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1 Decentralization in the Public Sector: An Empirical Study of State and Local Government

John Joseph Wallis and Wallace E. Oates

1.1 Introduction

Decentralized choice in the public sector (as in the private sector) provides an opportunity to increase economic welfare by tailoring levels of consumption to the preferences of smaller, more homogeneous groups. More centralized decisions typically involve relatively uniform levels of consumption that circumscribe the diversity of outputs needed to accommodate differences in tastes. The existing literature in local public finance has explored the normative theory of decentralization in substantial depth. The important Tiebout model, for example, describes the way in which mobile consumers through their location decisions can make use of decentralized choice in the public sector to enhance the efficiency of resource allocation.

The purpose of this paper is to explore empirically the extent and variation in fiscal decentralization in the state and local sector in the United States. The state-local sector exhibits wide variation in the relative roles of state and local government both over time and across states. In 1902, local governments accounted for 82 percent of the tax revenues in the state-local sector; by 1982, this had fallen to 43 percent.

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Likewise, wide variations in the extent of fiscal decentralization are evident among states. In 1981, for example, state government spending in New York accounted for only 28 percent of total state-local expenditures in contrast to Vermont, where the state government share of spending was 60 percent.

In this paper, we shall investigate the extent to which the existing theory of decentralized fiscal choice can explain the observed patterns in the structure of the state-local sector both over time and across states. Our approach is to set forth the conditions that would enhance the potential welfare gains from a more decentralized public sector and then to see if the presence of these conditions is, in fact, associated with greater fiscal decentralization. Using a large panel data set of the U.S. state-local sector reaching back to 1902, we explore econometrically the variation both over time and across states in various measures of fiscal centralization.

In the first part of the paper we provide a historical overview of the trends in fiscal centralization during the twentieth century. A pervasive tendency toward centralization in the state-local "fisc" is evident; there are also some interesting regional differences with historical roots. In the second section, we discuss the circumstances that enhance the potential welfare gains from fiscal decentralization and formulate some specific testable hypotheses concerning the determinants of the optimal degree of decentralization. The third section then presents the findings from our econometric analysis, where we make use of the error-components approach to our panel data set to test the hypotheses. The final section of the paper offers some reflections on likely future tendencies in the centralization of the state-local sector. In addition, we include an appendix that describes our data base.

1.2 Trends in Fiscal Centralization in the State and Local Sector during the Twentieth Century

We begin our investigation of fiscal centralization with an overview of the trends in the vertical structure of the state and local sector during the present century. At the outset, we acknowledge the difficulty of developing a fully satisfactory measure of the extent of decentralization (see Oates 1972, 196–98). Available data essentially limit us to fiscal measures, and, following earlier work, we will use the fiscal share of the state government in the state-local sector as our measure of fiscal centralization.

Even this does not resolve all the ambiguities, since we can construct fiscal "centralization ratios" (i.e., the state share in the state-local fisc) on either an expenditure or revenue basis. Should we measure the relative importance of a level of government by the share of public revenues that it raises or by its share of public expenditures? The basic

issue here is how to treat intergovernmental transfers of revenues. If we use a revenue measure, we attribute such funds to the grantor. This seems sensible if the grantor prescribes to a significant extent the use of the funds. However, where such funds are transferred unconditionally (say, under a revenue-sharing program) so that the grantor is simply a revenue-collection agent for the recipient, it may make more sense to attribute the funds to the transfer recipient. Since grants of both kinds are widely used in the public sector, we shall not opt for one measure over the other; instead we shall present fiscal centralization ratios in both revenue and expenditure terms and note where the two measures generate divergent results.

Table 1.1 presents the state and local government shares in public expenditure for selected years.[1] These are the respective shares in "direct expenditure" (that is, in disbursements to final recipients of government payments) so that intergovernmental transfers of funds are attributed to the recipient level of government. The most striking feature of table 1.1 is the dramatic increase in fiscal centralization that it reveals over the current century. The state share of state and local spending was only 12.4 percent in 1902; by 1982, this figure had risen to 40.5 percent. On closer inspection, however, the table reveals an interesting feature of the process of centralization: nearly all of this process seems to have taken place in the first half of the century. By 1952, the state share had risen to 35 percent (in fact, in 1950 this share was 39 percent). Since 1950 the state share in state and local sector expenditure has grown only very slightly.

What accounts for this trend toward centralization? There are logically three ways in which changes in these shares can occur: the services that states perform may have grown in fiscal terms relative to

Table 1.1 **State and Local Government Shares in State-Local Expenditures for Selected Years (in percentages)**

Year	State Share	Local Share
1902	12.4	87.6
1913	13.2	86.8
1922	19.2	80.8
1932	24.1	75.9
1942	32.6	67.4
1952	35.0	65.0
1962	36.1	63.9
1972	38.1	61.9
1982	40.5	59.5

Source: The figures from which these percentages were computed come from Tax Foundation, Inc., *Facts and Figures on Government Finance*, 23d biennial ed., (New York: Tax Foundation, Inc., 1986), Table D1, p. d3.

those of local governments; there may have been a shifting of services from local to state governments; or certain new services may have been introduced with a disproportionate assignment of these new services to the state government level. A closer investigation indicates that the explanation is largely a matter of the last of these alternatives: the state-local sector was called upon to provide a number of new services in the first half of the century with state governments playing the more important role. In particular, state governments over this period entered into the provision of highways, higher education, public welfare, and various retirement and unemployment compensation programs that account for the bulk of the expansion in the state share. For highways, for example, state governments in the aggregate spent only $4 million in 1902; with the advent of the automobile, state level expenditures rose to $2.56 billion by 1952. This represents an increase in the state share of total state and local spending on highways from 2.0 percent in 1902 to 55 percent in 1952. The relative role of state government in education likewise exhibits a striking expansion. In 1902 we find state governments in the aggregate spending only $17 million on education; by 1952 this figure has become $1.49 billion. This represents an increase in the state share of educational spending from 7 percent in 1902 to 18 percent in 1952. The major portion of this spending is for public higher education in which state governments have taken the lead.

Similarly, state governments in the first half of the century greatly expanded their efforts in the provision of public welfare support. Aggregate spending by state governments on public welfare grew from $10 million in 1902 to $1.4 billion by 1952, representing an increase in the state share of public welfare expenditures from 27 percent in 1902 to 51 percent in 1952. Much of this growth, incidentally, took place during the New Deal years when the federal government relied heavily on state governments for the operation of relief programs (see Wallis 1984, 1987). Finally, there was a rapid expansion of state insurance trust fund expenditures, including unemployment compensation and retirement benefits (again associated with the New Deal), from virtually zero in 1902 to $1.4 billion in 1952.

