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Intercounty Differences in West Virginia Government Expenditures

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CHAPTER I

PRINCIPAL FINDINGS AND RECOMMENDATIONS

FINDINGS

Fiscal Capacity and Effort. When compared with the national average, West Virginia ranks extremely low in per capita measures of public expenditures and fiscal capacity, while the tax effort exerted by state residents is average at best. Consequently, if public service levels in West Virginia are ever to "catch up," substantially more federal assistance and a much greater fiscal effort will be required.

Distribution of Expenditures. Financial support for the education, highway, and welfare programs is highly centralized in West Virginia. This centralization plus legal restrictions on local government sources of revenue has led to a distribution of the public budget in which the proportion devoted to these three functions exceeds the national average, while relative spending for services which by tradition are financed locally (police, fire, refuse collection, local roads and streets, etc.) is generally below the national average.

Variations in Expenditures. Because of the overwhelming importance of state and federal aids and direct expenditures in West Virginia, the identification of a set of factors which explains variations in total expenditures made in counties necessarily involves the identification of a set of factors which explains intercounty variations in state and federal fiscal activity. In effect, state government policy determines the nature of the among-county distribution of per capita total public expenditures. In fact, this distribution is sufficiently equalizing to create an inverse relationship between per capita income and per capita *total* public expenditures in counties. Conversely, when only government expenditures from local sources are examined, factors such as income level and degree of urbanization—which reflect need, and perhaps preference differentials—are observed to be significant determinants of the level of per capita spending.

An analysis of intercounty education expenditures shows that the higher income counties made a concentrated effort to increase expenditures from their own sources over the 1957-1962 period. Conversely, it is found that in counties where the relative importance of state and federal education aids is greater (the lower income counties), per capita education expenditures from local sources are generally smaller. Consequently, there may be a substitution of state and federal funds for local funds for the education function in West Virginia.

Per Capita Expenditure Variations. Per capita expenditures from local sources for the state as a whole increased at a greater rate than did either per capita income or per capita assessed value over the 1951-1964 period. However, in the more highly urbanized areas (which were experiencing increases in population), the rate of growth in per capita expenditures from local sources was less than that in per capita income. This raises the possibility that for these areas, local government services did not rise adequately to meet the demand for greater scope and quality of public facilities.

Balancing Fiscal Capacity and Efforts. Over the 1951-1964 period, population declined in a majority of the West Virginia counties. Given the reasonable assumption that the out-migrants were primarily from the lower income stratum, it is likely that population movements in the state have generally resulted in a better overall balance between per resident demand for and per resident ability to finance a given level of public services.

Subregional Fiscal Capacity and Effort. An examination of fiscal activity in each of nine West Virginia subregions indicates that those regions which have the lowest scope and quality of locally financed services have a lower fiscal effort and historically have done the least to improve public service levels. This means that these subregions will continue to fall further behind the rest of the state unless relatively greater amounts of outside assistance are funneled into the regions, or unless a method is found to induce the local governments in these regions to increase fiscal effort. The converse of this is also true, that is, local governments in those regions which have the highest levels of public services are making the greatest effort to increase the scope and quality of locally financed services. Consequently, given current trends, by 1970 they will far outstrip their less wealthy and less motivated neighbors.

RECOMMENDATIONS

Specification of Goals. The state government should define the role of the state-local public sector in the long run economic development of the state; consequently, the policy governing the future distribution of aids and direct expenditures within the state should reflect this role. The real cost of an equalization policy can best be measured in terms of the public services foregone in urban areas. If, as is generally concluded, the future of the state lies in economic development of the growth areas, it is not reasonable to continue to favor rural areas with relatively heavy public investment. Given the scarce financial resources available in West Virginia, it is not possible to simultaneously equalize public service activity within the state and adequately stimulate development of urban (growth) areas.

Since low levels of public services may discourage the location of industry in West Virginia urban areas, the state government should take steps to remove the legal barriers which restrict the sources of local government revenue or reduce the degree to which the distribution of direct state assistance is equalizing.

Impediments to Improvements in Local Functions. The low level of local public services in West Virginia is partially a result of legal restrictions on local government sources of revenue and partially a result of below average fiscal effort in many areas of the state. There is a strong possibility that increased amounts of federal aid will become available to states in the near future, but in West Virginia there exists no mechanism through which these funds may be used to upgrade the levels of such local functions as police and fire, roads and streets, sewage and sanitation, and parks and recreation. Consequently, the authors recommend the following:

1. The state should institute a system of grants-in-aid to municipal governments which could be used at the discretion of the local government to improve the level of public services. These grants should be distributed on a per capita basis to those municipalities which meet the requirement of maintaining a specified level of fiscal effort. This would tend to make the overall distribution of state assistance less equalizing.

2. Municipal governments should be permitted to levy a tax on personal income, the burden of which the taxpayer could partially shift to the state government through the use of a state-local tax credit. Under the tax credit proposal, the taxpayer would be allowed to deduct from his state income tax payment a substantial percentage of his local income tax payment. This would enable the municipality to levy a personal income tax with the net effect of shifting some predetermined portion of taxpayer burden to the state government.

   Since this credit will result in a reduction in revenues from the state personal income tax, the magnitude of increased federal assistance to the state will affect the state decision on the size of the tax credit. The advantages of such a plan are: (a) fiscal effort will automatically increases in those municipalities which choose to initiate a local income tax, (b) since the level of personal income is a reasonable measure of the level of demand for public services, increased demands will automatically generate increased local government revenues, and (c) since the credit is allowed against income, the more highly urbanized areas, which have the greater potential for economic growth, will benefit most.

CHAPTER II

INTRODUCTION

Recent economic forecasts suggest the continued spectacular growth in state and local government expenditures and most agree that the receipts of these governments will not rise adequately. Joseph Pechman[1] estimates state-local government spending at $103 billion in 1970—$15 billion above the projected level of state-local receipts. Dick Netzer[2] estimates revenue needs at $122 billion and sees a $10 billion gap between revenues and expenditures. He calculates that state-local governments would need to increase tax *rates* by 18.5 per cent to reach the $122 billion level. A slightly different view is taken by Selma Mushkin and Gabrielle Lupo[3] who estimate 1970 requirements at $122 billion but contend that the projected gap may not appear *if* federal grants under the present system double and a rise in gross borrowing by state and local governments occurs.

Regardless of discrepancies in these statistical forecasts, the needs of state and local governments are real. Among the many problems in need of attention are air and water pollution, inadequacies in the quality and quantity of public education, inadequate streets, sidewalks, sewers, and police protection. Walter Heller, former chairman of the Council of Economic Advisors, suggests that before one jumps to the complacent conclusion that state-local needs can be met without undue strain

> . . . let him probe the reality that lies behind and beneath the statistics he uses as a point of departure. Let him find a single major city or state that is not under fiscal duress, that can meet its pressing needs and aspirations without fiscal heroics.[4]

To meet the pressing needs at the state-local level, a number of institutional and procedural changes have been proposed and in some cases implemented to either relieve the fiscal pressure on these governments or make the decision-making process and program implementation more efficient. Among these developments are (a) proposed new dimensions in intergovernmental fiscal relations such as tax credits to states and block grants, (b) program budgeting, (c) legislative reapportionment, and (d) areawide planning and governmental reorganization. However, a prerequisite to the success of any of these measures is a fairly detailed knowledge of the trend and pattern of public expenditures within the state. The primary goal of this paper is to provide that information.

OBJECTIVES

If the factors which are most closely associated with differences among governments in the level of per person expenditures could be identified, several desirable objectives could be attained. State and federal aids could be distributed more efficiently to local governments on a needs basis; local governments could forecast needs and requirements more accurately; and a more meaningful integration of fiscal and physical planning could be accomplished. However, public expenditure decisions at the local level are shaped by the actions and interactions of a wide range of economic, political, sociological, and physical forces; consequently, economists have met with varying degrees of success in attempting to identify empirically and quantify the "determinants" of state and local government spending both among states and among jurisdictions within states.[5]

Implications of intrastate studies of this type are especially relevant to problems of evaluating the effectiveness of the state's distribution of funds among local governments. If the distribution of funds by the state is found to be inconsistent with the objectives of an aid program, questions arise as to whether or not federal aids should be direct federal-local, and whether or not the "conditional" nature of most federal aids is desirable. An adequate evaluation of the effects of alternative intergovernmental grant schemes in West Virginia would require a thorough knowledge of the pattern of public expenditures within the state. For example, before one can evaluate the equalization features of aids to local governments, the nature and magnitude of existing intercounty variations in public service levels must be identified.

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[1] Joseph A. Pechman, "Financing State and Local Government," Proceedings of a *Symposium on Federal Taxation* (New York: The American Bankers Association, 1965), p. 76.

[2] Dick Netzer, "State-Local Finance in the Next Decade" (unpublished manuscript for the Committee for Economic Development, Washington, August 1965).

[3] Selma Mushkin and Gabrielle Lupo, "Project '70," *State and Local Finances Project* (Washington: Council of State Governments, 1966), p. 46.

[4] Walter Heller, "Federal Block Grants to States and Cities: One View" (unpublished manuscript for the CUE Conference on Urban Economics, Washington, January 1967), p. 3.

[5] The authors have identified over 40 multivariate analyses of public expenditures. The results of some of the more relevant works, especially those of an intrastate nature, will be discussed at a later point in the text.

The major objective of this study is to provide government decision-makers with a reasonably complete description and analysis of the trend and pattern of West Virginia state and local government spending. To the extent this objective is accomplished, it will be possible to suggest answers to the following questions:

1. What are the underlying factors which determine intercounty differentials in public expenditures, and how do these factors differ between West Virginia and other states?
2. To what extent are public service levels being equalized among counties within the state, and how would intergovernmental uniformity of fiscal effort affect intrastate disparities in per capita expenditures?
3. How does the county-to-county pattern of spending *by local governments* differ from the pattern of spending by all levels of government?
4. Does the long-term trend in per capita expenditures of local governments reveal movements toward equalization among counties, economies of scale, and greater homogeneity of fiscal capacity and effort?
5. What are the relative merits of the alternative solutions to the problem of alleviating increasing fiscal problems of local governments? To what extent are local governments in West Virginia capable of satisfying expenditure requirements from their own revenue sources? Has the present method of shifting functional responsibility from local to state government resulted in equalizing public service levels?

OUTLINE OF THE ANALYSIS

Much effort has been devoted to analyzing interstate variations in per capita state and local government expenditures to measure the degree of interstate expenditure equalization brought about by the existing federal grants program and to identify the reasons for interstate differences in per capita expenditures, e.g., economies of scale or different preference patterns. In this study, a parallel type of analysis is applied on an intrastate basis, where the *physical unit* of analysis is the county area and the *spending unit* is either an aggregate of all governments making expenditures in the county or an aggregate of local governments in the county.

The remainder of this chapter involves a comparison of activity in the public sector in West Virginia relative to that of the United States as a whole. Once the levels of public expenditures, fiscal capacity, and fiscal effort for the state relative to those of the nation are established, the variability of these fiscal characteristics within the state (among counties) may be examined. Accordingly, Chapter III involves a detailed description of county-to-county differences in per capita expenditures and in selected indicators of fiscal capacity and tax effort. Data are examined for the years 1957 and 1962. In Chapter IV, several statistical models are tested in an attempt to identify and measure those underlying factors which are closely related to intercounty differences in per person public expenditures in 1957 and 1962. Conversely, in Chapter V the pattern of West Virginia public spending over the past 15 years is examined, using a time series application of regression analysis. Consequently, Chapter IV is addressed to the problem of determinants of *differences* among counties in per capita expenditures, while in Chapter V the concern is the determinants of *changes* in per capita expenditures. Stated another way, the analysis of Chapter IV "explains" county-to-county differences in per person expenditures but gives little information about the pattern of public expenditures in a given county, while in Chapter V the focus is on the long-term trend within individual counties. In Chapter VI a summary of the empirical findings is presented, together with an examination of the implications of alternative possibilities for equalizing public service levels and thereby advancing state development.

DATA AND METHOD

Most data used in this study are secondary. Municipal and county expenditures are taken from the *Budget Levy Estimates*[6] compiled by the West Virginia State Tax Commissioner's Office, education data from the *Annual Reports*[7] of the West Virginia State Superintendent of Schools, highway data from the West Virginia State Road Commission *Annual Reports*,[8] and welfare expenditure data from the West Virginia State Department of Public Assistance *Annual Reports*.[9] For the cross-section analyses of 1957 and 1962 data, expenditures are adjusted to exclude capital outlays where possible.

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[6] "County Court Levy Estimates," 1956-1957 and 1961-1962 (unpublished data submitted by county court clerks to West Virginia State Tax Commissioner, Charleston, West Virginia, 1956-1957 and 1961-1962).

[7] State of West Virginia, *Report of the State Superintendent of Free Schools of the State of West Virginia*, July 1, 1956-July 1, 1957 and July 1, 1961-July 1, 1962 (Charleston: Department of Education, 1957, 1962).

[8] State of West Virginia, *Annual Report of the State Road Commission of West Virginia*, July 1, 1956-July 1, 1957 and July 1, 1961-July 1, 1962 (Charleston: State Road Commission, 1957, 1962).

[9] State of West Virginia, *Annual Report of the West Virginia State Department of Public Assistance*, July 1, 1956 to June 30, 1957 (Charleston: Department of Public Assistance, 1957) and same report, now given in Statistical Supplement to *Annual Report of the West Virginia Department of Welfare*, July 1, 1961 to June 30, 1962 (Charleston: Department of Welfare, 1962).

The analyses of Chapters IV and V are based on relatively standard multivariate regression and time series techniques. While a thorough knowledge of statistical inference is not necessary for understanding the results of this study, a more technical presentation of the statistical analysis is included for those who wish to follow the line of reasoning behind the results.

EXPENDITURES, CAPACITY, AND EFFORT IN WEST VIRGINIA

In 1963, West Virginia ranked 41st among the states in per capita income and 46th in per capita state and local expenditures less federal grants.[10] While the relative growth in per capita government spending in West Virginia has been slightly above the national average (see column 4 of Table 1), the level of per capita public expenditures is generally lower than that of surrounding states and considerably below the national average. However, on the basis of the comparative public expenditure-personal income ratios shown in column 3 of Table 1, it may be suggested that the relative preference for public versus private spending is approximately the same among West Virginia residents as among those of surrounding states, i.e., these states differ little in the proportion of income which is devoted to state and local expenditures. But again, West Virginia governments spend less per dollar of income than the 50-state average.

Distribution of Public Expenditures Among Functional Categories

The proportion of the public budget devoted to education, public assistance, and highways in West Virginia exceeds the national average, while relative spending for services which by tradition are financed locally (police, fire, sanitation, local roads and streets) is generally below the national average (see Table 2). These results are not unexpected, given the rural-low income character of the state's population, the incentive provided by the federal government to increase state spending on highways, and the level of federal public assistance grants.

The change between 1957 and 1962 in the relative distribution of expenditures (see Table 2) indicates that the emphasis on welfare and highways increased in West Virginia, while the nationwide proportions devoted to these functions fell. For all state and local governments in the United States, proportional emphasis was shifted away from the highway and welfare functions to the education program. By contrast, in West Virginia, the proportions of total resources devoted to welfare and to highways increased while the proportion devoted to education declined. Government administrators, in reallocating total expenditures among functions, should attempt to maximize the net benefits received for the marginal dollar of public funds spent. If such an attempt was made in West Virginia, the administrators concerned apparently believed that greater gains would result from shifting funds to welfare and highways than from shifting funds to education. However, since federal public assistance and highway grants are conditional aids, the responsibility for this reallocation decision does not lie entirely with the West Virginia state and local governments.

TABLE 1

COMPARISON OF PER CAPITA STATE AND LOCAL GOVERNMENT GENERAL EXPENDITURES (LESS FEDERAL GRANTS) AND FISCAL EFFORT* UNITED STATES, WEST VIRGINIA AND SELECTED STATES, 1963

State	Per Capita Expenditures†	Per Capita Income†	Fiscal Effort*	Per Cent Increase in Per Capita Expenditures 1957-1963
United States	$300	$2,366	$0.13	40.2
West Virginia	196	1,810	0.11	44.1
Kentucky	239	1,712	0.14	77.1
Tennessee	199	1,702	0.12	45.2
North Carolina	197	1,732	0.11	44.8
Pennsylvania	271	2,363	0.11	47.3
Ohio	263	2,392	0.11	27.7
Virginia	233	2,018	0.12	42.1

*State and local government expenditures from own sources per dollar of personal income.

† The per capita expenditure data are figured on the basis of the fiscal year ending in 1963. The income data are figured on the basis of the calendar year 1962.

Sources: Expenditures from U.S. Bureau of the Census, *Governmental Finances in 1963* (Washington: Government Printing Office, November 1964) and U.S. Bureau of the Census, *U.S. Census of Governments: 1957*, Vol. III, No. 5, Compendium of Government Finances (Washington: Government Printing Office, 1959). Income data from James A. Maxwell, *Financing State and Local Governments* (Washington: Brookings Institution, 1964), p. 251, table citing *Social Security Bulletin* (June 1964), p. 21.

Fiscal Capacity in West Virginia

The Advisory Commission on Intergovernmental Fiscal Relations has undertaken the task of developing appropriate measures of the relative fiscal capacity of states[11] and has tentatively proposed two separate indexes or measures. First, since state and local taxes are partially related to personal income,

[10] Federal aids are subtracted from expenditures in order to compare interstate expenditures of funds raised from internal sources (see Table 6).

[11] Advisory Commission on Intergovernmental Relations, "Measures of State and Local Fiscal Capacity and Tax Effort" (A staff paper prepared by the Advisory Commission on Intergovernmental Relations, Washington, 1962).

TABLE 2

PER CENT DISTRIBUTION OF STATE AND LOCAL GOVERNMENT GENERAL EXPENDITURES (INCLUDING FEDERAL GRANTS) WEST VIRGINIA AND UNITED STATES 1957 AND 1962

Function	WEST VIRGINIA 1957	WEST VIRGINIA 1962	WEST VIRGINIA Change in Percentage	UNITED STATES 1957	UNITED STATES 1962	UNITED STATES Change in Percentage
Education	40.7	37.9	−2.8	35.0	36.9	+1.9
Financial Administration and General Control	3.9	3.5	−0.4	4.3	3.9	−0.4
Police	2.4	2.1	−0.3	3.6	3.5	−0.1
Health and Hospitals	6.1	5.2	−0.9	7.9	7.2	−0.7
Highways	19.4	21.3	+1.9	19.4	17.2	−2.2
Public Welfare	11.4	13.7	+2.3	8.4	8.4	0.0
Interest on Debt	3.5	2.6	−1.1	2.7	3.3	+0.6
Sanitation	2.0	3.2	+1.2	3.6	3.2	−0.4
Fire	1.1	1.0	−0.1	2.0	1.9	−0.1
Other and Unallocable	9.5	9.5	0.0	13.1	14.5	+1.4
TOTAL	100.0	100.0	----	100.0	100.0	----

Source: U.S. Bureau of the Census, *U.S. Census of Governments: 1957*, Vol. III, No. 5, Compendium of Government Finances (Washington: Government Printing Office, 1959).

partially to income produced, and partially to corporate income, an index combining these three was constructed to reflect more accurately the total income flow available to states for tax purposes. By this composite income index, West Virginia ranked 38th among the 50 states.

A second, more direct, approach to the measurement of fiscal capacity is to evaluate the bases available for taxation in each state and then to estimate the amount of revenue each could raise if all applied a uniform tax system. Using this criterion, the ACIR found West Virginia ranked 41st among the states. Given this low level of fiscal capacity, the question is not whether West Virginia will need continued federal assistance to upgrade public services to some national minimum standard, but rather what will be the optimal method by which to distribute these aids in the state.

Fiscal Effort in West Virginia

While measures of fiscal capacity are intended to gauge the taxable resources at the disposal of a jurisdiction, tax effort refers to the extent to which the jurisdiction uses this capacity to raise revenue through taxation. A moderately good measure of tax effort may be derived by dividing actual state and local tax collections by some measure of fiscal capacity. Using 1960 data, the ACIR found West Virginia to rank 31st in tax effort when the composite income index was used as the capacity measure, and 18th when the representative tax system was used as the base. This would seem to suggest that West Virginia's fiscal problems may be due less to an unwillingness of residents of the state to finance a higher level of public services, than to the limited fiscal capacity of the state.

INTERGOVERNMENTAL RELATIONS IN WEST VIRGINIA

Government fragmentation is much less a problem in West Virginia than in the nation as a whole since public services are financed through a relatively small number of government units (225 municipalities, 55 county governments, 55 school districts, and 32 special districts in addition to the state and federal government). Table 3 shows that the relative importance in West Virginia of the traditional subdivision of local government (municipalities, counties, special districts, and townships), in terms of expenditures made, is decidedly below the national average. A comparison of the distribution of fiscal responsibility between the state government and local governments in West Virginia as opposed to the nation as a whole (see Table 4) also suggests a much greater degree of state government functional centralization.

Aspects of intergovernmental fiscal relations which are relevant to the present analysis concern federal-state relations and state-local relations. Federal-local and inter-local governmental fiscal interactions are not considered because they are either insignificant in size in West Virginia or the nature of the relationship is not essential to the present study.

TABLE 3

EXPENDITURES OF LOCAL GOVERNMENTS* BY TYPE OF AREA AND GOVERNMENT WEST VIRGINIA AND UNITED STATES 1962

	WEST VIRGINIA		UNITED STATES	
	Amount (Millions of dollars)	Per Cent	Amount (Millions of dollars)	Per Cent†
Distribution by Area				
Within SMSA's	85	39.3	27,885	69.6
Outside SMSA's	132	61.7	12,172	30.4
TOTAL	217	100.0	40,057	100.0
Distribution by Type of Government				
Counties	24	11.0	8,690	21.7
Municipalities	55	25.3	13,457	33.6
School Districts	135	62.4	14,867	37.1
Special Districts	3	1.3	2,112	5.3
Townships	------	------	1,632	4.1
TOTAL	217	100.0	40,057	100.0

*Includes intergovernmental grants.
†May not add to 100 because of rounding errors.
Source: U.S. Bureau of the Census, *U.S. Census of Governments: 1962*, Vol. IV, No. 4, Compendium of Government Finances (Washington: Government Printing Office, 1964).

TABLE 4

GOVERNMENT EXPENDITURES BY FINAL SPENDING UNIT AND FUNCTION WEST VIRGINIA AND UNITED STATES 1962

	WEST VIRGINIA (Millions of dollars)		WEST VIRGINIA State / Local	UNITED STATES State / Local
Function	State	Local		
Total	248.4	202.3	1.23	0.51
Education	39.4	133.7	0.29	0.24
Welfare	60.1	2.5	24.00	0.97
Health and Hospitals	14.2	12.0	1.18	0.99
Highways	91.4	5.8	15.76	1.79
Police and Fire	2.0	12.0	0.17	0.10

Source: U.S. Bureau of the Census, *U.S. Census of Governments: 1962*, Vol. IV, No. 4, Compendium of Government Finances (Washington: Government Printing Office, 1964).

Federal-State Relations

In 1962, approximately one-fourth of West Virginia's state government revenues were in the form of federal grants-in-aid. Though over half of the $85 million in grants was for public assistance, aids for highways and education also constituted significant amounts (see Table 5). In an attempt to explain more thoroughly the net effect of federal aids, Maxwell has computed a measure of income redistribution attributable to federal grants, by subtracting from federal grants to states the amounts of federal taxes collected from states to pay for these grants.[12] He found the per capita redistribution for West Virginia to be a positive $48, fifth highest in the United States, ranking behind Alaska, Wyoming, Montana, and New Mexico. This means that there is a net inflow of federal funds into West Virginia amounting to $48 per resident.

TABLE 5

FEDERAL FUNDS RECEIVED BY WEST VIRGINIA STATE GOVERNMENT 1962

Program	Amount (In thousands of dollars)	Per Cent
Roads	$24,390	28.47
Welfare	45,275	52.85
Vocational Rehabilitation	2,483	2.90
Vocational Education	645	0.75
Veterans Training	3	0.00
Veterans Education-Federal Reimbursement	28	0.03
State Health Department	2,669	3.12
Department of Agriculture	73	0.09
Hot Lunch Program	1,800	2.10
Employment Security Administration	3,169	3.70
Department of Natural Resources	668	0.78
Department of Civil Defense and Flood Funds	1,057	1.23
West Virginia Library Commission	153	0.18
Department of Mental Health	69	0.08
Department of Education	865	1.01
West Virginia University	1,882	2.20
West Virginia University Medical Center	434	0.51
TOTAL	$85,662	100.00

Source: State of West Virginia, *Budget Document for the Fiscal Year, July 1, 1963 to June 30, 1964* (Board of Public Works, 1964).

Many would argue that the federal grants program is not designed to equalize interstate income disparities, but rather to equalize interstate differences in public service levels. However, in 1963, West Virginia received $54 per capita in federal grants (the national average is $44), yet ranked 46th in per capita expenditures from own sources and also 46th in total per capita expenditures (including federal aids). Consequently, the interstate equalizing effect of aids on West Virginia public expenditures is negligible.

State-Local Relations[13]

As noted above, West Virginia is characterized by a high degree of administrative centralization, especially with respect to the highway, education, and

[12] James A. Maxwell, *Financing State and Local Governments* (Washington: Brookings Institution, 1964), pp. 63, 253.
[13] Claude J. Davis, *et. al., West Virginia State and Local Government* (Morgantown, West Virginia: Bureau for Government Research, West Virginia University, 1963), Chapter 2.

welfare functions. As in Delaware and North Carolina, responsibility for the highway system is completely concentrated in the hands of the state. There is substantial state control of the school system, with much of the educational policy being formulated at the state level, even though school affairs are administered on a local level. Welfare administration is concentrated in the State Department of Welfare, however, the pattern of welfare administration does not differ radically from that in other states.

In addition to this high degree of administrative centralization, financial support of state and local government programs is strongly centralized. Table 4 provides a comparison of per capita state and local spending for selected functions in West Virginia, and in the United States as a whole. If the ratio of state to local support may be used as an index of fiscal centralization, it can be observed that West Virginia ranks above the national average for every function considered.

Even though financial support for the education, highway, and welfare functions is highly centralized, the grant-in-aid has been used on a very limited scale in West Virginia. The observed centralization has been accomplished through a transfer of program responsibility from locality to state.[14] Other than the existing state aid program for education, West Virginia's historical experience in state aid programs is limited to the years 1941-1949 when surpluses from the state liquor monopoly were distributed among municipalities and villages. In 1949, the State Supreme Court of Appeals ruled that such grants were unconstitutional and hence the program was terminated.[15]

SUMMARY

In Table 6, West Virginia and national average measures of state and local fiscal capacity, fiscal effort, and public expenditures are presented. In terms of per capita spending from local sources, the state ranks 46th, and even the relatively high level of federal aids is not sufficient to increase the relative standing when states are arrayed by per capita total expenditures from all sources. Three potential measures of fiscal capacity are available to compare the taxable resources at hand in West Virginia as opposed to the national average. In each case it may be seen that West Virginia ranks quite low in the hierarchy of states. Finally, a comparison of three alternative measures of tax effort shows that the state ranks below the national mean and generally below the median. These rankings do, however, suggest a decidedly higher relative level of fiscal effort than did rankings computed in a study by Hanczaryk and Thompson for 1941 and 1953.[16] Using the ratio of state and local revenues from own sources as an index of economic ability, they found that the state ranked 41st among 48 states in 1941 and 37th in 1953. Hence, the *long-run trend* in fiscal effort has been in an upward direction even

TABLE 6

SUMMARY COMPARISON OF PUBLIC FINANCES 1962

	UNITED STATES Average Amount	WEST VIRGINIA Amount	Rank
Public Expenditure Measures			
Total per capita state and local expenditures	$ 343.64	$ 250.72	46
Per capita state and local expenditures (less federal grants)	299.25	196.14	46
Per capita federal grants	44.39	54.58	22
Fiscal Capacity Measures			
Per capita income	2,366.00	1,810.00	41
ACIR measures of fiscal capacity			
Composite income	2,382.00	1,903.00	38
Per capita yield of a representative tax system	202.00	150.00	41
Fiscal Effort Measures			
State-local revenues from own sources per thousand dollars of personal income	117.61	116.20	29
ACIR measures of tax effort			
Composite income base	100*	92*	31
Representative tax system base	100*	101*	18

*The states were ranked on a relative basis, i.e., U.S. Average = 100.0.

