition for this result should be clear. Increasing the size of the legislature without affecting the number of executive positions improves the electoral control on the agenda setter since his continuation value from pursuing reelection goes up. However, it weakens the control working through legislative opposition because it is now easier to find a cheap majority that supports a default bill. For instance, if the size of the legislature increases by two seats there is one more vote required to build a simple majority and a previously expensive member of the coalition can be replaced with one of the two, cheaper, non-executive positions added.[12]

3 Empirical Evidence

3.1 Economic and Political Organization of U.S. County Governments

Counties in the U.S. are established and regulated by state legislation and not by the federal government. They have developed during the twentieth century from mere administrative units of state government to major providers of a wide range of governmental services under a character-

[11] Formally the setter's opportunity cost is given by

$$\hat{x}_a = n - \min_M \sum_{i \in M} \left[R + \delta U_i \left(m, n \right) \right]$$

where M is the majority needed to pass a default bill and $U_i \left(m, n \right)$ is the continuation value of member i of the cheapest majority.

[12] The claim in the second part of proposition 2 is also implied by the literature on pork barrel politics where it is known as the Law of $1/n$. See Crain and Bradbury (2001) and Baqir (2002) for discussions. The intuition there is quite different, however. In a polity divided into n electoral districts each district values spending targeted to itself in full but bears only $1/n$ of the cost. Thus the incentive to demand such programs increases with n.

istic political structure. In 1993, 36 of the 48 states with operational county governments[13] had granted counties some form of home-rule authority to regulate locally issues such as political organization, functional organization and fiscal administration. Despite the trend towards greater autonomy, however, over 90 percent of American counties remain general law organizations subject to considerable dependence on state institutions.

The main economic function of county government is the provision of public goods, the dominant service areas being welfare and social services, health and hospitals and education. In recent years other areas that have been devoted substantial resources are public safety, highways and debt maintenance. For instance, in 1988-1989 the U.S. Bureau of Census reported that on average 15.9 percent of total county expenditures was going to finance health and hospitals, 13.9 percent to education and 13.7 percent to public welfare. We should observe that the services provided by county governments are less targetable when compared to federal or state levels, by virtue of the spatial characteristics of these political units.

Traditionally, the primary sources of revenues for counties have been property taxes and intergovernmental aid (26.9 percent and 34.7 percent, respectively, in 1988-1989). However, partly due to local opposition to burdensome property taxes, counties have been moving away from a reliance on property taxes to other sources of revenue such as sales taxes, local income taxes and user fees. In 1991, 31 states permitted county governments to levy sales taxes; more than one third of U.S. counties employed this source of revenue.

There are three main forms of county government in the U.S.: commission, county executive and county administrator. One way in which they can be distinguished is according to the relationships that exist between legislative and executive power. The commission form has historically been the most common. Voters elect a board of commissioners which exerts both legislative and executive power (and sometimes judicial power as well). The board adopts the county budget, passes laws and ordinances, appoints advisory boards or committees and its members serve as, or appoint, heads of executive departments, such as finance, utilities, police, fire, highways and so on. The commission form is also known as the *plural executive* form because it diffuses executive power to the entire board of individually elected commissioners.

Under a county executive form there is complete separation of executive and legislative power. The executive is elected separately from the legislature, usually at large i.e. by the entire population.

[13] Connecticut and Rhode Island although divided into geographical units called counties lask functioning county-level government according to the definition of this term issued by the US Bureau of Census.

This form is also referred to as the *single executive* form to better capture the distinction from the plural executive commission form. Although there is a lot of variation in the powers exerted by the executive office, elected county executives typically have the power to set the budgetary and legislative agendas for the council, appoint and fire department heads, veto acts of the legislature and oversee the operations of the executive departments. Finally, the county administrator form is characterized by an elected legislative body that appoints an executive official, usually called administrator, who remains responsible to the legislature. The formal duties of the administrator vary considerably across states, however some administrators can be endowed with formal powers comparable to an elected executive in the county executive form.