We thus find that the centralizing trend in state and local expenditures is largely a phenomenon of the first half of the century and represents an expansion of state governments into the provision of several major new public services. State governments, in fact, played a very minor fiscal role at the turn of the century, but in the ensuing 50 years they became an equal fiscal partner in the state and local sector. This expansion of the relative role of the states would seem not to be purely politically motivated; there is a sound economic case for state provision of the services that expanded so rapidly in this period. The need for a highway system to link localities within a state clearly calls for a level

of government transcending that with a purely local orientation. Likewise, the development of a viable system of higher education reaching out beyond major urban centers requires a supra-local presence. And, finally, as has been argued in the pubic finance literature (e.g., Oates 1972), there are serious constraints on the ability of local governments to provide assistance to the poor; the need for programs at higher levels of government for poor relief is widely recognized.

If we examine the trends in fiscal centralization from the perspective of revenues rather than expenditures, we find roughly the same picture except that levels of centralization are generally a bit higher for revenues than for expenditures. Table 1.2 reports state and local shares in revenues from own sources. The major difference between tables 1.1 and 1.2 is that the latter attributes intergovernmental revenues to the level of government that is the source (not the recipient) of the funds. Using a revenue measure of fiscal centralization, we find again a quite dramatic trend toward fiscal centralization. The state share of state-local revenues from own sources was only 17.6 percent in 1902; by 1982 this had risen to 56.8 percent. Thus, state governments shifted from being a relatively minor partner in the fund-raising function of the state and local sector at the beginning of the century to becoming the major partner by 1982. Once again, we find that the bulk of this centralizing process took place in the first half of the century; by 1952, the state's share in state and local revenues was already over 50 percent. Since midcentury, there has been some further centralization of revenues, but the trend has slowed significantly. This has been accompanied by a continuing increase in the reliance on state intergovernmental grants to local governments. Table 1.3 documents this trend with figures indicating the fraction of local revenues coming from intergovernmental transfers; the rise in this figure over the first half of the century has continued since 1950.

Table 1.2 **State and Local Government Shares in State-Local Revenues from Own Sources for Selected Years (in percentages)**

Year	State Share	Local Share
1902	17.6	82.4
1913	17.8	82.2
1922	24.4	75.6
1932	29.7	70.3
1942	48.9	51.1
1952	50.4	49.6
1962	48.9	51.1
1972	52.9	47.1
1982	56.8	43.2

Source: Same as Table 1.1.

Table 1.3 **Intergovernmental Transfers as a Percentage of Local Government Revenues for Selected Years**

1902	6.6
1913	6.0
1922	8.3
1932	14.3
1942	27.8
1952	31.6
1962	30.6
1972	37.7
1982	41.5

Source: Tax Foundation, *Facts and Figures*, Table F14, p. f19.

The fiscal evolution of the state and local sector thus reveals a very striking tendency toward centralization in both spending and revenues over the first half of the century. This trend has moderated since 1950, however, with only a very slight increase in the state share of fiscal activity since then.

In addition to a strong secular trend toward a more centralized state and local sector, there is also a persistent and interesting historical pattern of centralization across regions. The southern regions of the country in 1902 had much more concentrated public sectors than did the other regions of the nation. Table 1.4 presents our fiscal centrali-

Table 1.4 **Fiscal Concentration Measures by Region, by Year — 1902 to 1982**

	Revenues/Expenditures				
Region	1902	1922	1942	1962	1982
New England	0.195	0.259	0.494	0.468	0.591
	0.191	0.237	0.450	0.454	0.523
Mid-Atlantic	0.159	0.194	0.455	0.405	0.526
	0.131	0.198	0.338	0.282	0.358
East North Central	0.155	0.187	0.517	0.441	0.539
	0.139	0.194	0.333	0.298	0.384
West North Central	0.172	0.209	0.448	0.432	0.546
	0.165	0.221	0.357	0.386	0.425
South Atlantic	0.284	0.311	0.620	0.604	0.612
	0.268	0.305	0.487	0.421	0.452
East South Central	0.281	0.284	0.597	0.584	0.619
	0.273	0.281	0.429	0.473	0.481
West South Central	0.248	0.272	0.629	0.612	0.605
	0.241	0.255	0.466	0.472	0.446
Mountain	0.246	0.335	0.529	0.534	0.583
	0.238	0.307	0.441	0.430	0.411
Pacific	0.179	0.241	0.571	0.515	0.570
	0.186	0.260	0.430	0.379	0.396

Note: First row for each region is revenue measure; second row for each region is expenditure measure.

zation measures for both expenditures and revenues for twenty year intervals from 1902 to 1982. In 1902 state governments in the South Atlantic and East South Central regions accounted for roughly twice as much of the state-local fisc as did state governments in the Mid-Atlantic or East North Central regions; other regions fell between these two extremes. While regional differences have narrowed with time, the southern regions still remained slightly more centralized in 1982.

These regional differences may reflect to some extent the variation in the underlying economic, social, and demographic factors that we discuss in the next section. There are, however, strong historical differences in the structure of the state-local sector that must be kept in mind. Colonial land laws were particularly important. Although both the southern and northern colonies began under the same Virginia Company charter, the two regions developed distinctly different ways of establishing private property rights in land. In Virginia and surrounding colonies, an individual was allowed to decide which specific parcel of land he would take title to. People took their 50-acre head rights, for example, in the best bottomland available, leaving hilltops and scrub land to the colonial government.

In the New England colonies, under the joint influence of the Virginia Company charter and the Massachusetts Bay Colony charter, the colonial government generally made large grants of land to towns. These grants were typically ten miles square and were made to an already existing group of prospective townsmen. The colonial land grant was to the town, not to individuals, and the town council then distributed lands to the members of the community (occasionally selling land directly). This method of land distribution accounts for (perhaps it would be better to say "was endogenous with") the importance of community leaders and institutions like the local minister and the church, as well as for the vigor of the typical New England town meeting.

The New England method of distributing land led naturally to a very active local political life, and it created local governments which had, from the very beginning, considerable real assets at their disposal. In contrast, the process of distributing land in the South did very little to encourage local governments. In many areas large land owners were the effective government, and local agreement to levy taxes on themselves would only occur on issues on which there was considerable agreement. Indeed, the effects of land policy are still visible on the maps of southern states today. The numerous small counties and tortured boundary lines follow the borders of the existing private property distribution at the time the counties were formed. This contrasts sharply with the geometric precision of New England townships.

The compromise between northern, southern, and other interests that led to the Northwest Ordinances of 1785 and 1789 created a method for establishing private property rights over federal lands in the Old

Northwest and eventually the trans-Mississippi West that followed the New England model in geometry and the southern model in individuality: land was sold in rectangular plots, but sold directly to individuals. And, importantly, the ordinances retained the New England principle of providing for the support of local government by allotting fixed amounts of land for the support of schools and other public functions.

The result of this historical development was relatively strong local governments in the northern and western regions of the country and relatively weak local governments in the southern regions. These regional differences persisted well into the twentieth century. Unlike the trend toward centralization (most of which had taken place by mid-century), the near equalization of fiscal centralization ratios across regions appears to be a phenomenon of the latter half of the century. Centralization ratios take a sharp jump upwards between 1922 and 1942, but they retain their pattern of regional differences into the 1960s.

