

## Tax Equity: Environmental Influences on a Policy Outcome\*

RICHARD B. WEBB  
Texas Tech University

ROBERT L. SAVAGE  
University of Arkansas, Fayetteville

During the past two decades, political scientists and economists have contributed to our knowledge of the impacts of differing political, governmental, economic and social characteristics of jurisdictions on the policy outcomes of state and local governments (see Dye, 1979). While their findings have important implications for the distribution of public benefits according to normative criteria of fairness, the issue of equity has been largely overlooked in the empirical investigations.<sup>1</sup> Nevertheless, equity and the identification of factors associated with inequity deserve attention. The extent to which citizens are treated in a discriminatory or preferential manner in violation of commonly accepted norms is an outcome that has implications for public support of governmental institutions and officials. Of equal importance, the equitable treatment of citizens by their government is itself an ultimate value which has been considered to be so important as to be enshrined in the U.S. and state constitutions.

This study identifies factors which affect the equitable distribution of property tax burdens among residential properties. The standard of equity promulgated in state constitutions and statutes is that the burdens be distributed among property-owners in proportion to the value of their property (Aaron, 1977). This requires that property be assessed at a uniform fraction of market value as well as taxed at a uniform rate.<sup>2</sup> However, equally-valuable properties are frequently assessed at widely divergent fractions of market value by local tax assessors, which results in property-owners paying considerably more or less than their fair share of the tax burden despite a uniform tax rate.

\*This essay is a much revised version of a paper originally presented at the Annual Meeting of the Midwest Political Science Association, Milwaukee, Wisconsin, April, 1982

<sup>1</sup>Notable exceptions are Fry and Winter, 1970, and Booms and Halldorson, 1973.

<sup>2</sup>Some states provide for the application of different tax and/or assessment rates to each class of property (residential, agricultural, commercial, etc.), but properties within a class are required to be uniformly assessed and taxed (Aaron, 1975: 57).

Prior studies seek to explain these assessment nonuniformities in terms of the methods and procedures of local assessors, but this analysis focuses on the impact of economic, social and political environments of assessors' jurisdictions. Through factor analysis, single-trait measures of different aspects of the environment are resolved into distinct patterns or dimensions which are theoretically related to assessment uniformity. These dimensions become the independent variables in a regression analysis to test their effects on uniformity. The analysis is based on data for all seventy-five assessment jurisdictions in Arkansas.

The magnitude of the assessment nonuniformity problem nationwide is documented by the Census Bureau. The usual measure of uniformity is the coefficient of intra-area dispersion, which is analogous to a coefficient of variation. It measures the average percent by which the assessment to market-value ratio of individual parcels deviate from the median for the assessment jurisdiction; larger coefficients indicate more variation and nonuniformity in the community. Some nonuniformities are to be expected since property assessment is not a rigorous science. For single family residences, tax authorities consider coefficients of 20% or less as acceptable and 15% or less as achievable, while coefficients exceeding 20% are deemed unacceptable (Almy, 1977: 156). For this property class, however, the Census Bureau (1978: 89) found that fifty-eight percent of the jurisdictions in its national sample had coefficients greater than 20%, and fourteen percent exceeded 40%. In effect, property-owners in a majority of local jurisdictions paid much more or less than their legal share of the tax burden due to nonuniformity in assessments; over-assessed properties paid more than their share while underassessed parcels enjoyed extra-legal tax relief.

Moreover, the nonuniformities resulted in a regressive distribution of tax burdens. The higher-value properties tend to receive the extra-legal tax break, while the lower-value properties bear more than their share of the tax burden (see U.S. Census Bureau, 1978: 93). As a result the tax burden falls disproportionately on non-white, crowded, blighted and/or ghetto neighborhoods; low-quality, older and/or depreciating properties; rentals and low-income families. On the other hand, extra-legal tax relief is enjoyed by white and suburban neighborhoods; higher quality, newer, owner-occupied and/or appreciating properties, and higher income families.<sup>3</sup>

### The Assessment Environment

The empirical, comparative studies of assessment uniformity to date

<sup>3</sup> Extensive confirmation exists for this finding; see Black, 1972; Engle, 1975; Oldman and Aaron, 1965; Peterson, 1973; Paul, 1975; Schroeder and Sjoquist, 1976.

have been executed within the paradigm of the traditional reform literature in the property tax area. A stepchild of the prescriptive principles approach to government administration associated with Gulick, Urwick and their heirs (Lowery, 1982), this literature focuses on improving assessment administration through modifications of assessment system traits under the control of assessors and policy officials, while ignoring the environment in which that system must function.<sup>4</sup> On the basis of a priori principles, it is argued that assessment nonuniformity is due to such system variables as part-time, elected, inexperienced, untrained and low-salaried assessors and staff; small assessment jurisdictions; failure to reassess property at periodic intervals; and lack of tax maps, updated reproduction cost schedules, analyses of sales data and other tools considered essential for the accurate assessment of property, etc.<sup>5</sup>

Using regression models, such hypotheses have been tested in comparative analyses of assessment jurisdictions in New Jersey (James, 1975), Wisconsin (Geraci and Plourde, 1976), Virginia (Bowman and Mikesell, 1978), and more ambitiously a national sample of jurisdictions (Almy, 1977). Typical of the findings, James (1975) concludes that community and housing characteristics in New Jersey are more important than system attributes in determining assessment uniformity, while in Virginia it was found that

variables over which the assessor and other public officials have little or no control account for the largest part of the variation in assessment quality . . . . Certain community characteristics that may be expected to make assessing more difficult turn out to be quite important. (Bowman and Mikesell, 1978: 146).

What are the community or environmental characteristics which affect assessment uniformly and property tax equity? As yet, the issue has not received systematic attention in the empirical studies. The few environmental variables that are included in the regression models are intended to control for "assessment difficulty," but judging by the selection of variables there is little agreement on operationalizing the concept, and other aspects of the environment are ignored. Nevertheless, a number of characteristics may affect uniformity.

The recent literature cites two dimensions of the environment as complicating the assessment task and thereby affecting the ease or

<sup>4</sup>Examples of this reform literature are Advisory Commission on Intergovernmental Relations, 1963; Lynn, 1969; and all issues of the *Assessors Journal*.