In the 1988 Form of Government Survey conducted by the International City/County Management Association (response rate 42.5 percent, with slight overrepresentation of the more populous counties) 39.7 percent of counties reported being governed according to the commission form, whereas 22.1 and 38.2 percent had county executive and county administrator forms, respectively. These statistics indicate that a substantial shift has taken place in recent years away from the traditional commission structure. The commission form is currently most likely to be found in small and rural counties, the administrator form in mid-sized suburban counties and the executive form in large counties that usually surround a major city.

Representatives in county government are typically elected in plurality rule, district-based, partisan elections. Under district elections the county is subdivided into smaller geographic units called districts or wards and voters elect one (in single-member districts) or more (in multi-member districts) representatives from each of these smaller subdivisions. Proportional representation systems have been experimented with at the local level but remain infrequently used in county politics. In counties with an elected executive position this seat is filled using at large elections that allow candidates to run county-wide campaigns. A small minority of counties, in particular in the Mid-Atlantic and Mountain states, organize at large elections for every seat in the board of commissioners.

3.2 Data and Empirical Strategy

Under the 1891 Kentucky Costitution county government in he state was organized around a county court presided over by a county judge. The court combined a number of judicial, legislative and administrative duties. During the twentieth century the Kentucky General Assembly assigned the office of the county judge additional duties of an executive and administrative nature. However, it was only in the late 1970s that several state decisions substantially reformed the institution

Table 3.1 - Summary Statistics, Entire Sample

Variable	Unit of measurement	Obs.	Mean	Standard deviation		Minimum	Maximum
				Across cities	Within cities		
County population	thousand residents	1,400	30.654	57.011	4.770	2.162	703.267
General revenues per capita	1982-84 dollars	1,400	692.24	347.72	300.33	218.77	4561.64
Taxes per capita	1982-84 dollars	1,400	162.31	89.55	51.58	19.55	694.89
Property taxes per capita	1982-84 dollars	1,400	127.30	66.76	37.46	17.62	670.77
General expenditures per capita	1982-84 dollars	1,400	678.66	340.80	294.84	218.56	4614.88
Budget deficit, proportion of revenues	percentage points	1,400	-1.3279	14.2131	13.3293	-49.5066	183.9298
Budget deficit, proportion of county income	percentage points	1,400	-0.1381	1.1581	1.0817	-9.4189	11.3421
General debt per capita	1982-84 dollars	1,203	850	2,371.11	1,753.20	0	37,679.88
General debt, proportion of county income	percentage points	1,203	9.5006	23.5001	17.9383	0	425.2887
Percent population younger than 5	percentage points	1,400	7.7147	1.5472	1.3193	3.8300	16.2200
Percent population older than 65	percentage points	1,400	12.6804	2.7873	1.4096	4.1906	21.0441
Percent population black	percentage points	1,400	3.5183	4.2290	0.8867	0	25.0061
Personal income per capita	1982-84 dollars	1,400	8,276.85	2,837.30	2,299.83	1,570.89	18,421.53
Manufacturing establishments	number	1,341	31.11	70.51	9.10	0	955

Notes: The unit of observation is a county-year. The sample is a panel of 175 counties every five years over the period 1962-1997. The number of observations per county varies between 5 and 8, with an average across counties between 6.8742 and 8 depending on variable. Population for 1962 and 1967 linearly interpolated. The three age and race characteristics variables linearly interpolated from the four decenial censuses that span our sample period. Data sources described in section 3.2.

of the county judge. First, in 1975 the Judicial Amendment to the Constitution reorganized the state's judicial system and, in the process, stripped the office of the county judge of its judicial powers and responsibilities according to the principle of separation of powers. Second, during the 1976 Extraordinary Session of the General Assembly legislation was enacted that strengthened the administrative, appointive and executive powers of the county judge and it renamed the office as county judge/executive. Additional measures that increased the county judge/executive's responsibilities for financial administration were passes by the General Assembly in 1978 and 1980. These responsibilities now include preparation of the county budget, oversight of county funds, financial reporting to the fiscal court and fiscal record keeping.