1.3 The Economics of Decentralization in the Public Sector: Toward Some Testable Hypotheses

The decentralized provision of public services provides a means to increase the level of economic welfare by differentiating levels of public outputs according to the demands of local constituencies. The magnitude of the potential gains from such decentralization depends upon the variation in the optimal levels of public outputs across jurisdictions. If the optimal level of output varies little from one jurisdiction to another, then the welfare losses from providing a uniform level of output of public services across all jurisdictions will tend to be relatively small. The case for decentralized provision will, in such instances, be less compelling than where desired outputs vary widely from one area to another.[2]

The general approach in this study will be to identify the conditions that enhance the welfare gains from decentralization and then to see (in the next section) if these conditions can "explain" in econometric terms the observed variation in fiscal decentralization in the state and local sector both over time and across states. The primary determinants of the optimal degree of fiscal decentralization encompass three classes of variables:

1. Conditions relating to the land area of the state, the size of its population, and the geographical distribution of the population
2. The level of income and wealth in the state
3. The extent of diversity of tastes for public outputs and their geographical distribution among the population

We shall consider each of these classes of determinants in turn and see what they imply in terms of testable hypotheses.

The size of the state both in terms of population and land area has potentially important implications for the optimal degree of decentralization. That is, in certain ways, a fairly obvious point. A large jurisdiction with a sizeable population offers more opportunities for welfare-enhancing decentralization. As John Stuart Mill observed over a century ago in his tract on *Representative Government,* "There is a limit to the extent of country which can advantageously be governed, or even whose government can be conveniently superintended, from a single centre." This immediately suggests

Hypothesis 1: The larger the size of a state in terms of land area, the less centralized, other things equal, should be its public sector.

However, there is a bit more to the economics of size and geography. Many public services have important economies of scale with respect to population size. For services with important dimensions of "publicness" (i.e., where units of output can be consumed by additional persons without reducing the level of consumption of anyone else), cost per unit of services *per person* varies inversely with the size of the population. In relatively small states, population size at decentralized levels may simply be insufficiently large to exhaust the available economies of scale. In such instances, it may be more economical to provide these services at the state rather than the local level. This suggests

Hypothesis 2: The larger the population of the state, other things equal, the less centralized should be its public sector.

More than simply aggregate population size is at issue here. The way the population of a state is distributed among its local jurisdictions is of central importance for the optimal degree of decentralization. The point is that to take advantage of existing economies of scale with respect to population at the local level requires a certain concentration of economic units. Certain public outputs (including things like zoos, museums, and various specialized services) involve significant indivisibilities; the first "unit" of output of such goods may require a substantial expenditure. Even if all persons have similar demand functions for such a good, it does not become efficient for a locality to provide the good until the sum of the individual demands exceeds its cost. In short, the range of services provided at the local level will depend on the extent of the concentration of the population in urban areas.

In an intriguing study of one metropolitan area, Schmandt and Stephens (1960) found that the number of distinct "subfunctions" (or particular services) that were provided in a municipality was strongly and positively associated with population size. The larger a local jurisdiction, the greater the range of services it provides. This suggests

that if the population of a state is thinly spread throughout its land area, there will be a relatively small role for local government. In contrast, the concentration of population in urban areas will make it economically desirable for the local sector to provide a wider range of services.

Hypothesis 3: The larger the fraction of a state's population residing in urban areas, the less centralized, other things equal, should be the state and local sector.

The second set of considerations influencing fiscal decentralization involves the level of income and wealth in the state. Higher levels of income seem to have two effects on the extent of decentralization—effects that work in opposite directions. First, it has been observed in a number of empirical studies (Martin and Lewis 1956; Oates 1972; Kee 1977; Oates 1985; Bahl and Nath 1986) that the higher-income, developed countries have much more decentralized public sectors than do the poorer, developing countries. In one of these studies using data for the mid-1970s, Oates (1985) finds that for a sample of 18 industrialized nations, the mean central government share of total public expenditure is .65; for the corresponding sample of 25 developing countries, the central share is .89. Higher-income countries seem to have a much stronger tendency toward (or history of) decentralization in the public sector. Several explanations have been suggested for this pervasive finding. Wheare (1964), for example, contends that decentralization is expensive and that a country must be relatively affluent to adopt a relatively decentralized form of government. Alternatively, Martin and Lewis (1956) suggest that centralization is necessary in the early stages of development to economize on scarce administrative talent.

This particular line of argument, however, does not seem relevant to a study of the state and local sector in the United States, for the finding of a significant negative relationship between per capita income and fiscal decentralization is limited to comparisons of developed and developing countries. Where the sample is limited to higher-income, developed countries, the relationship between income and decentralization disappears (see Kee 1977; Oates 1985). This suggests that among the states within the U.S., which all fall within the "developed" classification on a world scale, this "income effect" on decentralization is unlikely to be of importance.

There is, however, a second way in which the level of income can influence the extent of fiscal decentralization. It has been observed that the propensity to engage in income redistribution has a relatively high income elasticity. Wealthier polities tend to provide much more in the way of transfers (as a fraction of total income) to lower-income (and other) groups. Local governments tend to be notably circumscribed in their capacity to redistribute income to poor economic units because

of the mobility of potential recipients (and sources) across local jurisdictions (see, e.g., Brown and Oates, 1987). For this and other reasons, programs aimed at assisting the poor tend to be more centralized than those involving direct services. On these grounds we might expect higher-income states, other things equal, to have more centralized state and local sectors.

Hypothesis 4: The higher the level of per capita income in a state, the more centralized, other things equal, should be its public sector, as a result of a higher level of involvement in redistributive programs.

The third set of considerations relating to fiscal decentralization encompasses the effects of variations in tastes and demands for public services. The general idea here is a straightforward and seemingly unambiguous one: the greater the diversity of tastes and demands among economic units, the more likely, other things being equal, will be significant differences in the optimal levels of outputs across local jurisdictions. This suggests that we seek some proxy variables for taste and demand differences for public services.

We expect the demand for public (like private) goods typically to vary positively with income; thus, one determinant of the variation in demand should be the degree of inequality in the distribution of income. This suggests that the value of the Gini coefficient will be positively associated with the variation in the demand for public services.

Hypothesis 5: The more unequal the distribution of income. the less centralized, other things equal, should be the state and local sector.

Other proxy measures for the variation in demand for public services are less clear. We expect various socioeconomic differences in the population to manifest themselves in varying demands for public services. Variation in such things as the age distribution of the population, racial composition, and religious affiliations may well contribute to an increased diversity in demands for publically provided services. There may exist, for example, a certain life-cycle pattern to demand for public services with younger households with children present exhibiting a higher demand for things like public education than older households. Or, to take another possible case, states with a substantial mixture of religious groups, some of which provide their own schools, may tend to have widely varying demands for public education. While all this admittedly requires closer examination, we take as a "working hypothesis"

Hypothesis 6: States exhibiting more in the way of diversity as indicated by socioeconomic indicators should tend to have, other things equal, more decentralized public sectors.