<sup>5</sup>For an interesting effort to reformulate the assessor performance issue according to public choice theory, see Lowery, 1982. Unfortunately, his test of the theory uses a measure of assessment level rather than assessment uniformity.

difficulty of achieving assessment uniformity. The first involves the heterogeneity of property, with jurisdictions having a more varied mix of property classes (industrial, commercial, residential, etc.) requiring more specialized skills and sophisticated appraisal methods to estimate market value. Even then accurate assessment is improbable due to the absence of sales of comparable properties to serve as proximate indicators of market value (Netzer, 1966: 180-182). The same argument applies to properties within the same class. The market value of residential parcels, for example, is affected by such characteristics as neighborhood, age, style, and condition; greater variation on these and other characteristics requires the assessor to collect and analyze more information and sales data on more housing types in order to accurately assess the stock of housing. Again, accurate assessment of some types of housing may be especially difficult in the absence of sales of comparable properties, e.g., older, deteriorating houses or expensive homes with unique decorative detail (Netzer, 1966: 79, 182).

The implication is that urban assessors confront a more difficult task than their rural counterparts (Geraci and Plourde, 1976; Bowman and Mikesell, 1977). Reflecting their more complex economies, urban centers have a more heterogeneous mix of property classes as well as more within class variation. According to Netzer (1966: 77), it is unlikely that urban assessors can achieve a high degree of assessment uniformity due to the extremely varied nature of properties in large cities.

The expected nonuniformities in urban areas due to the difficulties confronting the assessor are reinforced by other factors. Paul (1975: 10) argues that in small towns with relatively homogeneous housing, homeowners can easily compare their assessments with their neighbors', and thus discover, appeal and correct unequal treatment by the assessor. In cities, however, this corrective mechanism is underutilized due to obstacles to comparing one's assessment against comparable homes in distant neighborhoods, resulting in a pattern of overassessment of blighted neighborhoods and underassessment of stable and upward neighborhoods.

The second aspect of the environment which is thought to complicate the assessment task is the assessor's workload (Almy, 1977). Workload is determined by the number and mix of properties in the jurisdiction, with fewer parcels, property classes and subclasses easing the assessment task. Although urban areas have numerous and a varied mix of properties, workload is an independent dimension because rural areas also may have large numbers of parcels adding to the workload.

The traditional reform literature approaches the workload issue indirectly in advocating the consolidation of smaller assessment jurisdictions into larger units. Although increasing the workload of an assessor, larger jurisdictions have economies of scale and greater resource support to replace part-time with full-time assessors, to hire professionally trained staff, to promote staff specialization, and to employ modern assessment tools and practices. In effect, the professionalism which larger jurisdictions permit is thought to contribute to more

accurate assessments and more uniformity (Assessment Principles, 1937; Advisory Commission of Intergovernmental Relations, 1963.)

Thus, workload's effect on uniformity is unclear. While more parcels may add to the task and complicate the achievement of uniformity within the constraints of personnel, training, tools and time, large jurisdictions may have the resources to relax the constraints on professionalism and thereby overcome the size problem and achieve greater uniformity.

In addition to workload and urbanism which affect assessment uniformity by making accurate assessments inherently more difficult, demographic and social factors may be important through their influence on the behavior of assessors. Bowman and Mikesell (1977) hypothesize that low-income families and the elderly are likely beneficiaries of extra-legal tax relief by assessors who purposely underassess their property to shield them from the full brunt of the property tax. Aaron (1975: 62), Netzer (1966: 82) and Peterson (1973: 92) suggest that middle and upper income families may receive relief to stem their outmigration. On the other hand, assessors tend to overassess multifamily units; crowded, blighted and low-value housing; and housing occupied by minorities. This pattern may be the result of assessors a) applying an implicit benefit principle by which structures housing occupants who receive more public services are assessed and taxed more heavily (Oldman and Aaron, 1965; Netzer, 1966: 81-82), b) exercising less diligence in accurately assessing the property of the politically weak since they are not as likely as other property-owners to protest and appeal their assessments (Schroeder and Sjoquist, 1976; Paul, 1975: 10), or c) failing to periodically reappraise properties in neighborhoods of declining market values (Peterson, 1973: 6; Engle, 1975). Regardless of the reason, the social and demographic characteristics of the jurisdiction appear to be a factor in uniformity.

Another aspect of the environment which we expect to be a factor is the demand for public services. Higher demand places a greater burden on the property tax to fund local services. Additional revenues from the tax may be raised by either increasing the tax rate, increasing the fraction of market value at which all properties are assessed, or increasing the assessed value of reassessed properties and neighborhoods to the average fraction for the jurisdiction. Since an increase in the tax rate is a very visible and unpalatable action to voters, elected officials are likely to pressure the assessor to increase the assessment level and eliminate underassessed properties. Both steps improve assessment uniformity (see Shannon, 1967).

Finally, we expect that the nature of political life in a jurisdiction is important. The traditional reform literature takes a dim view of elected tax assessors, condemning the electoral process for elevating to office individuals who have little or no expertise in the intricacies of the assessment function and who may use their assessment powers to promote their political fortunes (Assessment Principles, 1937). Pursuing this logic, it can be argued that electoral pressures induce candidates to promise small and large favors for property-owners, resulting in less

uniform assessments within the jurisdiction. We prefer to argue, as La Key (1964: 298-299) and Lockard (1959: 337), that voter turnout and party competition promote accountability to the entire constituency and to the accepted tenets of equitable administration of the assessment task. The elected assessor who faces no threat of replacement at the polls is more likely to act arbitrarily and be less diligent in the performance of his duties.<sup>6</sup>

### Operationalizing The Environment

The seventy-five counties in Arkansas were selected for the analysis due to the availability of data necessary for constructing a measure of uniformity for each assessment jurisdiction, as well as the availability of measures of their environmental characteristics. Elected for a two-year term of office, the county assessor determines the assessed value of all parcels, except public utilities and common carriers, and thus establishes the property tax base for the tax rates levied by the county, cities and school districts. State statutes specify that residential properties are to be assessed at twenty percent of value, but permissive language has permitted assessors to base values on those prevailing in the year of their choice and to use whatever valuation methods they prefer. In practice, assessors have had considerable latitude for the past twenty years. The result is large variations in assessment performance across counties with average county ratios of assessments to 1977-78 market values ranging between 3% and 14% (Thompson, 1978).

We depart from earlier studies in measuring the environmental dimensions which are thought to affect assessment uniformity. Since their purpose is to test for the effects of the assessment system itself, the received models include a few environmental variables to control for assessment difficulty. The choice of such variables is inconsistent between studies, and at times the same variables are used to operationalize different concepts. This lack of agreement on the appropriate measures raises questions about the validity of the variables used. Rather than relying on a few measures of doubtful validity, we use a number of indicators for each hypothesized dimension. The eighty-three measures are resolved into distinct patterns through factor analysis. This approach serves to test implicit hypotheses regarding the dimension or concept being measured by the indicators, as well as to empirically define major environmental dimensions of the counties. These empirical dimensions are the independent variables in the subsequent analysis of assessment uniformity.