We interpret the reforms in Kentucky county government at the end of the 1970s as an exogenous change in the degree of concentration of fiscal power in the county legislatures. In order to identify the effect of power diffusion on fiscal performance we include in our sample together with the 120 Kentucky counties a control group consisting of the 55 counties of the neighboring state of West Virginia. In West Virginia county government has been organized according to the traditional commission form since their formation. Each West Virginia county fuses executive and legislative power in a board of three commissioners and at the same time diffuses these powers among the three members. The commissioners share executive authority typically being responsible by rotation of different executive departments.

We collected data on the 175 counties in our panel every five years over the period 1962-1997. Summary statistics for all variables included in the empirical analysis are presented in Table 3.1. Half of the observations, four years of data, precede the Kentucky reorganization, and four years come after it. Fiscal data comes from two sources. The first is the City and County Data Book, editions 1962, 1967, 1972, 1977, 1982, 1988, 1994, and 2000; we used both hard copies and the electronic versions made available by the Geostat Center at the University of Virginia. The second is the U.S.A. Counties 1998 CD published by the U.S. Bureau of Census. We measure fiscal variables in 1982-84 dollars using the Consumer Price Index for all urban consumers (CPI-U) issued by the Bureau of Labor Statistics and made available online at their website. The average revenue per capita raised and spent by counties in the two states during this period was around 680 dollars, about 8.2 percent of the average personal income per capita of 8,276.85. Around 23.8 percent of the budget is revenue raises in local taxes most of which take the form of property taxes. The average level of indebtness is approximately 850 dollars per capita or about 9.5 percent of county personal income per capita. Overall during this period counties in the two states have had a slight

surplus in the budget balance.

We employ a number of demographic and economic variables as controls. Data on population numbers and characteristics is collected every ten years by the U.S. Bureau of Census. Population numbers are then estimated for intercensal years using demographic formulas. Our population data comes from the annual series issued by the Bureau of Economic Analysis (BEA) at the U.S. Department of Commerce and are available for the period 1969-2005. To obtain the numbers for 1962 and 1967 we interpolated linearly the data for 1960, from the U.S.A. Counties 1998 CD, and the data from the BEA. We applied the same procedure to obtain the intercensal estimates for the age and race characteristics: proportion of the population below the age of 5, percent of population over 65, and percent population black. The decennial census figures for these variables are taken from the U.S.A. Counties 1998 CD and the City and County Data Books. We expect that this approximations will have a negligible effect on the estimation results since demographic variables even in the U.S. have tended to evolve very slowly.

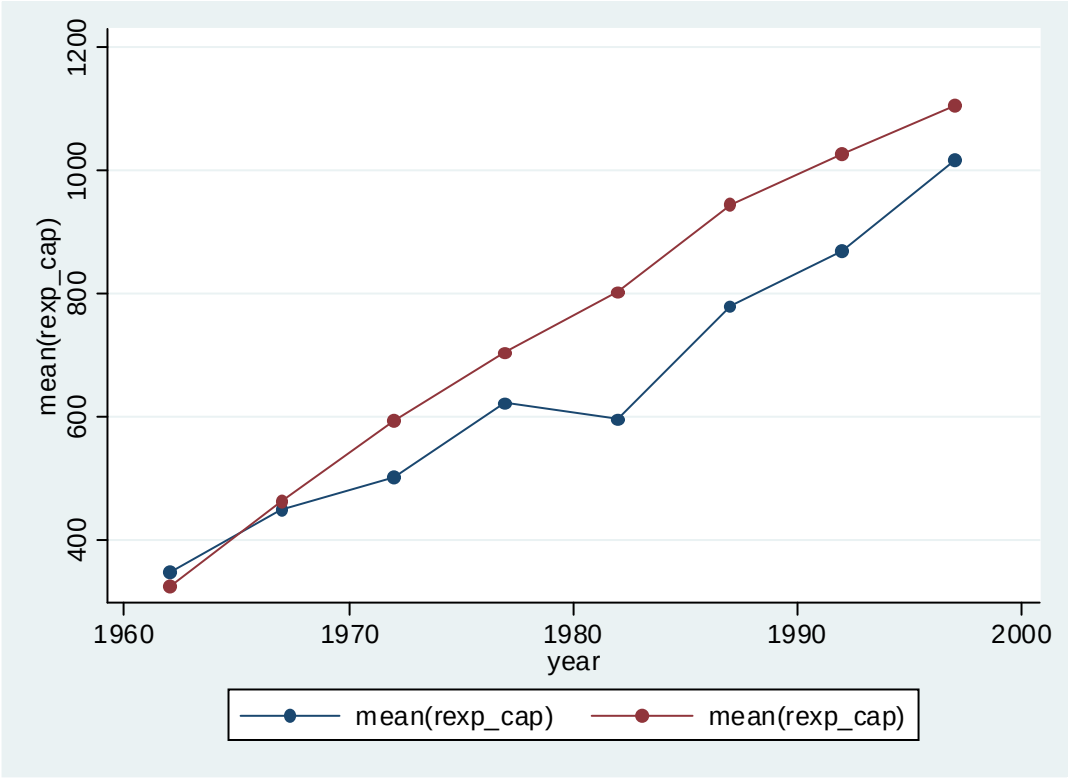
As economic controls we use personal income per capita and the number of manufacturing establishments. Income per capita data is available annually 1969-2005 at the county level from the BEA. The data for 1962 and 1967 was obtained by adjusting the figures for 1960 (from the 1967 City and County Data Book) and 1969 (from BEA) respectively using an implicit annual growth rate of 3 percent. The data on the number of manufacturing establishments is from the U.S.A. Counties 1998 CD (for 1977 to 1992) and from the electronic version of the City and County Data Books for the rest of the period.