This last set of considerations relating to the extent of differences in demands for public services is subject to one important qualification. In order for the variation in demand for local services among the pop-

ulation of a state to manifest itself in the form of welfare gains from increased decentralization, there must be some tendency for people with similar demands to be grouped together in local jurisdictions. If the intrastate diversity in individual demands is mirrored in each local jurisdiction, then there will be little in the way of differences in demands aggregated at the local level. It is where individuals separate themselves into groups with relatively homogeneous demands for public services (as in the Tiebout model) that the welfare gains from fiscal decentralization reflect the diversity of household demands. This suggests a further reason for expecting the optimal degree of decentralization to vary directly with the extent of urbanization within a state. It is within metropolitan areas where individuals can conveniently work in one jurisdiction (the central city) and live in another (a suburban community) that the opportunity for sorting of households in residential communities according to demands for local services has its greatest potential.

As will be discussed in the following section, our measures of socioeconomic diversity are rather naive. The two measures available over the entire sample period are the population living on farms and the ethnic composition of the population.[3] Our "homogeneity" measure is simply $(PC - .5)^2$, where PC is the percentage of the population that is white or (under the alternative definition) living on farms. This variable takes on its maximum possible value of ¼ for a completely homogenous population and declines to a minimum possible value of zero for a population that is evenly divided between the two groups. This measure is admittedly crude, but we hope that it captures the essential point of the hypothesis.

Historically, however, simply the proportion of farmers and that of whites in the population have also been important determinants of public policy. Farmers are a diverse lot, but their late nineteenth-and early twentieth-century political goals can be subsumed under the common label of "populism." While supporting a fairly wide range of social and economic reforms, the populists stood firmly behind the notions that a small government was better than a large one and that local governments were better than more centralized governments. Agrarian elements, reformer or otherwise, were also leery of the "city," and states with farm majorities often apportioned state legislative districts to give rural areas disproportionate representation. The net effect of having a large share of the population living on farms is not altogether clear: farmers were against large cities which would tend to promote a more centralized state-local fisc, but they also supported smaller and more decentralized governments as a general principle. As the following section will show, accounting for the share of farmers in the population is important econometrically, even if we do not have a clear-cut theoretical prior on the sign of the variable.

The percentage white variable is unavoidably connected with historically centralized southern governments and with a difficulty in interpreting how race relations would affect the structure of government in the South. Since Southern states have historically been more centralized, we expect that

Hypothesis 7: States in the southern region of the country will, other things equal, have more centralized public sectors.

Since the percentage white is considerably lower in most southern states than elsewhere, simply including the percentage white will pick up a "southern" effect. We try to control for this with a dummy variable, but a more complicated problem remains. In many states, especially in the South, a large part of the black population was denied the right to vote until the 1960s. We do not know whether the enforcement of laws (or more informal measures) designed to control and coerce a substantial part of the community requires a more or less centralized government. We also do not know whether the granting of black suffrage would have led to a movement for more or less centralized government; it might have encouraged decentralization as black majorities in local government attempted to use their newly obtained political power in those governments over which they had the most control. As we shall see, it appears as though the level of the black population, as well as our diversity measures, may be an important determinant of the degree of centralization.[4]

1.4 An Econometric Study of Fiscal Decentralization

To test our set of hypotheses on fiscal decentralization, we shall make use of a large panel data set on the state and local sector that we have assembled in the course of a broader historical study of U.S. government finance. Drawing on the U.S. *Census of Governments* and various other sources, we have collected data on state and local governments and on other relevant socioeconomic variables at roughly decade intervals beginning in 1902. We thus have nine sets of cross-sectional observations on the 48 contiguous states that include data on expenditures, revenues, and tax receipts for state government and for local governments in each state. For a description of our data base, we refer the reader to the appendix at the end of this paper.

With this panel data set, we can explore both changes over time and differences among states in the extent of fiscal decentralization. For this purpose, we have adopted the error-components technique for the estimation of our regression equations. Using the error-components estimator, our general approach to the testing of our various hypotheses takes the form:

$$C_{it} = a + bX_{it} + cZ_{it} + s_i + t_t + e_{it}, \tag{1}$$

where C_{it} is our measure of fiscal centralization (i.e., the state share of state-local spending or revenues), X_{it} is a vector of control variables, Z_{it} is the vector of variables representing our hypotheses, s_i is a state-specific disturbance term, t_t is a time-specific disturbance term, and e_{it} is the normal disturbance term with zero expected mean. Part of the appeal of the error-components approach is that it allows us to separate out an effect that is specific to each state in our sample and also to each time period. The remaining component of the disturbance term is the usual random error term with zero mean.

We begin the econometric analysis by presenting the simple regression equations involving our measures of fiscal centralization and each of the variables chosen to test one of our hypotheses. We are unable unfortunately to test all the hypotheses we set out in the preceding section because of limitations on our data. We have measures for each state and time period on land area, population size, urbanized population, and per capita income. This allows us to test hypotheses one through four. We do not, however, have data on the distribution of income so that we are unable to test hypothesis five.[5] Next, we have a set of socioeconomic variables from which we will create proxies for variations in tastes for public services so that we can explore hypothesis six. And, finally, the use of a dummy variable for southern states will provide a test of hypothesis seven.

The results of the simple regressions appear in table 1.5. Each row of the table reports the results of the univariate error-components regressions for one of our proposed explanatory variables; the first two columns indicate the results using the state share of total state-local expenditures as the dependent variable, and the second two columns report the estimated equation with the state share of total state and local revenues as the dependent variable. The first set of hypotheses, numbers one through three, relate to the size and urbanization of the state. Here we find that the simple regressions provide support for two of the three hypotheses. The size of the state (measured in terms of population) and the extent of urbanization both have the hypothesized negative coefficients, and these coefficients are statistically significant at the .01 level regardless of whether the expenditure or revenue variable is employed to measure fiscal centralization. Size as measured by land area, although it has the hypothesized sign, is not statistically significant.[6]

Hypothesis four proposes a positive relationship between fiscal centralization and the level of per capita income. In the univariate regression, however, we find an inverse association. [More on this shortly.] To explore hypothesis six concerning variation in tastes, we have used two proxies for the homogeneity of the state's population. As noted earlier, the measures are the squares of the difference between .5 and

Table 1.5 **Simple Univariate Error-Components Regressions, Fiscal Concentration Measure on Selection of Independent Variables (Absolute t-Statistics)**

	Expenditures		Revenues	
	Constant (1)	Coefficient (2)	Constant (3)	Coefficient (4)
LAND AREA	0.3622	−1.94E−07	0.4309	−7.38E−08
	(10.3)***	(.90)	(7.7)***	(.34)
POPULATION	0.3802	−1.01E−05	0.4392	−4.3E−06
	(12.4)***	(5.9)***	(9.0)***	(2.5)***
PERCENTAGE URBAN	0.4587	−0.2147	0.4956	−0.1371
	(15.2)***	(6.7)***	(11.7)***	(4.3)***
PER CAPITA INCOME	0.3853	−1.9E−05	0.476	−2.71E−05
	(11.7)***	(1.54)	(10.5)***	(2.06)**
HOMOGENEITY FARM	0.3816	−0.3009	0.4517	−0.2428
	(13.6)***	(3.3)***	(10.5)***	(2.8)***
HOMOGENEITY WHITE	0.3849	−0.2075	0.4865	−0.3602
	(10.6)***	(2.13)**	(8.6)***	(4.0)***
PERCENTAGE FARM	0.3396	0.0442	0.4265	−0.0008
	(13.8)***	(1.21)	(11.3)***	(.02)
PERCENTAGE WHITE	0.4962	−0.1642	0.6003	−0.1958
	(8.5)***	(2.9)***	(8.5)***	(3.8)***

Notes: Every row represents two univariate regressions. In columns (1) and (2) the constant and coefficent are from a regression of the percentage of total state and local expenditures undertaken at the state level, regressed on the individual independent variables. In columns (3) and (4) the constant and coefficent are from a regression of the percentage of total state and local revenues undertaken at the state level, regressed on the individual independent variables.