Source: See text.

[14] James E. Larson and Harold J. Shamberger, *Intergovernmental Relations in West Virginia* (Morgantown, West Virginia: Bureau for Government Research, West Virginia University, 1951), Chapter 2.

[15] *Charleston v. Sims*, 132 W. Va. 826, 54 S.E. (2nd) 729 (1949).

[16] Edwin W. Hanczaryk and James H. Thompson, *The Economic Impact of State and Local Taxes in West Virginia* (West Virginia University Business and Economic Studies. Morgantown, West Virginia: Bureau of Business Research, 1958), Chapter 1.

though the absolute *level* of fiscal effort in the state is rather low.

Considering this combination of low effort and an extremely low fiscal capacity, it is not difficult to see that if public service levels in West Virginia are to approach the national average, substantially more federal assistance and a much greater fiscal effort will be required.

CHAPTER III

INTRASTATE DISPARITIES IN PER CAPITA PUBLIC EXPENDITURES

While the preceding chapter dealt exclusively with the aggregate level of state and local spending in West Virginia, the primary concern of this chapter is a description of the level of, and variance in, public expenditures within the state. The same general procedures used to analyze *interstate* differentials in the level of spending, fiscal capacity, and tax effort will be used in this chapter to identify *intercounty* variations in these factors.

Intercounty differences in per capita expenditures are examined using county-wide public spending aggregates in the following two forms: (a) expenditures of *all governments* within the county (municipalities, county, special districts, school district, and the state and federal government), (b) aggregated expenditures of *all local governments* within the county (municipalities, county, special districts, and the school district).[1]

Mean per capita expenditures, when presented, are the average *among the 55 counties* and are not weighted by county population size.[2] Any ranking of counties on the basis of per capita expenditures involves the tacit assumption that the average dollar per capita expenditure for police protection buys the same quality of service for residents of Wirt County (smallest in the state) as for residents of Kanawha County (largest in the state). While this is probably an unrealistic assumption, it is not readily apparent that county population provides an appropriate index of the quality of public services. Finally, it should be noted that only those expenditures which may be allocated among counties are included in the intrastate analysis. Thus, important state government public programs such as police protection, interest costs and other expenses of financial and general administration, and the unallocable portions of the education, welfare, and highway functions are omitted from the analysis.

FUNCTIONAL DISTRIBUTION OF EXPENDITURES

Three-fourths of all public spending in West Virginia counties is for education, welfare, and highways, but when only local government spending (approximately 30 per cent of all public expenditures in counties) is considered, the fraction devoted to these programs drops to 57 per cent. A comparison of 1957 and 1962 per capita government expenditures in counties reveals that the education, welfare, and highway functions showed the most significant dollar increments. Over the same time period, local governments increased per capita expenditures by the greatest absolute amount for the education, police, and health and hospital programs (see Tables 7 and 8). These total-local differences suggest the need for examining separately the pattern of *total* public expenditures and the pattern of expenditures by *local* governments in each county. The former gives a picture of the overall level of public expenditures in the county, while the latter offers a description of the distribution of funds raised from own sources.

In addition to a rising level of per capita expenditures in West Virginia, there has also been a substantial movement toward intercounty uniformity in spending by all levels of government. Such a trend is suggested by the decline, during this period, in among-county variability within the functional expenditure categories (see Table 7).[3] This increased uniformity may be partially explained by increased equalization in the distribution of per capita state and federal aids and expenditures, since the simple correlation coefficient rose from $-.43$ in 1957 to $-.58$ in 1962.

It may also be noted that the relative variability in per capita local government expenditures declined between 1957 and 1962 (see Table 8). However, a comparison of these data shows that spending by local governments tends to be much more erratic than does spending by all levels of government in county areas.

PERCENTAGE DISTRIBUTION OF EXPENDITURES

The degree of intercounty variation in the proportion of total spending which is devoted to each function is also an important consideration. The coefficients of variation presented in Table 9 show that

[1] Education expenditures will be treated at a later point because of the relative importance of this function, and because the factors which are associated with higher or lower levels of education spending may be quite different from those which are related with other public expenditure programs.

[2] Unless stated otherwise all among-county averages will be unweighted means.

[3] A decline in the coefficient of variation between 1957 and 1962 shows that per capita county expenditures are grouped relatively closer about their mean in the later year.

TABLE 7

MEAN PER CAPITA EXPENDITURES IN WEST VIRGINIA COUNTIES BY ALL LEVELS OF GOVERNMENT FOR SELECTED FUNCTIONS 1957 AND 1962

Function	1957		1962		Absolute Change in Per Capita Amount 1957-1962
	Per Capita Amount	Coefficient of Variation	Per Capita Amount	Coefficient of Variation	
Total	$127.97	25.57	$163.20	20.62	$ 35.23
Education	52.40	13.89	66.70	13.19	14.30
General Control	4.37	40.30	4.56	35.21	0.19
Police	2.69	53.62	3.60	48.41	0.91
Fire	n. c.	n. c.	1.13	147.68	n. c.
Health and Hospitals	4.13	193.40	3.91	179.77	—0.22
Welfare	21.03	48.97	32.83	49.14	11.80
Highways	39.37	64.86	43.14	58.95	3.77

n.c.—Not computed.
Source: See text.

TABLE 8

MEAN PER CAPITA EXPENDITURES IN WEST VIRGINIA COUNTIES FROM LOCAL SOURCES FOR SELECTED FUNCTIONS 1957 AND 1962

Function	1957		1962		Absolute Change in Per Capita Amount 1957-1962
	Per Capita Amount	Coefficient of Variation	Per Capita Amount	Coefficient of Variation	
Total	$35.01	39.35	$49.03	36.52	$14.02
Education	16.73	38.11	25.36	37.94	8.63
General Control	4.37	40.30	4.56	35.21	0.19
Police	2.69	53.62	3.60	48.41	0.92
Fire	n. c.	n. c.	1.13	147.68	n. c.
Health and Hospitals	4.13	193.40	4.71	169.92	0.58
Welfare	1.01	28.92	0.62	71.77	—0.39
Highways	2.09	70.41	2.50	62.98	0.41

n.c.—Not computed.
Source: See text.

public spending for education exhibits a considerably greater degree of intercounty uniformity than do the other functions.[4] Hence, the relative importance of the education function is assessed quite equally in West Virginia counties, i.e., a similar fraction of the total government spending in counties is devoted to education regardless of the level of public funds which is available.

A comparison of the percentage distribution by function of all government expenditures with those of local governments alone (the latter probably being a better measure of intercounty differences in relative preference) shows a greater homogeneity among local units in the relative amounts spent for traditionally local, non-aided functions—police, fire, health and hospitals, and general control (see Table 9). For those functions in which the state participates more heavily—education, welfare, and highways—per capita expenditures by local governments exhibit greater diversity. This tends to support the conclusion that local governments are relatively homogeneous in their distribution of funds among local functions, but exhibit a greater degree of diversity in their financial contribution to functions which have been partially transferred to, or are heavily aided by, the state.

THE EFFECTS OF SOCIAL AND ECONOMIC DIFFERENCES AMONG COUNTIES

A meaningful way to describe intrastate differences in per capita public expenditures is to make comparisons between groups of counties which are more homogeneous in terms of population size,

[4] The coefficients are computed on the distribution of the proportion of total spending devoted to the relevant function.

TABLE 9

FUNCTIONAL DISTRIBUTION OF PER CAPITA EXPENDITURES AMONG WEST VIRGINIA COUNTIES FROM LOCAL SOURCES AND BY ALL LEVELS OF GOVERNMENT* 1957 AND 1962

Function	LOCAL SOURCES Proportion of Total Expenditure 1957	1962	Change in Proportion of Total Expenditure 1957-1962	ALL LEVELS OF GOVERNMENT Proportion of Total Expenditure 1957	1962	Change in Proportion of Total Expenditure 1957-1962
Education	49 (20.80)	53 (22.49)	4	43 (18.34)	42 (18.87)	−1
Welfare	3 (32.20)	1 (72.16)	−2	16 (41.83)	20 (42.08)	4
Highways	6 (49.81)	5 (55.93)	−1	29 (38.45)	25 (39.56)	−4
Health and Hospitals	9 (163.15)	8 (152.72)	−1	3 (201.97)	2 (161.75)	−1
Police	7 (32.81)	7 (30.45)	0	2 (70.74)	2 (58.68)	0
Fire	1 (174.09)	2 (107.23)	1	0 (182.24)	1 (151.32)	1
General Control	13 (26.67)	10 (29.40)	−3	4 (49.67)	3 (41.97)	−1

*Items in parentheses are coefficients of variation (standard deviation as a per cent of the mean). This measure enables a comparison of the relative dispersion of series with different means.

Source: See text.

income level, and fiscal capacity. In this manner it may be possible to identify some consistent relationships between public expenditures, public service levels, and needs or preferences. Further, these simple classification schemes would seem necessary to justify the regression analysis in the following chapters.

The term "public service levels" is used in a general context in the present study and is not strictly synonymous with public expenditure levels. Local public service levels are defined here to be higher to the extent that benefits from a government expenditure are (a) distributed evenly among residents of a county and (b) not shared immediately with residents outside the county. With regard to the first criteria, benefits from police and fire protection probably result in a higher level of local public services than do benefits from an equal per capita expenditure for public assistance. Relative to the second condition, county public service levels in a central West Virginia county will probably be increased more by an incremental government expenditure on a limited area smog control program than by an equal per capita amount spent for resurfacing an arterial highway which connects the northern and southern parts of the state. This working description of public service levels is at best rough and ignores the rather serious question of the existence of diminishing marginal utility of benefits from public expenditures. Further, this definition ignores the fact that the same objective may be accomplished by alternative means, e.g., the problem of juvenile delinquency may be approached by instituting or upgrading vocational training programs, pursuing more vigorous recreational programs, or undertaking an urban renewal project, as well as by increasing the quantity and quality of police services. However, while trade-offs among programs is a relevant concern at the margin, the quality and quantity of public services offered by West Virginia local governments is sufficiently low to negate consideration of this problem. As is shown in Table 10 below, average per capita expenditures in West Virginia counties are decidedly below the national averages for those functions which are more commonly financed at the local level. It is utilized only to point out that per capita expenditures in a county, and public service levels in that county, are not necessarily the same. In fact, it is shown that West Virginia counties in which the greatest per person public expenditures are made typically have the poorest system of local roads and streets, the poorest police and fire protection service, and the poorest quality sanitation and sewage services, if it can be assumed that per capita expenditures provide a representative measure of the quality of local services.

TABLE 10

PER CAPITA LOCAL GOVERNMENT EXPENDITURES WEST VIRGINIA AND UNITED STATES MEANS FOR SELECTED FUNCTIONS 1962

Function	West Virginia	United States Average
Total	$94.56	$242.45
Police	2.65	9.98
Fire	0.63	6.05
General Control	2.38	5.49
Sanitation	0.50	3.69
Sewage	0.71	6.85
Parks and Recreation	0.11	4.77
General Public Buildings	0.75	2.54

Source: U.S. Bureau of the Census, *U.S. Census of Governments: 1962*, Vol. IV, No. 4, Compendium of Government Finances (Washington: Government Printing Office, 1964).

Population Size

It may be seen from the data in Table 11 that total per person public expenditures made in counties (the sum of federal, state, municipal, county, and school district) are inversely related to population size. However, this does not reflect a higher level of local public services in less populous counties but rather the influence of intergovernmental expenditures for the education, highway, and welfare functions. Since these small population counties are for the most part the lower income counties,[5] per person public assistance payments are higher; and since the fiscal capacity of these counties is low, per capita state education expenditures are also higher.[6] Most highway expenditures in these counties are made by the state on primary and secondary roads and, therefore, do not relate to local need in the sense of providing a better network of local roads and streets. Consequently, while the state government, through a system of direct expenditures, has affected a higher level of per capita expenditures for the less populous counties, it is not clear that intercounty levels of local public services have been equalized.

When per person total spending from local sources is considered, the more heavily populated counties generally rank higher for the traditionally local functions. The first of three possible explanations for this finding is that more populous counties are enjoying greater scope and quality of local public services and thus spend more per capita. The second is that diseconomies of large scale operation, i.e., higher public employee salary requirements and increased administrative and control needs, result in higher per person costs in the more heavily populated counties. Finally, the level of per capita expenditures for certain local functions may be higher because needs are directly related to population size.

Further, it is possible that the intercounty gap in service levels is widening since increments in per capita spending by local governments between 1957

[5] In 1962, the simple correlation between population and per capita income was .40. Further, if county population is correlated with the raito of county income to total state income (a measure of the relative importance of a county in the distribution of the state's income), the observed zero order coefficient is a near perfect .99. Hence, counties with smaller populations have significantly lower per capita incomes and significantly larger proportions of families in the low income brackets.

[6] State aids for education are distributed among counties partially on an equalizing basis, i.e., counties having lower fiscal capacities receive greater per capita amounts. State of West Virginia, *School Laws of West Virginia* (West Virginia State Superintendent of Schools, 1962).

TABLE 11

MEAN PER CAPITA EXPENDITURES IN WEST VIRGINIA COUNTIES BY ALL LEVELS OF GOVERNMENT AND FROM LOCAL SOURCES BY COUNTY POPULATION SIZE CLASS 1957 AND 1962

Size Class	ALL LEVELS OF GOVERNMENT $\bar{E}_{57}$	ALL LEVELS OF GOVERNMENT $\bar{E}_{62}$	ALL LEVELS OF GOVERNMENT Difference	FROM LOCAL SOURCES $\bar{E}_{57}$	FROM LOCAL SOURCES $\bar{E}_{62}$	FROM LOCAL SOURCES Difference
Over 75,000	$ 98	$140	$42	$43	$79	**$36**
50,000-74,999	104	145	41	42	60	**18**
30,000-49,999	104	148	44	37	47	**10**
20,000-29,999	133	146	13	35	47	12
10,000-19,999	133	169	36	28	40	12
Under 10,000	163	202	39	37	47	10

Sources: See text. County population estimates from Leonard M. Sizer, "Provisional Estimates of the Population of West Virginia Counties: July 1, 1964," Current Report 44 (West Virginia Agricultural Experiment Station, September 1965), and Leonard M. Sizer, "Population Estimates for the Counties of West Virginia: July 1, 1958," Current Report 25 (West Virginia Agricultural Experiment Station, February 1960).

TABLE 12

MEAN PER CAPITA EXPENDITURES IN WEST VIRGINIA COUNTIES BY ALL LEVELS OF GOVERNMENT AND FROM LOCAL SOURCES BY COUNTY INCOME CLASS 1957 AND 1962

Per Capita Income Class	ALL LEVELS OF GOVERNMENT $\bar{E}_{57}$	ALL LEVELS OF GOVERNMENT $\bar{E}_{62}$	ALL LEVELS OF GOVERNMENT Difference	FROM LOCAL SOURCES $\bar{E}_{57}$	FROM LOCAL SOURCES $\bar{E}_{62}$	FROM LOCAL SOURCES Difference
Over $2,200	$128	$142	$14	$34	$81	$47
2,000-2,999	104	151	47	45	63	**18**
1,800-1,999	111	149	38	47	56	**9**
1,600-1,799	121	157	36	41	44	3
1,400-1,599	119	169	50	34	42	**8**
Under 1,400	142	192	50	28	41	13

Source: West Virginia Chamber of Commerce, *Personal Income and Retail Sales in West Virginia by Counties: 1956-1962* (West Virginia Chamber of Commerce, June 1963).

TABLE 13

PER CAPITA EXPENDITURES IN WEST VIRGINIA COUNTIES BY ALL LEVELS OF GOVERNMENT AND FROM LOCAL SOURCES FOR SELECTED FUNCTIONS 1962

Income Class	TOTAL EXPENDITURES			EDUCATION			WELFARE			HIGHWAYS		
	All	Local	Difference	All	Local	Difference	All	Local	Difference	All	Local	Difference
Under $1,400	$192	$41	$151	$69	$22	$47	$48	$ .40	$47.60	$58	$1.70	$56.30
1,400-1,600	169	42	127	67	23	44	41	.50	40.50	44	2.00	42.00
1,600-1,800	157	44	113	65	21	44	28	.55	27.45	44	2.30	41.70
1,800-2,000	149	56	93	69	33	36	25	.83	24.17	35	2.60	32.40
2,000-2,200	151	63	88	66	29	37	18	.91	17.09	38	3.80	34.20
2,200 and up	142	81	61	58	33	25	14	1.10	12.90	28	5.30	22.70

Source: See text.

and 1962 have also been greater for the more heavily populated counties.

Income Level

The distribution of state aids to counties and direct state expenditures within counties in West Virginia is sufficient to create an inverse relationship between per capita income and per capita expenditures (see Table 12), even though local governments of low income counties spend considerably less than their high income counterparts. That is to say, the gap between per resident local government expenditures in high and low income counties is *more than offset* by state fiscal activity (either grant or direct expenditure programs) in these counties. While the 1957-1962 increase in per capita expenditures by all governments is comparable among counties, the increment in local government expenditures is decidedly lower for the poorer counties.

Again, while the state government has been successful in equalizing the level of per capita total expenditures, it does not follow that public service levels have been equalized. Table 13 clearly shows that most of the equalization among income classes is in the form of higher state welfare and highway expenditures in lower income counties. For example, it may be observed that $104 of the $151 per capita spent from non-local government funds in counties having per capita incomes less than $1,400 was for welfare and highways. It would be difficult to conclude that an equating of public expenditures in this manner among income classes is analogous to an equating of level of local public services since local functions such as police, fire, roads and streets, and sanitation will still be at a decidedly lower level of service in the poorer counties.

By comparing the simple correlation coefficient of per capita expenditures with per capita income and county population size, function by function, both for all levels of government and for local governments alone, the effect of direct state expenditures and aids in equalizing per capita expenditures may be evaluated. Table 14 shows these statistics for both 1957 and for 1962. Where the sign of the coefficient changes from positive for local governments to negative for all governments, direct state expenditures (or state aid in the case of education) have resulted in equalizing intercounty differences in expenditures for that function. From the data in Table 14, it may be seen that equalization has occurred for total expenditures as well as for the welfare, highway, and education functions. The data illustrate the degree to which per capita spending on the three aided functions is equalized and show that this is sufficient to have a strong equalizing effect on the level of total per capita expenditures in counties.

Per Capita Expenditures and County Growth Rates

Several hypotheses have been offered to explain the relationship between the rate of population growth and the level of per capita public expenditures. Spangler states that faster growing areas should spend more because of what he terms ". . . the disruptive effects of expansion."[7] Scott and Feder, in a study of California municipalities, observe that only in the more rapidly growing areas does rate of population growth exert a significant influence on per capita expenditures[8] and in those cases the relationship is inverse. This latter finding may be attributed to a lag on the part of governments of rapidly

[7] Richard Spangler, "The Effects of Population Growth Upon State and Local Government Expenditures," *National Tax Journal*, XVI (June 1963), pp. 432-437.

[8] Stanley Scott and Edward Feder, *Factors Associated with Variations in Municipal Expenditure Levels* (Berkeley, California: Bureau of Public Administration, University of California, 1957).

TABLE 14

SIMPLE CORRELATION COEFFICIENTS BETWEEN PER CAPITA EXPENDITURES AND PER CAPITA INCOME AND COUNTY POPULATION SIZE FOR ALL GOVERNMENT EXPENDITURES IN WEST VIRGINIA COUNTIES AND FOR EXPENDITURES FROM LOCAL SOURCES† 1957 AND 1962

Per Capita Expenditure Function	Per Capita Income 1957	Per Capita Income 1962	Population Size of County 1957	Population Size of County 1962
Education	−.47* (.23)	−.18 (.40)*	−.37* (.19)	.08 (.40)*
General Control‡	.31*	.54*	.20	.31*
Police‡	.48*	.60*	.58*	.58*
Fire‡	.04	.51*	−.04	.63*
Health and Hospitals	.25 n. c.	.04 n. c.	−.02 n. c.	−.16 n. c.
Welfare	−.54* (.19)	−.67* (.52)*	−.34* (.11)	−.29 (.34)*
Highways	−.13 (.53)*	−.23 (.57)*	−.39* (.37)*	−.45* (.43)*
TOTAL	−.28 (.40)*	−.35* (.64)*	−.42* (.31)*	−.33* (.50)*

*Denotes significance at the .05 level.
n.c.—Not calculated.
†The coefficients for local government expenditures are shown in parentheses below those for all governments.
‡All expenditures are made at the local level, therefore, the coefficient does not change.
Source: See text.

growing areas in increasing the level of public services to meet the demands and needs of the expanded population.

Among West Virginia counties, per capita expenditures in counties vary inversely with rate of population growth. This finding may also be explained in terms of the three major components of the state expenditure program—welfare, highways, and education. Those counties which are losing population are the less populous and lower income, and thus per capita public assistance payments are high (see Table 15). Education aids are also distributed on a needs basis and likewise would be high for these counties. Finally, highway expenditures are largely for the state primary system and are substantially unrelated to local need, i.e., they are more closely related to statewide or regional need. Thus, the *per capita* statement of the amount is in general greater for the less populous counties. When only local government expenditures are considered, the pattern is as expected—more rapidly growing areas spend a greater amount per capita. It is interesting to note from Table 15 that per resident state and federal aids for welfare, highways, and education increased by the greatest amounts in those counties which suffered absolute declines in population between 1950 and 1960.

Intercounty Differences in Fiscal Capacity and Tax Effort

Several indicators may be used to compare the relative capacities of West Virginia local governments to finance minimum levels of public services. Two logical series, per capita income and per capita assessed value, are shown for 1957 and 1962 (by county population size class) in Table 16. Per capita income is a commonly used, though imperfect, indicator of economic well-being and thus seems an appropriate measure of fiscal capacity. Alternatively, per capita assessed value indicates the relative size of the property tax base and, even though this tax is a less important local revenue source in West Virginia than in other states, its yield is sufficiently large to warrant inclusion as a measure of fiscal ability. Though these data clearly indicate that ability to finance is directly related to population size, it is not clear that this pattern has been reinforced through time, i.e., that the fiscal capacity of less populous counties has been expanding at a slower rate. Among counties of population size 20,000 to 30,000 (which is below the average county population size for the state in both years), the rate of increase in both per capita assessed value and per capita income is greater than among counties of size 30,000 to 75,000 (see Table 16). Only among counties with populations in excess of 75,000 is the mean increase greater. However, the reasons for this relatively rapid growth in per capita fiscal capacity among less populous counties is probably related to declines rather than to increases in economic activity. If the rate of decrease in population is (a) greater than the rate of decrease in income (and it will be to the extent the unemployed and the low income residents migrate) and (b) greater than the rate of decrease in assessed value (and this seems plausible considering the relative inflexibility of the property tax base), a *per capita* expression of income and assessed value will show an upward movement through time. What these data suggest are that among smaller counties, net migration may have brought about a better balance between the level of *per resident* fiscal resources and the level of *per resident* demand for public services.

Intercounty comparisons of fiscal capacity demonstrate differences in abilities, but give little information about the fiscal effort expended by local governments (or the willingness on the part of county residents to finance an adequate level of public services). A simultaneous consideration of capacity and effort enables a clearer statement of the function of equalization policies of the state and federal

TABLE 15

MEAN PER CAPITA EXPENDITURES BY ALL LEVELS OF GOVERNMENT AND FROM LOCAL SOURCES IN WEST VIRGINIA COUNTIES BY COUNTY POPULATION GROWTH RATE CLASS 1957 AND 1962

Growth Rate Class	ALL LEVELS OF GOVERNMENT			FROM LOCAL SOURCES			NON-LOCAL EXPENDITURES FOR WELFARE AND HIGHWAYS		
	$\overline{E}_{57}$	$\overline{E}_{62}$	Difference	$\overline{E}_{57}$	$\overline{E}_{62}$	Difference	$\overline{E}_{57}$	$\overline{E}_{62}$	Difference
−20% or more	$149	$186	$37	$28	$41	$13	$76	$95	$19
−10 to −19	130	164	34	29	39	10	59	80	21
0 to −9	122	164	42	37	55	18	50	69	19
0 to +9	125	150	25	43	61	18	46	56	10
Over 9	128	139	11	47	60	13	55	46	−11

Source: See text and Table 11.

TABLE 16

INDICATORS OF FISCAL CAPACITY OF WEST VIRGINIA COUNTIES BY POPULATION SIZE CLASS 1957 AND 1962

Population Size Class (In thousands)	MEAN PER CAPITA INCOME			MEAN PER CAPITA ASSESSED VALUATION		
	1957	1962	Per Cent Change	1957	1962	Per Cent Change
Over 75	$1,804	$2,016	12	$1,981	$2,638	33
50-74.9	1,765	1,850	5	1,812	2,015	11
30-49.9	1,518	1,661	9	1,714	2,099	22
20-29.9	1,383	1,515	10	1,656	2,128	29
10-19.9	1,459	1,557	7	1,663	1,956	18
Under 10	1,394	1,559	12	1,948	2,125	9

Source: See Tables 11 and 12. State of West Virginia, Office of Tax Commissioner, *Bienniel Report*, 1956-1957 and 1961-1962 (Charleston: Office of Tax Commissioner, 1957 and 1962).

TABLE 17

EXPENDITURES FROM LOCAL SOURCES PER DOLLAR OF PERSONAL INCOME IN WEST VIRGINIA COUNTIES BY POPULATION SIZE CLASS 1957 AND 1962

County Population Size Class (In thousands)	MEAN GENERAL EXPENDITURES PER DOLLAR OF PERSONAL INCOME FROM LOCAL SOURCES				MEAN PER CAPITA STATE AND FEDERAL AIDS		
	1957	1962	Absolute Increase	Per Cent Increase	1957	1962	Per Cent Increase
Over 75	$.239	$.389	$.150	62.75	$ 53.92	$ 61.44	13.95
50-74.9	.231	.315	.084	36.36	61.18	84.97	38.89
30-49.9	.240	.291	.051	21.25	66.60	100.51	50.92
20-29.9	.249	.314	.065	26.10	92.88	99.04	6.63
10-19.9	.198	.258	.060	30.30	98.99	128.75	30.06
Under 10	.268	.306	.038	14.17	111.13	155.23	43.61
All Counties	.233	.299	.066	28.33	87.04	114.18	31.20

Source: See text.

government. Consider the hypothetical three-county example shown below. It may be seen that the size of the equalization grant is sufficient to equate per capita revenues among governments having different fiscal capacities *but making the same effort* (Counties A and B). If County C should now choose to increase its tax effort to the point where the effort ratio would equal 0.33, total revenues in that county would also equal 800.

County	Per Capita Income	Per Capita Revenue from Local Sources	Revenue from Local Sources / Income	Per Capita Equiliza-tion Grant	Per Capita Total Revenues
County A	$1,800	$600	0.33	$200	$800
County B	2,400	800	0.33	0	800
County C	2,000	500	0.25	133	633

Table 17 shows effort ratios by population size classes and compares changes in this ratio between the two years considered. Though the *level* of the effort ratio varies erratically among population size classes, the data (columns 3 and 4) reveal a drastic change between 1957 and 1962 in the fiscal effort of local governments (in both relative and absolute terms) in the more heavily populated counties. Further, the distribution of state and federal aids within the state are shown to be relatively invariant with respect to effort differentials.

SUMMARY

Though the data presented clearly show that state and federal funds are distributed among counties on an equalizing basis, it is suggested that this does not necessarily result in substantial intrastate equalization of per resident local public service levels. The size of intergovernmental expenditures and aids is such that per person public expenditures are higher in low income, less populous counties with slow or declining rates of population growth. Most of the intergovernmental aid and expenditures is for the public assistance and highway functions, consequently, sizeable intercounty differences continue to exist in per capita expenditures for the traditionally local, non-aided functions, e.g., police, fire, local roads and streets, and general control. For these functions, the higher income counties spend substantially more.