Table 3.2 summarizes the data by state. It also presents p-values for t-tests of the equality of variables' means across the two subsamples. In general we observe that counties in Kentucky raise and spend somewhat less per capita despite the statistically insignificant difference in mean incomes per capita. Probably as a result of this weaker fiscal base they are also more likely to run high debts. When we compare the mean values of the budget deficit across the two groups we see a slightly higher surplus in West Virginia counties, but the difference is not statistically significant. Demographically, there do not appear to be statistically significant differences in mean populations although in terms of population characteristics we detect some significant, although perhaps not economically important, differences. Kentucky has younger residents on average and a higher proportion of black population. There are no significant differences in income per capita or number of manufacturing establishments. Overall West Virginia counties appear to be an adequate control group.

Table 3.2 - Means Comparison t-Tests, by State

Variable	Kentucky		West Virginia		p-value
	Obs.	Mean	Obs.	Mean	
County population	960	29.348	440	33.5039	0.1199
		(2.086)		(1.668)	
General revenues per capita	960	661.40	440	759.53	<0.0001
		(10.99)		(16.87)	
Taxes per capita	960	148.25	440	192.99	<0.0001
		(2.75)		(4.33)	
Property taxes per capita	960	107.19	440	171.19	<0.0001
		(1.57)		(3.75)	
General expenditures per capita	960	647.96	440	745.63	<0.0001
		(10.78)		(16.51)	
Budget deficit, proportion of revenues	960	-1.2569	440	-1.4830	0.7262
		(0.5270)		(0.3729)	
Budget deficit, proportion of county income	960	-0.1325	440	-0.1504	0.7462
		(0.0421)		(0.0355)	
General debt per capita	839	936.44	364	652.08	0.0293
		(88.73)		(95.39)	
General debt, proportion of county income	839	10.6617	364	6.8245	0.0025
		(0.8856)		(0.9070)	
Percent population younger than 5	960	7.8393	440	7.4428	<0.0001
		(0.0504)		(0.0706)	
Percent population older than 65	960	12.4967	440	13.0812	0.0002
		(0.0900)		(0.1307)	
Percent population black	960	4.1137	440	2.2194	<0.0001
		(0.1456)		(0.1515)	
Personal income per capita	960	8261.18	440	8311.04	0.7480
		(95.33)		(122.42)	
Manufacturing establishments	922	30.48	419	32.50	0.5127
		(2.72)		(1.46)	

Notes: The table presents mean values and standard errors (in parentheses) of all variables on the left hand side by state. The last column lists p-values corresponding to t-tests with unequal variances of the null hypothesis that the mean values across the two states are equal. Variable definitions are in subsection 3.2. The sample is the same as in Table 3.1 and is described in subsection 3.2.