In addition to testing implicit hypotheses, the approach has other advantages. It helps resolve conflicting interpretations of the concept being measured by an indicator, thereby improving the validity of the

<sup>6</sup>For an extended discussion of the politics of property assessments, see Paul, 1975.

study. And, the approach is consistent with our a priori assumption that the environment is complex, consisting of a number of relevant dimensions. Each dimension, in turn, most likely consists of a complicated structure of interrelated elements which together occupy more conceptual space than can be adequately tapped by a few surrogates. Thus, we expect that the approach will yield more adequate measures of the environmental dimensions affecting assessment uniformity.

The eighty-three measures, listed in Table 1, are taken from Census Bureau and state documents. Their selection was guided by the previous discussion of the environment. Most tap different aspects of economic, housing, social and demographic conditions in the seventy-five counties. A number are indicators of the same phenomena for both the county and its urban places; others tap the same phenomena at different cutting points or for Blacks or for different classes of residential occupants. Also included are measures of public service demand, property tax revenues, and characteristics of the assessment system. Since assessors are elected every two years, the data set contains measures of voter registration, voter turnout and electoral competition for the assessors' and other offices.<sup>7</sup>

Through trial and error, a factor-analytic solution consisting of seven factors was accepted.<sup>8</sup> This decision was prompted by two major considerations: 1) the maintenance of reasonably large communalities for most of the variables as well as an overall high level of explanation in the total variance (68% in this case), and 2) factors interpretable in terms of underlying dimensions having a number of variables with

<sup>7</sup>Most measures are based on 1970 data, whereas the dependent variable utilizes 1977-78 data. Dictated by the availability of data, it must be assumed that the characteristics of counties have not changed significantly in the 1970 to 1978 period; for the most part, the assumption is consistent with impressionistic judgements. On the other hand, it can be argued that assessment performance as measured by the dependent variable did not instantaneously occur in 1977-78. Today's performance is the result of cumulated assessment practices for the past twenty years and the latitude permitted to local assessors in the choice of valuation methods and standards. As such, today's performances reflect the responses of assessors to both past and present conditions in their environment. From this perspective the 1970 data can be viewed as a realistic compromise.

<sup>8</sup>Principal components with varimax rotation were employed resulting in orthogonal factors unrelated to each other. The initial factor-analytic solution indicated that sixteen factors would emerge utilizing an eigenvalue-one criterion. Most of these factors had no more than one or two variables of significant saturation.

significant loadings.<sup>9</sup> Even with the high level of overall explanation, eighteen measures have communalities of less than 0.50, with one measure as low as 0.08. Still, for the remaining sixty-five variables, half or more of their variance is explained by the seven underlying dimensions. The seven factors and the variable loadings are shown in Table 1.

As mentioned previously, the factor analysis of the measures is a test of a number of implicit hypotheses. While some were supported by the factors which emerged or by the loadings of individual measures, other hypotheses were not. A major surprise was assessment difficulty which as discussed in the literature has two subdimensions -- urbanism (or heterogeneity) and workload; the analysis uncovered four subdimensions. Another hypothesized dimension was public demand, but a number of measures of demand loaded on other factors. These and other results contrary to expectations are indicated in the following discussion of each factor.

The first four factors affect the difficulty of accurately assessing properties, and hence we consider them to be subdimensions of assessment difficulty. Factor I is Assessor Workload. All absolute measures of population have their strongest loadings on this factor, as well as the Minimum Foundation Program -- the State's primary vehicle of support for public schools -- which is primarily determined by population. Closely associated with population is greater numbers of residential, wholesale and manufacturing properties, which increases the workload of the assessor's office. Moreover, the factor is related to affluence, as suggested by the loading of mean assessed values of parcels and the secondary saturations of a number of variables indicative of greater wealth. As expected, this factor reflects a pattern which is distinct from urbanism, which will be discussed shortly. For reasons previously mentioned, its affect on assessment uniformity is not clear.

Factor II is Black Housing. The Black-related variables load on this factor, as well as most variables indicative of less desirable or dilapidated housing such as crowded living space, inadequate plumbing and older, rented housing. Factor II is also associated with the Delta County, an index value of Arkansas regionalism which points to a large number of interrelated characteristics shared by the southern and eastern counties (Savage and Price, 1980; Savage and Gallagher, 1977). Typical of Southern "Black Belt" counties, Arkansas counties of the Delta type are rural and have disproportionately higher percentages of Blacks in the population. The other aspect of this dimension is the lower population growth, still another characteristic long associated with Southern counties having large concentrations of Blacks.

<sup>9</sup>Strictly speaking, statistical significance is inappropriate as the entire population of Arkansas counties is included. However, we prefer to use this measure for determining the consequence of individual loadings than some a priori but altogether arbitrary loading as factor analysts all too often do.