Among-county differences in per capita expenditures are affected by heterogeneous economic, social, and demographic characteristics of county populations. Some of these distortions may be removed by making comparisons among groups of counties with similar population sizes, similar growth rates, or similar per capita income levels. It is found that state and federal aids for welfare and highways are distributed such that total per capita public expenditures are greater in the low income, less populous counties which are tending to decline in population. Conversely, per capita expenditures on local functions and presumably per person local public service levels are higher in the more rapidly growing counties with higher incomes.

One question left unanswered is the extent to which the intercounty variance in per resident expenditures is systematically related to intercounty differentials in identifiable economic, demographic, and social characteristics. This will be examined in the following chapter.

CHAPTER IV

FACTORS ASSOCIATED WITH INTERCOUNTY VARIATIONS IN PER CAPITA EXPENDITURES

The objective of this chapter is to "explain" county-to-county per capita public spending differences by measuring the degree of covariation between per resident expenditures and a number of factors which reflect socio-economic and demographic differences among counties. First, the results of previous empirical analyses using a similar statistical technique are analyzed. Second, the explanatory variables chosen for the present analysis are described and their interrelations analyzed so that county profiles may be developed, i.e., so that factors common to homogeneous groupings of counties may be identified. Finally, the expenditure models are tested empirically using a multiple regression technique and the implications of the results are explored.

PREVIOUS EXPENDITURE VARIATION STUDIES

Numerous empirical studies have focused on the relationship between the variability in per capita expenditures and the variability in selected "explanatory" factors, with the governmental unit being analyzed taking the form of state and local governments aggregated by state, city, or county government, or school districts.

On a scale more limited than the nationwide analyses, intrastate studies have been carried out involving intermunicipal comparisons in California, Ohio, Massachusetts, and Washington, and on an intercounty basis in California.[1] The scope of the present analysis is the most comprehensive of the "within state" studies in that an attempt is made to examine both intergovernmental (county governments and school districts) and inter-area (all governments and local governments aggregated by county) spending differentials.

Scott and Feder, in studying 192 California municipal governments with populations of 2,550 or more, found per capita expenditures to be significantly related to four variables: per capita assessed value, per capita retail sales, rate of population growth, and persons per occupied dwelling units.[2] Vieg reached similar conclusions in the 1957 examination of expenditures of 303 city and 57 county governments. He found per capita assessed value, per capita taxable sales, population size, and the ratio of taxable to non-taxable retail sales to be significant.[3] Finally, Elsner and Sosnick have found per capita expenditures of 228 California cities in 1960 to be significantly related to seven variables including per capita retail sales and per capita intergovernmental grants.[4]

These studies, as well as most other "determinants" studies, may be criticized for including measures of fiscal capacity among the "explanatory" factors. Rater than explaining intergovernmental differences in the level of per person public services, the conclusions reached may suggest only that expenditures will be higher if revenues are higher. The real questions which must be answered are: (1) What are the factors which cause intercounty local revenues to differ (e.g., preferences, tax structure, level of income and wealth)? and (2) What are the factors which cause the per person cost of supplying public services to differ among county areas (e.g., population density, income structure, proportion of employment in agriculture or manufacturing)?

In a statistical analysis of a cross section of per capita expenditures in 478 county areas in the United States, Adams concludes:[5]

> . . .the most important set of factors indicative of individual preferences for public services is that which reflects the geographic, social, and economic environment of a county area, as well as the attitudes and values of the individuals who consume such services. By contrast, income is shown to be an unimportant factor. The efficiency of the public sector and its responsiveness to demand, the study further indicates, has little effect on the quantity of public services consumed.

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[1] Albert A. Montgomery, *Washington Expenditures: 1947-1957—An Economic Analysis* (Pullman, Washington: Washington State University Press, 1963); Harvey Brazer, "City Expenditures in the United States," Occassional Paper No. 66 (New York: National Bureau of Economic Research, 1959); Scott and Feder, *Factors Associated with Variations in Municipal Expenditure Levels* (Berkeley, California: Bureau of Public Administration, 1957); John A. Vieg, *et. al., California Local Finance* (Stanford: Stanford University Press, 1960), pp. 330-334; Gary H. Elsner and Steven H. Sosnick, "Municipal Expenditures in California: Statistical Correlates," Davis Occasional Paper No. 2 (Davis: University of California, July 1964).

[2] *Ibid.*

[3] *Ibid.*

[4] *Ibid.*

[5] Robert Frank Adams, "Determinants of Local Government Expenditures" (unpublished Ph. D. dissertation, University of Michigan, Ann Arbor, 1963), p. 1.

THE EXPLANATORY VARIABLES

In order to analyze intercounty public expenditure variations in West Virginia, data were collected on a series of thirteen socio-economic and demographic variables for the years 1957 and 1962. The nature and extent of the interdependency or covariation among these variables was then examined by constructing a matrix of correlation coefficients of all possible combinations of every two variables (see Appendix Table A-1). On the basis of the observed interrelationships, the variables were divided into five groups which are neither mutually exclusive nor collectively exhaustive; however, the resulting covariation within each of the groups is greater than that existing between the groups. The following is a class-by-class description of the final groupings of the variables.

Income Flow

Per capita county income, per cent of families with income less than $3,000 in each county, and the per cent of annual West Virginia personal income earned within each county are sufficiently interrelated to be used as proxy measures for the flow of income generated within each county per time period.[6] The relationship among these three variables reveals that for both years examined, counties with higher per capita incomes have smaller percentages of families with incomes less than $3,000 and account for a greater porportion of total yearly West Virginia income.

Wealth Stock

A second grouping of variables reflects an attempt to measure the relative magnitude of the stock of wealth contained in each county and the extent to which this stock is being utilized to finance public programs. Two variables examined for this purpose are per capita county assessed valuation and the ratio of total dollar property tax yield to total county assessed value (property tax rate).[7] In both 1957 and 1962, a significant positive relationship is observed between these two variables, reinforcing the earlier contention that fiscal capacity and tax effort (in this case property tax effort) are positively related at the local level, i.e., counties having a greater wealth base generally tax property at a higher rate than do their less wealthy counterparts. Per capita assessed value is not used in the analysis to reflect differences in the property tax base but rather to describe intercounty differences in overall wealth. The relationship between the income and the wealth variables shows that counties which have higher per capita incomes and lower proportions of families in the less than $3,000 income bracket tend also to have a higher total assessed valuation of property.

Population Concentration

Three factors selected to measure differences in the degree of urbanization among the 55 West Virginia counties are population per square mile, number of dwelling units per square mile, and the proportion of county population residing within city limits.[8] In both years these three variables are positively associated at a highly significant level, hence any one could be used as a proxy measure of differentials in population concentration. The relationships between the population concentration and the income and wealth variables indicate that more heavily urbanized counties tend to have a higher level of per unit income and a greater wealth base.

General Economic-Demographic

In order to describe, in more specific terms, intercounty differences in economic and demographic structure, a fourth group of variables is examined. Six factors included in this group are per capita county retail sales, per cent of labor force unemployed in the county, rate of population growth for the previous five years in cities, rate of county population growth over the past five years, per cent of county labor force employed in manufacturing, and per cent of county labor force employed in agriculture.[9] An examination of the interrelationships existing among these six variables reveals that counties with comparatively high unemployment rates tend also to be counties with comparatively high levels of agricultural employment, comparatively low rates of population growth, and comparatively low levels of per capita retail sales.

The relationships observed between the general economic-demographic variables and the other variable groups show that counties having relatively low income, low wealth, and low population concentration are also characterized by proportionately greater agricultural employment, higher unemployment, lower population growth rates and a lower dollar volume of per capita retail activity.

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[6] Computed from West Virginia Chamber of Commerce, *Personal Income and Retail Sales in West Virginia by Counties, 1956-1962* (West Virginia Chamber of Commerce, June 1963).

[7] State of West Virginia, Office of Tax Commissioner, *Biennial Report*, 1957, 1962.

[8] Computed from Leonard M. Sizer, "Provisional Estimates of the Population of West Virginia Counties: July 1, 1964," and "Population Estimates for the Counties of West Virginia: July 1, 1958." See footnote for Table 11.

[9] *Ibid.*, and U. S. Bureau of the Census, *County and City Data Book, 1962* (Washington: Government Printing Office, 1962).

Intergovernmental Revenue

Two additional factors are examined in an attempt to establish the relationship between expenditures financed from non-local sources and the economic and demographic character of the county. The two variables used to investigate the effect of non-local revenues are per capita state and federal aids and direct expenditures, and the ratio of state and federal aid and direct expenditures to total expenditures in the county.[10] These two factors vary closely at a positive level in both 1957 and 1962 indicating, as would be expected, that counties which receive greater *absolute* amounts of per capita intergovernmental aid tended to finance *proportionately* smaller amounts of total expenditures from internal sources. The question then arises as to whether the relatively small contribution of local governments to total county spending reflects only differences in fiscal ability and the ensuing effect of the equalizing nature of state direct expenditures, or if it means that counties receiving large per capita state and federal aids have relaxed efforts to maximize returns from the local tax base. Indeed, the data shown in Table 17 indicate that increments in fiscal effort have been generally lower than among counties receiving higher amounts of intergovernmental aids per capita, a fact which immediately suggests that state and federal grants may be substitutive at the local level. That is, local governments may view a dollar of state or federal money at least partially as a substitute for, rather than a complement to, a dollar which could be raised at the local level.

An examination of the relationships existing between the non-local revenue variables and the income, wealth, and population concentration groups show that in both years, the low income, low wealth base, low population concentration counties received greater amounts of per capita outside assistance in the form of state and federal aid. This is consistent with the finding of the previous chapter that direct state expenditures and aids are distributed among counties on an equalizing basis.

Of the characteristics examined above, only per capita state and federal aids and direct expenditures in counties, and the property tax rate may not be validly used to explain expenditure variations among counties. However, the intercounty differences in the level of intergovernmental aid is closely associated with other demographic and economic factors, hence the influence cannot be completely eliminated. For example, the county profiles developed above reveal that the lower income, less urbanized and more economically depressed counties are the recipients of greater per capita amounts of state and federal aid and direct expenditures. Since state and federal expenditures constitute such a large proportion of total public spending in counties, these same factors would be expected to relate significantly to intercounty variations in expenditures. The simple correlation coefficient between the total of per capita state and federal aids and direct expenditures in the county, and per capita total public spending in that county by all levels of government, reveals that variations in per person state and federal aids and direct expenditures account for 77 per cent of intercounty variations in per person expenditures in 1957 (81 per cent in 1962). This illustrates the great influence of state and federal programs on West Virginia county expenditure levels, or alternatively, it shows the influence of those economic, demographic, and sociological characteristics of counties which result in greater levels of intergovernmental aids. The point is, in West Virginia, the identification of a set of factors which will explain variations in total expenditures made in counties may necessarily involve the identification of a set of factors which explains intercounty variations in state and federal fiscal activity.

The relationships observed among the five variable groups and the positive relationships existing between expenditures and aid reinforce the contention that it is in the low income, heavily aided counties that the greatest per capita total public expenditures are made (see Table 12). The levels of total public expenditures show that intergovernmental expenditures and aids by the state and federal government are of such great magnitude in West Virginia that the direct relationship between income and expenditures found to exist in most interstate and intrastate expenditure studies is reversed. With the exception of the very high income class in 1957, mean per capita county expenditures by all levels of government are larger in the lower income counties. However, the data presented in Table 12 also reveal that when the effects of outside revenues are removed and only local government spending is considered, the income-expenditures relationship is essentially reversed, that is, higher income counties make greater local government expenditures per capita. This is not unexpected since the higher income, more prosperous counties should be able to generate more revenue per person from internal sources.

[10] State of West Virginia, *Report of the State Superintendent of Free Schools of the State of West Virginia, loc. cit., Annual Report of the State Road Commission, loc. cit.*, and *Annual Report of the West Virginia State Department of Public Assistance, loc. cit.* See footnotes 7, 8, and 9 in Chapter 2.

TABLE 18

NET REGRESSION COEFFICIENTS, STANDARD ERRORS, AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON TOTAL COUNTY EXPENDITURES BY ALL LEVELS OF GOVERNMENT 1957 AND 1962

Year	Per Cent of Families with Income Less Than $3,000 X_1	Population Density X_2	Per Capita Assessed Value X_3	Agricultural Employment / Manufacturing Employment X_4	Coefficient of Determination R^2
1957	1.5065*	—.0821	.0218*	— 5.0696	
	(.4808)	(.0439)	(.0091)	(7.7250)	.4244
	.6014	—.2994	.3248	— .0988	
1962	2.5323*	—.0149	.0257*	—14.7595*	
	(.5194)	(.0419)	(.0093)	(7.4772)	.4759
	.9828	—.0528	.3703	— .2775	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

A REGRESSION ANALYSIS OF EXPENDITURE VARIATIONS

There are three basic steps to the construction of linear least squares statistical models like those used in the present analysis. First, factors which would theoretically be expected to influence the level of per capita county expenditures must be identified. Second, proxy variables which meaningfully reflect these factors must be found. Finally, the interrelationships among the proxy variables must be carefully scrutinized so that explanatory factors which are highly intercorrelated may be excluded. Since the interpretation of selected variables and their interrelationships was discussed earlier in this chapter, a specific model is now introduced and tested.

Total Expenditures in Counties

To explain intercounty variations in expenditures by *all* levels of government, per capita total expenditures are regressed on the following variables:

X_1 = per cent of families in the county with incomes less than $3,000.
X_2 = the ratio of county population to county land area (population density).
X_3 = per capita assessed property value in the county.
X_4 = the ratio of agricultural to manufacturing employment.

These four variables are representative of each of the four non-revenue factor groups discussed at the beginning of the chapter, i.e., income flow (X_1), population concentration (X_2), wealth stock (X_3),[11] and general economic-demographic (X_4). Variable X_4, which is a combination of two of the general economic-demographic variables, should give some indication of among-county differences in employment structure.

The results of the regressions (see Table 18) show that the four independent variables jointly explain, or are associated with, approximately 42 per cent of the intercounty variations in per capita expenditures by all levels of government in 1957 and approximately 47 per cent in 1962. In both years the income variable is positively and significantly associated with expenditures. Since federal and state assistance for welfare and education is distributed to a great extent on a needs basis, the strong positive association between per capita total expenditures and per cent of families with incomes less than $3,000 is hardly surprising.

Per capita assessed value is included in the regression to indicate the relative level of fiscal capacity among local units by describing differentials in both the wealth base and the tax base. In both years it is found to be positively and significantly related to expenditures. At first glance this appears to be an inconsistency in that it has been shown that counties with lower incomes and wealth bases receive greater levels of intergovernmental aids and consequently have greater per capita expenditures. Further, a simple correlation coefficient between per capita expenditures and per capita assessed value shows a negative relationship. However, the regression equation expresses a *net* rather than a *gross* relationship, i.e., when variations due to income, density, and the relative magnitudes of agricultural and manufacturing employment are accounted for or held constant, assessed value is positively related to expenditures.

[11] Since local expenditures are less than a third of total expenditures in counties, it is felt that the explanatory variable, per capita assessed value (X_3), exerts an influence other than merely as an indicator of relative levels of property tax receipts.

Consequently, it may be concluded that when the effects of the other variables in the equation are held constant (and also the effects of federal and state aid, the variable with which they are closely associated), the larger the wealth base of the county, the larger are its per capita total expenditures.[12]

Population density is negatively, though not significantly, related to expenditures in both years. A negative relationship would be expected since the less dense areas are the lower income areas and hence receive greater per resident amounts of state and federal aid, and possibly because public services can be supplied to densely populated counties more efficiently because of economies of scale, or of density, and therefore, per resident government costs are lower.

The final variable included in the regression is the ratio of agricultural to manufacturing employment. In 1957, it is shown to be negatively, though not significantly, related to total expenditures. Again this observed inverse relationship must be interpreted within the context of the regression equation. It shows that greater agriculture-manfacturing employment ratios are associated with smaller per capita expenditures when income, density, and assessed value are held constant. However, without the effects of income and density held constant, the agriculture-manufacturing employment ratio is positively related to total expenditures, primarily because the predominantly agricultural counties are those which receive relatively larger per capita amounts of state and federal aids. A larger numerator in the agriculture-manufacturing ratio implies a greater level of intergovernmental aid, hence the positive relationship between the ratio and per capita expenditures.

The results of this analysis of intercounty variations in per capita total expenditures by all levels of government verify the conclusions of the analysis of the interrelations among five factor groups presented earlier in this chapter. The highest per capita expenditures occur in lower income, less urbanized counties. This finding, it has been shown, merely reflects the higher level of per capita intergovernmental aids to these counties. Only if the effects of state and federal aid are netted out can the underlying effects of differentials in income, urbanization, and employment structure on county-to-county differences in the level of per resident public expenditures be identified and measured.

[12] To examine the contention that the major effects of outside aids have been accounted for by the variables in the model, state and federal aids as a per cent of total expenditures was added as a fifth explanatory variable but failed to increase explained variation by more than 1 per cent in either year.

Total Expenditures by Local Governments from Own Sources

To abstract from the direct influence of the intergovernmental aids on intercounty variations in expenditures, the dependent variable is now examined net of state and federal aids. Specifically, per capita total spending in the county by all *local* governments is regressed on the following five variables:

X_4 = ratio of agricultural to manufacturing employment.
X_5 = per cent of labor force unemployed.
X_6 = per capita income.
X_7 = ratio of county population living within cities to total county population (per cent of urban population).
X_8 = ratio of county assessed value to county income.

These explanatory variables were chosen from the four non-revenue source groups as proxies for influences which shape the level of per capita expenditures by local governments. The first two are representative of the general economic-demographic factor group, variable X_6 is an income flow proxy, variable X_7 is the population concentration proxy, and X_8 is an adjusted wealth stock variable. The wealth stock variable, per capita assessed value, is divided by per capita income in order to develop a more effective indicator of the total resource base of each county. Assessed valuation alone is a singularly inappropriate explanatory variable when the dependent variable is local government expenditures, since it only indicates the magnitude of intercounty variations in property tax collections. The use of only per capita assessed value as an explanatory variable in this model, then, would lead to the sterile conclusion that counties which have greater revenues make greater expenditures.

The results of these regressions (see Table 19) indicate that the five proxy variables are related to per capita local government expenditures in approximately the same manner in both years. The per cent of labor force unemployed is significantly related to per capita expenditures at a positive level only in 1962. This result suggests the possibility of a distortive effect of intergovernmental aids. In both years examined, per capita welfare payments by *all levels of government* are positively related to the unemployment rate—higher per capita welfare payments are made in counties with higher levels of unemployment. However, per capita welfare payments made in the counties by *only local governments* are negatively related to the level of unemployment in

TABLE 19
REGRESSION COEFFICIENTS, STANDARD ERRORS, AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON TOTAL COUNTY EXPENDITURES FROM LOCAL SOURCES 1957 AND 1962

Year	Agricultural Employment / Manufacturing Employment X_4	Per Cent Unemployed X_5	Per Capita Income X_6	City Population / County Population X_7	Assessed Value / Income X_8	Coefficient of Determination R^2
1957	−1.7956	.0443	.0148*	26.6270*	18.1734*	
	(2.3388)	(.0566)	(.0048)	(9.4088)	(4.7171)	.5469
	— .0831	.0951	.3960	.3981	.4622	
1962	−3.7275	1.6451*	.0385*	29.2163*	30.7156*	
	(2.2999)	(.5442)	(.0059)	(10.4163)	(5.4623)	.7469
	— .1317	.2719	.6883	.3209	.4951	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

TABLE 20
REGRESSION COEFFICIENTS, STANDARD ERRORS, AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON TOTAL WELFARE EXPENDITURES, IN THE COUNTY BY ALL LEVELS OF GOVERNMENT 1957 AND 1962

Year	Per Cent of Families with Income Less Than $3,000 X_1	Population Density X_2	Per Capita Assessed Value X_3	Agricultural Employment / Manufacturing Employment X_4	Coefficient of Determination R^2
1957	.6557*	—.0055	—.0011	— 4.8879*	
	(.1337)	(.0122)	(.0025)	(2.1483)	.5507
	.8315	—.0637	—.0501	— .3026	
1962	1.0491*	.0036	—.0047	— 9.9520*	
	(.2340)	(.0189)	(.0042)	(3.5021)	.5370
	.8493	.0263	—.1426	— .3904	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

both years. It is conceivable, then, that the more economically depressed counties view state and federal assistance payments as substitutes for, rather than supplements to, local resources which may be devoted to the welfare function. To the extent that these aids are viewed as substitutes, local governments may channel their own resources into other public programs. Consequently, counties into which greater welfare payments are injected (those having higher unemployment rates) may devote relatively more to local programs, thus the positive relationship between unemployment level and per capita local expenditures.

The income, population density, and resource base variables are all found to be positively related to local expenditures. This is to be expected since residents of the higher income, more heavily urbanized counties probably demand and are willing and fiscally able to support a higher level of public services.

A third set of regressions on per capita total expenditures was run in an effort to explain variations in *county government* expenditures. Several theoretically appealing models were tested, but in no case could a significant amount of variation be explained. Hence, it must be concluded that the variability in the level of per capita expenditures among county governments is not systematically associated with factors within the scope or interest of this research.

Per Capita Functional Expenditures

Per capita expenditures in counties by all levels of government, and by local governments, are separated into individual expenditure programs in order to explain a greater proportion of intercounty expenditure variations. For each major expenditure function, 1957 and 1962 expenditures by all levels

TABLE 21

REGRESSION COEFFICIENTS, STANDARD ERRORS, AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON TOTAL WELFARE EXPENDITURES FROM LOCAL SOURCES 1957 AND 1962

Year	Agricultural Employment / Manufacturing Employment X_4	Per Cent Unemployed X_5	Per Capita Income X_6	City Population / County Population X_7	Assessed Value / Income X_8	Coefficient of Determination R^2
1957	−.1331*	−.0013	.0004*	−.2310	.5982*	
	(.0503)	(.0012)	(.0001)	(.2024)	(.1014)	.5386
	−.2889	.1346	.4507	−.1621	.7138	
1962	−.1866*	.0036	.0011*	−.5428	.7904*	
	(.0804)	(.0190)	(.0002)	(.3639)	(.1909)	.5054
	−.2637	.0236	.8059	−.2385	.5098	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

of government are regressed on variables X_1 through X_4. Likewise, functional expenditures by local governments are regressed on variables X_4 through X_8.

The public assistance expenditure regressions are shown in Table 20 (for all levels of government) and Table 21 (for local governments). Over 50 per cent of county-to-county variations in per capita welfare expenditures are explained by the two models in each of the two years. The direction of the relationships between the significant explanatory variables and per capita welfare expenditures are the same as observed for per capita total expenditures (see Tables 18 and 19). In general, the greater per capita state and federal public assistance payments in the lower income, more rural counties result in higher per capita total welfare expenditures. But when only *local* welfare expenditures are considered, the low income, smaller resource base counties spend less per capita on the welfare function, probably because of some combination of limited fiscal capacity and the substitutability of state and federal resources for local resources.

The results of the highway expenditure regressions, shown in Tables 22 and 23, illustrate the influence of state and federal aid since higher per capita total highway expenditures (by all levels of government) are made in lower income, and less urbanized counties. Conversely, for per capita road and street expenditures by local governments, it was found that the more highly urbanized the population in a county, the greater are the per capita expenditures by local governments for roads and streets (see Table 23).

The results of the regressions on local government expenditures for the police and fire functions are shown in Table 24. In the case of per capita fire protection expenditures, the only significant factor in either regression is the population concentration variable which suggests the existence of a greater demand for fire protection services among residents of more heavily urbanized counties. The police expenditure regressions yield a similar conclusion that the governments of the more highly urbanized counties with relatively low proportions of agricultural employment and high per capita incomes spend the greatest amounts per resident.

No meaningful results could be obtained in an analysis of variations in per capita health and hospital spending, possibly due to the questionable reliability of the data, but more probably due to the random nature of intercounty differences in expenditures for this function.

A REGRESSION ANALYSIS OF EDUCATIONAL EXPENDITURES

Since the education function represents the largest single expenditure program in West Virginia, the statistical identification of those factors affecting intercounty variations in per capita education outlays are examined in somewhat greater detail then were the regressions on the other functional expenditure categories. Tables 25 and 26 show the results of regressing 1957 and 1962 county education expenditures by all levels of government, and by local governments, on the appropriate explanatory models (variables X_1 through X_4 and variables X_4 through X_8). For those variables which are

TABLE 22

REGRESSION COEFFICIENTS, STANDARD ERRORS, AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON TOTAL HIGHWAY EXPENDITURES IN THE COUNTY BY ALL LEVELS OF GOVERNMENT 1957 AND 1962

Year	Per Cent of Families with Income Less Than $3,000 X_1	Population Density X_2	Per Capita Assessed Value X_3	Agricultural Employment / Manufacturing Employment X_4	Coefficient of Determination R^2
1957	.4173	—.0826*	.0120	1.4358	
	(.4316)	(.0394)	(.0082)	(6.9352)	.2384
	.2134	—.3861	.2294	.0358	
1962	1.0553*	—.0647*	.0213*	.4505	
	(.4155)	(.0336)	(.0074)	(6.2177)	.4126
	.5419	—.3027	.4069	.0112	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

TABLE 23

REGRESSION COEFFICIENTS, STANDARD ERRORS, AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON TOTAL HIGHWAY EXPENDITURES FROM LOCAL SOURCES 1957 AND 1962

Year	Agricultural Employment / Manufacturing Employment X_4	Per Cent Unemployed X_5	Per Capita Income X_6	City Population / County Population X_7	Assessed Value / Income X_8	Coefficient of Determination R^2
1957	—.1855	—.0015	.0008	4.8814*	.1074	
	(.2004)	(.0048)	(.0004)	(.8063)	(.4042)	.7092
	—.0802	—.0299	.1928	.6822	.0255	
1962	—.1530	.0024	.0006	5.6485*	—.2469	
	(.2360)	(.0558)	(.0006)	(1.0689)	(.5606)	.6554
	—.0615	.0045	.1235	.7055	—.0453	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

TABLE 24

REGRESSION COEFFICIENTS, STANDARD ERRORS, AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON POLICE AND FIRE EXPENDITURES FROM LOCAL SOURCES 1957 AND 1962

Year	Agricultural Employment / Manufacturing Employment X_4	Per Cent Unemployed X_5	Per Capita Income X_6	City Population / County Population X_7	Assessed Value / Income X_8	Coefficient of Determination R^2
Police 1957	—.4405*	.0066*	.0006*	4.8380	.2234*	
	(.2086)	(.0050)	(.0004)	(.8391)	(.4207)	.6702
	—.1950	.1350	.1523	.6919	.0543	
Police 1962	—.6598	.0696*	.0019	4.5429	1.0463*	
	(.2407)	(.0596)	(.0006)	(1.0902)	(.5717)	.7081
	—.2392	.1181	.3561	.5120	.1731	
Fire‡ 1962	—.1507*	.0968*	.0010*	5.7616	.8100*	
	(.2705)	(.0640)	(.0007)	(1.2253)	(.6425)	.5945
	—.0573	.1722	.2016	.6810	.1405	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.
‡Because of limitations in the data, the regression on fire expenditures for 1957 is not presented.