Mean real expenditures per capita, Kentucky (below) vs. West Virginia (above).

Pre-treatment tests justify the validity of our identification strategy. Before 1980 F-tests cannot reject the null that the mean values of the independent variables are different between Kectucky and West Virginia. See Figure 1 for an illustration of a typical time series pattern.

3.3 Empirical Specifications and Results

To determine how fiscal outcomes in Kentucky changed as a result of the county government reorganization we use a fixed effects difference-in-differences approach with the treatment group made of all 120 counties in the state of Kentucky and the control group made of the 55 counties in West Virginia. We also present OLS difference-in-differences estimates for purposes of comparison. Formally, we estimate variants of the following baseline linear regression model:

$$Y_{it} = \Psi_1 K_{it} R_{it} + \Psi_2 K_{it} + \Psi_3 R_{it} + \boldsymbol{\phi} \mathbf{w}_{it} + \nu_t + \lambda_i + \varepsilon_{it} \tag{6}$$

Table 3.3 - Effect of Centralization on County Revenues and Expenditures

Dependent variable	ln(Revenues per capita)		ln(Expenditures per capita)	
Estimation method	OLS DD	FE DD	OLS DD	FE DD
	(1)	(2)	(3)	(4)
Kentucky×Reorganization	-0.1236***	-0.1126***	-0.1416***	-0.1282***
	(0.0295)	(0.0321)	(0.0311)	(0.0341)
Kentucky	-0.0392**	—	-0.0376*	—
	(0.0189)		(0.0205)	
Reorganization	0.3147***	—	0.3165***	—
	(0.0257)		(0.0274)	
County population	-0.0013***	0.0010	-0.0011**	-0.0015
	(0.0005)	(0.0025)	(0.0005)	(0.0025)
County population squared	0.0000	-0.0000	-0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Percent population younger than 5	-0.0425***	-0.0039	-0.0318***	-0.0003
	(0.0096)	(0.0174)	(0.0104)	(0.0171)
Percent population older than 65	0.0001	-0.0047	0.0034	-0.0078
	(0.0041)	(0.0094)	(0.0043)	(0.0104)
Percent population black	-0.0104***	0.0093	-0.0097***	0.0109
	(0.0016)	(0.0090)	(0.0019)	(0.0091)
Personal income per capita	0.0001***	-0.0001	0.0001***	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Manufacturing establishments	0.0013***	0.0010	0.0014***	0.0003
	(0.0004)	(0.0012)	(0.0005)	(0.0010)
Year fixed effects	Yes	Yes	Yes	Yes
County fixed effects	No	Yes	No	Yes
R^2	0.6720	0.8235	0.6274	0.7716
Observations	1,341	1,341	1,341	1,341

Notes: Robust standard errors reported in parantheses for OLS difference-in-differences (OLS DD) estimates. Standard errors clustered by counties reported in parantheses for fixed effects difference-in-differences (FE DD) estimates. The dependent variables listed at the top of the table. The independent variables are listed in the leftmost column. The sample is a panel of 175 US counties, 1962-1997. Year indicators included in the fixed effects regressions. Every specification includes a constant, not reported. *** significant at 1%, ** significant at 5%, * significant at 10%.