TABLE I  
DIMENSIONS OF THE ASSESSMENT ENVIRONMENT IN ARKANSAS: FACTOR MATRIX

| Environmental Variables <sup>b</sup>   | Factor Loadings <sup>a</sup> |     |     |     |     |     |     | h <sup>2</sup> |
|--|------------------------------|-----|-----|-----|-----|-----|-----|----------------|
|  | I                            | II  | III | IV  | V   | VI  | VII |                |
| Population, 1975   | 93                           | -03 | 05  | 32  | 06  | 05  | -04 | 0.97           |
| Public school enrollment, 1970   | 93                           | 09  | 09  | 28  | 08  | 03  | -05 | 0.96           |
| Total year-round housing units, 1970   | 92                           | -01 | 02  | 31  | 09  | 06  | -06 | 0.96           |
| Total wholesale establishments, 1972   | 92                           | -01 | -00 | 26  | 09  | 03  | -05 | 0.93           |
| Total owner-occupied housing units, 1970   | 91                           | -06 | -02 | 32  | 08  | 06  | -07 | 0.96           |
| Urban owner-occupied housing units, 1970   | 93                           | 02  | -06 | 26  | 07  | 02  | -02 | 0.95           |
| Urban Negro renter-occupied housing units, 1970  | 88                           | 28  | 01  | 12  | 12  | -02 | 03  | 0.89           |
| Minimum Foundation Program aid, 1977-78  | 91                           | 07  | 13  | 32  | 05  | 03  | -04 | 0.96           |
| Total manufacturing establishments, 1972   | 85                           | -03 | -16 | 39  | 07  | 10  | -16 | 0.94           |
| Mean assessed value of parcels, 1977-1978  | 50                           | 05  | 10  | 59  | 11  | 10  | -01 | 0.75           |
| % of year-round units in structures containing 5 or more units, 1970                       | 57                           | 02  | 03  | 56  | 11  | 14  | 05  | 0.68           |
| % of population that is Black, 1970  | 10                           | 90  | 03  | 02  | 10  | -20 | 04  | 0.88           |
| % of dilapidated units occupied by Negroes, 1970   | 16                           | 87  | -00 | 08  | 12  | -22 | -04 | 0.84           |
| % of urban units lacking some or all plumbing facilities, 1970                             | 02                           | 83  | 11  | 29  | 00  | 01  | 20  | 0.82           |
| % of urban owner-occupied housing owned by Negroes, 1970                                   | 03                           | 83  | 03  | 24  | 03  | -06 | 14  | 0.78           |
| % of urban rental housing units occupied by Negroes, 1970                                  | 10                           | 88  | 04  | 23  | 07  | -08 | 08  | 0.86           |
| Delta County type (Q-factor loading)   | 09                           | 85  | 29  | 20  | -01 | -19 | -07 | 0.91           |
| % of occupied units 1.01 or more persons per room, 1970                                    | 03                           | 76  | 41  | -28 | -11 | -06 | 21  | 0.80           |
| % of urban owner-occupied units valued at less than \$5,000, 1970                          | -23                          | 68  | -03 | 38  | -14 | -09 | 03  | 0.69           |
| Average annual percentage change in per capita income, 1969-1974                           | -07                          | 51  | 48  | -05 | 02  | -30 | -08 | 0.59           |
| % of owner-occupied units occupied since 1960  | 21                           | -58 | 38  | 27  | 03  | 16  | 39  | 0.78           |
| Voter turnout, 1976 general election -- % of registered voters voting in Presidential race | -04                          | -59 | 01  | 12  | -05 | 35  | -12 | 0.50           |
| Ozark County type (Q-factor loading)   | -52                          | -59 | -19 | -53 | -07 | 04  | 03  | 0.94           |
| % occupied units that are owner-occupied, 1970   | -22                          | -66 | -58 | -25 | 00  | 09  | 06  | 0.88           |

| Environmental Variables   | Factor Loadings |     |     |     |     |     |     | h <sup>2</sup> |
|---|-----------------|-----|-----|-----|-----|-----|-----|----------------|
|   | I               | II  | III | IV  | V   | VI  | VII |                |
| % change in number of year-round housing units, 1960-1970                       | 03              | -74 | -03 | 12  | 31  | 11  | 36  | 0.80           |
| % change in public school enrollment, 1970-1975                                 | -15             | -74 | -13 | 03  | -05 | -03 | 28  | 0.67           |
| % change in net migration, 1970-1975  | -01             | -84 | -13 | 02  | -03 | 08  | 27  | 0.80           |
| % change in population, 1970-1975   | 06              | -83 | -06 | 07  | -05 | 07  | 29  | 0.79           |
| Total acreage in farms, 1974  | 01              | 20  | 89  | 17  | -04 | 09  | -06 | 0.87           |
| % of all lands in farms, 1974   | 00              | 17  | 84  | 11  | -10 | 02  | 09  | 0.76           |
| Value of farm products sold by farms with sales of \$2,500 and over             | 01              | 14  | 72  | 30  | 08  | 17  | -28 | 0.74           |
| % change in land in farms, 1969-1974  | -16             | 02  | 46  | -37 | 14  | -05 | 15  | 0.42           |
| % of population 65 years and older, 1975  | -40             | -21 | -41 | -25 | 21  | 22  | 18  | 0.56           |
| Coefficient of variation of sale prices, 1977-1978                              | -14             | 09  | -43 | -03 | -00 | -21 | -38 | 0.41           |
| % of civilian labor force employed in manufacturing, 1970                       | -21             | -05 | -46 | -09 | -23 | -08 | -14 | 0.34           |
| Urban County type (Q-factor loading)  | 28              | -23 | -08 | 85  | 04  | 15  | -13 | 0.90           |
| % of total renter-occupied units that are urban, 1970                           | 27              | 32  | -06 | 85  | 00  | 05  | -02 | 0.90           |
| % of urban owner-occupied units occupied since 1960                             | 06              | 24  | 17  | 84  | -03 | 02  | 07  | 0.79           |
| % of urban owner-occupied units valued at \$15,000 or more, 1970                | 24              | 18  | 19  | 82  | 15  | 03  | 09  | 0.82           |
| % of year-round urban units built in 1950 or later                              | 11              | 26  | 26  | 81  | 03  | -01 | 09  | 0.81           |
| % of population living in urban areas, 1970                                     | 35              | 41  | 03  | 79  | 00  | 04  | -01 | 0.92           |
| Per capita income, 1974   | 38              | -06 | 09  | 76  | 07  | -18 | -21 | 0.82           |
| % of year-round urban units in structures containing 5 or more units, 1970      | 40              | 03  | 10  | 67  | 12  | 13  | 01  | 0.64           |
| % of families with incomes \$15,000 and over, 1969                              | 57              | 22  | 17  | 66  | 08  | -00 | -10 | 0.85           |
| Median value of owner-occupied, single-family units, 1970                       | 47              | -30 | 25  | 60  | 20  | 21  | 25  | 0.88           |
| Mean sales price of parcels, 1977-1978  | 40              | -03 | 03  | 62  | 22  | 08  | 04  | 0.60           |
| % of total owner-occupied units valued at \$20,000 or more, 1970                | 45              | -05 | 20  | 57  | 34  | 15  | 23  | 0.76           |
| % of civilian labor force employed in wholesale and retail trade, 1970          | 24              | 09  | 17  | 55  | -02 | 12  | 01  | 0.41           |
| Median gross rent of renter-occupied units, 1970                                | 47              | -31 | 36  | 51  | 15  | 10  | 16  | 0.76           |
| Number of taxing jurisdictions within county                                    | -03             | -27 | 41  | 47  | 06  | 20  | -23 | 0.56           |
| Average value of farm land and buildings per acre, 1974                         | 31              | 18  | 42  | 45  | -00 | 05  | -13 | 0.52           |
| Property tax revenues per capita, 1971-1972 (includes all taxing jurisdictions) | 28              | 37  | 03  | 42  | 31  | -19 | -05 | 0.52           |
| % of manufacturing establishments with 20 or more employees, 1972               | 09              | 22  | 20  | 40  | -08 | -09 | -12 | 0.29           |
| % of total owner-occupied units valued at less than \$5,000, 1970               | -40             | 35  | -19 | -55 | -13 | -23 | -25 | 0.75           |