TABLE 25

REGRESSION COEFFICIENTS, STANDARD ERRORS AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON PER CAPITA EDUCATION EXPENDITURES IN COUNTIES BY ALL LEVELS OF GOVERNMENT 1957 AND 1962

Year	Per Cent of Families with Income Less Than $3,000 X_1	Population Density X_2	Per Capita Assessed Value X_3	Agricultural Employment / Manufacturing Employment X_4	Coefficient of Determination R^2
1957	.3030*	—.0203*	.0040*	—1.042	
	(.1081)	(.0099)	(.0020)	(1.7360)	.4127
	.5436	—.3329	.2705	— .0913	
1962	—.0489	—.0243	—.0003	—3.1846	
	(.1787)	(.0144)	(.0032)	(2.6734)	.0921
	—.0726	—.3291	—.0148	— .2292	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

TABLE 26

REGRESSION COEFFICIENTS, STANDARD ERRORS AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON PER CAPITA EDUCATION EXPENDITURES IN COUNTIES FROM LOCAL SOURCES 1957 AND 1962

Year	Agricultural Employment / Manufacturing Employment X_4	Per Cent Unemployed X_5	Per Capita Income X_6	City Population / County Population X_7	Assessed Value / Income X_8	Coefficient of Determination R^2
1957	—3.1126*	—.0161	.0068*	.8978	12.1914*	
	(1.0356)	(.0251)	(.0021)	(4.1663)	(2.0888)	.5856
	— .3111	—.0747	.3901	.0289	.6697	
1962	—5.7166*	.4289	.0189*	—1.8592	20.3405*	
	(1.5291)	(.3618)	(.0039)	(6.9253)	(3.6316)	.6123
	— .3761	.1319	.6286	— .0380	.6104	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

significant, the relationships between per capita education expenditures and the independent variables generally parallel those observed in the regressions on total expenditures (see Tables 18 and 19).

The major deviation in the results of the analysis of education expenditures from those of the regression models in the preceding sections is in the analysis of intercounty variations in per capita education expenditures by all levels of government in 1962. Only 9 per cent of the variation in education expenditures is explained in that year and none of the independent variables are statistically significant. To explain this result, it is necessary to consider in some detail the interrelationships among the variables in the model. An examination of the relevant simple correlation coefficients indicates that significant changes occurred between 1957 and 1962 in the relationship between several of the independent variables and total education expenditures. In 1957, the high density counties spent proportionately less per capita on education than did counties with a smaller degree of population concentration. However, in 1962, this relationship was considerably weaker. In 1957, counties with large proportions of families earning less than $3,000 had consistently higher per capita total education expenditures, but in 1962 there existed no systematic relationship between intercounty differences in the distribution of income and the level of per capita total education expenditures. Finally, the strength of the relationships existing between the agriculture-manufacturing employment variable and education expenditures, and between

per capita assessed value and education expenditures, were substantially smaller (in terms of absolute value) in 1962 than in 1957. Though there existed no measurable relationship between per capita education expenditures by local governments and per capita expenditures by all levels of government in 1957, a positive and significant relationship is observed between these two variables in 1962. Consequently, the distribution of state and federal education aids among counties in 1962 no longer over-equalized per capita total education expenditures, since during the 1957-1962 period the higher income and more heavily urbanized counties tended to raise a proportionately greater amount of educational funds from internal sources. In fact, this greater portion of locally financed education expenditures was almost sufficient to reverse the existing inverse relationship between per capita education expenditures and the level of per capita personal income. Consequently, the fact that no consistent relationships are observed between the independent variables and 1962 per capita total education expenditures is at least partially explained.

West Virginia Local School District Interrelationships

Several specific characteristics of county school districts are analyzed in order that intercounty differentials in educational environment factors may be more clearly identified. Since these variables have not been examined earlier in this paper, their interrelationships will be examined here in a manner similar to the development of county profiles earlier in this chapter (see Appendix Table A-2). Intergovernmental revenue data is examined in the form of per capita state and federal aids to education while the income flow and wealth stock proxy groups discussed earlier are supplemented with per student statements of income and assessed value.[13]

Seven additional variables are examined in an attempt to pinpoint intercounty differences in "educational environment" factors. These are as follows:

1. The ratio of the number of students in the county to the number of schools (average students per school).
2. The average daily public primary and secondary school attendance in the county.
3. The number of public schools in the county.
4. The median school years completed by the residents of the county.
5. The average salary of public school teachers in the county.
6. The number of public school teachers in the county.
7. The ratio of the number of schools in the county to population density.

All but the last of these are self-explanatory. The final variable is a proxy for among-county differentials in the relationship between the spatial distribution of population and the spatial distribution of schools.

An examination of the interrelationships among these seven factors reveals that those counties having larger numbers of students per school have the highest average daily attendance, more schools, a greater number of teachers and a proportionately smaller number of schools per person per square mile of population. Further, residents of these same school districts on the average have completed a greater number of school years and pay higher teacher salaries. The interrelations of these specific educational variables and the income flow, wealth stock, intergovernmental revenue, population concentration, and general economic-demographic variable groups discussed in the previous sections, show that the counties in the high average daily attendance grouping tend to have a greater population, higher per capita income, greater per capita assessed value, and receive a proportionately smaller amount of per capita state and federal education aids.

Per Capita Education Expenditure Variations

To identify and measure the underlying factors which affect intercounty education spending differences, a regression model is specified in which per capita total education expenditures and per capita local government education expenditures are the dependent variables. The first of the three independent or explanatory factors is the ratio of county assessed value to county income (X_8) and is included because it appears to be a relatively good proxy for the relative wealth base of counties. Previously, it has been shown to be significantly associated with local education expenditures at a positive level. The second explanatory factor included is the ratio of state and federal education aids and direct expenditures for education financed from local sources (X_9). This variable is included to indicate the relative dependence of local governments on non-local revenue

[13] The per student values were found to be very closely related with the per capita values indicating that for analytical purposes they added little to the analysis.

TABLE 27

REGRESSION COEFFICIENTS, STANDARD ERRORS AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON PER CAPITA EDUCATION EXPENDITURES IN COUNTIES BY ALL LEVELS OF GOVERNMENT 1957 AND 1962

Year	Assessed Value / Income X_8	State and Federal Aid to Education / Education Expenditures from Local Sources X_9	Average Students Per School X_{10}	Coefficient of Determination R^2
1957	6.5901*	1.4018*	—.0343*	
	(2.6252)	(.7542)	(.0160)	.3613
	.3171	.2912	—.3207	
1962	—.0647	—1.4704	—.0051	
	(1.4710)	(1.6338)	(.0212)	.0228
	—.0021	— .1741	—.0438	

*Significant at the .05 level.

†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

sources. The third variable considered in the regression model is the average number of students per school in the county (X_{10}). It was found in the previous section that this variable is a relatively good proxy for the seven specific educational environment factors which were examined.

These three independent variables are regressed on per capita total education expenditures made in the county for both 1957 and 1962 (see Table 27). The amount of variation explained does not suffer substantially from the results obtained from the regression of independent variables X_1 through X_4 on per capita total education expenditures (see Table 25). In 1957, counties in which state and federal aid to education accounted for a greater proportion of total education expenditures spent greater per capita amounts on education; however, it has been pointed out that this relationship does not hold for 1962. These counties also have fewer students per school, thereby accounting for the inverse relationship observed between average enrollment and per capita education expenditures. Finally, holding constant the effects of differences in intergovernmental assistance and in educational environment, counties having a greater adjusted wealth base spend greater per capita amounts on education.

The above three independent variables are also regressed on per capita local government education expenditures in 1957 and 1962. These two regressions (see Table 28) account for the explanation of approximately 20 per cent more of the inter-county variations in education expenditure than do the local education expenditure models using variables X_1 through X_4 (see Table 26). The primary difference appears to be that portion of the variation attributable to the factor reflecting the relative importance of intergovernmental aids (i.e., the ratio of externally to internally raised revenues for the education function). The results show that local governments of the high income, urbanized counties, spend significantly more per capita for education than do local governments in counties for which external aids constitute a large proportion of total support for the education function. This parallels the results observed when total local government expenditures by all functions were examined in an earlier section of this chapter. When statistically significant, the ratio of assessed value to income and average enrollment are observed to be positively associated with per capita school district education expenditures.

Finally, a third set of models, which involves regressing the above three independent variables on the ratio of education to non-education expenditures, is examined in regard to both local governments and all levels of government (see Tables 29 and 30). A significant negative relationship between the ratio of state to local support for education and the dependent variable (see Table 29) in 1962 reveals that in those counties which were receiving relatively less aid for education (the urban high income counties) a proportionately greater amount was spent for the education function. This result together with the fact that the aid variable is not statistically

TABLE 28
REGRESSION COEFFICIENTS, STANDARD ERRORS AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON PER CAPITA EDUCATION EXPENDITURES IN COUNTIES FROM LOCAL SOURCES 1957 AND 1962

Year	Assessed Value Income X_8	State and Federal Aid to Education / Education Expenditures from Local Sources X_9	Average Students Per School X_{10}	Coefficient of Determination R^2
1957	5.5883*	—2.9004*	.0082	
	(1.3743)	(.3948)	(.0083)	.7720
	.3069	— .6872	.0877	
1962	2.7391	—7.0739*	.0211*	
	(2.2273)	(.7744)	(.0100)	.8174
	.0822	— .7658	.1654	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

TABLE 29
REGRESSION COEFFICIENTS, STANDARD ERRORS AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON THE RATIO OF TOTAL EDUCATION EXPENDITURES IN COUNTIES BY ALL LEVELS OF GOVERNMENT TO TOTAL NON-EDUCATION EXPENDITURES IN COUNTIES BY ALL LEVELS OF GOVERNMENT 1957 AND 1962

Year	Assessed Value Income X_8	State and Federal Aid to Education / Education Expenditures from Local Sources X_9	Average Students Per School X_{10}	Coefficient of Determination R^2
1957	—.0727	—.0499	.0007	
	(.1010)	(.0290)	(.0006)	.1929
	—.1022	—.3028	.1920	
1962	—.2089*	—.0943*	.0010*	
	(.0835)	(.0290)	(.0004)	.4946
	—.2781	—.4529	.3375	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

TABLE 30
REGRESSION COEFFICIENTS, STANDARD ERRORS AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS† OF SELECTED INDEPENDENT VARIABLES ON THE RATIO OF EDUCATION EXPENDITURES FROM LOCAL SOURCES TO NON-EDUCATION EXPENDITURES FROM LOCAL SOURCES 1957 AND 1962

Year	Assessed Value Income X_8	State and Federal Aid to Education / Education Expenditures from Local Sources X_9	Average Students Per School X_{10}	Coefficient of Determination R^2
1957	.0011	—.1693*	—.0032*	
	(.1516)	(.0436)	(.0009)	.2934
	.0010	—.6403	—.5507	
1962	.0927	—.2654*	—.0015*	
	(.3109)	(.1081)	(.0014)	.1476
	.0419	—.4448	—.1854	

*Significant at the .05 level.
†Standard errors are shown in parentheses under the regression coefficients and the standardized partial regression coefficients are shown below the standard errors.

significant in 1957 further illustrates the increasingly greater proportion of education expenditures made by the more prosperous local governments in 1962.

These results again suggest the possible distortive effects of the state assistance program to education. In counties where education aids are a larger fraction of total education expenditures, a proportionately smaller amount of available local resources is devoted to the education program. Hence, it is conceivable that the lower income, less populous counties view state and federal education assistance as substitutes for local funds.

SUMMARY

The analysis in the present chapter indicates that intergovernmental assistance is by far the most important determinant of intercounty variations in West Virginia public expenditures. However, when only government expenditures from internal sources are examined, factors such as income level and degree of urbanization—which reflect need, and perhaps preference differentials—are observed to be significant determinants of the level of per capita spending. Nevertheless, income level is inversely related to the level of *total* public expenditures in counties.

These findings show that state and federal expenditures and aids are allocated among counties on an equalizing basis. The equalization features of the distribution are sufficiently strong to create a significant negative relationship between per capita intergovernmental aids (direct expenditures and grants) and total per capita income in West Virginia counties ($r = -.58$ in 1962). Conversely, the distribution of federal grants-in-aid among the 48 continental United States results in a nonsignificant correlation coefficient of .07 between per capita federal aids and per capita state income. In fact, whereas the federal grants program generally only *reduces* the per capita expenditure disparity between high and low income states, the distribution of intergovernmental assistance in West Virginia generally *reverses* the income-expenditure relationship, i.e., the lower the level of per capita income, the higher the level of per capita public expenditures made in the county.

An analysis of intercounty variations in per capita highway, welfare, and education expenditures also generally show total spending to be inversely related to income, while spending from local sources is positively related to income.[14] This finding suggests the possibility that local governments in low income counties may be substituting state and federal funds for local funds. The positive relationship between fiscal effort and income level (see Chapter 2) would tend to support the substitution thesis.

A more intensive analysis of intercounty education spending shows that higher income counties made a concentrated effort to increase expenditures from their own sources over the 1957-1962 period. As a result, the level of per capita education expenditures in counties and the level of county income are positively and significantly related in 1962. Per capita government expenditures from local sources for the education function are, as would be expected, positively related to income level and the degree of urbanization in a given county.

More pronounced evidence of a substitution of state and federal funds for local funds in West Virginia may be observed for the education function. It was found that (1) the relative importance of state and federal education aids (i.e., the ratio of state and federal education aids to total local general revenues) is inversely and significantly related to the level of per capita education expenditures from local sources, and (2) the *proportion* of total expenditures from own sources devoted to the education function is also significantly and negatively related to the relative importance of intergovernmental education aids in the revenue structure of the county. These results indicate that *relatively* high levels of state and federal assistance may foster a lower level of activity in absolute (per capita) terms for the aided function.

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[14] The lone exception to this statement is the regression on education expenditures for 1962.

CHAPTER V

THE SECULAR PATTERN OF LOCAL GOVERNMENT EXPENDITURES IN WEST VIRGINIA

While a statistical analysis of factors determining among-county *differences* in per capita expenditures is presented in the preceding chapter, the focal point of this chapter is an analysis of factors associated with *changes* in per capita local government expenditures. Rather than examining cross sections of data for all counties in each of two years, a time series analysis is carried out for each county over the 14-year period from 1950 through 1963.

OBJECTIVES OF THE TIME SERIES ANALYSIS

The first of the three major objectives of this chapter is to measure and compare among counties and for the state as a whole the responsiveness of per capita expenditures to secular movements in the income level, and to changes in the property tax base. This necessitates a county-by-county examination of the temporal relationships among per capita local government expenditures, per capita income, per capita assessed value and fiscal effort. Second, through an examination of the long-run relationship between per resident spending and population size, it is hoped that some insight may be gained regarding the existence of local government economies of scale in West Virginia. A third objective is to separate real from money increases in per capita expenditures, income and assessed value and describe the covariability among the three, and the trends in each on a county-by-county basis.

STATISTICAL METHOD

For each of 55 counties, a time series regression line is fitted on data for the 14 years between 1950 and 1963 inclusive. The least squares equations are of the form.

$$\log Y = \log a + b_1 \log X_1 + b_2 \log t,$$

where

- Y = per capita local government expenditures,
- X_1 = some explanatory variable,
- t = time,
- b_1 = the partial elasticity coefficient of the independent variable,
- b_2 = the partial elasticity coefficient of time.

Of particular interest in intercounty comparisons are the partial elasticity coefficients (b_1 and b_2) which measure the per cent change in per capita expenditures (Y) associated with a 1 per cent change in the respective independent variable (X_1 or t), given that the other independent variable is held constant. If the sign of the coefficient is positive, both variables move in the same direction; if negative, increases in one are associated with decreases in the other and vice versa.

Time is introduced as an independent variable in the model in an attempt to randomize the residuals with respect to time. To the extent this is not accomplished, i.e., if the error terms are still significantly autocorrelated, the usual error formulas do not apply and the traditional tests of statistical significance are invalid.[1]

AN AGGREGATE STATE TIME SERIES

First, the time series analysis of aggregated local government expenditures for the entire state is presented. The dependent variable used is total local government spending in the state divided by total state population.

Appendix Table B-1 shows both real and money amounts of per capita local government expenditures, per capita income, and per capita assessed value for the years 1950-1964. Table 31 shows the average

TABLE 31

AVERAGE RATES OF GROWTH IN PER CAPITA EXPENDITURES FROM LOCAL SOURCES, PER CAPITA INCOME, AND PER CAPITA ASSESSED VALUE IN WEST VIRGINIA 1950-1963

	Regression Coefficient* (Average Rate of Growth) 1950-1963 (In dollars)	Elasticity Coefficient (Per Cent Increase) 1950-1963
Per Capita Expenditures from Local Sources	2.58 (2.03)	.3386
Per Capita Income	53.76 (32.07)	.1786
Per Capita Assessed Value	79.98 (53.57)	.2240

*The figure shown in parenthesis is the respective coefficient when the data are adjusted for changes in the price level.

[1] Mordecai Ezekiel and Karl Fox, *Methods of Correlation and Regression Analysis*, Third Edition (New York: John Wiley and Sons, Inc., 1959), Chapter 20.

rates of growth (between 1950 and 1963) obtained from simple linear least squares regressions of these data on time. For example, the regression coefficients in column 1 show that over the period in question the average annual increase in per capita money income is $53.76 and the average annual increase in per capita real income is $32.07.

A comparison of average growth rates in this form is biased because of scale differences, e.g., an average annual increase of $10 might be extremely high for per capita expenditures but extremely low for per capita assessed value. Elasticity coefficients which give the average annual *per cent* increase in each of the three variables over the same period of time are used to eliminate this bias. Accordingly, Table 31 shows per capita expenditures to be increasing at a relatively greater rate than either per capita income or per capita assessed value.

In order to determine the secular income elasticity of per capita expenditures, the latter is regressed on the explanatory variables per capita income and time.[2] The results yield an estimate of 1.117 for the partial income elasticity of per capita local government spending between 1950 and 1963. Thus for the state as a whole, increments in per capita income were accompanied on the average by slightly greater than proportionate increases in per capita expenditures. However, the reasons for this elastic relationship may be found in the declining population base over this period, which could have resulted in bringing about a better balance between the *per resident* demand for, and overall ability to support, a given level of local services.

THE SECULAR PATTERN OF LOCAL GOVERNMENT EXPENDITURES

The aggregated state time series reveals the average movement in per capita expenditures through time relative to movements in per capita income and per capita assessed value, but does not enable observation of county-to-county differences in the trend and pattern of local government expenditures. Consequently, the balance of this chapter involves a time series analysis of each county—parallel to that performed on aggregate state data in the preceding section—with the objective of identifying and measuring the relative importance of factors associated with differences in the nature of long run movements in local government expenditures.

[2] All variables are expressed in log form, hence the regression equation is again of the type

$$\log Y = \log a + b_1 \log X_1 + b_2 \log t.$$

Expenditures and Income

It would seem plausible to assume that as the level of economic well-being of residents of a county increases, they will demand such things as better local roads and streets, an adequate park and recreation program, better schools, increased police and fire protection, and sidewalks. If per capita income may be taken as a proxy measure of the level of demand for public services, then for any given county a rising level of per resident income should be accompanied by a rising level of per resident public expenditures. It has already been shown that increments in the level of personal income in the state as a whole have resulted in an even more than proportionate increase in per capita expenditures.

Data presented in Appendix Table B-2 show the temporal relationship between per capita local government expenditures and per capita income for each of 55 counties. Column 1 is the partial income elasticity of expenditures, holding the effects of time constant. It is the per cent increase in per capita expenditures brought about by a 1 per cent increase in per capita income. For example, for every 1 per cent increase in per capita income in Barbour County, per capita local expenditures rose on the average by about 0.9 per cent.[3] Thus, for Barbour County, per resident expenditures and income have varied about proportionally. Conversely, it may be seen from Appendix Table B-2 that in Ritchie County relative increments in per resident spending have exceeded those in per resident income; while in Mason County, there is little observed response in the level of public expenditures to movements in the income level. Finally, in counties such as Doddridge and Greenbrier, rising per capita personal income has actually been accompanied by a decreasing level of per resident local government expenditures.

Counties within the state may be broken down arbitrarily into three general classes according to their partial income-elasticity of expenditures. A county which has an *elastic* coefficient will be defined as one in which a 1 per cent change in per capita income is accompanied by a proportionately greater increase in per capita expenditures. A county with an *inelastic* coefficient is one in which the change in expenditures is proportionately less than that in income, while for counties in which the per cent changes in income and expenditures are approximately equal, the elasticity coefficient may be said

[3] Again, this coefficient in column 1 is actually a partial elasticity coefficient, in that it gives the proportionate response of expenditures to income given that the effects of time are held constant.

to be *unitary*. For purposes of this analysis, counties are grouped as elastic if the coefficients are greater than 1.2, inelastic if the coefficients are less than 0.8, and unitary if the coefficients lie between 0.8 and 1.2 inclusive.[4] Over half (29) of West Virginia's 55 counties fall into the inelastic class while only 11 show expenditures to be income elastic (see Appendix Table B-2).

An identification of factors which are common to counties within any of the three groupings may suggest possible determinants of the widely varying expenditure-income relationship. Nine of the 11 counties showing a strong secular elasticity between income and expenditures experienced a severe decline in population over the 1950 to 1963 period; consequently, it is possible that among these counties the elastic relationship has little meaning. If the substantial out-migration was primarily due to movement of the low income and unemployed, the denominator of the ratio $\frac{\text{Income}}{\text{Population}}$ would be expected to decline relatively much more than the numerator, i.e., per capita income will rise.[5] Conversely, the level of local government expenditures may be invariant with respect to the level of unemployment, therefore, migration of the unemployed would probably cause a greater proportionate reduction in the denominator of the ratio $\frac{\text{Expenditures}}{\text{Population}}$ than in the numerator. Hence, even if the local governments spend smaller absolute amounts in successive years, the level of *per capita* expenditures could rise. If, in fact, the expenditure-income relationship is elastic because of out-migration, and not because local governments have increased public services to meet a rising demand, then one returns to the argument that population movements in West Virginia in the past 15 years have brought about a better balance between *per resident* demand and ability to pay and the *per resident* level of public services.

It is significant that among the 14 counties having positive rates of population growth between 1950 and 1960,[6] only two have elastic expenditure-income coefficients. Further, only one among the seven counties in the state having over half their population living in urban areas was observed to have an elastic expenditure-income relationship (see Table 32). On the basis of this historical data, it can be hypothesized that among the more rapidly growing and more heavily urbanized areas, local government services did not rise adequately to meet the demand for greater scope and quality of public facilities. (Again, it is assumed that changes in the income level are a sufficient proxy indicator of changes in the demand for public goods.)

Expenditures and Assessed Value

It would not be startling to find a high degree of covariability between temporal movements in total dollar amounts of local government expenditures and assessed value since the property tax is a primary source of revenue at the local level in West Virginia. However, at least three questions concerning the relationship between expenditures and assessed value through time do merit special attention: (1) What is the nature of intercounty differences in the degree of covariability between *per capita* expenditures and *per capita* assessed value, i.e., in the size of the partial elasticity coefficients? (2) How are secular movements in this particular measure of fiscal ability (assessed value) related to changes in the demand for public services (income)? (3) Have long term increments in fiscal capacity been accompanied by increasing, decreasing, or constant changes in fiscal effort?

TABLE 32

RATE OF POPULATION GROWTH, LEVEL AND PER CENT INCREASE IN PER CENT URBAN AND POPULATION DENSITY FOR SELECTED WEST VIRGINIA COUNTIES*

	RATE OF POPULATION GROWTH	PER CENT URBAN		POPULATION DENSITY	
	1950-1960	Level in 1960	Per Cent Increase 1950-1960	Level in 1960	Per Cent Increase 1950-1960
Boone	—13.3	0	0	57.0	—13.6
Clay	—20.2	0	0	35.0	—20.5
Grant	— 5.2	0	0	17.0	— 5.6
Hampshire	— 6.9	0	0	18.0	—10.0
Jefferson	8.6	17.8	0.1	89.0	9.9
Kanawha	5.5	66.8	10.2	279.0	5.7
Lincoln	— 9.8	0	0	46.0	—11.8
Randolph	—13.8	31.5	1.7	25.0	—16.7
Ritchie	—13.2	0	0	24.0	—14.3
Tucker	—26.9	0	0	18.0	—28.0
Wood	—17.7	72.5	2.6	213.0	17.7
11 County Average	—10.3	17.1	1.3	74.6	— 7.9
Total State Average	— 7.2	38.2	3.6	77.0	— 7.2

*Counties in the elastic expenditure-income group.
Source: See text.

[4] This is at best a very rough method of classifying counties, but because of the small number of observations and the degree of autocorrelation which exists, significance tests will not be presented. Hence, the procedure of classifying counties by whether or not their elasticity coefficient is *significantly* greater than, equal to, or less than 1 is rejected in favor of this more crude method.

[5] This is not to say that the remaining residents in the county are now earning a greater wage, but rather, if the annual income in the county were to be apportioned equally among residents, the share per person would be greater.

[6] Berkeley, Brooke, Cabell, Hancock, Jackson, Jefferson, Kanawha, Marshall, Mason, Mineral, Morgan, Pleasants, Putnam, and Wayne.

Data presented in Appendix Table B-3 show partial elasticity and correlation coefficients for the log-log relationship between per capita local government expenditures (Y), per capita assessed value (X_3) and time (X_2). It may be observed from this table that 14 counties show an elastic assessed value-expenditure coefficient while in 34 others the response of per capita expenditures to changes in per capita assessed value is less than unity. The reasons for this predominately inelastic relationship may be better examined by considering counties according to (a) the *strength* of the expenditure-assessed value relationship, and (b) their rate of population growth. It is possible that for those counties experiencing substantial net out-migration in the form of unemployed and low income families, the decline in assessed value is relatively smaller and probably unrelated to changes in per capita local government expenditures.

A comparison of the partial correlation coefficients in column 4 of Appendix Table B-3 shows that of the 24 counties having coefficients smaller than .5, only two had a positive rate of population growth between 1950 and 1960.[7] Further, 10 of the 13 counties which had population declines in excess of 17 per cent during this period fall in this class. Of the 31 counties for which the expenditure-assessed value relationship is close (i.e., the partial correlation coefficient is greater than .5) over half are observed to have elastic coefficients.

Even if the observed relationship is elastic, it shows only that, proportionately, the ratio $\frac{\text{Local Expenditures}}{\text{Population}}$ has increased at a greater rate than the ratio $\frac{\text{Total Assessed Value}}{\text{Population}}$. If the scope and quality of public services is not enlarged and if total expenditures increase only because of inflationary pressures, the level of *per capita* expenditures will increase in the face of population out-migration. However, if the nature of this migration is such as to affect assessed value to a much smaller extent than it affects local government spending, per capita expenditures may easily increase relatively more than per capita assessed value. Hence, the existence of this elastic expenditure-assessed value relationship does not necessarily prove that the level of spending by local governments is quite responsive to increases in assessed value.

[7] A partial correlation coefficient less than .5 means that less than 25 per cent of year to year differences in per capita local expenditures which are not accounted for by "time" may be explained by temporal movements in per capita assessed value.

Income and Assessed Value. Before the significance of the expenditure-assessed value relationship may be examined, it would seem appropriate to establish the strength and direction of the temporal relationship between the demand for public services (per capita income) and one measure of the ability to finance these services (per capita assessed value). It has already been shown, in the cross-sectional analysis, that higher *levels* of per capita income are associated with higher *levels* of per capita assessed value among counties in a given year. Alternatively, using a time series technique, one may analyze for each county the association between *changes* in per capita income and *changes* in per capita assessed value. A simple time series regression of per capita income on per capita assessed value[8] (see Appendix Table B-4) shows the relationship to be inelastic (less than 0.8) in only 14 of 55 counties. Therefore, for most counties in West Virginia, changes in per capita income over the 1950-1964 period are accompanied by at least proportionate changes in assessed value. However, it does not necessarily follow that per capita property tax yields will be generally "income elastic" in periods when population is increasing. Though empirical analyses have not been consistent in estimates of the income elasticity of the property tax, the nature of the assessment procedure, i.e., periodic reassessment and fractional valuation, suggests that for a growing area the rate of increase in per capita income will probably exceed that of per capita assessed value.