N = 432 for all regressions

*** = 1% significance level

** = 5% significance level

* = 10% significance level

the percentage white or the percentage residing on farms. A state with 50 percent of its population living on farms, for example, would be as diverse as possible, and the farm homogeneity variable would, in this instance, equal zero. We find in table 1.5 that the univariate results support neither version of hypothesis six: the estimated coefficient on both the farm and white homogeneity variables is negative and statistically significant in both equations, indicating that more homogeneous populations are associated with more decentralized governments.

The percentage white variable has a significantly negative association with fiscal centralization, which probably reflects the southern effect. The percentage of the population living on farms does not exhibit a significant association with centralization (with opposite signs for the revenue and expenditure equations).

While the univariate equations are of some interest, a multiple-regression model containing a set of control variables is obviously needed to provide a more reliable test of the various hypotheses. We present in table 1.6 the results of our error-components multiple-regression analysis. The first two columns indicate the estimated coefficients for the equation using the expenditure measure of fiscal centralization, while the second two columns report the results using the revenue definition for the fiscal centralization variable. The multivariate tests for the first three hypotheses confirm the univariate findings: the extent of fiscal centralization is significantly and negatively related to the size of the population and the percentage urban, but is not significantly associated with land area. Larger states in terms of population and states whose population is more highly urbanized tend to have more decentralized fiscal systems.

Table 1.6 **Error-Components Regressions, Fiscal Concentration Measure on Selection of Independent Variables (absolute t-statistics)**

	Expenditures		Revenues	
	(1)	(2)	(3)	(4)
LAND AREA	−2.05E−07	−1.37E−07	−6.13E−08	−1.21E−08
	(1.3)	(.87)	(.37)	(.07)
POPULATION	−9.30E−06	−7.02E−06	−5.48E−06	−3.37E−06
	(5.2)***	(3.9)***	(3.1)***	(1.87)*
PERCENTAGE URBAN	−0.1966	−0.2917	−0.0783	−0.1933
	(4.7)***	(6.2)***	(1.9)*	(4.15)***
PER CAPITA INCOME	2.39E−05	3.58E−05	3.01E−06	1.62E−05
	(1.76)*	(2.5)***	(.20)	(1.09)
HOMOGENEITY FARM	−0.045	−0.1707	−0.0092	−0.2134
	(.41)	(1.48)	(.08)	(1.89)*
HOMOGENEITY WHITE	−0.1628	0.5812	−0.3573	−0.0331
	(1.81)*	(2.11)**	(3.8)***	(.12)
PERCENTAGE FARM	—	−0.2284	—	−0.2477
		(4.3)***		(4.7)***
PERCENTAGE WHITE	—	−0.4305	—	−0.1748
		(2.9)***		(1.19)
SOUTHERN DUMMY	—	0.0377	—	0.0416
		(1.67)*		(1.84)*
Constant	0.4686	0.8073	0.5411	0.7343
	(13.3)***	(7.5)***	(11.8)***	(6.7)***

Notes: The dependent variable in columns (1) and (2) is the concentration measure for expenditures and in columns (3) and (4) is the concentration measure for revenues.

N = 432 for all regressions.

*** = 1% significance level.

** = 5% significance level.

* = 10% significance level.

When we come to the income variable, however, the results differ from the univariate cases: for the multivariate equations, the estimated coefficient on per capita income possesses the hypothesized positive sign and is statistically significant in the expenditure equation. Higher income states thus exhibit a tendency toward more centralized state and local sectors (at least in terms of the expenditure measure of centralization).[7]

The estimated coefficients for the southern dummy variable are positive (as hypothesized) and statistically significant. Simply being a southern state seems to explain roughly a third of the difference in fiscal centralization between southern and northeastern states. However, the results for the socioeconomic variables are more difficult to interpret. The estimated coefficients on our homogeneity variables, both percentage white and farm, are extremely sensitive to the specification of the equation, and we hesitate to place much confidence in these estimates. The coefficient on the farm homogeneity variable is negative in all four equations, which runs counter to hypothesis six. There is another intrepretation of this variable in conjunction with the percentage farm variable in equations (2) and (4) in table 1.6. Having more farmers appears to produce a more decentralized government, but at a decreasing rate. Or, what may be the more appropriate way to phrase that statement in the American historical context: having fewer farmers (as has happened over time) leads to a more centralized government, and does so at an increasing rate. This effect is quite interesting in light of the strong negative effect that urbanization exerts on centralization, as it indicates that we cannot simply think of percentage farm and percentage urban as proxies for one another.

The racial homogeneity variable has the predicted positive sign in equation (2) and is statistically significant. But it is negative in the other three equations in Table 1.6. The estimated coefficient for percentage white is negative in both instances, but statistically significant only in equation (2). We find these results difficult to interpret. Taken at face value, the results in equation (2) indicate that a larger white population results in greater decentralization but at a diminishing rate. The white "decentralization effect" is increasingly offset by the "diversity effect" as percentage white rises toward 100 percent.

Finally, we thought it would be of interest to compare our results for the error-components analysis covering the entire period of eighty years with the set of cross-sectional multiple-regression equations for each decade. We present in table 1.7 the estimated cross-sectional equations for each of our observed years (using ordinary least squares). The estimated equations use the expenditure definition of the dependent variable.[8] While the overall results correspond roughly to our earlier

Table 1.7 **OLS Regressions. Fiscal Concentration Measure on Selection of Independent Variables by Year, 1902 to 1982 (absolute t-statistic)**