Table 3.4 - Effect of Centralization on Categories of Revenues

Dependent variable	ln(Taxes per capita)		ln(Property taxes per capita)	
Estimation method	OLS DD	FE DD	OLS DD	FE DD
	(5)	(6)	(7)	(8)
Kentucky×Reorganization	-0.2424***	-0.2399***	-0.5095***	-0.4896***
	(0.0395)	(0.0358)	(0.0398)	(0.0376)
Kentucky	-0.1921***	—	-0.2421***	—
	(0.0267)		(0.0272)	
Reorganization	-0.0865**	—	-0.0713*	—
	(0.0356)		(0.0365)	
County population	-0.0013	0.0035	-0.0018**	-0.0009
	(0.0008)	(0.0030)	(0.0007)	(0.0027)
County population squared	-0.0001***	-0.0001**	-0.0001***	0.0001
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Percent population younger than 5	0.0262**	-0.0251	0.0322***	-0.0212*
	(0.0123)	(0.0225)	(0.0120)	(0.0124)
Percent population older than 65	0.0132***	-0.0267**	0.0111**	0.0000
	(0.0052)	(0.0133)	(0.0049)	(0.0000)
Percent population black	0.0109***	0.0056	0.0056**	0.0148
	(0.0025)	(0.0104)	(0.0026)	(0.0125)
Personal income per capita	0.0001***	0.0001	0.0001***	0.0001
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Manufacturing establishments	0.0052***	0.0023*	0.0034***	0.0021*
	(0.0008)	(0.0012)	(0.0007)	(0.0010)
Year fixed effects	Yes	Yes	Yes	Yes
County fixed effects	No	Yes	No	Yes
R^2	0.6137	0.5572	0.5928	0.5065
Observations	1,341	1,341	1,341	1,341

Notes: Robust standard errors reported in parantheses for OLS difference-in-differences (OLS DD) estimates. Standard errors clustered by counties reported in parantheses for fixed effects difference-in-differences (FE DD) estimates. The dependent variables listed at the top of the table. The independent variables are listed in the leftmost column. The sample is a panel of 175 US counties, 1962-1997. Year indicators included in the fixed effects regressions. Every specification includes a constant, not reported. *** significant at 1%, ** significant at 5%, * significant at 10%.

where i indexes the counties in the sample, t is a time index, Y_{it} is a measure of fiscal performance (for instance, log revenues per capita, deficit as a proportion of income etc.), K_{it} is an indicator variable equal to one if county i is in the state of Kentucky and zero otherwise, R_{it} is an indicator equal to one if the government of county i was reorganized as an elected county executive type structure and zero otherwise, $\mathbf{w}_{it}$ is a vector of demographic, economic and fiscal controls, ν_t is a year indicator, λ_i is a county fixed effect and ε_{it} is an error term. We assume that the error terms are independent across counties but not necessarily within counties.

Note that Ψ_1 measures the difference between the change occurring in fiscal outcomes after the reorganization in the treatment group (Kentucky counties) and the corresponding change in the control group (West Virginia counties). Thus the testable hypothesis is that Ψ_1 is negative. For instance, if the dependent variable is log of revenues per capita, Ψ_1 is the effect of political reorganization on county revenues: the average difference between the growth rate in revenues in Kentucky and the growth rate in revenues in West Virginia.

Tables 3.3 to 3.5 present regression estimates of two different specifications of equation (6) for each dependent variable. The first is a classical OLS difference-in-differences estimator with robust standard errors. The second is a fixed effects differences-in-differences estimator with standard errors clustered by counties that are robust to heteroskedaticity and autocorrelation within counties. All fixed effects specification include year indicators as covariates. In both the OLS and FE regressions we include the same set of demographic and economic controls; these are also maintained across models to facilitate comparison. The exception is the model for the size of the budget deficit where we add an extra control for the level of county revenues per capita.

The estimates for Ψ_1 in equation (6) are negative and highly significant lending strong support to our hypothesis. Moreover, the effects are also economically important. The effect on the revenue outcomes ranges from around negative 11 percent for general revenues to around negative 39 percent for property taxes per capita. These numbers imply an annual effect on revenues which ranges, depending on revenue type, between 2.1 percent and 6.8 percent. For the regressions on deficit magnitudes we use two measures of the budget deficit: as a fraction of total revenues and as a fraction of total personal income. The results are stronger for the second measure but more substantial for the first measure. The model for debt per capita yields the largest value for the estimated effect of concentration of power, namely negative 49 percent $\left(e^{-0.68}-1\right)$, equivalent to a yearly decline in general debt per capita as a result of the reorganization of about 8.3 percent.