Effort and Assessed Value. It is also of interest to compare secular movements of per capita assessed value with those of fiscal effort. Per capita assessed value is chosen in this case to represent not only the relative magnitude of the property tax but also the general level of wealth in the county. In this respect, per capita assessed value seems a fair proxy for overall ability to finance. Data presented in Appendix Table B-5 show the results of county-by-county time series of per capita assessed value and time on the ratio $\frac{\text{Expenditures}}{\text{Income}}$. The ratio, which measures local government expenditures from own sources per dollar of personal income, may be thought of as a measure of fiscal effort, or at least as a measure of relative preference for public goods, since it indicates the proportion of each dollar

[8] The equation is of the form

$$\log Y = \log a + b \log X,$$

where

Y = per capita assessed value,
X = per capita income.

The results of this regression are shown in Appendix Table B-4.

earned in the county which is devoted to public expenditures. Column 1 of Appendix Table B-5 shows the magnitude of the change in this effort measure which is associated with a 1 per cent change in per capita assessed value, given the effects of time. Thus an elastic coefficient ($b > 1.2$) indicates that increases in effort have been more than proportionate to changes in per capita assessed value. Of the 55 counties, only eight had elastic coefficients, while eight more showed an approximately proportionate relationship between assessed value and income; hence for 39 counties, the increment in average fiscal effort was less than the average increment in per capita assessed value. In fact, for 21 counties increments in per capita assessed value were associated with a declining level of fiscal effort.

In order to determine whether or not the temporal pattern of the effort-assessed value relationship is systematically related to identifiable socio-economic or demographic factors, mean value of income, population size, rate of growth, and per cent urban are computed for counties grouped according to the size of their elasticity coefficients. Table 33 shows the results of these computations. It is not evident from these data that higher income and more heavily urbanized counties have generally realized *increments* in fiscal effort which are at least proportionate to fiscal capacity. This is not inconsistent with the earlier finding that higher income and more heavily populated counties have shown the greater absolute increases in fiscal effort. It does amend this statement, however, by showing that *relative to increases in per person fiscal capacity* (assessed value), these counties have not shown proportionately greater increments in effort. On the other hand, this finding does not mean that local governments of lower income, less populated areas have increased tax rates or user charges. Consider the following hypothetical numerical example (all dollar values expressed in thousands):

	Period 1	Period 2	Per Cent Change
Assessed Value	$1,000	$ 990	.....
Population	1,000	900	.....
Per Capita Assessed Value	$ 1.0	$ 1.1	+10%
Total Government Expenditures from Local Soures	$ 30	$ 30	.....
Total Income	$1,500	$1,200	.....
Expenditures from Local Sources / Income	.020	.025	+25%

$$\text{Elasticity Coefficient} = \frac{\text{Per Cent Change in Effort}}{\text{Per Cent Change in Per Capita Assessed Value}}$$

$$= \frac{25}{10} = 2.5$$

Though the numbers here do not approximate the actual situation, they serve the purpose of showing that the effort-assessed value relationship may be substantially affected by population decline. In this example, the assessed value-effort relationship is found to be elastic even though both assessed value and income declined between the two periods. The point is that a declining population has in this case imposed a greater average fiscal effort on the remaining citizens of the county.

TABLE 33

MEAN PER CAPITA INCOME, POPULATION GROWTH RATE, POPULATION SIZE, AND PER CENT URBAN: FOR WEST VIRGINIA COUNTIES GROUPED BY SIZE OF THE EFFORT– ASSESSED VALUE ELASTICITY COEFFICIENT*

	SIZE OF ELASTICITY COEFFICIENT			
	Greater than 1.2	0.8 to 1.2	0.0 to 0.8	Less than 0.0
Per Capita Income	$1,554	$1,583	$1,619	$1,510
Rate of Population Growth	– 5.1%	–10.1%	– 5.4%	–13.6%
Population Size	20,253	63,405	35,355	25,243
Per Cent Urban	7.9%	27.8%	26.9%	18.3%
Number of Counties	8	8	16	23

*Partial elasticity coefficient computed from

$$\log Y = \log a + b_1 \log X_1 + b_2 \log t,$$

where

Y = the ratio of local government expenditures to personal income,
X_1 = per capita assessed value,
t = time.

Economies of Scale

Public finance literature abounds with empirical attempts to establish the existence or nonexistence of economies of scale in local government finance. The phrase "economies of scale," as used here, denotes a situation where the *per resident cost* of public services supplied by a local government declines as the number of residents within the bounds of the local government increases.

There are many conceptual and methodological barriers to achieving a valid statistical answer to this question. First, most studies have involved analysis

of cross sections of data, thereby describing the association between *differences* in per capita expenditures and *differences* in population size but giving little information about the *changing* level of per capita expenditures brought about by population *increases*. Second, interrelationships among the variables make it difficult, if at all possible, to isolate the effect of population size on expenditures from the effect of other factors, e.g., income, intergovernmental aids, etc. Third, it has not been possible to separate changes in per capita costs due to scale economies or diseconomies from those due to changes in the scope or quality of services. The present analysis is one of the few statistical examinations of local public expenditures which is free of the first of these barriers. The latter two limitations cannot be overcome, given existing data and the statistical technique employed.

A two-variable time series regression is run for each county with per capita expenditures as the dependent variable and population size as the independent variable. Using the criterion of a negative regression coefficient to discern economies of scale, 37 counties show long run declines in per capita expenditures (costs) to be associated with long run increments in population, or vice versa (see Appendix Table B-6).

Included among the counties where economies of scale are not observed—where per capita expenditures and population size are positively related—are all 13 counties which had a positive rate of population growth between 1950 and 1960. At least three possible explanations may be offered for this observation. Spangler has hypothesized that areas having more rapid rates of population growth are subject to "the disruptive effects of expansion" and therefore realize diseconomies.[9] He suggests that the most efficient level of operations may be the present one, the one to which the workers are accustomed, and thus more rapid growth rates foster inefficiencies. A second possible explanation is that since these are the most prosperous counties in the state, the scope and quality of public services have been enlarged through time. Rising population, income levels, and fiscal capacity probably dictated changes such as higher quality police and fire protection, and better refuse collection and road and street maintenance service. At any rate, the higher costs associated with expanding the scope and quality of government operations may offset any real economies of scale. Yet a third possibility for the positive coefficient for these counties is that at higher levels of government operations, scale economies are outweighed by inefficiencies resulting from top-heavy administration and the ills of political patronage that often accompany too large a local government unit.[10]

The fact that the population-per capita expenditure relationship is inverse for most counties which are losing population may not indicate economies of scale, but rather only certain effects on public expenditures which are peculiar to out-migration.[11] For example, if local governments in county A are spending $40 per resident for public services, it does not follow that a migration of 1,000 residents will automatically reduce expenditures by $40,000. The reduction will be considerably smaller to the extent the out-migrants are the unemployed and low income (who exert less upward pressure on public expenditures). For those 13 counties in which the population is expanding, scale economies are either nonexistent or are obscured by changes in the scope and quality of public services. For the remaining counties, population data show a long-run secular decline; hence for West Virginia, it must be concluded that contrary to the statistical findings there is little *a priori* evidence to support the argument that as the population of an area rises, the costs incurred by the local government in supplying public services falls.

It must be emphasized that the time series technique in this chapter involves a county-by-county analysis of per capita *aggregated local government expenditures*—the sum of expenditures by the city government, the county government, and the school district. Therefore, the question at hand is whether increasing population size leads to lower per resident costs, *given the existing structure of local government*. Graphically, one may conceive of the existence of economies of scale defined in this manner, as a movement along a curve such as AC_1 (see figure below). To demonstrate statistically that this curve has a negative slope is the primary objective of the above analysis.

It is important to distinguish between this question and those which may arise regarding the

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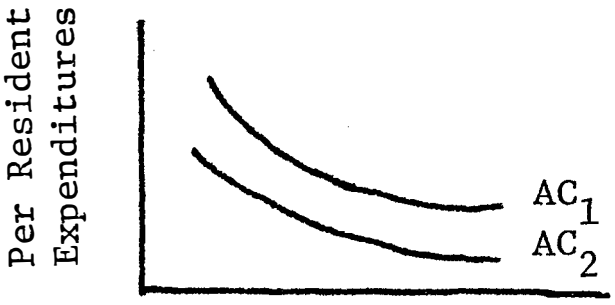
[9] Richard Spangler, "The Effect of Population Growth Upon State and Local Government Expenditures," *National Tax Journal*, XVI, No. 2 (June 1963), pp. 193-196.

[10] See Werner Z. Hirsch, "Administrative and Fiscal Considerations in Urban Development," *The Annals of the American Academy of Political and Social Science Urban Revival: Goals and Standards* (March 1965), p. 55.

[11] The negative coefficient in this case describes an *increase* in per capita expenditures which accompanies a *decrease* in population size.



diseconomies wrought by "balkanization," or governmental fragmentation. It may be hypothesized that duplication of services among local governments in the same county area may foster significant inefficiences. For example, both the city and county may provide police and fire protection services and both may assume an administrative and control function. Conceivably, the consolidation of local jurisdictions would eliminate this duplication and if the offsetting effects of "big government" are relatively small, the net result would be a shift in the average cost curve from AC_1 to AC_2, i.e., population size has remained the same, but per resident costs have been reduced.

The Secular Pattern of Real Expenditures, Income and Assessed Value

The above analysis has been devoted exclusively to an examination of the secular trend in per capita expenditures. However, secular increments in per capita expenditures do not necessarily imply increases in public service levels since two dollars may buy no more fire protection in 1964 than did one dollar in 1950, as increments in the price level have affected substantially the cost of local government operations.

Data presented in Appendix Table B-7 show the results of time series regressions of the consumer price index on per capita income for each county. The regression equation is of the form

$$CPI = aY^c, \qquad (1)$$

where

CPI = consumer price index,
Y = per capita income.

The elasticity coefficient (c) is an estimate for each county of the per cent rise in the consumer price index which accompanies a 1 per cent increase in per capita income, e.g., for Marion County, on the average, approximately one-third of every 1 per cent increase in per capita income was due to an increase in the general price level.

Compare this with the expenditure-income time series regression (see Appendix Table B-2)

$$E = aY^{b_1}t^{b_2}, \qquad (2)$$

where

E = per capital expenditures,
Y = per capita income,
t = time.

The partial elasticity coefficient (b_1) is an estimate of the per cent increase in per capita expenditures associated with a 1 per cent increase in per capita income. Then it follows that if for any county $c > b_1$, a 1 per cent increment in per capita income is associated with a proportionately greater rise in the consumer price index than in per capita expenditures, i.e., per capita income and *real* per capita expenditures are inversely related. Conversely, to the extent $b_1 > c$, secular increments in per capita income are associated with increments in real per capita expenditures. The 13 counties in which temporal increases in per capita income are associated with a long run decline in real per capita expenditures ($c - b_1 > 0$, see column 3 of Appendix Table B-7) are primarily low income counties which are losing population. Hence, even though declining population may bring about a better balance between *per resident* fiscal capacity and per resident need, temporal movements in real expenditures in these counties have not increased proportionately with the demand for public services. Moreover, in only nine counties has the increment in real per capita expenditures been proportionate to the increase in per capita income; and none of these counties are above average in income or have positive rates of population growth between 1950 and 1960. Since the property tax is a major source of local revenue, the temporal real-income inelasticity of per capita expenditures (observed in 33 counties) may be partially due to the relative inelasticity of the property tax base with respect to per capita income.

The first three columns of Appendix Table B-8 show the average annual change in real amounts of per capita expenditures, income, and assessed valuation, i.e., the slope of the least squares regression line between real per capita expenditures, income or assessed value, and time, for each county during the period 1950-1964. For example, the average annual increment in per capita real expenditures by

local governments in Mason County between 1950 and 1964 was $1.80, whereas for Braxton County it was only $0.50. In order to make intercounty comparisons, these relationships are expressed in per cent changes and are shown in columns 4, 5, and 6 of Appendix Table B-8. These columns are interpreted similarly, e.g., over the same period of time, per capita real expenditures increased by about 19 per cent in Berkeley County, 45 per cent in Jackson County, and 10 per cent in Wirt County. By using these per cent changes, counties may be classified according to their rate of growth in real per capita expenditures, income and assessed value.

SUMMARY

In this chapter the results of a time series analysis of 55 West Virginia counties for the 14-year period 1950 through 1963 are presented. An attempt is made to identify factors which are associated with *changes* in local government expenditures over the period. These secular relationships between per capita expenditures, per capita income, per capita assessed value and county fiscal effort are analyzed using alternative multiple regression models; however, the results are in some cases difficult to interpret. The primary difficulty results from the fact that population declined in 41 of the 55 counties over the period. It is observed that per capita expenditures from local sources increased at a greater rate than did either per capita income or per capita assessed value, and population declined in the majority of the West Virginia counties. Given the reasonable assumption that the out-migrants were primarily from the lower income stratum, it might be concluded that population movements in West Virginia have generally resulted in a better overall balance between per resident demand for and per resident ability to finance a given level of public services.

In an attempt to measure possible economies of scale, the relationship between per resident costs and population change are examined for each of the 55 counties over the period. A decline in per resident costs accompanying an increase in population is defined as a situation in which economies of scale could have been present. However, all 13 counties which had positive population growth rates between 1950 and 1960 did not reveal any significant negative relationship between population and expenditures. Several possible reasons for this observed finding are presented but may not be tested empirically.

Finally, an attempt is made to examine "real" changes in the income-expenditure relationship or changes other than those associated with changes in the price level. A limitation of this analysis is that the index used to adjust for price changes is the consumer price index which is available only on a nationwide basis. The rationale for using this index is that the analysis is concerned only with price variations from year to year and not from county to county. Consequently, if the assumption is valid that price levels associated with the West Virginia counties tend to vary proportionately with the consumer price index, then the analysis presented is feasible.

CHAPTER VI

IMPLICATIONS OF THE INTRASTATE ANALYSIS

A detailed analysis of the trend and pattern of public expenditures in West Virginia is presented in the first five chapters of this study. This analysis is meaningful only if it is used in the formulation of public policy. Accordingly, this chapter involves a summary consideration of certain problems and issues vital to the public economy of West Virginia. Specifically, the sections below include discussions of (a) alternative forms of future federal assistance, (b) alternative methods by which the state may assist local units of government, (c) equalization as a possible deterrent to long run economic development and (d) comparative projections of public sector activity among subregions within the state.

FUTURE FEDERAL ASSISTANCE TO WEST VIRGINIA

It was established in Chapter II that West Virginia ranks from below average to very low in most measures of fiscal capacity and public spending for nearly all functions. Further, the analyses have revealed that if this state (as well as similar low-income states) is to attain at least minimum standards in the performance of public services, substantial federal assistance will be required. However, the *method* by which this assistance will be distributed among states is the subject of much debate at the national as well as state level. Of the alternatives which have been considered, all are not equally beneficial from the point of view of West Virginia.

In addition to the possibilities for tax reform at the state level, it has been proposed that fiscal relief be provided in the form of an intensifying of the present system of federal grants-in-aid, a program of either unconditional or block grants, a negative income tax, or a federal state-tax credit or tax sharing plan. These alternatives are examined in the following sections.

Conditional Grants-In-Aid

It has been proposed that the growing pressure on state and local resources may be relieved somewhat by increasing the amounts of assistance provided under the existing system of conditional grants-in-aid. The main features of this grant program are that (a) the funds must be spent for a designated function, (b) the grant is generally made directly to the state rather than the local government, and (c) the state is usually required to provide some matching funds from its own sources. Proponents of this system of federal assistance contend that the conditional provisions permit the federal government to ensure minimum levels of service in all states with respect to the aided functions. Under the existing grants program, West Virginia, in 1963, received $54.58 per capita and ranked 22nd among the states.[1]

Unconditional and Block Grants[2]

Before escalation of the war in Viet Nam, an issue of much concern was the so-called Heller plan (named for Walter Heller, Chairman of the Council of Economic Advisors under Presidents Kennedy and Johnson) for unconditional or block grants to states.[3] Under this plan, funds would be distributed to the states (on an equalizing basis) and could be used at the discretion of the state. A slightly modified version of the plan would limit the use of these funds to wide ranges of purposes, for example, to public assistance as a whole rather than to specific categories of public assistance.

It is argued that the advantage of the block grant form over the conditional grant form is a partial elimination of budget distortion created by the shifting of funds from non-aided to aided functions. In general, the block grant enables the federal aid system to take account of interstate variations in specific needs by making the allocation of available resources among alternative ends a state decision.

James Plummer[4] has estimated the distribution of block grants among states based on a modified Heller method which was suggested by Professor Joseph A. Pechman of the Brookings Institution.[5] Under this scheme the grant would be composed of a major portion and an equalization portion. The fraction

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[1] See Maxwell, *Financing State and Local Governments, op. cit.*, p. 251.

[2] A block grant is one appropriated for a wide variety of functions rather than for a specific function, e.g., one appropriated for public assistance as a whole rather than for specific categories of public assistance. An unconditional grant is simply a block grant not tied even to a broadly defined state-local function. Maxwell, *op. cit.*, p. 68.

[3] See Walter Heller, *New Dimensions in Political Economy* (Harvard University Press, 1966).

[4] James L. Plummer, "Federal-State Revenue Sharing," *Southern Economic Journal* (July 1966), p. 120-126.

[5] Joseph A. Pechman, "Financing State and Local Government," Proceedings of a *Symposium on Federal Taxation* (New York: The American Bankers Association, 1965), pp. 71-85. See also the comments by George S. Moore, Charles H. Percy, and Nat Weinberg in the same volume.

of the major portion allocated to each state is obtained by the following formula:

$$\frac{P_i R_i}{\sum_{j=1}^{50} P_j R_j},$$

where P_i is the population of the i^{th} state and R_i is the relative state and local revenue effort (the ratio of state and local general revenues from own sources to total state personal income). The term in the denominator $\sum_{j=1}^{50} P_j R_j$ represents the sum of these values over all 50 states. Hence a state may improve the fraction of the major portion of aid it receives by increasing its fiscal effort relative to that of the other 49 states. Population growth at a rate above the U.S. average is automatically accounted for in the formula.

The equalization portion of the grant would be distributed only to the poorest one third of the states according to the formula:

$$\frac{\frac{P_j}{Y_j}}{\sum_{j=1}^{50} \frac{P_j}{Y_j}},$$

where P_j is population of the j^{th} state, and Y_j is per capita personal income of the j^{th} state. Roughly, this formula provides for a distribution among these 17 states in which the fraction received is directly related to the relative population size and inversely related to relative per capita income, population being more important than income in determining the fraction.

The size of the equalization portion is not specified by Pechman and would, undoubtedly, be the subject of much debate should this form of federal assistance continue to receive attention. According to Plummer, most conjectures about the size of the equalization portion put the fraction anywhere from 10 per cent to 25 per cent, hence he calculates the proportion of $1 billion which each state would receive under the assumption that the equalizing proportion is 10 per cent and again under the assumption that it is 25 per cent.[6] He concludes that West Virginia would rank 13th under the 10 per cent equalization portion assumption and 12th under the 25 per cent scheme. In either case, the state would benefit since, as previously noted, it ranks 22nd in the existing conditional grants scheme. In summary, the possibility of block grants to states suggests not only that West Virginia will receive a higher level of federal assistance, but also that the relative share allocated to the state will increase substantially.

[6] See Plummer, *op. cit.*, p. 122.

The Negative Income Tax[7]

The negative income tax is exactly what the name implies—an income tax in reverse. Under the present federal income tax system, individuals with adequate incomes pay taxes and those with barely adequate incomes do not. The negative income tax proposal adds a third dimension by providing that those with less than adequate incomes receive payments from the U.S. Treasury. Since these payments are made directly to individuals, the benefits derived by state and local governments will be only indirect; for example, the level of public assistance payments may be reduced, thereby freeing resources for other purposes. However, the most important potential effects of a negative income tax on the public economy would be long run, and related to the degree to which this anti-poverty measure is a stimulus to the economic development of the state. Hence, the negative income tax proposal does not afford state and local governments (even in a state such as West Virginia which would benefit substantially from such a tax) a great amount of relief from *current* fiscal problems.

Tax Credit and Tax Sharing

In addition to intensification of the present system of grants, unconditional grants, and the negative income tax, two other proposed methods of federal assistance to state and local governments which have been given some attention are tax credits,[8] and the relinquishment of certain tax sources to state or local governments (tax sharing). The tax on local telephone service is the most often suggested candidate with respect to the latter proposal. However, this and other possibilities which have been mentioned have the common shortcoming that they are relatively small sources of revenue and would probably be of little assistance to the lower income states such as West Virginia.

[7] See Robert J. Lampman, "Approaches to the Reduction of Poverty," *American Economic Review*, LV (May 1965), pp. 521-529, and Thomas K. Hitch, "Why the Negative Income Tax Won't Work," *Challenge*, XIV (July/August 1966), pp. 13-15.

[8] This plan was proposed by the Advisory Commission on Intergovernmental Relations in their report, *Federal-State Coordination of Personal Income Taxes* (Washington: Government Printing Office, October 1965), pp. 14-19.

Under the tax credit proposal, the taxpayer would be allowed to deduct from his federal income tax payment a substantial percentage (40 per cent has been suggested) of his state income tax payments. This would enable the state to increase personal income taxes with the net effect of shifting up to 40 per cent of the increased taxpayer burden to the federal government. Since the credit is allowed against income, the more wealthy states would potentially benefit most from this type of credit. Consequently, it appears that neither of these alternatives offers a method of federal assistance which would be as advantageous to West Virginia state and local governments as a system of grants-in-aid allocated among states on an equalizing basis.

STATE ASSISTANCE TO LOCAL GOVERNMENTS

The above discussion centers around possible methods by which the federal government may provide assistance to a state, given the problem of a level of resources which is not adequate to meet current and estimated future need. However, of as much importance is the manner in which the state distributes these funds locally in the state.

Historically, the state of West Virginia has made extensive direct expenditures and provided grants-in-aid almost exclusively for the education, highway, and welfare functions and has not assisted county and city governments in the provisions of such services as police, fire, refuse collection and sewage disposal, and local park and recreational facilities. At the same time, local governments in the state have been severely restricted in their ability to raise additional funds by the state tax limitation amendment of 1933 which established ceilings on various types of property tax rates. Further, local governments are prohibited from turning to a number of alternative non-property tax revenue sources. The result is that West Virginia state government has assumed major responsibility for the education, highway, and welfare functions and there has been less than adequate growth in the quantity and quality of the remaining services offered by local governments.

While additional federal aids are sure to improve the education, highway, and public assistance programs which already have been assigned a high priority, the vehicle by which these aids are distributed may determine whether or not local public service levels will be improved. There are a number of alternative methods by which the state may allocate additional funds. In the section below is presented a cursory examination of the possibilities open to the state government for alleviating fiscal pressures on local governments.

Direct Expenditures

If additional federal funds were to become available, the state could increase assistance to local areas by increasing direct expenditures for the education, highway, and welfare functions. This conceivably would free some local funds for the more typically local-supported functions and hence could raise local public service levels. But since municipal and county governments spend nothing for education and very little for public assistance, the amount of local funds freed for other uses would be small. Other shortcomings of this method are that it reduces local autonomy, or makes the expenditure decision a state rather than a local decision, and it requires the state government to assess the relative priority of needs among aided functions in each county area.

State Grants-In-Aid

Two forms of the grant-in-aid may be considered as theoretical possibilities for assisting West Virginia local governments. The first is the conditional or earmarked grant which is made to a local government for a specific purpose. The second type is an unconditional or a block grant which is made to a local government with little or no restriction on its use.

Experience with the unconditional grant at the state-local level in this country has been very limited. The Moore plan in New York State (1946) provided for grants to municipalities for general purposes thereby giving localities a stable revenue which could be used for any purpose.[9] The state of Michigan also transfers substantial amounts to local units without restrictions as to use. The Michigan state constitution (in 1958) provided for one-sixth of the net revenue of the sales tax to be returned to cities, villages, and townships on a per capita basis.[10] The history of state-to-local grants in West Virginia is limited to the period 1941-1949 when surpluses from the state liquor monopoly were distributed among local units on a per capita basis. In 1949 these grants were ruled unconstitutional by the state supreme court of appeals and were discontinued.

It is contended that a major advantage of the unconditional or loosely defined grant-in-aid is that

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[9] Maxwell, *op. cit.*, p. 78-79.

[10] Robert H. Pealy and Deil Wright, "State-Local Financial Relations in Michigan," *Michigan Tax Study Staff Papers*, Legislative Committee, House of Representatives (Lansing, Michigan: 1958), p. 546-547.

the expenditure decision becomes a local matter. Proponents of this method argue that there is a question concerning the relative efficiency with which the state government can accurately assess the differing needs and priorities of great numbers of municipal and county governments throughout the state. Opponents to the block grant method counter with the argument that the state government has a vested interest in assuring that certain public functions be supported at predetermined standards and that a conditional grant or direct expenditure policy could be used to assure these standards. In the case of West Virginia, the general form of the grant-in-aid may be appealing for several reasons, but the fact remains that it was ruled unconstitutional as a revenue source for counties in 1949.

Shared Taxes and Other Methods[11]

Another method of providing state assistance to local areas is the shared tax. Under this scheme, the state controls both the levy and administration of the tax while a fixed and uniform proportion of the amount collected in each county is allocated back to that county. Theoretically, the most appealing prospect for a shared tax in West Virginia is the gross receipts, or gross sales tax. Though this source would generally satisfy the taxation maxims of productivity and stability, it is subject to what could be a major reservation in that it would provide for the largest yield in those counties where economic activity is greatest and hence would not have an equalizing effect.

Of course, certain local governments could elect to use the method of a tax supplement, i.e., to impose an additional rate on a state revenue source as some West Virginia cities have done with the gross receipts tax. The general problem with a tax supplement is that it permits the local government to assess a rate on the base of a state tax independently of the state taxing decision (though maximum rates are set by the state in this case). This could prove incompatible with the state fiscal goals of long run flexibility in the tax system and could result in an inequitable distribution of taxpayer liability.

Several other possibilities for improving the fiscal plight of West Virginia local governments remain, but many would require a revision of the state constitution (as would a proposal for grants-in-aid to municipalities). The unrealistically low property tax limitations imposed in West Virginia, together with the state's prohibition of use of income taxes at the local level, form an impediment to the consideration of at least two other potential solutions to the revenue dilemma of these governments.

[11] For an excellent and brief summary of tax sharing, supplements, deductibility and credits, see James A. Maxwell, *Tax Credits and Intergovernmental Fiscal Relations* (Washington: The Brookings Institution, 1962).

EQUALIZATION IN THE DISTRIBUTION OF STATE ASSISTANCE

While the focus of the preceding section is on the methods by which state assistance might be distributed to the counties, the concern here is the relationship between the distribution of aids and direct expenditures among counties and their respective demographic and economic characteristics. That is, should the state government distribute funds among counties on an equalizing basis (higher per capita grants and direct expenditures to lower income counties and vice versa), and how should the state government distribute funds between rural and urban areas?

The public sector may not only play a significant role in the economic development of the state but also may give direction to the form of this development. Since state revenues are a scarce resource, and since the level of public services in the state is generally very low, the future geographical allocation of state assistance may be an important determinant of the intrastate pattern of growth in the private sector.

For example, assume that some predetermined goals of the development of economic activity and the long run elimination of poverty in West Virginia may be accomplished by encouraging migration within the state to the more heavily urbanized areas. To the extent state revenues are distributed on an equalizing basis, there will occur an allocation which substantially improves the level of total public spending in the lower income counties. The real cost of this action can best be measured in terms of the expenditure increments foregone in the urban areas. It could be argued that a less equalizing distribution of state assistance (i.e., one that favors urban areas) would be more compatible with the above assumed goals on the grounds that rural-urban migration is at least partially affected by the relative attractiveness of the rural and urban alternatives. If tax effort as well as fiscal capacity is relatively low in the rural area, but state assistance results in per resident expenditures which are comparable to outlays of governments in urbanized areas, the relative attractiveness of the urban area is not enhanced.