	1902	1913	1922	1932	1942
LAND AREA	4.09E−08	−1.14E−07	−2.06E−08	−2.10E−07	−3.84E−07
	(1.99)*	(.37)	(.07)	(.79)	(1.36)
POPULATION	−1.08E−05	−8.38E−06	−1.27E−04	−9.96E−06	−3.66E−06
	(1.93)*	(1.29)	(2.22)**	(1.85)*	(.65)
PERCENTAGE URBAN	−0.2139	−0.3637	−0.0922	−0.3881	−0.6506
	(2.03)**	(2.64)**	(.66)	(2.47)**	(3.55)***
PER CAPITA INCOME	−5.27E−05	−1.10E−04	7.04E−05	6.98E−05	−2.41E−05
	(1.05)	(1.41)	(.84)	(1.28)	(.44)
HOMOGENEITY FARM	0.2753	0.5569	−0.2164	−0.1137	0.7401
	(1.15)	(1.61)	(.56)	(.24)	(1.22)
HOMOGENEITY WHITE	0.8875	−0.154	−1.404	−0.3403	−0.8996
	(2.01)*	(.23)	(1.83)*	(.38)	(.89)
PERCENTAGE FARM	0.2356	−0.2117	−0.0988	−0.1183	−0.3778
	(2.31)**	(1.15)	(.51)	(.57)	(1.30)
PERCENTAGE WHITE	−0.6444	0.147	0.5052	0.0436	0.5309
	(3.61)***	(.49)	(1.31)	(.09)	(.92)
SOUTHERN DUMMY	0.0261	−0.043	−0.025	0.0371	0.0359
	(.64)	(.79)	(.52)	(.75)	(.70)
Constant	0.8056	0.4787	0.1031	0.5157	0.5139
	(6.5)***	(2.12)**	(.35)	(1.49)	(1.18)
R_2	0.67	0.35	0.37	0.60	0.46

findings, a cursory examination of the table indicates that the results vary considerably from one period to the next; the estimated coefficients on many of the variables exhibit substantial changes in their magnitude and the values of their *t*-statistics from one period to the next. The population and percentage urban variables, however, are consistently negative (with only one exception) and often statistically significant.

In summary, our econometric results, while admittedly somewhat mixed, do provide support for several of the hypotheses. We find that the extent of fiscal centralization varies inversely and significantly with both population size and urbanization (although not significantly with land area). In addition, we have found a positive relationship (at least in the multivariate error-components analysis) between fiscal centralization and the level of per capita income. This is consistent with the view that higher-income states will have a more pronounced inclination to engage in redistributive activities which tend to have a disproportionately large role for the state government. As suggested by the historical discussion, we have found that southern states (at least until quite recently) have relatively centralized state and local fiscs. Finally, we obtained quite mixed (and often puzzling) results with our racial

Table 1.7 (continued)

	1952	1962	1972	1982
LAND	−3.01E−07	2.25E−07	−9.90E−08	−2.70E−07
	(1.07)	(1.04)	(.44)	(1.33)
POPULATION	−5.97E−06	−9.55E−06	−5.77E−06	−4.80E−06
	(1.15)	(3.19)***	(2.18)**	(2.15)**
PERCENTAGE	−0.8729	−0.4959	−0.1905	−0.1493
URBAN	(3.8)***	(3.42)***	(1.56)	(1.29)
PER CAPITA	1.62E−05	−3.68E−05	−8.45E−05	−2.65E−05
INCOME	(.35)	(.94)	(2.39)**	(.97)
HOMOGENEITY	1.467	1.396	3.297	11.201
FARM	(1.61)	(1.24)	(1.81)*	(2.37)**
HOMOGENEITY	−0.9271	0.0621	0.4963	−0.2163
WHITE	(.74)	(.05)	(.39)	(.16)
PERCENTAGE	−0.1491	0.33	2.037	9.262
FARM	(.29)	(.45)	(1.48)	(2.32)**
PERCENTAGE	0.7064	0.0631	0.0424	0.2931
WHITE	(.93)	(.09)	(.05)	(.33)
SOUTHERN	0.0697	0.0291	0.0493	0.0276
DUMMY	(1.35)	(.78)	(1.49)	(1.00)
Constant	0.277	0.4959	−0.0389	−2.3211
	(.48)	(.98)	(.06)	(1.74)*
R^2	0.53	0.66	0.66	0.54

Notes: The dependent variable in all regressions is the state share of combined state and local expenditures.

N = 48 for all regressions.

*** = 1% significance.

** = 5% significance.

* = 10% significance.

and farm variables. Although they often have significant explanatory power in the regression equations, they do not provide clear support for hypothesis six and present formidable problems of interpretation.

1.5 Some Reflections on Future Trends in Fiscal Centralization

As we have seen, the twentieth century has been a period over which the state and local sector has exhibited a strong tendency toward increased fiscal centralization. Is this a trend that is likely to continue? This is not an easy question to answer, but we would like to offer some thoughts. At the turn of the present century, the fiscal role of state governments was a very modest one. However, various developments brought an increased demand for important new public services, notably highways, higher education, and public assistance programs, that were appropriately placed in the domain of state government. As a

result, the fiscal share of state government in the state and local sector rose dramatically. But, as we saw, this rise in the extent of fiscal centralization was primarily a phenomenon of the first half of the century. The trend toward further fiscal centralization has slowed dramatically (if not ceased altogether). From this perspective, it would appear that the forces behind the trend toward centralization are largely history now; without some new thrust for state-level intervention, there would seem to be little reason to expect further centralization of the state and local sector.

On closer examination, there appear to be some such centralizing forces still at work—at least to a modest degree. The primary force is a continuing concern with so-called fiscal equalization: the more equal access of all socioeconomic groups to "satisfactory" levels of public services. This concern (although by no means new) has been reinforced by court decisions on public education and various restrictions on local finances, and is no doubt partly responsible for the continuing tendency toward heavier reliance on intergovernmental aid to local governments. Equalizing grants from the states have provided a means for reducing the fiscal disparities between wealthier and poorer localities.

At the same time, there are some reasons to expect the potential welfare gains from decentralized finance to remain substantial and perhaps to grow over time. A basic mechanism for the realization of these gains is the mobility of individuals, permitting the formation of communities that are relatively homogeneous in their demands for local services. The development of metropolitan areas in which individuals work in one locality (perhaps the central city) but reside in a nearby residential community provides a setting well suited to the realization of the gains from local finance. Rising incomes, improved transportation, and the increasing mobility of individuals would suggest that the potential gains from decentralization should remain substantial.

Our overall econometric results point to these divergent forces. If population and urbanization continue to grow, this will create pressures for more decentralized government. However, the positive effect of income growth on fiscal centralization should continue; indeed the concern with equalization may be the manifestation of a kind of income effect. But the other major source of centralization, the declining number of farmers, cannot be expected to contribute much to centralization in the future.

There are thus forces at work, some of which favor increased centralization, but others of which increase the relative gains from decentralized finance. Any prediction of outcomes is thus extremely precarious. However, we would venture the conjecture that the local sector is unlikely, at least in terms of expenditure responsibilities, to experience much further diminution in its relative fiscal role over the

next few decades. The local provision of services promises important welfare gains that will not go unnoticed.

Appendix

The variables used in this paper are taken from a variety of Commerce Department sources and are, for the most part, exactly what they seem. Problems arose occasionally from gaps in the available series. This appendix describes how the gaps where bridged.

The fiscal variables, revenues and expenditures by state for state and local governments, were taken from the decennial Census of Governments. This census was taken in 1902, 1913, 1922, 1932, 1942, 1962, 1972, and 1982 (with additional censuses taken in 1927, 1957, 1967, and 1977). A census was contemplated, but not taken, in 1952. Coverage of local governments in the 1902, 1913, and 1922 censuses varied slightly. And the 1922 census did not include a complete enumeration of local government expenditures. These gaps were filled by several interpolation techniques.