| Environmental Variables   | Factor Loadings |     |     |     |     |     |     | h <sup>2</sup> |
|---|-----------------|-----|-----|-----|-----|-----|-----|----------------|
|   | I               | II  | III | IV  | V   | VI  | VII |                |
| % of direct general expenditures spent on education, 1976-1977 (includes all jurisdictions)                                     | -09             | -07 | 21  | -55 | -09 | -12 | -02 | 0.38           |
| % of eligible voting population who are registered to vote, 1978  | -22             | -26 | -45 | -58 | -01 | 08  | 16  | 0.69           |
| % of eligible voting population who are registered to vote, 1976  | -21             | -19 | -48 | -62 | 02  | 08  | 23  | 0.76           |
| % of year-round units in one-unit structures, 1970  | -52             | -14 | -23 | -64 | -14 | 04  | -08 | 0.78           |
| % of occupied units lacking some or all plumbing facilities, 1970   | -19             | 49  | 05  | -75 | -05 | 17  | 19  | 0.90           |
| % of total units lacking some or all plumbing facilities, 1970  | -21             | 45  | 04  | -76 | -07 | 19  | 18  | 0.90           |
| % of families with incomes below 125% of poverty level, 1969  | -24             | 37  | 13  | -76 | -03 | 14  | 18  | 0.85           |
| Change in property tax revenues per capita, 1971-1972 to 1976-1977 (all taxing jurisdictions)                                   | 04              | -24 | 04  | 14  | 84  | -02 | -01 | 0.79           |
| Assessed valuation per child enrolled, K-12, 1977-1978  | 13              | 05  | -01 | 23  | 81  | 05  | -18 | 0.77           |
| Property tax revenues per capita, 1976-1977 (includes all taxing jurisdictions)   | 18              | 03  | 05  | 34  | 80  | -12 | -04 | 0.81           |
| School revenues per child in ADA, K-12, 1977-1978   | 26              | 25  | -12 | -01 | 69  | -03 | -22 | 0.67           |
| Current school expenditures per child in ADA, K-12, 1977-1978   | 34              | 36  | -10 | -12 | 63  | -00 | -24 | 0.73           |
| Minimum Foundation Aid per ADA, 1977-1978   | 15              | -04 | -15 | 26  | -32 | -18 | 14  | 0.26           |
| Republican support, 1976 -- average % of votes cast for Republican candidates for President and Governor in general election    | 14              | -28 | -10 | 13  | 01  | 83  | 08  | 0.83           |
| Republican support, 1978 -- average % of votes cast for Republican candidates for U.S. Senator and Governor in general election | 07              | -53 | -27 | 10  | -03 | 64  | 02  | 0.77           |
| Electoral competition in Assessor's race, General Election, 1976  | -04             | -12 | -02 | -07 | 03  | 55  | 04  | 0.33           |
| Electoral competition in Assessor's race, General Election, 1978  | -05             | -17 | 01  | -13 | -13 | 51  | 02  | 0.32           |
| Voter turnout, 1978 General Election -- % of registered voters voting in Governor's race  | -20             | -27 | 09  | 05  | 09  | 51  | 29  | 0.48           |
| Voter turnout, 1978 Democratic primary -- % of registered voters voting in U.S. Senate race                                     | -24             | 08  | -28 | -11 | 05  | -76 | -12 | 0.75           |
| Voter turnout, 1976 Democratic primary -- % of registered voters voting in Governor's race                                      | -32             | -03 | -21 | -16 | -04 | -78 | 02  | 0.79           |

| Environmental Variables  | Factor Loadings |      |      |      |      |      |      | h <sup>2</sup> |
|--|-----------------|------|------|------|------|------|------|----------------|
|  | I               | II   | III  | IV   | V    | VI   | VII  |                |
| Assessor turnover--number of elected assessors since 1970          | -19             | 08   | -11  | 08   | -23  | 13   | 57   | 0.45           |
| Average county millage, 1977                                       | 15              | -26  | -18  | 13   | 07   | 32   | 46   | 0.46           |
| Assessor turnover--number of elected assessors since 1960          | -23             | -13  | -03  | -08  | 02   | 06   | 40   | 0.24           |
| % of year-round units built in 1950 or later                       | 30              | -34  | 33   | 22   | 25   | -20  | 41   | 0.64           |
| Electoral competition in Assessor's race, Democratic primary, 1978 | -10             | -12  | -13  | 12   | 17   | -05  | -34  | 0.20           |
| Total mineral industries establishments, 1972                      | 10              | 13   | -40  | 23   | 08   | 12   | -41  | 0.44           |
| County land area in square miles                                   | 11              | 04   | 17   | 22   | 09   | 28   | -48  | 0.41           |
| Number of months the 1978 Assessor held office, as of June, 1978   | 04              | 03   | -06  | 06   | 23   | -16  | -61  | 0.46           |
| Electoral competition in Assessor's race, Democratic primary, 1976 | 10              | -10  | -19  | -11  | 11   | -03  | -02  | 0.08           |
| Cumulative percentages of total variance are:                      | 14.8            | 30.1 | 37.3 | 54.2 | 59.1 | 64.5 | 68.9 |                |

<sup>a</sup>Decimals are omitted from factor loadings (FL). Saturations on loadings are statistically significant with  $p < 0.01$  where  $FL > 0.27$ .

<sup>b</sup>Data sources are Arkansas, Department of Education, Annual Statistical Report of the Public Schools of Arkansas, Little Rock, AR, 1978; Arkansas, Department of Education, Statistical Summary for the Public Schools of Arkansas, 1976-77, Little Rock, AR, 1979; Arkansas, Secretary of State, 1976 Arkansas Elections, Little Rock, AR, 1980; Arkansas, Secretary of State, 1978 Arkansas Elections, Little Rock, AR, 1980; Robert L. Savage and John P. Price, "Regionalism in Two Southern States: An Exploratory Study of Intrastate Politicocultural Cleavages," Arkansas Political Science Journal, 1 (February 1980), 25-49; U.S. Bureau of the Census, County and City Data Book, 1977 (Washington, D.C.: Government Printing Office, 1978); U.S. Bureau of the Census, 1970 Census of Housing, Vol. I, Housing Characteristics for States, Cities and Counties, Part 5 Arkansas (Washington, D.C.: Government Printing Office, 1972); U.S. Bureau of the Census, 1977 Census of Governments, Vol. 4, Governmental Finances, No. 5, Compendium of Government Finances (Washington, D.C.: Government Printing Office, 1979).