Consider, for example, the case of the education function in West Virginia. Presently, the state ranks close to the bottom in spending for education and

teachers' salaries. Hence, it seems improbable that the state of West Virginia will be able to bid quality teachers away from other potential employment; in fact, it is probable that relatively low salaries in West Virginia may contribute to a net outflow of quality teachers. The real effect of the state equalization policy then, is to enable low income counties to compete with higher income counties in the state in terms of teachers' salaries. Reduction in the disparity between the quality of education in potential growth areas in West Virginia and that in competing areas in other states is (given the limited financial resources of the state) not compatible with a policy of equalizing per capita expenditures within the state. Very conceivably the effect of an equalization policy could be to widen the disparity in the quality of education between West Virginia and the national average. The same may be true of public investment in other functions.

Conversely, it might be argued that equalization of education, highway, and welfare spending is compatible with any overall plan for the economic development of the state, even one which calls for movement to the urban areas. This argument for equalization could not be made analogously, however, should the state consider participation in the financing of the more traditionally local-supported functions.

In summary, the question is whether or not the public economy of urban areas in the state is going to be made increasingly attractive relative to that of the rural areas. While it is debatable how the distribution of funds for state assistance to education, highways, and welfare may potentially affect the economic development of the state, it is conceivable that state assistance for the typically local functions (police, fire, refuse collection, etc.) could be used as a positive stimulus to urban migration. This is not to say that low income and lesser urbanized areas should not receive intergovernmental assistance, but that there is a valid question of the extent to which it should be distributed on an equalizing basis.

SUBREGION ANALYSIS

The questions raised in the preceding discussion pertaining to the desirability of expenditure equalization may be examined in greater detail through the projection to 1970 of per capita expenditures for the various geographic areas in the state. In the following sections, the long term trend in per capita local government expenditures, and per capita expenditures for education by all levels of government, will be examined in some detail for each of nine subregions which have been delineated in the West Virginia state development plan.[12]

Demographic and Economic Characteristics

Segmenting the state into nine subregions was accomplished on the basis of historical, demographic, socio-economic, transportation, and topographical considerations. Boundaries are constrained to follow county lines, include contiguous counties, and not segment standard metropolitan statistical areas. Each subregion contains a minimum population of 100,000, has an identifiable center of population or urban focus, and is sufficiently large to contain adjacent urban land development and growth. In addition, these subregions are composed of counties which are in some way economically, sociologically, or politically related, and which reflect unifying and dividing topographical characteristics.

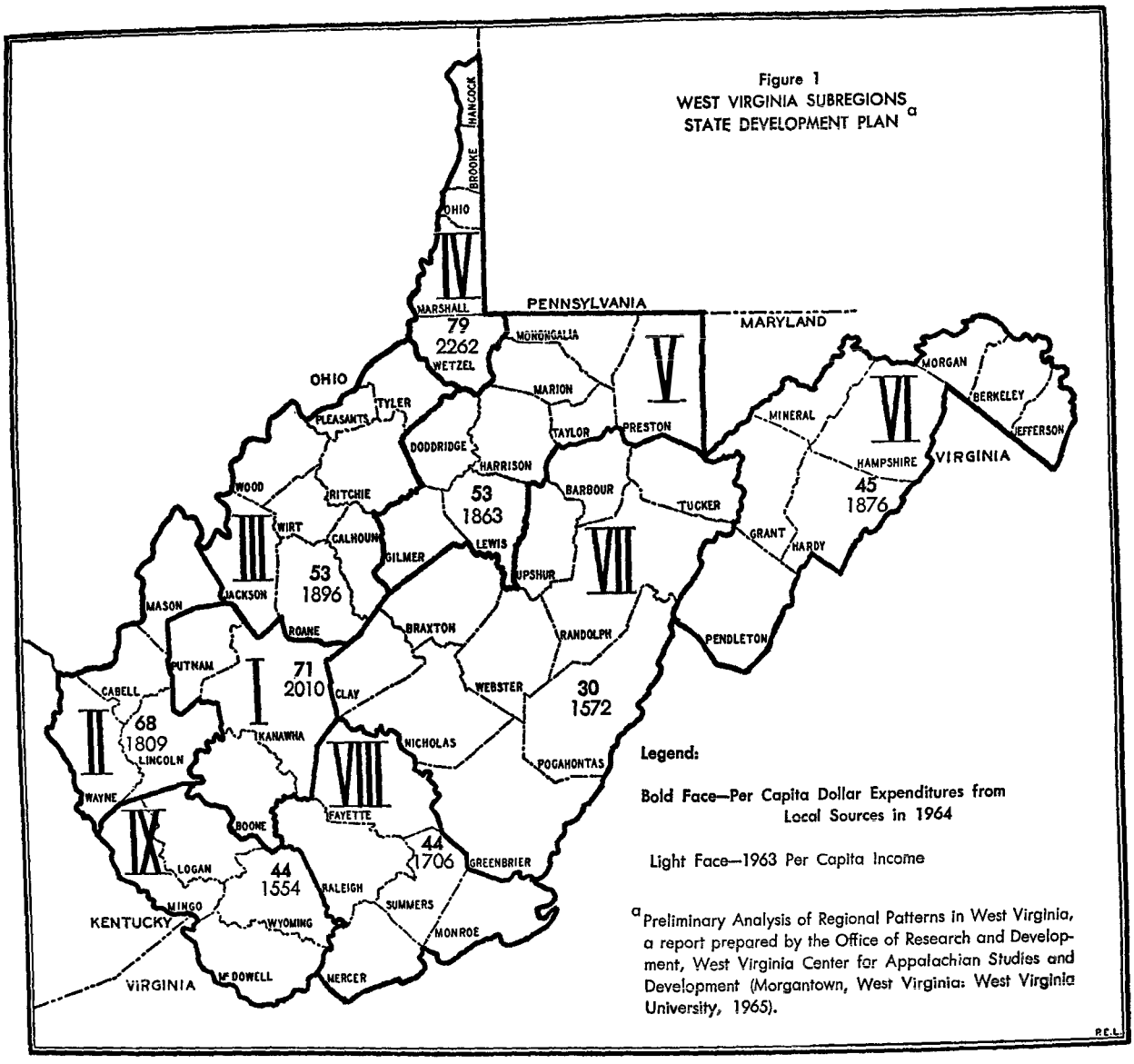
Among the reasons suggested for designating a set of subregions are (a) to provide administrative districts for state agencies, (b) to provide a geographical (as opposed to a governmental) framework for regional planning, (c) to provide a framework for multi-county and regional cooperation in development in order to give guidance to joint efforts by local units of government, and (d) to provide a relatively small number of geographical areas so that problems unique to particular areas may be considered in the development of a state-wide policy.

Figure 1 shows the nine subregions together with 1963 per capita income and per capita local government expenditures in 1964. Table 34 identifies the component counties for each subregion together with a summary description of the nature and level of economic activity for each.

Local Government Expenditures

In this section is presented an examination of public spending by all local governments in each of the nine subregions. The per capita expenditure data are obtained by summing expenditures by all local governments in a given subregion and then dividing by the population of that region. For the purpose of formulating development policy, the trend in per person expenditures is examined below as if each subregion were a single governmental unit. Three classes of expenditures (total by local governments, total education by local governments, and total education by all levels of government) are analyzed.

[12] See *Preliminary Analysis of Regional Patterns in West Virginia*, a report prepared by the Office of Research and Development, West Virginia Center for Appalachian Studies and Development, West Virginia University (Morgantown: December 1965), pp. 24-61.



Data limitations prohibit an examination of total expenditures by all levels of governments.

Table 35 shows per capita local government expenditures for each subregion for each of the 14 years considered. The row labeled Average Increase shows the average rise in per capita expenditures in dollars per year. The analysis reveals that per capita local government spending in 1963 is substantially lower in regions VI, VII, VIII, and IX. Further, the average rate of growth in per person spending is also significantly lower in these areas than in regions I, II, III, and IV.

When simple linear least squares equations are used to project per person spending in each subregion in 1970, the implications of the differing expenditure growth rates become apparent. The widening projected gap in per capita spending suggests that successively greater amounts of state and federal assistance will have to be devoted to the low expenditure subregions if a reduction in the inequality of public service levels is one objective of the state distribution of aids. These projections of course assume that the trend and pattern of development in both the public and private sections will be relatively the same through time for each subregion.

Education Expenditures

Tables 36 and 37 show (for each subregion) per capita spending on education from local sources and from all sources. Table 36 indicates that local governments in subregions I, II, and IV spent the highest per capita amounts in 1963 and that in

TABLE 34

ECONOMIC AND DEMOGRAPHIC PROFILE

SUBREGION I

Counties	Population 1960	Total Retail Sales 1963	Total Wholesale Trade 1963	GOVERNMENT EXPENDITURES FROM LOCAL SOURCES, 1962 Per Capita Amount	Rank	Total Amount (000)	Rank
Kanawha	248,503	$307,597	$ 23,855	$85.28	3	$26,418	1
Putnam	23,886	13,952	996	57.04	14	1,363	20
Boone	26,918	19,088	2,374	49.04	27	1,318	23
TOTAL	299,307	$340,637	$ 27,225			$24,099	
Per Cent of State Total	16.5	19.1	2.0			22.6	

MAJOR CITIES: Charleston, South Charleston, St. Albans, Dunbar.
SALIENT ECONOMIC CHARACTERISTICS: Substantial activity in chemical and related manufacturing, retail, and wholesale trade and government; transportation hub of the state.

SUBREGION II

Counties	Population 1960	Total Retail Sales 1963	Total Wholesale Trade 1963	GOVERNMENT EXPENDITURES FROM LOCAL SOURCES, 1962 Per Capita Amount	Rank	Total Amount (000)	Rank
Cabell	107,380	$152,824	$287,262	$88.55	2	$ 9,566	2
Wayne	39,157	18,384	18,441	36.00	41	1,419	19
Mason	24,512	15,719	7,518	70.61	8	2,639	11
Lincoln	20,802	7,006	562	31.30	48	643	33
TOTAL	191,851	$193,993	$313,783			$14,267	
Per Cent of State Total	10.6	10.8	22.5			13.4	

MAJOR CITIES: Huntington, Point Pleasant.
SALIENT ECONOMIC CHARACTERISTICS: More diversified industrial employment than any other subregion, industrial growth is likely to continue.

SUBREGION III

Counties	Population 1960	Total Retail Sales 1963	Total Wholesale Trade 1963	GOVERNMENT EXPENDITURES FROM LOCAL SOURCES, 1962 Per Capita Amount	Rank	Total Amount (000)	Rank
Wood	76,431	$ 99,513	$ 54,209	$61.83	12	$ 4,714	5
Jackson	19,299	15,480	3,939	54.86	18	165	54
Wirt	4,456	1,190	n. a.	25.67	54	111	55
Roane	15,745	11,324	7,005	30.63	49	476	44
Ritchie	10,293	8,333	3,016	38.66	38	404	45
Pleasants	7,425	6,882	1,125	71.37	5	508	40
Tyler	9,950	7,420	531	53.14	20	522	39
Calhoun	7,923	4,765	265	50.48	24	396	46
TOTAL	151,522	$154,907	$ 70,090			$ 7,296	
Per Cent of State Total	8.4	8.7	5.0			6.8	

MAJOR CITY: Parkersburg.
SALIENT ECONOMIC CHARACTERISTICS: Diversified industrial and agricultural economy. As a focus for the new transportation system, the Parkersburg region is expected to be the center of substantial industrial growth during the next decade.

TABLE 34—(Continued)

SUBREGION IV

Counties	Population 1960	Total Retail Sales 1963	Total Wholesale Trade 1963	GOVERNMENT EXPENDITURES FROM LOCAL SOURCES, 1962			
				Per Capita		Total	
				Amount	Rank	Amount (000)	Rank
Ohio	65,113	$113,181	$143,174	$111.91	1	$ 7,375	3
Brooke	28,543	23,960	3,446	56.12	15	1,617	18
Hancock	39,448	36,410	4,899	75.38	4	2,981	9
Marshall	37,186	27,432	6,165	53.49	19	1,999	14
Wetzel	19,585	19,685	4,968	55.33	17	1,094	25
TOTAL	189,875	$220,668	$162,652			$15,066	
Per Cent of State Total	10.5	12.4	11.7			14.1	

MAJOR CITIES: Wheeling, Weirton, Moundsville.
SALIENT ECONOMIC CHARACTERISTICS: Heavy industry and supporting services are the predominant economic base. Commuting and trade patterns are closely integrated with adjacent areas in Ohio and Pennsylvania.

SUBREGION V

Counties	Population 1960	Total Retail Sales 1963	Total Wholesale Trade 1963	GOVERNMENT EXPENDITURES FROM LOCAL SOURCES, 1962			
				Per Capita		Total	
				Amount	Rank	Amount (000)	Rank
Monongalia	53,509	$ 54,635	$ 25,614	$67.60	9	$ 3,652	7
Marion	60,780	67,805	36,105	40.15	36	2,659	10
Harrison	74,337	95,560	100,687	71.34	6	5,333	4
Lewis	20,248	17,921	8,371	45.95	30	924	27
Gilmer	8,596	5,659	(D)	32.94	43	281	51
Doddridge	7,307	3,431	(D)	49.16	26	1,289	24
Taylor	14,416	12,975	3,767	39.86	37	582	37
Preston	26,716	16,497	6,569	49.41	25	1,338	22
TOTAL	265,909	$274,483	$181,113			$16,058	
Per Cent of State Total	14.7	15.4	13.0			15.1	

MAJOR CITIES: Morgantown, Fairmont, Clarksburg.
SALIENT ECONOMIC CHARACTERISTICS: Contains a diverse economy including agriculture, mining, and gas and oil production as well as major glass and other manufacturing activities. West Virginia University and other institutions of higher learning are located here.

SUBREGION VI

Counties	Population 1960	Total Retail Sales 1963	Total Wholesale Trade 1963	GOVERNMENT EXPENDITURES FROM LOCAL SOURCES, 1962			
				Per Capita		Total	
				Amount	Rank	Amount (000)	Rank
Berkeley	33,937	$ 36,681	$ 17,598	$40.18	35	$ 1,347	21
Jefferson	18,492	19,396	6,704	45.54	31	860	29
Morgan	8,228	5,806	1,778	71.30	7	615	36
Mineral	22,857	19,575	2,314	32.02	45	720	31
Hampshire	11,634	8,000	2,001	56.03	16	623	35
Grant	8,339	7,405	5,868	62.73	11	499	41
Hardy	9,311	6,484	9,164	36.80	40	341	48
Pendleton	8,037	4,203	1,817	26.33	52	212	53
TOTAL	120,835	$107,550	$ 47,244			$ 5,217	
Per Cent of State Total	6.7	6.1	3.4			4.9	

MAJOR CITIES: Martinsburg, Keyser.
SALIENT ECONOMIC CHARACTERISTICS: Diverse economy that includes agriculture and lumbering as well as a variety of manufactured products. The eastern section of the subregion is becoming absorbed in the expansion of the Washington and Baltimore Metropolitan Areas. The western section has experienced a substantial growth in recreation and tourism activity.

TABLE 34—(Continued)

SUBREGION VII

Counties	Population 1960	Total Retail Sales 1963	Total Wholesale Trade 1963	GOVERNMENT EXPENDITURES FROM LOCAL SOURCES, 1962			
				Per Capita		Total	
				Amount	Rank	Amount (000)	Rank
Randolph	27,097	$ 22,499	$ 17,558	$33.32	42	$ 893	28
Tucker	7,539	5,850	209	36.98	39	288	50
Barbour	14,877	7,984	2,076	32.54	44	487	42
Upshur	17,786	18,067	5,194	31.94	46	576	38
Braxton	14,770	9,985	4,689	25.69	53	384	47
Webster	12,974	7,609	2,545	51.73	22	668	32
Pocahontas	9,857	6,156	2,184	48.07	28	486	43
Nicholas	24,139	19,423	4,586	31.38	47	754	30
Greenbrier	33,527	33,935	16,294	29.72	50	1,021	26
Clay	11,623	4,139	n.a.	26.76	51	313	49
TOTAL	182,039	$135,647	$ 51,335			$ 5,870	
Per Cent of State Total	10.0	7.6	3.7			5.5	

MAJOR CITY: Elkins.
SALIENT ECONOMIC CHARACTERISTICS: Has been dependent primarily upon agricultural and forest products. In recent years, recreation and tourism has developed into a major economic activity. Secondary wood processing may also achieve greater importance.

SUBREGION VIII

Counties	Population 1960	Total Retail Sales 1963	Total Wholesale Trade 1963	GOVERNMENT EXPENDITURES FROM LOCAL SOURCES, 1962			
				Per Capita		Total	
				Amount	Rank	Amount (000)	Rank
Raleigh	72,591	$ 68,485	$ 40,828	$47.64	29	$ 3,472	8
Mercer	67,210	69,015	100,650	58.77	13	3,947	6
Fayette	59,218	51,491	11,605	42.15	33	2,508	12
Summers	15,102	10,574	2,684	41.39	34	639	34
Monroe	11,503	6,460	n. a.	22.59	55	255	52
TOTAL	225,624	$206,025	$155,767			$10,821	
Per Cent of State Total	12.4	11.6	11.2			10.2	

MAJOR CITIES: Beckley, Bluefield.
SALIENT ECONOMIC CHARACTERISTICS: Mining, lumbering, and manufacturing are the major economic activities. The West Virginia Turnpike will continue to provide the dominant pattern of movement.

SUBREGION IX

Counties	Population 1960	Total Retail Sales 1963	Total Wholesale Trade 1963	GOVERNMENT EXPENDITURES FROM LOCAL SOURCES, 1962			
				Per Capita		Total	
				Amount	Rank	Amount (000)	Rank
Logan	56,033	$ 45,544	$ 22,250	$43.31	32	$ 2,460	13
Mingo	39,807	33,898	27,309	50.79	23	1,985	15
McDowell	65,051	42,561	12,880	65.65	10	1,632	17
Wyoming	32,997	23,441	6,877	52.74	21	1,773	16
TOTAL	193,888	$145,444	$ 69,316			$ 7,850	
Per Cent of State Total	10.7	8.2	4.9			7.4	

MAJOR CITIES: Logan, Williamson, Welch.
SALIENT ECONOMIC CHARACTERISTICS: The principal economic activities are mining and related services and lumbering. Although there is high density settlement pattern, no municipality exceeds 7,000 population. The new north-south Development Highway should substantially affect travel patterns in the future.
n.a.—Not available.
D—Denotes figures withheld to avoid disclosure of operations of individual reporting units.
Source: U.S. Bureau of the Census, *U.S. Census of Business, 1963,* Vol. I, Retail Trade and Vol. 4, Wholesale Trade (Washington: U.S Government Printing Office, 1965), and see text.

region VII spent the lowest. A comparison of these data with that in Table 37 reveals the extent to which intergovernmental aids are used to equalize education outlays among subregions. Consequently, it may be concluded that the geographic distribution of state aid equalizes per resident education expenditures in West Virginia.

Least squares projections to 1970 of local government and total education spending are presented in the last row of Tables 35 and 36. The relatively low average annual rates of increase in per capita local government education expenditures in subregions V, VI, VII, VIII, and IX suggest that if education outlays are to be equalized, the state must continue to divert substantial assistance to these subregions. If state and federal assistance and direct expenditures are allocated among subregions in exactly the same manner as they are presently, the 1970 per capita amounts will be as shown in the last row of Table 37. It would appear that a needed allocation of intergovernmental assistance may be necessary in the form of a relative increase in the amounts distributed to subregions III, IV, V, VI, and VII.

Fiscal Effort Comparisons

Projections of fiscal effort to 1970 are presented in Tables 38 and 39. The data shows that if past trends in effort continue, the existing disparities among subregions will increase substantially by 1970. Further, the local expenditures effort ratio (expenditures from local sources per dollar of personal income) and the total local school expenditures effort ratio (expenditures from local sources per dollar of personal income) point, in general, to the same regions as making a significantly below average attempt to increase the scope and quality of their public services.

TABLE 35

PER CAPITA GOVERNMENT EXPENDITURES FROM LOCAL SOURCES FOR SUBREGIONS 1951-1964 (In dollars)

	SUBREGION								
Year	I	II	III	IV	V	VI	VII	VIII	IX
1951	$28	$33	$22	$ 37	$27	$20	$15	$21	$22
1952	30	37	23	40	29	23	16	18	24
1953	32	39	24	43	30	24	17	23	25
1954	34	41	25	46	31	25	18	24	27
1955	36	41	27	46	35	25	20	26	27
1956	38	43	29	50	39	26	21	25	28
1957	41	43	34	56	41	27	22	28	29
1958	46	47	36	62	45	30	25	31	33
1959	49	50	39	61	48	31	30	33	36
1960	55	58	44	70	48	35	27	38	33
1961	67	62	45	71	49	38	27	41	43
1962	72	64	49	74	54	42	24	43	44
1963	71	65	51	74	51	44	28	43	44
1964	71	68	53	79	53	45	30	44	44
Average Increase*	$ 3.81	$ 2.73	$ 2.62	$ 3.35	$ 2.24	$ 1.94	$ 1.14	$ 2.12	$ 1.89
Correlation Coefficient†	.97	.98	.99	.99	.98	.97	.92	.97	.96
Projection to 1970‡	$95	$83	$68	$100	$69	$56	$37	$58	$57

*(In dollars per year) The average increase is b_i in the equation $E_i = a + b_i t$ where E is per capita expenditures from local sources and t is time (t = 1 in 1951).

†Between per capital total local expenditures and time.

‡From the least squares equation $E_i = a + b_i t$ for each subregion on 14 years. The linear regression equations used for these projections are shown below for each of the nine subregions:

I. $E = 19.20 + 3.81\ t$
II. $E = 28.84 + 2.73\ t$
III. $E = 16.09 + 2.62\ t$
IV. $E = 32.60 + 3.35\ t$
V. $E = 24.50 + 2.24\ t$
VI. $E = 16.72 + 1.94\ t$
VII. $E = 14.14 + 1.14\ t$
VIII. $E = 15.37 + 2.12\ t$
IX. $E = 18.70 + 1.89\ t$

where E = per capital expenditures and t = 1 in 1951, thus t = 20 in 1970.

In order to facilitate interregional comparisons, the subregions are ranked according to the rates of increase and current levels of fiscal effort and the rates of increase and current levels of expenditures financed from local sources (see Table 40). From the rankings it can be observed that those counties which have the highest level of effort in 1963 tend to have the greatest rates of increase in effort and the highest levels and rates of increase of expenditures financed from local sources. Subregions I, IV, and II tend to rank relatively high on all counts while subregion VII is consistently at the bottom followed closely by VI and VIII.

These results suggest that, in general, those regions in the state which have the lowest scope and quality of locally financed services have a lower fiscal effort and historically have done the least to improve public service levels. This means that these subregions will continue to fall further behind the rest of the state unless relatively greater amounts of outside assistance are funneled into the regions, or unless a method is found to induce the local governments in these regions to increase fiscal effort. The converse of this also tends to be true, that is, local governments in those regions which have the highest levels of public services are making the greatest effort to increase the scope and quality of locally financed services. Consequently, given current trends, by 1970 they will far outstrip their less wealthy and less motivated neighbors.

CONCLUSIONS

The objective of this study is a detailed description and analysis of the pattern of spending in West Virginia counties by local governments, and by all levels of government. The analysis presented in Chapters III, IV, and V indicates quite clearly that intercounty differences in economic and demographic characteristics are closely related to differences

TABLE 36

PER CAPITA GOVERNMENT EDUCATION EXPENDITURES FROM LOCAL SOURCES FOR SUBREGIONS 1951-1964 (In dollars)

Year	SUBREGION I	II	III	IV	V	VI	VII	VIII	IX
1951	$14	$16	$10	$17	$12	$10	$ 7	$12	$14
1952	14	17	11	19	13	11	7	8	15
1953	15	19	11	20	14	12	8	12	20
1954	16	19	10	21	15	13	8	12	17
1955	17	19	11	21	16	13	9	14	17
1956	17	20	13	22	18	13	10	13	17
1957	18	21	15	25	20	14	10	14	17
1958	21	23	17	27	22	16	12	15	19
1959	21	24	18	28	23	15	16	17	21
1960	28	30	21	35	23	17	12	20	21
1961	32	33	23	36	24	18	13	23	27
1962	36	34	24	38	27	21	11	25	27
1963	36	35	26	37	27	23	13	24	26
1964	37	35	27	41	28	24	13	25	26
Average Increase*	$ 2.02	$ 1.62	$ 1.46	$ 1.91	$ 1.27	$ .97	$ .52	$ 1.29	$ .98
Correlation Coefficient†	.952	.961	.976	.968	.993	.954	.922	.945	.973
Projection to 1970‡	$48	$45	$35	$52	$36	$28	$17	$33	$33

*(In dollars per year) The average increase is b_1 in the equation $E_1 = a + b_1t$ where E is per capita expenditures from local education and t is time (t = 1 in 1951).

†Between per capita total education expenditures and time.

‡From the least squares equation $E_1 = a + b_1t$ for each subregion on 14 years. The linear regression equations used for these projections are shown below for each of the nine subregions:

I. $E = 7.80 + 2.02\ t$
II. $E = 12.58 + 1.63\ t$
III. $E = 6.09 + 1.46\ t$
IV. $E = 13.40 + 1.91\ t$
V. $E = 10.52 + 1.27\ t$
VI. $E = 8.36 + .97\ t$
VII. $E = 6.78 + .52\ t$
VIII. $E = 7.01 + 1.29\ t$
IX. $E = 13.01 + .98\ t$

where E = per capital expenditures and t = 1 in 1951, thus t = 20 in 1970.

in the level and rate of growth in per capita spending by local governments. Further, the data show that a relatively great amount of state assistance is distributed among counties so as to have a substantial equalizing effect on the level of per resident total public expenditures. However, because this aid is primarily for the education, welfare, and highway functions, the level of local public services remains very low in the lower income counties.

An examination of fiscal activity in each of nine West Virginia subregions indicates that the effort (that fraction of the privately earned dollar which is devoted to purchasing public goods) put forth in lower income areas is generally below that of the higher income regions. Generally, linear projections to 1970 of the fiscal status of the nine subregions indicate the possibility of a growing gap between (a) per resident expenditures from local sources in high income regions and per resident expenditures from local sources in low income regions and (b) fiscal effort expended in high income regions and fiscal effort expended in low income regions. The implication is that expenditure equalization will be achieved in the future only by channeling relatively greater amounts of assistance to the lower income areas of the state.

In light of these findings it is possible to critically examine several important questions in regard to alternative methods of influencing an efficient development of activity in the public sector in West Virginia. It is almost a certainty that increased federal assistance to state and local governments will be a reality in the near future. It is also probable that these funds will come directly to the state government from the federal government and there will be alternatives as to the manner in which the state distributes these funds geographically. There are at

TABLE 37

PER CAPITA TOTAL EDUCATION EXPENDITURES FOR SUBREGIONS 1951-1964 (In dollars)

	SUBREGION								
Year	I	II	III	IV	V	VI	VII	VIII	IX
1951	$33	$35	$35	$35	$32	$39	$36	$35	$ 34
1952	36	41	37	37	37	41	40	35	40
1953	36	41	37	39	37	43	40	40	42
1954	39	43	38	39	39	45	43	43	48
1955	40	42	38	38	40	42	44	45	47
1956	42	45	41	38	44	45	46	45	49
1957	46	49	45	42	48	50	52	52	56
1958	49	50	45	43	51	51	54	54	61
1959	51	53	47	44	52	50	58	57	65
1960	59	60	52	52	53	53	58	62	58
1961	64	63	54	54	54	55	59	67	75
1962	68	68	60	61	60	61	53	72	81
1963	71	67	62	62	59	62	61	70	79
1964	75	70	66	67	63	64	62	73	80
Average Increase*	$ 3.31	$ 2.71	$ 2.39	$ 2.37	$ 2.33	$ 1.89	$ 1.98	$ 3.19	$ 3.69
Correlation Coefficient†	.979	.976	.967	.929	.992	.968	.950	.989	.973
Projection to 1970‡	$92	$86	$77	$76	$77	$74	$75	$94	$104

*(In dollars per year) The average increase is b_1 in the equation $E_1 = a + b_1 t$ where E is per capita expenditures from total education and t is time (t = 1 in 1951).

†Between per capita total education expenditures and time.