The 1902 census of governments recorded complete information on public revenues and expenditures for all levels of government.[9] The 1913 Census of Governments included all governments except for places with population less than 2,500.[10] The 1922 Census of Governments included information on receipts for all levels of government, and expenditures for state governments only.[11]

To account for the exclusion of governments in places with less than 2,500 population, we utilized the breakdown of government expenditures by population size in the 1902 census. The 1902 returns reported fiscal totals for cities with population of 8,000 to 25,000 and all minor subdivisions. The 1913 Census reported fiscal totals for all cities with population of 2,500 to 8,000 but for no smaller units. Both censuses reported totals for larger cities and counties. We calculated revenues and expenditures of minor subdivisions (cities with under 8,000 population) as a percentage of revenues and expenditures for cities with over 8,000 population and counties in 1902. Then revenues and expenditures for cities with over 8,000 population and counties in 1913 were multiplied by the 1902 shares to generate an estimate of "all minor subdivision" revenues and expenditures for 1913.

The revenue data for 1922 were fairly complete. We were able to collect total revenue and expenditure data for state governments, as well as local tax revenues and local revenue from state grants. The census department estimated a nationwide total for local revenues in 1922 at $4,148 million.[12] We assumed that the ratio of local nongrant

total revenues to tax revenues was the same in each state as it had been in 1913, and calculated an estimated nongrant total revenue figure for 1922. The estimated nationwide total was slightly higher than the census estimate, and therefore every state was adjusted by a common factor (.927469) to bring our total revenues in line with the census total. Finally, we estimated local expenditure by assuming that the ratio of expenditures to revenues in each state was the same as the nationwide estimates made by the census.[13]

Complete state level data were available for 1953, but no local data were collected. Information on local revenues was collected in 1953 and that information was used to construct estimates of local revenues and expenditures for 1952. Specifically, the census department estimated that nationwide local revenues in 1952 were .91 of the total local revenue in 1953. We simply adjusted the 1953 revenue figures by .91 to obtain our 1952 estimates. The census also estimated that local expenditures in 1952 were 1.2 times greater than revenues, and we calculated local expenditures by multiplying our revenue estimate by 1.2.

The control variables where comparatively easy to assemble. From *Historical Statistics* it was possible to collect population, land size, racial composition, and urban population for each decade. Note that the census data refer to census years (years ending in 0), while the financial variables refer to the relevant Census of Government years. The one variable that caused a problem was per capita income.

Per capita income is available in *Historical Statistics* from 1929 on. Before 1929 the state level income estimates of Richard Easterlin (1957) are available for the years 1900 and 1920. Nationwide GNP per capita was $246 in 1900, $382 in 1910, and $860 in 1920. Of the total growth in income between 1900 and 1920, therefore, .2215 occurred between 1900 and 1910. We took 22.15 percent of the income growth in each state between 1900 and 1920, and added it to the 1900 income figure from Easterlin to estimate per-capita income in each state for 1910.

Notes

1. The years are mainly those during which there was a Census of Governments in the United States (see the appendix).

2. For a more rigorous treatment of the determinants of the optimal degree of decentralization, see Oates (1972, appendix to chapter 2).

3. We also have information on the age structure of the population, but including variables on age structure had no measurable effects on the results; these variables were not statistically significant in the regression analysis.

4. Including a measure of the share of whites in the population along with our racial homogeneity variable in the same equation raises some tricky issues

of interpretation. There is the question of whether this specification is any different than one which enters the white share variable in a nonlinear form with both linear and square terms. If one believes that the homogeneity of the population (as measured by the squared deviation from one-half of the fraction of the population that is white) influences fiscal centralization, then the specification including both PC and $(PC - .5)^2$ is appropriate. However, this is admittedly a restrictive specification; in particular, it imposes a symmetry condition on the effects of homogeneity (i.e., 55 percent white has the same effect as 45 percent white). If our specification is not the correct one, then of course there may well be some confounding of measured effects between the share and homogeneity variables. We have examined some other (and more complicated) specifications, but they have not altered the main empirical findings in the paper (these results are available from the authors). The interpretation of the homogeneity measure depends upon the particular specification, but not always in a way that is easily characterized. Since the results for these variables are quite sensitive to specification, we are reluctant to place much weight on them in this paper. But as the results in the next section indicate, there does seem to be something here that merits further investigation. This discussion applies as well to our treatment of the farm variables, where we include in the regression equations measures of both the share of the farm population and a farm homogeneity variable.

5. In a cross-sectional study of fiscal decentralization using data for 1969–70, Giertz (1976) finds that the Gini coefficient is positively and significantly associated with the extent of fiscal centralization, suggesting that a higher degree of inequality in the distribution of income is associated with a more centralized state and local sector. This finding runs counter to our hypothesis five. Giertz argues that this result reflects the greater need for income redistribution in states with more inequality.

6. In an earlier cross-sectional study using data for 1962, Litvack and Oates (1970) likewise found population size and percentage urban to be negatively and significantly associated with fiscal centralization in the state and local sector. Giertz (1976) found, in addition, a negative and significant relationship between fiscal centralization and land area.

7. Giertz (1976) found such a relationship in his cross-sectional study.

8. The results using the revenue version of the dependent variable do not differ in any important ways from those reported in table 1.7.

9. U.S. Bureau of the Census (1907). Receipt and Expenditure data taken from Table 10, pp. 982–93.

10. U.S. Bureau of the Census (1914). Receipt and expenditure data for states taken from Table 6, pp. 36–37, Table 8, pp. 40–41. Table 10, pp. 44–45; for counties Table 3, pp. 122–23 and Table 5, pp. 210–11; for incorporated places Table 3, pp. 462–69 and Table 5, pp. 560–67.

11. U.S. Bureau of the Census (1924). Receipts for local governments taken from Table 1, pp. 12–16. Receipts and expenditures taken from Table 2, p. 17, Table 3, pp. 52–53, and Table 4, p. 54.

12. The census estimates for local finances were based on information gathered by the census from a sample of large cities and scattered data collected by the census bureau. Estimates of local government finances were built up from these partial samples. We have used these estimates to fill in missing data in 1922 and in 1952.

13. Local Expenditures = 1.101013 · Local Revenues

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Comment

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John Wallis and Wallace Oates present an intriguing analysis of twentieth-century trends in state and local public finance. As its title suggests, their paper focuses on the pattern and causes of public sector decentralization, where the authors understand "centralization" to mean the extent to which state governments account for total state and local spending or revenues. As their table 1.1 illustrates, the striking feature of recent state and local fiscal relations is the sharp rise around World War II in state spending and revenues relative to local spending and revenues. Hence, the subnational public sector is more centralized now than it was in the first three decades of this century.