Table 3.5 - Effect of Centralization on Fiscal Discipline

Dependent variable	Deficit, percent of revenues		Deficit, percent of income		ln(General debt per capita)	
Estimation method	OLS DD	FE DD	OLS DD	FE DD	OLS DD	FE DD
	(9)	(10)	(11)	(12)	(13)	(14)
Kentucky×Reorganization	-2.9018**	-2.8155*	-0.2585**	-0.2908**	-0.6861***	-0.6871***
	(1.3794)	(1.5450)	(0.1188)	(0.1386)	(0.1611)	(0.2168)
Kentucky	1.1317	—	0.0675	—	1.2403***	—
	(1.1619)		(0.0932)		(0.0829)	
Reorganization	0.6701	—	0.1608	—	0.5251***	—
	(1.2640)		(0.1450)		(0.1549)	
County population	0.0084	-0.0988	0.0009	-0.0051	0.0020	0.0190
	(0.0243)	(0.1361)	(0.0019)	(0.0105)	(0.0021)	(0.0118)
County population squared	-0.0001	0.0002	-0.0001**	0.0001	-0.0001***	-0.0001**
	(0.0000)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Percent population younger than 5	1.1537**	0.3021	0.0787*	0.0442	0.1013***	-0.0365
	(0.5466)	(0.8150)	(0.0407)	(0.0715)	(0.0353)	(0.0767)
Percent population older than 65	0.3902*	-0.4705	0.0379**	0.0442	0.0254	-0.0082
	(0.2259)	(0.5086)	(0.0155)	(0.0715)	(0.0165)	(0.0467)
Percent population black	0.0691	0.3083	0.0085	0.0493	-0.0075	0.0970*
	(0.1146)	(0.5143)	(0.0103)	(0.0424)	(0.0061)	(0.0519)
Personal income per capita	0.0003	-0.0006	0.0001	-0.0001	0.0002***	0.0001*
	(0.0002)	(0.0007)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Manufacturing establishments	0.0163	-0.0775	0.0022	-0.0045	0.0087***	-0.0023
	(0.0237)	(0.0622)	(0.0022)	(0.0037)	(0.0023)	(0.0032)
Revenues per capita	-0.0030*	-0.0047**	-0.0007**	-0.0010**	—	—
	(0.0015)	(0.0023)	(0.0003)	(0.0005)		
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
County fixed effects	No	Yes	No	Yes	No	Yes
R^2	0.0216	0.0441	0.0463	0.0711	0.3460	0.2071
Observations	1,341	1,341	1,341	1,341	1,185	1,185

Notes: Robust standard errors reported in parantheses for OLS difference-in-differences (OLS DD) estimates. Standard errors clustered by counties reported in parantheses for fixed effects difference-in-differences (FE DD) estimates. The dependent variables listed at the top of the table. The independent variables are listed in the leftmost column. The sample is a panel of 175 US counties, 1962-1997. Year indicators included in the fixed effects regressions. Every specification includes a constant, not reported. Number of observations smaller for models (13) and (14) due to missing data on general debt in 1997. *** significant at 1%, ** significant at 5%, * significant at 10%.

4 Conclusion

The purpose of this paper was to argue that there is an electoral accountability channel for the effect of political fragmentation on government spending. Our analysis is free from distributional issues and thus complements standard models based on a common pool logic. We formalized our argument by analyzing a moral hazard model of public good provision by a multi-member legislative body. In the model voters use the electoral mechanism in order to limit the unwarranted costs of public projects. In this setting we identified two types of control that voters can exercise on public spending, one direct, by influencing the spending proposals that are sent for a vote in the legislature, and one indirect, by influencing how legislators vote on the spending bills that are drafted by the agenda setter. We found that the direct control over proposals has a first-order effect on reducing wasteful spending and it can be strengthened by concentrating proposal power in the hands of a single member of the legislature.

To test our predictions we present evidence from an exogenous shift in county government organization towards more centralized authority. We observe that spending at the county level is less targetable than at the federal or state level, and thus the opportunities for distributive politics, and the potential common pool effects, are more limited. The empirical results show that the size of government does indeed go down and fiscal discipline improves after this type of institutional change. This finding is robust to the estimation procedure and to alternative measures of fiscal outcomes. The estimates suggest economically important effects ranging from 2.1 percent to 8.3 percent annually.