The emergence of this factor was surprising. The loading of the Black variables on a separate factor was expected, but their close association with poor housing was not. The latter was expected to be primarily an urban phenomena and to load on the urbanism dimension. In Arkansas, at least, poor housing appears to be a trait of Black living patterns, and this joint occurrence is a major characteristic of both urban and rural areas. We consider this factor to be a subdimension of assessment difficulty because the type of housing defined by it is usually thought to be the more-difficult-to-assess residential properties: dilapidated, crowded, older and low-value housing (Netzer, 1966: 56; Schroeder and Sjoquist, 1976). For this reason, the dimension should be negatively related to assessment uniformity. As discussed previously, this prediction is reinforced to the extent that assessors discriminate against the politically weak or use an implicit benefit principle in assessing Black-owned or -occupied housing.

Factor III distinguishes Farm Land. It should be emphasized that this dimension does not reflect rural properties in general or the opposite of urbanism. Rather, it points to counties having arable and productive lands. Factor scores for counties confirm this, for counties with notably low scores are primarily those located in south central Arkansas which typically have large areas of forest lands. Of interest is the negative loading of the coefficient of variation of sales prices of residential properties, indicating that the stock of residential parcels in counties with substantial and productive farm lands tends to be more homogeneous.

The emergence of this factor also was a surprise. We expected the measures of agricultural activity to load negatively on the urbanism dimension, but apparently ruralness is a more complex phenomena. Given the elements in the factor, this dimension should contribute to assessment uniformity. Higher proportion of the county's land in agriculture, as well as the homogeneity of housing values, suggest a less complex economy and housing market that are easier to assess accurately (Bowman and Mikesell, 1977).

Factor IV is a general Urbanism, for which the six variables having the strongest loadings all point to urban characteristics of Arkansas counties. Even more strongly than for Assessor Workload, affluence is clearly associated with Urbanism, but this affluence tends to be characteristic of smaller urban centers in Arkansas as metropolitan Pulaski County (Little Rock) has a negative score on the factor. Variables indicative of low-value and low-quality housing were expected to load on Urbanism, but due to their close association with Black housing patterns they are found on Factor II. Nevertheless, their secondary saturations on Urbanism indicate that urban areas have their share of poor housing despite the general affluence. Other elements in the pattern also suggest a heterogeneous mix of properties in urban areas, all of which should decrease assessment uniformity.

Relative measures of public revenues distinguish Factor V, prompting the label of Public Wealth. We expected these measures to form a pat-

tern with such indicators of public demand as student enrollment, migration and changes in population, wealth and housing units, but their loadings on other factors suggest that Factor V is tapping public affluence rather than demand. Its affect on assessment uniformity is unclear. Reflecting the wealth of property available for taxation, logic suggests that it would affect the general level of assessments and the tax rate rather than the uniformity of assessments.

Partisan Competitiveness underlies the sixth factor. This competitiveness is generalized, including general elections for the assessor's office. Basically, the factor distinguishes strong one-party Democratic counties and those in which Republican candidates have significant support and may occasionally win. Generally, the latter counties are scattered throughout Northwest Arkansas. As discussed earlier, we expect that Partisan Competitiveness contributes to assessment uniformity.

The loadings of variables indicative of Factor VII, Assessor Instability, are the weakest in the matrix. Yet, the measures of assessor turnover and assessor experience have the strongest loadings, and they do load in a consistent manner in which turnover and experience are polar attributes. The emergence of this factor was not expected. We anticipated that the measures of turnover and experience would be associated with Partisan Competitiveness, but their emergence as a separate factor is consistent with other information indicating that turnover in office is the result of death and resignation as well as electoral defeat.

By itself, we do not expect Assessor Instability to affect uniformity. When a vacancy occurs due to death or resignation, the local political elite appoints a replacement who may run for the office at the next election. New incumbents by appointment or election are not expected to modify the status quo in the majority of counties which are low in party competition, especially if existing assessment practices have the approval of the elite. In those counties relatively high in competition, however, the threat of a contested election may prompt new incumbents to be more responsive to voters and to introduce improved practices. Thus, we hypothesize an interaction between Assessor Instability and Partisan Competitiveness in which their joint occurrence contributes to assessment uniformity; this interaction is operationalized by a multiplicative term consisting of the product of the factor scores of Factors VI and VII.

## Findings and Discussion

To test the hypotheses, a measure of assessment uniformity is regressed on the factor scores of the seven factors and the interaction term. The data for the dependent variable are derived from a court-ordered, state-wide study conducted in 1978 by the Assessment Coordination Division (ACD), which is a state agency responsible for monitoring local assessments. For parcels sold during 1977 and early 1978, ACD collected information on their assessed value on the assessors' rolls

and their sales price as indicated by deed stamps. A total of 8,514 transactions spread across the seventy-five counties are included in the data set.<sup>10</sup>

The dependent variable constructed from the ACD data is the coefficient of intra-area dispersion for each county.<sup>11</sup> It is defined as,

$$CD = 100/Nr^* [\sum(r_i - r^*)]$$

where  $r_i$  is the assessment/sales price ratio of the  $i^{\text{th}}$  parcel,  $r^*$  is the median assessment/sales price ratio for the county, and  $N$  is the number of parcels.<sup>12</sup> Lower values indicate more assessment uniformity. With a mean county score of 44.0% and a standard deviation of 17.2%, there is considerable variation across the seventy-five counties. Moreover, only two counties have coefficients less than 20%, which is the magnitude of

<sup>10</sup> ACD staff investigated and eliminated from the data transactions of a suspicious nature in which the stated sales price may not be a reliable indicator of market value due to financing arrangements, forced sales, sales between relatives, etc. Since the ACD data include property of all classes, the data were edited to isolate residential properties. According to ACD estimates, 95% or more of the parcels in their study which are within municipal boundaries and rural plats are residential, and hence these were selected for the analysis. In addition, parcels suspected of being nonresidential from the information collected by ACD were eliminated after verification with local assessors.

<sup>11</sup> An alternative measure of equity is the median assessment to sales-price ratios of the jurisdiction which would measure uniformity across jurisdictions and compliance with the state standard of 20%. Since most services funded from the property tax are locally provided, however, equity is dependent on assessment uniformity within the local jurisdiction rather than uniformity across the state. Even though a jurisdiction assesses at 10% of market value instead of the state-mandated 20%, property owners would shoulder their fair share of the tax burden for local services to the extent that properties are assessed at the same 10% ratio. The coefficient of intra-area dispersion measures this aspect of uniformity within each jurisdiction.

<sup>12</sup> The coefficient is calculated about the median ratio, and not the mean, to minimize the influence of serious measurement errors and the possible inclusion of nonresidential property in the data set. It has been criticized for its statistical properties and for the nonrandom sample of parcels from which it is derived, but it is a widely used measure of uniformity in the absence of acceptable alternatives. See *Analyzing Assessment Equity*, 1977.

nonuniformity deemed acceptable by tax authorities, while one-half have coefficients of 40% or more.