Wallis and Oates seek to understand whether this pattern represents an economically efficient adjustment by different levels of government to changing underlying factors. The seven hypotheses they specify and test capture in part the intuition that public sector centralization is more desirable with a homogeneous population. This conclusion follows from assuming the functions of state and local governments to be the provision of substitute public goods. Since additional consumers can enjoy public goods at little (or zero) cost, simple cost-sharing argues for state rather than local provision of most public goods. On the other hand, citizens of a state must all consume the same bundle of public goods, despite their potentially divergent demands for public services. The more divergent these demands are, the more sense it may make for localities to provide a large fraction of the public goods and tailor them to local needs.

It is hard to know quite what to make of this efficient-response approach to public expenditures and the tests Wallis and Oates employ to evaluate it. One difficulty is the absence of a formal model, with the result that it is not easy to tell whether the data confirm or reject the theory. Presumably, the model requires the public services provided by different levels of government to be imperfect substitutes, since otherwise it is always most efficient for state (or national) governments to provide all the services. If public parks are all perfect substitutes, then it is not efficient for cities to build parks and exclude nonresidents from them; instead, states should pay for them. The nature of the efficient division of fiscal responsibility depends crucially on the substitutability or complementarity of different public services, as well as crowding, scale economies, and other size variables. As a result, most

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behavioral responses are consistent with the simple hypothesis that governments divide responsibilities efficiently.

A second difficulty is that even the desirability of disparate multilevel government expenditure levels does not require the "decentralization" of the state-local sector. Suppose that some jurisdictions within a state demand extensive subsidized public transportation while other parts of the state do not need such services. There is nothing statutory which prevents state governments from adjusting tax and spending levels to local tastes and needs. Of course, there may be strong political reasons for state governments not to favor some jurisdictions with services or light tax burdens at the expense of others. But it is easy to cite many examples of state (or national) governments doing exactly this.

Since the heterogeneity of local demands for public services plays such an important role in Wallis and Oates's explanation of decentralization patterns, it is worth considering whether state governments may feel compelled to equate tax or spending levels across jurisdictions for reasons other than a vague political desire for equality. Another reason why states may feel constrained to divide taxes and public services among jurisdictions to an inefficient degree is that information on local tastes for public services is not always available to state governments. If asked, localities would always claim to need extensive services and to possess fiscal characteristics (such as a real estate sector which responds elastically to local property taxes) which make it desirable to tax them lightly. The state government's problem then is to elicit truthful revelation of local preferences. Naturally, an extreme resolution of this problem is to decentralize the public sector by making localities rely on their own resources. Localities then have no incentives to distort their fiscal choices and in addition bear tax burdens which are generally (assuming no incidence spillovers) matched to the services they receive. But states need rely on decentralization only when they cannot obtain the information necessary to refine their tax and spending plans — and then only when characteristics differ among local jurisdictions. Note, however, that if characteristics differ systematically on the basis of observable features then state governments can target tax and spending programs based on those features.

A third reason why state governments may impose equal tax and benefit levels across communities is that population is mobile within a state (as well as across states) and the state government may fear excessive Tiebout shifting in response to unequal treatment of substate jurisdictions. While there is little conclusive evidence that taxpayers move in response to fiscal changes, it is possible that state governments perceive such movement to be a potential problem and respond by smoothing taxes and expenditures across jurisdictions.

One limitation of the empirical work Wallis and Oates present is that it is not capable of identifying changes in the desirability of decen-

tralization based on the second or third of these reasons. Wallis and Oates regress the degree of centralization on variables such as income, urbanization, population, and racial homogeneity, all of which are intended to capture the heterogeneity of local demands for public expenditures. But if these characteristics are in fact related to desired expenditure levels, then state governments can infer from demographic variables desired spending levels throughout the state and the problem of demand revelation need not affect the degree of centralization. If, on the other hand, state governments have legitimate fears of population movements in response to fiscal changes, then Wallis and Oates's regression strategy of assuming population characteristics to be exogenous is flawed and the model is not identified.

Another limitation of Wallis and Oates's regressions is that they measure public services by expenditures rather than by true service flow. Of course, this problem is ubiquitous in public finance analysis, since there are no reliable measures of public sector output. This problem becomes important whenever there are large changes in the cost of public services. If one thinks of public services as effective services per capita, then an increase in the heterogeneity of demands for public services raises their cost. But the response of total expenditures to a price change is ambiguous in sign: if the price rises and the demand elasticity is less than one, then total expenditures increase; if elasticity is greater than one expenditures fall. Thus, state-level expenditures may rise in response to a change in population characteristics that makes local expenditures relatively more desirable. This is not to say that local expenditures might not rise relative to state expenditures in such a scenario. But the sign and magnitude of the relative change will depend on specific price and income elasticities.

There is an empirical issue which is closely related to this theoretical ambiguity. The question has to do with the choice of an appropriate scale variable with which to measure centralization. Wallis and Oates choose as their index the ratio of state to total state/local taxes or expenditures. This ratio has been rising over time, but there are many possible sources of this change. Table C1.1 indicates that both the state and local sectors have been growing relative to GNP over this century, though the state sector has been growing at a faster rate. Since most variables of economic importance exhibit secular growth, the growth of state expenditures relative to local expenditures could be explained by a greater state spending elasticity with respect to income, population, other government spending, or many other variables.

It is noteworthy in this context that Wallis and Oates get much stronger results when they pool the data as reported in their table 1.6 than in the cross-sectional results reported in table 1.7. What this suggests is that rising income and other variables have been correlated with a rise in centralization, but that secular trends of unknown origin

Table C1.1 **State and Local Direct Expenditures, as a Percentage of GNP, Selected Years**

Year	Direct State Expenditures/GNP	Direct Local Expenditures/GNP
1902	0.63%	4.44%
1913	0.75	4.95
1922	1.46	6.15
1932	3.48	10.93
1942	2.25	4.64
1952	3.10	5.77
1962	4.51	7.97
1972	6.11	9.95
1982	6.89	10.15

Source: Author's calculations from data in Tax Foundation (1986).

may be driving this correlation since the data do not support the theory in the cross sections. The variables that do not change over time, land area and the southern effect, are not significant. On the other hand, the authors find the predicted sign for the population variable, which would not be expected just on the basis of secular drift, and the urbanization variable is significant in both the cross-sectional and panel regressions.

Fundamentally, the analysis of subnational fiscal centralization must concern itself with the political forces driving state and local relations, and it seems that Wallis and Oates's results should be interpreted as throwing some light on these forces. It is difficult to attach too strong an economic interpretation to their findings, since the best economic explanation still requires state governments to feel politically obliged to equalize spending and tax levels among different groups in the population. The degree to which economic and political considerations interact is very much an open question. More generally, political considerations may affect the extent to which state-level fiscal activity is "centralized" and local-level activity is "decentralized." Central Park in New York City is likely enjoyed by a larger and more heterogeneous group of people than is Taconic State Park in New York State; does this make it more "centralized"? A fuller understanding of the nature of state-local fiscal relations may have to wait for more complete interpretations of the political and economic consequences of taxing and spending.

References

Tax Foundation, Inc. 1986. *Facts and figures on government finance. 23d ed.* Washington, D.C.: Tax Foundation.