‡From the least squares equation $E_1 = a + b_1 t$ for each subregion on 14 years. The linear regression equations used for these projections are shown below for each of the nine subregions:

I. $E = 25.65 + 3.31\ t$
II. $E = 31.66 + 2.71\ t$
III. $E = 28.98 + 2.39\ t$
IV. $E = 28.87 + 2.37\ t$
V. $E = 30.36 + 2.33\ t$
VI. $E = 35.88 + 1.89\ t$
VII. $E = 35.64 + 1.98\ t$
VIII. $E = 29.74 + 3.19\ t$
IX. $E = 30.63 + 3.69\ t$

where E = per capital expenditures and t = 1 in 1951, thus t = 20 in 1970.

least two primary questions which must be answered: (1) Should the funds be distributed so as to favor state "growth points," i.e., the more highly urbanized-high income areas of the state, or should distribution be on an equalizing basis, and (2) regardless of the answer to (1), what method would be most efficient in dispersing the funds among local units?

Arguments for favoring urban areas in the distribution of fiscal assistance are numerous: (a) the needs of an urbanized population are greater and more complex than those of a rural population, (b) since a greater proportion of taxes are paid in urban areas, it is inequitable to redistribute the funds on an equalizing basis, and (c) if the future of the state lies in the economic development of the "growth areas," it is not reasonable to continue to favor rural areas with relatively heavy public investment. Conversely, those favoring equalization could argue that (a) the state government is obliged to equalize the level of public services among regions having different fiscal capacities, and (b) almost all public investment in the lower income areas is for education, highways, and public assistance, and state aids in these functional areas are essential to economic growth regardless of the geographic distribution of assistance within the state.

Obviously, the conclusion as to whether or not a policy of equalization should be followed involves a value judgment, but it is an extremely important value judgment since the consequences are integrally related to the successful implementation of the long run development plan of the state. For example, the real cost of the marginal dollar spent for highways in a rural area of the state may be a dollar's worth of air pollution control foregone in an urban area. The alternative of which to choose—the air pollution program in an urban area or the highway program in a rural area—is really determined by the role which public investment has been assigned in an overall state development plan.

TABLE 38

RATIO OF TOTAL EXPENDITURES FROM LOCAL SOURCES TO TOTAL INCOME, FOR SUBREGIONS 1951-1964

Year	SUBREGION I	II	III	IV	V	VI	VII	VIII	IX
1951	.22	.28	.19	.24	.22	.16	.16	.18	.18
1952	.22	.29	.19	.24	.23	.17	.15	.14	.18
1953	.23	.30	.19	.26	.24	.18	.16	.18	.20
1954	.25	.32	.21	.28	.25	.19	.18	.20	.24
1955	.25	.32	.21	.27	.26	.19	.18	.20	.21
1956	.24	.30	.20	.26	.25	.18	.17	.17	.19
1957	.24	.27	.19	.28	.25	.18	.16	.18	.19
1958	.27	.31	.23	.31	.27	.19	.19	.20	.24
1959	.27	.31	.24	.29	.29	.19	.22	.22	.27
1960	.31	.35	.25	.33	.29	.20	.19	.25	.30
1961	.37	.37	.26	.34	.28	.22	.19	.26	.30
1962	.37	.37	.27	.34	.31	.23	.16	.26	.30
1963	.35	.36	.27	.33	.28	.24	.18	.25	.28
1964	.35	.36	.26	.33	.26	.23	.18	.25	.27
Average Increase*	.0128	.0069	.0076	.0083	.0050	.0050	.0019	.0079	.0096
Correlation Coefficient†	.92	.83	.94	.93	.81	.89	.44	.88	.86
Projection to 1970‡	.44	.41	.33	.40	.32	.26	.20	.31	.36

*(In dollars per year) The average increase is b_1 in the equation $E_t = a + b_1 t$ where E is the ratio of total local expenditure to total income and t is time (t = 1 in 1951).

†Between the ratio of total local expenditures to total income, and time.

‡From the least squares equation $E_t = a + b_1 t$ for each subregion on 14 years. The linear regression equations used for these projections are shown below for each of the nine subregions:

I. $E = .1847 + .0128\ t$
II. $E = .2690 + .0069\ t$
III. $E = .1740 + .0076\ t$
IV. $E = .2298 + .0083\ t$
V. $E = .2245 + .0050\ t$
VI. $E = .1583 + .0050\ t$
VII. $E = .1619 + .0019\ t$
VIII. $E = .1509 + .0079\ t$
IX. $E = .1680 + .0096\ t$

where E = ratio of total local expenditures to total income and t = 1 in 1951, thus t = 20 in 1970.

TABLE 39

RATIO OF TOTAL EDUCATION EXPENDITURES FROM LOCAL SOURCES TO TOTAL INCOME, FOR SUBREGIONS 1951-1964

Year	SUBREGION I	II	III	IV	V	VI	VII	VIII	IX
1951	.10	.14	.09	.11	.11	.09	.07	.10	.10
1952	.10	.13	.09	.12	.10	.09	.07	.06	.11
1953	.10	.14	.09	.12	.11	.09	.07	.10	.12
1954	.11	.15	.08	.12	.12	.09	.08	.10	.14
1955	.12	.15	.09	.12	.12	.10	.08	.11	.12
1956	.11	.14	.09	.11	.12	.09	.08	.09	.11
1957	.10	.13	.09	.12	.12	.09	.08	.09	.11
1958	.12	.15	.11	.14	.13	.10	.09	.10	.14
1959	.12	.15	.11	.13	.14	.09	.12	.11	.16
1960	.16	.18	.12	.17	.14	.10	.09	.13	.19
1961	.18	.20	.13	.17	.14	.10	.09	.14	.19
1962	.19	.20	.13	.18	.15	.11	.07	.15	.19
1963	.18	.19	.14	.17	.15	.12	.08	.14	.18
1964	.18	.19	.14	.17	.14	.12	.08	.14	.18
Average Increase*	.007	.005	.005	.005	.003	.002	.001	.005	.007
Correlation Coefficient†	.89	.86	.92	.90	.94	.82	.30	.84	.87
Projection to 1970‡	.220	.220	.170	.200	.160	.120	.100	.170	.230

*(In dollars per year) The average increase is b_1 in the equation $E_1 = a + b_1 t$ where E is the ratio of total local school expenditures to total income and t is time (t = 1 in 1951).

†Between the ratio of total local school expenditures to total income, and time.

‡From the least squares equation $E_1 = a + b_1 t$ for each subregion on 14 years. The linear regression equations used for these projections are shown below for each of the nine subregions:

I. $E = .08 + .007\ t$
II. $E = .12 + .005\ t$
III. $E = .07 + .005\ t$
IV. $E = .10 + .005\ t$
V. $E = .10 + .003\ t$
VI. $E = .08 + .002\ t$
VII. $E = .08 + .001\ t$
VIII. $E = .07 + .005\ t$
IX. $E = .09 + .007\ t$

where E = ratio of total local school expenditures to total income and t = 1 in 1951, thus t = 20 in 1970.

TABLE 40

SUBREGIONS RANKED BY LEVELS AND RATES OF CHANGE IN FISCAL EFFORT AND PER CAPITA EXPENDITURES FROM LOCAL SOURCES*

Local Expenditure Effort 1963†	Rate of Increase in Local Expenditure Effort 1950-1963	Per Capita Local Government Expenditures 1963	Rate of Increase in Per Capita Local Government Expenditures 1950-1963	Education Effort Ratio 1963‡	Rate of Increase in Education Effort 1950-1963	Per Capita Education Expenditures from Local Sources 1963	Rate of Increase in Per Capita Education Expenditures from Local Sources 1950-1963
II	I	IV	I	II	I§	IV	I
I	IX	I	IV	I§	IX§	I	IV
IV	IV	II	II	IX§	II§	II	II
IX	VIII	III§	III	IV	III§	V	III
III§	III	V§	V	III§	IV§	III	VIII
V§	II	VI	VIII	V§	VIII§	IX	V
VIII	VI§	VIII§	VI	VIII§	V	VIII	IX
VI	V§	IX§	IX	VI	VI	VI	VI
VII	VII	VII	VII	VII	VII	VII	VII

*The subregions are ranked from the highest to the lowest.
†Expenditures from local sources per dollar of income.
‡Education expenditures from local sources per dollar of income.
§ Denotes tie.
Source: Tables 34-38.

However, all questions relating to state fiscal problems need not go unanswered. If it is decided that an equalization program is to be carried out, the objective could be stated as an equalizing of per resident public expenditures among counties having different fiscal capacities *but making the same fiscal effort*. It has been shown that the subregions into which the greatest amounts of aid have been pumped are putting forth a relatively low fiscal effort. The authors suggest that the level of fiscal assistance provided to local governments be somehow tied to the fiscal effort exerted by that government. Further work is needed here to develop adequate and equitable measures of fiscal effort for local units of government.

The second major question raised above concerns the *method* by which the state should distribute funds among local units. One possibility is to increase the degree of state financial responsibility for the education, welfare, and highway functions. But, since municipal and county governments do not support the education, highway, and welfare functions, no funds would be freed to raise the level of urban public services.

Consequently, some method of aiding urban governments will have to be found. Here there are at least three possibilities. First, the state could initiate a program of grants-in-aid to municipal and county governments on some fractional matching basis.[13] The grants could be general purpose and distributed among municipal and county units on a per capita basis.[14] Per capita distribution would insure that larger portions of the assistance would be channeled into the urban areas.

Second, city and county governments could be given authority to levy specific non-property taxes which could yield adequate amounts of revenue. There is precedent in West Virginia, since a primary source of revenue for the major cities in the state is the gross receipts tax. However, this alternative would of course increase taxpayer liability in the areas which chose to levy the tax.

A third possibility is a shared tax or some form of tax credit for local governments. The shared tax would involve an allocation by the state to the municipal or county unit of some fraction of the receipts from a state tax collected within the geographic confines of that unit. An alternative scheme might be the allowance of a credit against the state income tax. Under the latter plan, the local unit would levy an income tax, and the taxpayer would be able to deduct some proportion of the amount paid to the local unit from his state income tax payment. Hence, the total taxpayer burden would rise by only some fraction of the local levy. The state government would control the magnitude of the tax credit which would in turn be determined by the increased level of assistance provided by the federal government.

In conclusion, the overall fiscal picture of West Virginia is not promising. In addition to the underdeveloped economy of the state, the public sector is lagging far behind that of most states in the provision of goods and services to the state population. Further, assuming that state and local government revenues will continue to be a scarce resource, West Virginia is not going to catch up in the near future. Even with increasing amounts of federal aid at its disposal, the state government will have to divide fiscal resources carefully among regions to achieve the objective of long run economic development.

It is imperative that specific state objectives be clearly defined in a long run development plan in the near future. The pending reality of the Heller-Pechman or some other program of federal assistance necessarily means that the state government will be called on to decide on the geographic distribution of assistance and the proper vehicle through which to implement this assistance. These decisions should involve a thoughtful balancing of the relative costs and benefits of each alternative.

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[13] However, as has been pointed out earlier in this paper, a similar grant-in-aid was declared unconstitutional by the state supreme court of appeals in 1949.

[14] Another possibility is that the grants could be tied to improvements in local fiscal effort and the level of local fiscal effort.

APPENDIX A

Tables Showing Matrices of Zero-Order Correlation Coefficients 1957 and 1962

APPENDIX TABLE A-1

MATRIX OF ZERO-ORDER CORRELATION COEFFICIENTS BETWEEN ALL POSSIBLE COMBINATIONS OF THE INDEPENDENT VARIABLES FOR 1957 AND 1962

	County Population		City Population		County Population Growth Rate 1957-1962		City Population Growth Rate 1957-1962		Per Capita Income		Per Cent of Total Income of State Received by Residents of the County		County Population Density 1962		Number of Dwelling Units		Land Area in Square Miles		Per Capita Retail Sales 1962		Per Cent of Workers Employed in Agriculture		Per Cent of Workers Employed in Manufacturing	
County Population																								
City Population	.94	.92																						
County Population Growth Rate 1957-1962	.00	.13	.18	.16																				
City Population Growth Rate 1957-1962	.02	.00	.05	.03	.30	.50																		
Per Capita Income	.40	.32	.51	.41	.34	.37	.04	.02																
Per Cent of Total Income of State Received by Residents of the County	.99	.99	.98	.94	.06	.15	.02	.00	.49	.42														
County Population Density 1962	.56	.56	.68	.69	.12	.15	—.05	—.07	.60	.48	.81	.61												
Number of Dwelling Units	.99	.99	.95	.94	.02	.12	.02	.00	.43	.34	.99	.99	.58	.58										
Land Area in Square Miles	.22	.24	.07	.05	—.26	—.12	—.05	—.04	—.14	—.12	.18	.18	—.36	—.35	.21	.21								
Per Capita Retail Sales 1962	.57	.32	.68	.41	.16	.36	—.14	.01	.67	.99	.61	.42	.65	.48	.60	.34	—.01	—.12						
Per Cent of Workers Employed in Agriculture	—.48	—.50	—.41	—.42	.14	—.16	.15	.15	—.15	—.19	—.45	—.47	—.49	—.50	—.48	—.48	.15	.15	—.35	—.19				
Per Cent of Workers Employed in Manufacturing	.06	.02	.24	.23	.55	.43	.25	.25	.40	.36	.12	.08	.42	.39	.08	.05	—.37	—.38	.11	.36	—.12	—.12		
Per Capita State and Federal Aid and Direct Expenditures	—.51	—.48	—.57	—.54	—.34	—.27	—.06	.14	—.38	—.43	—.53	—.50	—.63	—.70	—.52	—.49	.21	.33	—.60	—.43	.52	.52	—.38	—.28
Per Cent of Workers Unemployed	—.16	—.12	—.30	—.30	—.53	—.16	—.12	—.12	—.28	—.18	—.19	—.16	—.35	—.32	—.17	—.15	.14	.14	—.38	—.18	—.03	—.04	—.47	—.48
Per Capita Assessed Value	.21	.08	.39	.31	.57	.08	.10	—.01	.50	.37	.27	.16	.51	.55	.23	.12	—.38	—.50	.39	.37	—.15	—.11	.51	.50
Property Tax Rate—Average of Four Property Classes	.51	.54	.39	.43	—.06	.26	.11	.00	.23	.06	.47	.49	.43	.47	.49	.51	—.17	—.09	.26	.06	—.69	—.74	.14	—.02
Per Cent of Population With Income Under $3000	—.52	—.51	—.56	—.57	—.30	—.46	—.02	—.02	—.56	—.51	—.54	—.53	—.71	—.70	—.52	—.51	.29	.29	—.52	—.51	.67	.67	—.56	—.55
Per Cent of County Population Which Resides in Cities	.43	.37	.63	.62	.47	.12	.02	—.04	.59	.47	.48	.43	.72	.69	.46	.42	—.34	—.36	.69	.47	—.39	—.38	.57	.58
Ratio of the City Population Growth Rate to the County Population Growth Rate	—.02	—.02	.01	—.06	.06	.00	.33	.30	—.11	.02	.03	—.01	.05	—.08	—.03	.00	—.03	.00	—.17	.02	—.01	.11	.18	—.16
Number of Persons per Dwelling Unit	.00	.12	.00	—.10	—.20	.42	.25	.17	—.30	—.16	—.07	.05	—.10	.00	—.05	.04	.15	.22	—.33	—.16	—.18	—.26	—.14	—.23
Number of Dwelling Units per Square Mile	.55	.55	—.16	.70	.13	.13	—.05	—.07	.62	.48	.60	.61	.99	.99	.57	.57	—.36	—.36	.68	.48	—.47	—.48	.40	.37
Per Cent of Total General Expenditures by All Governments Which are From State and Federal Sources	—.57	—.37	.68	—.57	—.32	—.19	—.05	.11	—.70	—.48	—.62	—.44	—.86	—.79	—.59	—.41	.35	.48	—.68	—.49	.49	.44	—.48	—.50
Per Capita Education Expenditures From All Sources	.08	—.37	—.10	—.48	—.38	—.42	.10	—.05	—.18	—.47	.03	—.41	—.19	—.53	.04	—.39	.11	.17	—.22	—.47	—.15	.37	—.28	—.39
Per Capita Total General Expenditures From All Sources	—.33	—.42	—.34	—.39	—.28	—.27	—.06	.10	—.35	—.28	—.33	—.41	—.45	—.50	—.34	—.42	.10	.14	—.37	—.28	.41	.44	—.25	—.11
Per Capita General Control Expenditures From All Sources	.32	.20	.41	—.43	.37	.01	.07	.04	.54	.31	.36	.27	.35	.54	.33	.25	—.13	—.32	.37	.30	—.24	—.14	.42	.35
Per Capita Police Expenditures From All Sources	.58	.58	.71	.71	.19	.09	—.07	—.18	.60	.48	.63	.63	.81	.93	.60	.60	—.24	—.27	.73	.48	—.57	—.58	.33	.35
Per Capita Fire Expenditures From All Sources	.63	—.04	.79	.01	.15	.25	.00	.01	.51	.04	.67	—.04	.80	.05	.66	.04	—.23	—.11	.77	.04	—.42	—.10	.21	.13
Per Capita Health and Hospital Expenditures From All Sources	—.16	—.02	—.11	.11	—.10	—.10	—.08	—.13	.04	.25	—.14	.02	—.16	.23	—.15	.00	.07	—.16	—.04	.25	.27	.01	—.14	.15
Per Capita Welfare Expenditures From All Sources	—.29	—.34	—.42	—.44	—.56	—.30	—.04	.01	—.67	—.54	—.35	—.38	—.48	—.54	—.32	—.36	.20	.19	—.49	—.54	.11	.20	—.54	—.39
Per Capita Highway Expenditures From All Sources	—.45	—.39	—.39	—.34	.07	—.14	—.06	.16	—.23	—.13	—.42	—.37	—.49	—.42	—.45	—.38	.02	.11	—.39	—.13	.59	.41	.02	.04
Per Capita Total General Expenditures From Local Sources	.50	n.c.	.64	n.c.	.24	n.c.	.04	n.c.	.64	n.c.	.56	n.c.	.72	n.c.	.53	n.c.	—.30	n.c.	.64	n.c.	—.38	n.c.	.37	n.c.
Per Capita Education Expenditures From Local Sources	.40	n.c.	.42	n.c.	.28	n.c.	.16	n.c.	.41	n.c.	.41	n.c.	.51	n.c.	.39	n.c.	—.33	n.c.	.32	n.c.	—.47	n.c.	.39	n.c.
Per Capita Welfare Expenditures From Local Sources	.34	n.c.	.39	n.c.	.44	n.c.	.03	n.c.	.52	n.c.	.36	n.c.	.39	n.c.	.35	n.c.	—.27	n.c.	.28	n.c.	—.34	n.c.	.37	n.c.
Per Capita Highway Expenditures From Local Sources	.43	n.c.	.60	n.c.	.28	n.c.	—.14	n.c.	.57	n.c.	.49	n.c.	.63	n.c.	.46	n.c.	—.25	n.c.	.66	n.c.	—.37	n.c.	.38	n.c.

n.c.—Not calculated.
Bold Face—1962.
Light Face—1957.

APPENDIX TABLE A-1—(Continued)

	Per Capita State and Federal Aid and Direct Expenditures		Per Cent of Workers Unemployed		Per Capita Assessed Value		Property Tax Rate—Average of Four Property Classes		Per Cent of Population With Income Under $3000		Per Cent of County Population Which Resides in Cities		Ratio of the City Population Growth Rate to the County Population Growth Rate		Number of Persons per Dwelling Unit		Number of Dwelling Units per Square Mile		Per Cent of Total General Expenditures by All Governments Which are From State and Federal Sources	
County Population																				
City Population																				
County Population Growth Rate 1957-1962																				
City Population Growth Rate 1957-1962																				
Per Capita Income																				
Per Cent of Total Income of State Received by Residents of the County																				
County Population Density 1962																				
Number of Dwelling Units																				
Land Area in Square Miles																				
Per Capita Retail Sales 1962																				
Per Cent of Workers Employed in Agriculture																				
Per Cent of Workers Employed in Manufacturing																				
Per Capita State and Federal Aid and Direct Expenditures																				
Per Cent of Workers Unemployed	**.55**	.28																		
Per Capita Assessed Value	**—.47**	—.44	**—.45**	—.48																
Property Tax Rate—Average of Four Property Classes	**—.47**	—.53	**—.02**	—.01	**.17**	.13														
Per Cent of Population With Income Under $3000	**.81**	.74	**.40**	.40	**—.58**	—.49	**—.66**	—.61												
Per Cent of County Population Which Resides in Cities	**—.72**	—.57	**—.52**	—.52	**.59**	.60	**.25**	.29	**—.69**	—.68										
Ratio of the City Population Growth Rate to the County Population Growth Rate	**—.11**	.04	**—.08**	.11	**.08**	—.12	**—.02**	.00	**—.05**	.06	**.11**	—.19								
Number of Persons per Dwelling Unit	**.06**	—.03	**—.07**	.22	**—.18**	—.45	**.38**	.41	**.00**	—.05	**—.38**	—.42	**.06**	.04						
Number of Dwelling Units per Square Mile	**—.69**	—.69	**—.34**	—.33	**.51**	.57	**.39**	.44	**—.69**	—.68	**.73**	.71	**—.05**	—.07	**—.15**	—.07				
Per Cent of Total General Expenditures by All Governments Which are From State and Federal Sources	**.84**	.76	**.43**	.35	**—.69**	—.72	**—.50**	—.48	**.83**	.71	**—.81**	.74	**—.08**	.09	**.17**	.21	**—.85**	—.80		
Per Capita Education Expenditures From All Sources	**.22**	.58	**.37**	.19	**—.09**	—.17	**.52**	—.14	**.02**	.58	**—.40**	—.56	**.10**	.06	**.48**	.04	**—.22**	—.54	**.11**	.42
Per Capita Total General Expenditures From All Sources	**.90**	.88	**.53**	.21	**—.17**	—.12	**—.33**	—.40	**.62**	.59	**—.50**	—.33	**—.10**	.00	**—.05**	—.20	**—.43**	—.48	**.52**	.37
Per Capita General Control Expenditures From All Sources	**—.34**	—.31	**—.24**	—.28	**.58**	.76	**.18**	.20	**—.44**	—.43	**.48**	.62	**.02**	—.10	**—.31**	—.42	**.36**	.58	**—.52**	—.60
Per Capita Police Expenditures From All Sources	**—.69**	—.69	**—.30**	—.28	**.59**	.54	**.43**	.54	**—.73**	—.73	**.77**	.78	**—.06**	—.21	**—.18**	—.07	**.82**	.92	**—.81**	—.77
Per Capita Fire Expenditures From All Sources	**—.60**	—.27	**—.28**	—.30	**.53**	.27	**.24**	.04	**—.55**	—.22	**.74**	.14	**.03**	—.07	**—.29**	—.06	**.82**	.05	**—.76**	—.28
Per Capita Health and Hospital Expenditures From All Sources	**.31**	—.20	**.23**	—.07	**—.05**	.22	**—.21**	.07	**.28**	—.05	**—.16**	.28	**—.06**	—.09	**—.19**	—.12	**—.15**	.23	**.09**	—.47
Per Capita Welfare Expenditures From All Sources	**.72**	.68	**.59**	.41	**—.54**	—.45	**—.15**	—.30	**.65**	.69	**—.65**	—.53	**—.12**	—.08	**.37**	.13	**—.49**	—.54	**.70**	.65
Per Capita Highway Expenditures From All Sources	**.79**	.80	**.25**	.10	**—.06**	—.09	**—.54**	—.47	**.53**	.40	**—.35**	—.22	**—.08**	.06	**—.28**	—.25	**—.47**	—.40	**.51**	.35
Per Capita Total General Expenditures From Local Sources	**—.55**	n.c.	**—.22**	n.c.	**.73**	n.c.	**.42**	n.c.	**—.64**	n.c.	**.68**	n.c.	**.05**	n.c.	**—.23**	n.c.	**.73**	n.c.	**—.79**	n.c.
Per Capita Education Expenditures From Local Sources	**—.55**	n.c.	**—.19**	n.c.	**.69**	n.c.	**.70**	n.c.	**—.74**	n.c.	**.47**	n.c.	**.13**	n.c.	**.15**	n.c.	**.48**	n.c.	**—.72**	n.c.
Per Capita Welfare Expenditures From Local Sources	**—.47**	n.c.	**—.22**	n.c.	**.64**	n.c.	**.32**	n.c.	**—.62**	n.c.	**.37**	n.c.	**.06**	n.c.	**—.06**	n.c.	**.37**	n.c.	**—.54**	n.c.
Per Capita Highway Expenditures From Local Sources	**—.56**	n.c.	**—.39**	n.c.	**.47**	n.c.	**.13**	n.c.	**—.52**	n.c.	**.80**	n.c.	**—.01**	n.c.	**.41**	n.c.	**.65**	n.c.	**—.58**	n.c.

n.c.—Not calculated.
Bold Face—1962.
Light Face—1957.