Consistent with prior studies, the natural log of the coefficient is used in the test for both theoretical and statistical reasons. Theoretically, the logarithmic transformation is a better measure of assessment improvements than the absolute values of the coefficient. From the perspective of assessment effort, an improvement in uniformity from a CD of 60 to 50 is not as easy to achieve as an improvement from 20 to 10; as assessment uniformity increases, an additional 10-point improvement requires more effort and is more difficult to achieve. A more plausible interpretation is that a 10% improvement on a base of 60 (from 60 to 54) requires a comparable effort as a 10% improvement on a base of 20 (from 20 to 18); the natural log takes these relative differences into account. Statistically, the absolute values of the coefficient are truncated from below at zero and its distribution is skewed to the right, whereas the natural log is more normally distributed (on both points see Geraci and Plourde, 1976: 240; Bowman and Mikesell, 1977: 139).

The results of the OLS regression are shown in Table 2, along with the hypothesized signs for each factor. A negative relationship indicates that a factor contributes to uniformity, and vice versa. With an  $R^2$  of .45, six factors and the interaction term are significant in both one- and two-tail tests at the .05 level, but two factors are contrary to expectations. Rather than contributing to less assessment uniformity, Urbanism and Black Housing are associated with more uniformity. Also contributing to more uniformity are Assessor Workload, Partisan Competitiveness and the interaction term. As expected, Public Wealth and Assessor Instability are not significant.

The finding for Assessor Workload is interesting in light of conflicting interpretations of its influence on assessment uniformity. On the one hand, jurisdictions with more parcels and a more varied mix of properties increase the burdens of the assessor which contribute to less uniformity. The results, on the other hand, support the traditional reform literature's argument that larger assessment jurisdictions -- with larger workloads -- have economies of scale and greater resources to support larger and professionally trained staffs, functional specialization and modern assessment tools and practices, all of which contribute to uniformity. This interpretation also is consistent with incomplete data indicating that counties with the highest factor scores on this dimension also employ more deputy assessors and appraisers.

The contrary results involving Black Housing and Urbanism are puzzling. Both were expected to magnify the problem of making accurate assessments, and hence be constraints on improving assessment uniformity. Rather than constraints, the evidence suggests that they contribute to uniformity. The possible explanations are speculative. The hypothesis for Urbanism was that urban areas, with their more complex economies, have a more heterogeneous mix of property classes and within-class variation, both of which increase assessment difficulty and nonuniformities. The mix of property classes, however, may not be important when the



Table 2. Coefficients for the OLS Regression of the Natural Log of the Coefficient of Intra-Area Dispersion

| <u>Variable<sup>a</sup></u>                              | <u>Estimate<sup>b</sup></u> | <u>Standard Error</u> |
|--|-----------------------------|-----------------------|
| Intercept  | 3.713*                      | .034                  |
| Assessor Workload (?)                                    | -.110*                      | .035                  |
| Black Housing (+)  | -.071*                      | .035                  |
| Farm Land (-)  | -.103*                      | .035                  |
| Urbanism (+)   | -.137*                      | .035                  |
| Public Wealth (?)  | .025                        | .035                  |
| Partisan Competitiveness (-)                             | -.104*                      | .035                  |
| Assessor Instability (?)                                 | -.038                       | .036                  |
| (Partisan Competitiveness<br>x Assessor Instability) (-) | -.109*                      | .037                  |

<sup>a</sup>Signs in parentheses indicate the hypothesized relationship.

<sup>b</sup>\*Statistically significant at the .05 level.

focus is on residential parcels as in this study. Indeed, the urban assessor may have difficulties in accurately assessing the industrial and commercial properties in the jurisdiction. But the difficulties in accurately assessing urban residential parcels may be mitigated by a larger volume of sales yielding information on the market value of comparable properties as compared to rural areas. Moreover, the difficulties may depend on the degree to which housing varies on characteristics affecting its market value. And contrary to the usual assumption, it is possible that urban areas have relatively less variation on housing characteristics than rural, especially in the developing South with newly emerging urban centers. At least, a closer examination of the elements in Factor IV suggests this explanation. Some elements do indicate that urban counties have more complex economies and heterogeneous mix of property types. But the more urban counties with their greater affluence also have higher proportions of newer and higher-value housing and lower proportions of dilapidated, crowded and low-value housing which is difficult to assess accurately. In effect, the loadings suggest that the urban assessor may have an easier task than his rural counterpart in assessing residential properties, thereby explaining the association of Urbanism with uniformity.

This explanation may have to be modified in light of the finding for Black Housing. Counties with both large Black populations and large quantities of poor housing do not have less uniformity as hypothesized. This expectation was based on case studies indicating that higher incidences of dilapidated, crowded and low-value housing occupied by low-income Black families contribute to less uniformity because a) the infrequent sales of such properties yield little information on the market value of comparable properties, and b) assessors discriminate against such properties by use of a benefit principle or by exercising less diligence in assessing market values. It is possible, however, that jurisdictions with large stocks of poor housing have sufficient sales to make more accurate assessments of comparable properties. Moreover, elected assessors of jurisdictions with high proportions of Blacks and Black-owned housing may exercise more diligence in assessing low-quality housing due to the threat of numerous assessment appeals and/or opposition votes at the polls.

Moreover, the explanation regarding assessment difficulty in rural versus urban areas may have to be modified in light of Farm Land. Compared to other rural areas, counties with more productive agricultural lands appear to be associated with more even distribution of wealth and more homogeneous housing stock which is easier to assess accurately, thereby contributing to assessment uniformity.

Given the frustrations of political scientists in identifying characteristics of political systems which have an independent effect on policy, the results for Partisan Competitiveness are gratifying. Controlling for numerous social, economic and demographic variables embedded in the other factors, electoral competition does affect an important local policy outcome. Counties with more competition for the races of assessor and other offices have more uniform assessments, suggesting the importance of contested elections or the threat of competition in keeping officials responsible to voters. Moreover, competition has an added effect in conjunction with Assessor Instability. The latter by itself is not significant and positive. Turnover in the assessor's office in general does not affect uniformity, but the joint occurrence of turnover and competition does improve uniformity. Thus, competition contributes to uniformity, and the contribution is even greater when associated with changes in office.

## Conclusion

While two hypotheses are not supported by the data, the results are suggestive of the importance of the economic, political and social environment for assessment uniformity, which is a prerequisite for property tax equity. The nonuniformities in Arkansas' taxing jurisdictions are substantial, and to a large degree the differences are associated with different dimensions of the tax assessors' environments. As such, these environments may act either as a set of constraining or facilitating conditions for the improvement of assessment uniformity and

equity. This is not to denigrate the importance of improvements in the assessment methods and procedures of local assessors in reducing non-uniformities to acceptable levels. The extent to which such improvements in the assessment system are successful, however, may well depend upon the configuration of the environmental dimensions in which the assessment system must function.