Given the relatively good fit between theory and the data at hand these findings may prove important in drawing implications for policy. First, they suggest that the spending bias inherent in collective decisionmaking bodies is not limited to situations of distributive politics but may also affect spending on public projects with uniform benefits. Thus, the need for institutional reform may be greater than previously recognized. Second, the results provide some guidance on the direction of these reforms. For instance, the model suggests that complete centralization and complete diffusion both dominate intermediate degrees of concentration/diffusion. Third, given that other levels of government share many features with U.S. county governments, the model's implications might prove relevant for voters in countries and cities considering changes in the political process to mitigate chronic fiscal problems.

Appendix

Proof of Proposition 1

Let $W(m,n)$ denote the equilibrium continuation value of the period's agenda setter and $V(m,n)$ the equilibrium continuation value for an ordinary legislator. In equilibrium the best voters in the setter's district can do is to keep him accountable up to a level where he becomes indifferent between gaining reelection and defaulting on voters i.e. pursuing only rents and being ousted. Let $\hat{x}_a$ denote the setter's opportunity cost of reelection. Then in equilibrium the condition for the setter's reelection:

$$\hat{x}_a \leq x_a^* + R + \delta W(m,n) \tag{7}$$

must bite, where the right side is the setter's payoff from winning reelection.

The setter can also explore the opportunity to impose the maximal tax rate and take as much out of it as possible. The value of this option depends on the number of executive positions m. Let us conjecture that the continuation value is higher for a legislator with a policy portfolio: $W(m,n) \geq V(m,n)$. Then, if $m \leq \frac{n+1}{2}$ the setter needs to buy off $\frac{n-1}{2}$ of the cheapest legislators' votes. Then the opportunity cost is:

$$\hat{x}_a = n - \frac{n-1}{2}\left[R + \delta V(m,n)\right].$$

If $m > \frac{n+1}{2}$ then the setter must include in the majority at least one of the more expensive legislators:

$$\hat{x}_a = n - (n-m)\left[R + \delta V(m,n)\right] - \left(m - \frac{n+1}{2}\right)\left[R + \delta W(m,n)\right].$$

In equilibrium the agenda setter abstains from defaulting and is reelected. The same is true of the other members of the legislature. Therefore $W(m,n)$ and $V(m,n)$ solve:

$$W(m,n) = \frac{1}{m}x_a + R + \delta W(m,n) \tag{8}$$

and

$$V(m,n) = R + \delta V(m,n) \tag{9}$$

since in equilibrium the setter's bill is approved by the legislature without the need to buy votes. This is possible because the voting strategies of non-setter districts require so.

Using equations (7), (8) and (9) we can solve for equilibrium rent extraction. For the case $m \leq \frac{n+1}{2}$ we have:

$$x_a^* = \frac{(1-\delta)\, n - \frac{n+1}{2} R}{(1-\delta) + \frac{\delta}{m}}$$

and for the case $m > \frac{n+1}{2}$ we have:

$$x_a^* = \frac{(1-\delta)\, n - \frac{n+1}{2} R}{(1-\delta) + \left(m - \frac{n-1}{2}\right) \frac{\delta}{m}}.$$

In order for rents to be positive we have to assume that ego rents from winning reelection are sufficiently small. The precise condition needed is $R \leq 2\,(1-\delta)$. The implied reelection strategies stated in proposition 1 now follow directly from the above discussion.

Proof of Proposition 2

Using proposition 1 the share of taxable income diverted in rents is:

$$\frac{x_a^*}{n} = \begin{cases} \frac{(1-\delta) - \frac{n+1}{2n} R}{(1-\delta) + \frac{\delta}{m}} & \text{if } m \leq \frac{n+1}{2} \\ \frac{(1-\delta) - \frac{n+1}{2n} R}{(1-\delta) + \left(m - \frac{n-1}{2}\right) \frac{\delta}{m}} & \text{if } m > \frac{n+1}{2} \end{cases}$$

It is now clear that $\frac{x_a^*}{n}$ is a continuous function of m. It increases in m up to the point where $m = \frac{n+1}{2}$ and decreases for larger values of m. Moreover it is increasing in n for every m.

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