From a policy perspective, the results warrant a note of optimism for achieving greater equity in property taxation. The bundle of elements which compose the Assessor Workload, Black Housing and Urbanism dimensions have been thought to contribute to greater difficulty in making accurate assessments and hence to less uniformity. In Arkansas, at least, they are not unconquerable obstacles; jurisdictions which are high on these dimensions also have more uniform assessments. This conclusion may not be generalizable to jurisdictions with lower levels of nonuniformities. These three subdimensions of assessment difficulty may be relatively easy to overcome by local assessors at the high levels of nonuniformity found in Arkansas' jurisdictions, but are more difficult as assessment uniformity improves. In effect, there may be a curvilinear relationship between uniformity and the three dimensions, and at some threshold of uniformity the relationships may change signs. This may account for the divergence in the findings between this and other studies (cf. Geraci and Plourde, 1976; James, 1975; Bowman and Mikesell, 1977).

The impact of the political process upon assessment uniformity is especially interesting. Finding that party competition contributes to uniformity both directly and indirectly through assessor turnover should be a caveat to those who would take the assessor's office from the partisan arena and neutralize the office as a professionalized administrative bureau. The finding also points to the importance of political processes for an important local policy outcome, a relationship which oftentimes has been masked in studies of the determinants of state and local policies.

The limitations of our study must be acknowledged. The sample of taxing jurisdictions here is actually the universe of such jurisdictions in Arkansas. Only similar studies elsewhere can extend the generalizability of the findings. Moreover, the variance in assessment uniformity among jurisdictions is only partially explained by environmental factors. With 55% of the variance unexplained, a more definitive study of the relative impact of these factors in combination with the practices and procedures of assessors remains to be done. Prior comparative studies of the assessment system use a few single-trait indicators to operationalize the environments of local assessors. Our factor analysis suggests that these indicators typically are surrogate measures of the same environmental dimension while other dimensions which we found to be important are overlooked and not controlled statistically in the analysis. In effect, our findings suggest that the environment surrounding tax assessors and affecting tax equity is more complex and consists of more dimensions than has been tapped in previous studies. On the basis of

these results we would argue that a more definitive study of the relative impact of the environment and assessment system must incorporate a more systematic conceptualization and measurement of the environmental factors impinging on tax equity. This study points to one direction the effort may take.

## References

- Aaron, H.J. (1975). *Who Pays the Property Tax? A New View*. Washington, D.C.: The Brookings Institute.
- \_\_\_\_\_. Comment on Gloudman's "Nonparametric Statistics and the Measurement of the Assessment Performance," (1977). In *Analyzing Assessment Equity*. Chicago: International Association of Assessing Officers.
- Advisory Commission on Intergovernmental Relations (ACIR) (1963). *The Role of the States in Strengthening the Property Tax*. Washington, D.C.: Government Printing Office.
- Almy, R.R. (1977). "The Impact of Assessment Performance" in *Analyzing Assessment Equity*. Chicago: International Association of Assessing Officers.
- Analyzing Assessment Equity* (1977). Chicago: International Association of Assessing Officers.
- Assessment Principles* (1937). Chicago: National Association of Assessing Officers.
- Black, D.E. (1972). "The Nature and Extent of Effective Property Tax Rate Variation Within the City of Boston," *National Tax Journal* 25.
- Booms, B.H., and Halldorson, J.R. (1973). "The Politics of Redistribution: A Reformulation," *American Political Science Review* 67.
- Bowman, J.H. and Mikesell, J.L. (1977). "Uniform Assessment of Property: Returns from Institutional Remedies," *National Tax Journal* 30.
- Dye, T.R. (1979). "Politics Versus Economics: The Development of the Literature on Policy Determination," *Policy Studies Journal* 7.
- Engle, R.F. (1975). "De Facto Discrimination in Residential Assessments: Boston," *National Tax Journal* 28.
- Fry, B.R. and Winters, R.F. (1970). "The Politics of Redistribution," *American Political Science Review* 64.
- Geraci, V.J. and Plourde, J.L. (1976). "The Determinants of Uniform Property Tax Assessment," *Assessors Journal* 11.
- James, F.J. (1975). "Assessment Procedures, Community Characteristics, and the Accuracy of Property Tax Assessments: Preliminary Findings," *International Property Assessment Administration* 8.
- Key, V.O., Jr. (1964). *Politics, Parties and Pressure Groups*. New York: Thomas Y. Crowell.
- Lockard, D. (1959). *New England State Politics*. Princeton, New Jersey: Princeton University Press.

- Lowery, D. (1982). "Public Choice When Services are Costs: The Divergent Case of Assessment Administration," *American Journal of Political Science*, 26.
- Lynn, A., Editor (1969). *The Property Tax and Its Administration*. Madison: University of Wisconsin Press.
- Netzer, D. (1966). *Economics of the Property Tax*. Washington, D.C.: The Brookings Institute.
- Oldman, O. and Aaron, H. (1965). "Assessment-sales Ratios Under the Boston Property Tax," *National Tax Journal*, 18.
- Paglin, M. and Fogarty, M. (1972). "Equity and the Property Tax: A New Conceptual Focus," *National Tax Journal*, 25.
- Paul, D. (1975). *The Politics of the Property Tax*. Lexington, Mass.: Lexington Books.
- Peterson, G.E., et. al. (1973). *Property Taxes, Housing and Cities*. Lexington, Mass.: Lexington Books.
- Savage, R.L. and Gallagher, R.J. (1977). "Politicocultural Regions in a Southern State: An Empirical Topology of Arkansas Counties," *Publius*, 7.
- \_\_\_\_\_ and Price, J.P. (1980). "Regionalism in Two Southern States: An Exploratory Study of Intrastate Politicocultural Cleavages," *Arkansas Political Journal*, 1.
- Schroeder, L.D. and Sjoquist, D.L. (1976). "An Investigation of the Causes of Variations in Property Tax Assessments," *Assessors Journal*, 11.
- Shannon, J. (1967). "Conflict Between State Assessment and Local Assessment Practice," in R.W. Lindholm (Ed.), *Property Taxation, USA*. Madison: University of Wisconsin Press.
- Thompson, A. (1978). "Sales ratio study," an unpublished memorandum to M. Russell, Director, Arkansas Assessment Coordination Division. Little Rock, July 28.
- U.S. Bureau of the Census (1978). *1978 Census of Governments, Vol. 2, Taxable Values and Assessment-sales Price Ratios*. Washington, D.C.: Government Printing Office.