APPENDIX TABLE A-2

MATRIX OF ZERO-ORDER CORRELATION COEFFICIENTS FOR PUBLIC EDUCATION ANALYSIS IN 1957 AND 1962

	Per Capita State and Federal Aid to Education		Per Student State and Federal Aid to Education		Per Capita State Aid to Education		Per Student State Aid to Education		County Population		Per Capita Assessed Value		Property Tax Rate Average of the Four Property Classes		County Population Density		Per Student Assessed Value		Per Cent of Total Income of State Received by Residents of the County		Number of Students per School (Average Daily Attendance)		Average Daily Attendance	
Per Capita State and Federal Aid to Education																								
Per Student State and Federal Aid to Education	**.83**	.90																						
Per Capita State Aid to Education	**.99**	.99	**.82**	.87																				
Per Student State Aid to Education	**.84**	.16	**.99**	.32	**.83**	.04																		
County Population	**—.33**	—.39	**—.46**	—.49	**—.32**	—.38	**—.46**	—.26																
Per Capita Assessed Value	**—.77**	—.63	**—.69**	—.45	**—.77**	—.64	**—.71**	.07	**.21**	.08														
Property Tax Rate Average of the Four Property Classes	**—.22**	—.47	**—.60**	—.71	**—.21**	—.44	**—.58**	—.29	**.51**	.54	**.17**	**.14**												
County Population Density	**—.68**	—.73	**—.70**	—.72	**—.67**	—.71	**—.69**	—.30	**.56**	.56	**.51**	.55	**.43**	.47										
Per Student Assessed Value	**—.83**	—.73	**—.67**	—.49	**—.87**	—.74	**—.68**	.02	**.20**	.12	**.91**	.93	**.05**	.10	**.65**	.69								
Per Cent of Total Income of State Received by Residents of the County	**—.38**	—.45	**—.48**	—.51	**—.38**	—.43	**—.48**	—.24	**.99**	.98	**.27**	.16	**.47**	.49	**.61**	.61	**.28**	.22						
Number of Students per School (Average Daily Attendance)	**—.57**	—.70	**—.72**	—.73	**—.59**	—.69	**—.75**	—.21	**.51**	.55	**.49**	.42	**.59**	.76	**.68**	.76	**.44**	.47	**.54**	.58				
Average Daily Attendance	**—.18**	—.28	**—.40**	—.44	**—.18**	—.25	**—.39**	—.28	**.98**	.98	**.10**	.06	**.57**	.45	**.46**	.45	**.05**	—.04	**.95**	.95	**.47**	.48		
Number of Schools	**.06**	.00	**—.18**	—.21	**.08**	.05	**—.15**	—.30	**.81**	.74	**—.18**	—.37	**.51**	.17	**.25**	.17	**—.21**	—.35	**.75**	.67	**.09**	.03	**.86**	.82
Median Number of School Years Completed by Populace	**—.81**	—.76	**—.67**	—.60	**—.80**	—.75	**—.67**	—.18	**.63**	.60	**.57**	.58	**.26**	.76	**.79**	.76	**.69**	.68	**.69**	.66	**.63**	.66	**.49**	.45
Mean Teacher's Salary	**—.67**	—.59	**—.76**	—.46	**—.67**	—.59	**—.76**	—.08	**.54**	.41	**.56**	.56	**.62**	.70	**.73**	.70	**.57**	.62	**.56**	.45	**.77**	.75	**.48**	.31
Number of Teachers	**—.19**	—.29	**—.40**	—.44	**—.19**	—.26	**—.40**	—.28	**.98**	.98	**.11**	—.04	**.57**	.46	**.47**	.46	**.06**	—.03	**.96**	.95	**.47**	.47	**.99**	.99
Per Capita Income	**—.58**	—.51	**—.52**	—.43	**—.58**	—.51	**—.53**	—.01	**.41**	.32	**.50**	.37	**.23**	.48	**.60**	.47	**.56**	.45	**.49**	.42	**.56**	.49	**.32**	.24
Per Student Income	**—.79**	—.69	**—.57**	—.50	**—.79**	—.70	**—.59**	.00	**.32**	.27	**.63**	.59	**.07**	.66	**.74**	.66	**.81**	.75	**.42**	.75	**.50**	.53	**.17**	.13
Number of Schools per Square Mile	**.64**	.68	**.62**	.60	**.65**	.68	**.64**	.04	**—.21**	—.26	**—.55**	—.56	**—.37**	n.c.	**—.51**	—.53	**—.55**	—.56	**—.25**	—.55	**—.71**	—.72	**—.14**	—.18
Per Capita Total Education Expenditures	**.46**	.75	**.07**	.62	**.46**	.72	**.07**	.28	**.08**	—.36	**—.09**	—.17	**.52**	.53	**—.18**	—.53	**—.36**	—.40	**.03**	—.40	**.06**	—.53	**.21**	—.26
Per Student Total Education Expenditures	**—.59**	—.04	**—.46**	.25	**—.60**	—.08	**—.47**	.44	**.21**	—.30	**.69**	.62	**.29**	.10	**.48**	.10	**.71**	.58	**.27**	.58	**.38**	—.12	**.11**	—.40
Per Capita Total Education Expenditures From Local Sources	**—.58**	—.66	**—.77**	—.65	**—.58**	—.68	**—.77**	.08	**.40**	.19	**.69**	n.c.	**.70**	.51	**.51**	.51	**.54**	.65	**.41**	.65	**.63**	.47	**.37**	.13
Per Student Total Education Expenditures From Local Sources	**—.82**	—.80	**—.82**	—.67	**—.81**	—.81	**—.82**	.06	**.38**	.19	**.81**	n.c.	**.50**	.69	**.68**	.69	**.81**	.86	**.42**	.86	**.62**	.54	**.28**	.07
Per Teacher Total Expenditure	**—.70**	—.50	**—.71**	—.35	**—.70**	—.52	**—.71**	.14	**.43**	.10	**.67**	n.c.	**.47**	.53	**.61**	.52	**.68**	.73	**.46**	.73	**.60**	.51	**.36**	.00
Per School Total Expenditure	**—.66**	—.73	**—.76**	—.70	**—.67**	—.72	**.78**	—.17	**.51**	.46	**.61**	n.c.	**.58**	.83	**.74**	.83	**.58**	.63	**.54**	.63	**.97**	.98	**.44**	.36

n.c.—Not calculated.
Bold Face—1962.
Light Face—1957.

APPENDIX TABLE A-2—(Continued)

	Number of Schools		Median Number of School Years Completed by Populace		Mean Teacher's Salary		Number of Teachers		Per Capita Income		Per Student Income		Number of Schools per Square Mile		Per Capita Total Education Expenditures		Per Student Total Education Expenditures		Per Capita Total Education Expenditures From Local Sources		Per Student Total Education Expenditures From Local Sources		Per Teacher Total Expenditure	
Per Capita State and Federal Aid to Education																								
Per Student State and Federal Aid to Education																								
Per Capita State Aid to Education																								
Per Student State Aid to Education																								
County Population																								
Per Capita Assessed Value																								
Property Tax Rate Average of the Four Property Classes																								
County Population Density																								
Per Student Assessed Value																								
Per Cent of Total Income of State Received by Residents of the County																								
Number of Students per School (Average Daily Attendance)																								
Average Daily Attendance																								
Number of Schools																								
Median Number of School Years Completed by Populace	**.22**	.09																						
Mean Teacher's Salary	**.21**	—.06	**.65**	.72																				
Number of Teachers	**.87**	.83	**.51**	.47	**.49**	.31																		
Per Capita Income	**.09**	.00	**.63**	.50	**.60**	.40	**.33**	.24																
Per Student Income	**—.06**	—.15	**.75**	.67	**.62**	.54	**.18**	.13	**.87**	.89														
Number of Schools per Square Mile	**.21**	.25	**—.54**	—.55	**—.67**	—.62	**—.14**	—.17	**—.45**	—.41	**—.51**	.49												
Per Capita Total Education Expenditures	**.26**	—.05	**—.39**	—.59	**.09**	—.35	**.21**	—.26	**—.18**	—.47	**—.45**	—.62	**.08**	.42										
Per Student Total Education Expenditures	**—.07**	—.48	**.48**	.18	**.62**	.30	**.13**	—.38	**.43**	.00	**.57**	.21	**—.49**	—.11	**.21**	.37								
Per Capita Total Education Expenditures From Local Sources	**.18**	—.08	**.46**	.48	**.76**	.49	**.39**	.14	**.41**	.23	**.38**	.34	**—.57**	—.55	**.45**	.00	**.79**	.48						
Per Student Total Education Expenditures From Local Sources	**.05**	—.18	**.66**	.65	**.80**	.63	**.30**	.09	**.55**	.36	**.67**	.59	**—.64**	—.60	**.10**	—.25	**.88**	.55	**.91**	.92				
Per Teacher Total Expenditure	**.12**	—.31	**.60**	.50	**.81**	.72	**.36**	.00	**.50**	.31	**.58**	.48	**—.65**	—.59	**.17**	—.03	**.85**	.67	**.86**	.73	**.92**	.80		
Per School Total Expenditure	**.07**	—.08	**.68**	.71	**.83**	.81	**.45**	.36	**.60**	.49	**.59**	.60	**—.72**	—.72	**.09**	—.47	**.58**	.10	**.74**	.57	**.77**	.68	**.73**	.66

n.c.—Not calculated.
Bold Face—1962.
Light Face—1957.

APPENDIX B

Table Showing Real and Money Amounts of Per Capita Expenditures from Local Sources, Per Capita Income and Per Capita Assessed Value for West Virginia, 1951-1964

and

Tables Showing Results of Regression and Correlation Analyses for West Virginia Counties Selected Years, 1951-1964

APPENDIX TABLE B-1

REAL AND MONEY AMOUNTS OF PER CAPITA EXPENDITURES FROM LOCAL SOURCES, PER CAPITA INCOME, AND PER CAPITA ASSESSED VALUE FOR WEST VIRGINIA 1951-1964

Year	Per Capita Expenditures from Local Sources	Real Per Capita Expenditures from Local Sources	Per Capita Income	Real Per Capita Income	Per Capita Assessed Value	Real Per Capita Assessed Value
1951	$25	$28	$1,226	$1,355	$1,402	$1,548
1952	26	29	1,295	1,399	1,456	1,574
1953	29	31	1,313	1,409	1,548	1,661
1954	30	32	1,262	1,350	1,623	1,734
1955	32	34	1,339	1,435	1,677	1,798
1956	34	36	1,525	1,612	1,804	1,905
1957	36	37	1,641	1,675	1,966	2,007
1958	40	40	1,583	1,572	2,033	2,019
1959	44	43	1,629	1,605	2,007	1,977
1960	47	46	1,665	1,615	2,069	2,007
1961	51	49	1,702	1,633	2,184	2,096
1962	54	51	1,779	1,688	2,200	2,143
1963	54	50	1,847	1,731	2,375	2,226
1964	55	51	1,936	1,791	2,428	2,241

Source: "County Court Levy Estimates" (1951-1964), *Biennial Report of the Tax Commissioner of West Virginia* (1950-1964), *Personal Income and Retail Sales in West Virginia, Federal Reserve Bulletin* (February 1966). See text for complete references.

APPENDIX TABLE B-2

PARTIAL ELASTICITY AND SIMPLE, PARTIAL, AND TOTAL CORRELATION COEFFICIENTS DERIVED FROM TIME SERIES REGRESSIONS* OF PER CAPITA LOCAL GOVERNMENT EXPENDITURES (Y) ON PER CAPITA INCOME (X_1) AND TIME (X_2) FOR WEST VIRGINIA COUNTIES, 1951-1964

COUNTY	PARTIAL ELASTICITY COEFFICIENTS		CORRELATION COEFFICIENTS		
	Income (X_1)	Time (X_2)	Simple r_{Y1}	Partial $r_{Y1.2}$	$R^2_{Y.12}$
Barbour	0.8726	−0.0038	0.4953	0.2097	0.2454
Berkeley	1.0168	0.1258	0.9200	0.6076	0.8910
Boone	1.3719	0.1837	0.9175	0.7579	0.8989
Braxton	0.4582	0.1342	0.9306	0.4742	0.9059
Brooke	0.9236	0.1490	0.7661	0.6862	0.9064
Cabell	0.8799	0.1257	0.9213	0.5465	0.8814
Calhoun	1.1168	−0.1305	0.8622	0.8622	0.7791
Clay	1.7859	0.0073	0.8848	0.6192	0.7849
Doddridge	−0.2826	0.2226	0.7260	−0.3261	0.8255
Fayette	1.0771	0.2276	0.8753	0.6230	0.8946
Gilmer	0.0638	0.1860	0.8636	0.1218	0.9129
Grant	2.2353	0.0817	0.8617	0.4203	0.7444
Greenbrier	−0.0826	0.2568	0.5366	−0.0252	0.3500
Hampshire	3.5847	−0.1699	0.9163	0.8638	0.8666
Hancock	0.7058	0.2545	0.9260	0.7206	0.9698
Hardy	1.0497	0.2164	0.8710	0.4188	0.8383
Harrison	0.9694	0.1698	0.9583	0.7421	0.9569
Jackson	0.4452	0.3550	0.7690	0.2788	0.6782
Jefferson	1.2423	0.0334	0.9338	0.7282	0.8739
Kanawha	1.7016	0.0928	0.9485	0.6690	0.9057
Lewis	0.9343	0.2650	0.9300	0.5068	0.9462
Lincoln	1.2673	−0.0176	0.8750	0.5165	0.7660
Logan	−0.4492	0.3144	0.6642	−0.4829	0.9172
McDowell	0.3109	0.2965	0.5956	0.1708	0.8414
Marion	0.6206	0.1684	0.9504	0.6280	0.9509
Marshall	0.0068	0.4571	0.8648	0.0017	0.8427
Mason	0.0956	0.2839	0.9081	0.0470	0.8995
Mercer	0.0281	0.3345	0.8513	0.0130	0.8766
Mineral	0.2184	0.1691	0.9125	0.3154	0.8892
Mingo	0.0105	0.3455	0.5174	0.0037	0.8093
Monongalia	0.6776	0.1101	0.9600	0.6995	0.9471
Monroe	0.8135	−0.0147	0.6904	0.4926	0.4784
Morgan	0.2900	0.2754	0.8286	0.1050	0.7932
Nicholas	0.6031	0.1803	0.9461	0.7440	0.9626
Ohio	1.0469	0.0711	0.9602	0.5957	0.9269
Pendleton	0.2623	0.2992	0.9732	n. c.	n. c.
Pleasants	0.7630	0.0728	0.8663	0.5953	0.8000
Pocahontas	−0.2133	0.2468	0.7913	−0.2001	0.8151
Preston	0.1167	0.2884	0.7395	0.0091	0.8077
Putnam	0.7688	0.2996	0.8584	0.4184	0.9282
Raleigh	0.9915	0.1913	0.7977	0.3872	0.6699
Randolph	1.4169	0.0297	0.9461	0.6999	0.8960
Ritchie	1.9846	−0.1567	0.8879	0.6611	0.8068
Roane	0.6311	0.0194	0.9798	0.8497	0.9611
Summers	0.1772	0.1922	0.7889	0.0934	0.7239
Taylor	0.5114	0.2137	0.9070	0.3516	0.9016
Tucker	1.6352	−0.0494	0.9723	0.8341	0.9467
Tyler	0.9615	0.1385	0.9294	0.4581	0.8787
Upshur	0.5475	0.2008	0.9220	0.6847	0.9540
Wayne	0.9799	0.0920	0.9472	0.7515	0.9128
Webster	0.5537	0.2169	0.8496	0.6583	0.9184
Wetzel	1.0176	0.0234	0.8802	0.5947	0.7757
Wirt	0.0549	0.1632	0.4976	0.0193	0.3002
Wood	1.8534	0.1191	0.9824	0.8783	0.9752
Wyoming	0.6887	0.1824	0.8575	0.5765	0.8319

*The regression equation is in a double-log form.
n.c.—Not calculated.

APPENDIX TABLE B-3

PARTIAL ELASTICITY AND SIMPLE, PARTIAL, AND TOTAL CORRELATION COEFFICIENTS DERIVED FROM TIME SERIES REGRESSIONS* OF PER CAPITA LOCAL GOVERNMENT EXPENDITURES (Y) ON PER CAPITA ASSESSED VALUE (X_3) AND TIME (X_2) FOR WEST VIRGINIA COUNTIES, 1951-1964

COUNTY	PARTIAL ELASTICITY COEFFICIENTS		CORRELATION COEFFICIENTS		
	Assessed Value (X_3)	Time (X_2)	Simple r_{Y3}	Partial $r_{Y3.2}$	$R^2_{Y.23}$
Barbour	−0.4135	0.2742	0.3523	−0.1196	0.2219
Berkeley	0.4693	0.1526	0.8957	0.7084	0.9140
Boone	1.6019	−0.1232	0.9316	0.6834	0.8734
Braxton	0.6469	0.1139	0.9450	0.6390	0.9282
Brooke	0.3747	0.1694	0.6741	0.3435	0.8440
Cabell	0.9147	0.0459	0.9436	−0.1097	0.9434
Calhoun	0.8323	−0.0584	0.7884	0.4646	0.6262
Clay	1.4429	−0.0603	0.9041	0.7059	0.8234
Doddridge	0.6035	0.0935	0.8930	0.4060	0.8369
Fayette	1.7988	−0.0415	0.9580	0.7260	0.9186
Gilmer	0.4550	0.1403	0.9218	0.4517	0.9296
Grant	1.7699	0.1622	0.8485	0.3492	0.7274
Greenbrier	−0.2605	0.3277	0.4417	−0.1644	0.3672
Hampshire	5.1195	−0.5673	0.7954	0.6717	0.7116
Hancock	0.4152	0.2757	0.9181	0.5311	0.9549
Hardy	1.3001	−0.0091	0.9141	0.4015	0.8356
Harrison	0.9509	0.2468	0.9282	0.3304	0.9145
Jackson	2.3297	−0.2432	0.9082	0.7392	0.8417
Jefferson	2.3475	−0.0959	0.9482	0.8118	0.9084
Kanawha	1.6801	−0.0473	0.9754	0.8502	0.9527
Lewis	0.6400	0.2449	0.9515	0.3901	0.9386
Lincoln	2.4217	−0.0491	0.9345	0.7844	0.8772
Logan	−0.4994	0.3365	0.8623	−0.3048	0.9020
McDowell	1.7951	−0.0473	0.9772	0.8578	0.9568
Marion	0.6735	0.1182	0.9725	0.7392	0.9632
Marshall	1.0697	0.1051	0.9577	0.7158	0.9233
Mason	0.7013	0.1648	0.9433	0.6906	0.9473
Mercer	1.2774	−0.0185	0.9738	0.7637	0.9486
Mineral	0.7509	0.1234	0.9406	0.6640	0.9312
Mingo	1.2295	0.0434	0.9533	0.7287	0.9106
Monongalia	0.3476	0.2073	0.9010	0.2245	0.9016
Monroe	1.0364	−0.1128	0.7320	0.6437	0.5966
Morgan	1.6325	0.0772	0.9081	0.4234	0.8284
Nicholas	1.0454	0.0713	0.9822	0.7929	0.9689
Ohio	−0.1869	0.2857	0.7609	−0.1324	0.8887
Pendleton	0.8746	0.1818	0.9727	0.4507	0.9561
Pleasants	1.8903	0.1923	0.5751	0.1903	0.7120
Pocahontas	−0.1871	0.2394	0.8485	−0.1144	0.8099
Preston	−0.7398	0.4691	0.8575	−0.2258	0.8157
Putnam	1.2739	−0.0364	0.9690	0.8428	0.9396
Raleigh	1.9561	−0.0558	0.8371	0.4821	0.7020
Randolph	1.7082	−0.1571	0.9685	0.8764	0.9527
Ritchie	2.4721	0.0687	0.8799	0.5959	0.7786
Roane	0.4874	0.1366	0.8888	0.4386	0.8869
Summers	0.1010	0.2003	0.8174	0.0432	0.7220
Taylor	0.2331	0.2590	0.9017	0.1228	0.8895
Tucker	1.0552	0.0989	0.9299	0.5023	0.8691
Tyler	−0.1303	0.3467	0.7489	−0.0711	0.8472
Upshur	0.7442	0.1285	0.9626	0.5362	0.9383
Wayne	1.1998	0.0693	0.9381	0.6517	0.8848
Webster	0.6508	0.1425	0.9429	0.7330	0.9334
Wetzel	1.0153	0.0611	0.7941	0.0996	0.6448
Wirt	1.6734	−0.0919	0.8979	0.8807	0.8460
Wood	0.8525	0.2993	0.9098	0.4490	0.9135
Wyoming	1.4843	−0.0012	0.9689	0.8698	0.9387

*The regression equation is in a double-log form.

APPENDIX TABLE B-4

ELASTICITY AND CORRELATION COEFFICIENTS BETWEEN PER CAPITA ASSESSED VALUE (Y) AND PER CAPITA INCOME (X_1) DERIVED FROM SIMPLE TIME SERIES REGRESSIONS FOR WEST VIRGINIA COUNTIES, 1951-1964

COUNTY	DOLLAR AMOUNTS		REAL AMOUNTS*	
	Elasticity Coefficient (X_1)	Correlation Coefficient	Elasticity Coefficient (X_1)	Correlation Coefficient
Barbour	0.8845	0.9503	0.8218	0.8921
Berkeley	1.7725	0.9143	2.5200	0.8473
Boone	1.4708	0.8797	1.4824	0.7523
Braxton	0.8355	0.9673	0.7827	0.9292
Brooke	1.1086	0.8727	1.0721	0.7784
Cabell	1.4166	0.9616	1.6101	0.9022
Calhoun	0.9908	0.9754	0.9814	0.9575
Clay	1.4737	0.9430	1.4412	0.7756
Doddridge	0.5722	0.8498	0.3375	0.5267
Fayette	1.3049	0.8617	1.0559	0.5967
Gilmer	0.5186	0.9157	0.3058	0.7100
Grant	1.0120	0.9865	1.0054	0.9671
Greenbrier	1.5283	0.9642	1.7093	0.9367
Hampshire	0.9665	0.9093	0.8551	0.7594
Hancock	1.0675	0.7853	1.0110	0.5965
Hardy	1.8792	0.9303	2.4775	0.7753
Harrison	0.5170	0.9198	0.2712	0.5814
Jackson	0.6854	0.8717	0.8907	0.8197
Jefferson	0.7090	0.9399	0.5601	0.8454
Kanawha	1.4332	0.9861	1.6459	0.9599
Lewis	1.5665	0.9650	2.0937	0.8839
Lincoln	0.6323	0.9295	0.4004	0.7971
Logan	0.8362	0.8084	0.5959	0.5794
McDowell	1.5507	0.6900	−0.3063	−0.1541
Marion	1.2156	0.9675	0.6815	0.9333
Marshall	2.1476	0.8922	2.0550	0.6411
Mason	1.1097	0.8367	0.8918	0.5779
Mercer	2.1774	0.5878	−1.1106	−0.4115
Mineral	0.4146	0.8410	0.2566	0.6499
Mingo	2.1774	0.5878	−1.1111	−0.4115
Monongalia	0.5885	0.9388	0.4315	0.7791
Monroe	1.2628	0.9647	1.2841	0.8976
Morgan	0.9498	0.8846	0.6791	0.6599
Nicholas	0.9301	0.9547	0.8691	0.9103
Ohio	0.5173	0.8218	0.2764	0.4114
Pendleton	0.7140	0.9400	0.5983	0.8859
Pleasants	3.8424	0.6627	−0.3349	−0.7816
Pocahontas	0.8847	0.9652	0.7966	0.9291
Preston	0.8882	0.8434	0.7315	0.6771
Putnam	1.5300	0.8964	1.5193	0.8001
Raleigh	0.9196	0.9312	0.8433	0.8661
Randolph	1.2655	0.9695	1.4061	0.9501
Ritchie	0.6301	0.9759	0.4708	0.8893
Roane	0.4539	0.9375	0.2735	0.7626
Summers	1.0868	0.9370	1.7406	0.8313
Taylor	0.8987	0.9518	1.2872	0.8780
Tucker	1.0003	0.9752	0.9138	0.9583
Tyler	0.5122	0.7841	0.2721	0.3891
Upshur	0.9834	0.8980	0.8937	0.7922
Wayne	0.8414	0.9539	0.7689	0.8999
Webster	1.2404	0.9460	1.2193	0.8777
Wetzel	0.8340	0.9698	0.7533	0.9436
Wirt	0.6807	0.6739	0.3404	0.3211
Wood	0.8746	0.9109	0.7922	0.7682
Wyoming	0.8559	0.8839	0.6880	0.7759

*Dollar Amounts are adjusted by using the 1957-1959 Consumer Price Index.
Source: CPI from *Federal Reserve Bulletin*, Vol. 53, No. 2 (February 1967).

APPENDIX TABLE B-5

PARTIAL ELASTICITY AND SIMPLE, PARTIAL, AND TOTAL CORRELATION COEFFICIENTS DERIVED FROM TIME SERIES REGRESSIONS OF FISCAL EFFORT* (Y) ON PER CAPITA ASSESSED VALUE (X_3) AND TIME (X_2) FOR WEST VIRGINIA COUNTIES, 1951-1964

COUNTY	PARTIAL ELASTICITY COEFFICIENTS		CORRELATION COEFFICIENTS		
	Assessed Value (X_3)	Time (X_2)	Simple r_{Y3}	Partial $r_{Y3.2}$	$R^2_{Y.32}$
Barbour	−1.0444	0.1742	−0.2250	−0.3088	0.1025
Berkeley	0.1680	0.0903	0.7496	0.3195	0.6869
Boone	0.7048	0.0107	0.8755	0.4397	0.7667
Braxton	−0.1883	0.0485	0.0506	−0.1782	0.0498
Brooke	n.c.	n.c.	n.c.	n.c.	n.c.
Cabell	0.2353	0.0480	0.7285	0.1943	0.5416
Calhoun	−0.1300	−0.0577	−0.6049	−0.1060	0.3796
Clay	0.9767	−0.0939	0.7290	0.5749	0.5697
Doddridge	0.2306	−0.0426	−0.0451	0.0883	0.0155
Fayette	0.9217	0.3278	0.9081	0.4749	0.8259
Gilmer	−0.6493	−0.0575	−0.3281	−0.3151	0.1423
Grant	0.9406	0.1335	0.7124	0.1981	0.5169
Greenbrier	−0.6784	0.2388	−0.1970	−0.4067	0.1655
Hampshire	3.9232	−0.4993	0.6982	0.6425	0.6084
Hancock	0.3370	0.1265	0.9223	0.5702	0.9244
Hardy	0.2397	0.1579	0.8185	0.0815	0.6822
Harrison	−0.1016	0.1751	0.8438	−0.0526	0.8222
Jackson	1.4761	−0.3384	0.4784	0.4585	0.3079
Jefferson	1.2483	−0.1239	0.7021	0.6168	0.5740
Kanawha	0.9869	−0.0428	0.9034	0.6298	0.8190
Lewis	−0.0697	0.2716	0.8956	−0.0493	0.8876
Lincoln	1.7512	−0.1593	0.6180	0.6571	0.5255
Logan	−0.9460	0.2765	0.4986	−0.3200	0.4388
McDowell	1.2016	0.0164	0.9101	0.5440	0.8287
Marion	−0.0419	0.1020	0.7087	−0.0530	0.5897
Marshall	1.0156	−0.0162	0.9142	0.6595	0.8360
Mason	0.7377	0.0036	0.8924	0.6643	0.7965
Mercer	0.9545	−0.0547	0.8815	0.5207	0.7803
Mineral	0.6501	−0.1961	−0.3649	0.3897	0.4286
Mingo	1.1220	0.0287	0.9196	0.6285	0.8466
Monongalia	−0.5984	0.1213	0.3229	−0.4903	0.4499
Monroe	0.1726	−0.0798	−0.2127	0.1222	0.0977
Morgan	1.4983	−0.0305	0.7875	0.3783	0.6213
Nicholas	−0.2579	0.1530	0.6883	−0.2361	0.6123
Ohio	−0.2952	0.1100	0.5026	−0.2602	0.5532
Pendleton	−0.1808	0.1391	0.8124	−0.1318	0.7204
Pleasants	−0.5093	0.0406	0.0449	−0.1321	0.0804
Pocahontas	−0.0134	0.2614	−0.2418	−0.5450	0.3032
Preston	−0.0221	0.6215	0.4937	−0.5415	0.5449
Putnam	0.8298	−0.0731	0.8479	0.5987	0.7256
Raleigh	0.8568	−0.0143	0.5670	0.2290	0.3216
Randolph	0.9981	−0.1674	0.8035	0.6889	0.7238
Ritchie	1.4338	−0.1416	0.4403	0.4220	0.2668
Roane	−0.5674	−0.0128	−0.9152	−0.7049	0.8413
Summers	−0.6162	0.1818	0.3296	−0.2426	0.2206
Taylor	−0.6492	0.2369	0.6767	−0.3439	0.6719
Tucker	0.2577	0.5141	0.7341	0.1918	0.5467
Tyler	−0.1123	0.1463	0.5725	−0.0689	0.5222
Upshur	−0.1766	0.1547	0.7353	−0.1379	0.6285
Wayne	0.1102	0.0649	0.6279	0.0907	0.4275
Webster	−0.3188	0.2249	0.5607	−0.3899	0.6680
Wetzel	0.0594	0.0150	0.1660	0.0378	0.0291
Wirt	1.6699	−0.2786	0.5134	0.8342	0.6967
Wood	0.3999	0.2009	0.8917	0.3363	0.8989
Wyoming	0.5435	0.0063	0.6806	0.3713	0.4635

*The effort measure used here is the ratio of government expenditures from local sources to personal income.
n.c.—Not calculated.

APPENDIX TABLE B-6

SIMPLE REGRESSION AND CORRELATION COEFFICIENTS DERIVED FROM TIME SERIES REGRESSIONS* OF PER CAPITA EXPENDITURES FROM LOCAL SOURCES (Y) ON POPULATION (X_1) FOR WEST VIRGINIA COUNTIES, 1951-1964

COUNTY	Simple Regression Coefficients	Simple Correlation Coefficients	COUNTY	Simple Regression Coefficients	Simple Correlation Coefficients
Barbour	— 0.0002	— 0.3575	Mineral	0.0005	0.6415
Berkeley	0.0002	0.6970	Mingo	0.0003	— 0.9818
Boone	— 0.0002	— 0.9525	Monongalia	0.0003	— 0.8360
Braxton	— 0.0003	— 0.9396	Monroe	— 0.0002	— 0.8000
Brooke	0.0003	0.6269	Morgan	0.0036	0.6664
Cabell	0.0006	0.6656	Nicholas	— 0.0004	— 0.9339
Calhoun	— 0.0005	— 0.8376	Ohio	— 0.0005	— 0.6279
Clay	— 0.0003	— 0.9510	Pendleton	— 0.0012	— 0.9395
Doddridge	— 0.0009	— 0.8927	Pleasants	0.0027	0.7404
Fayette	— 0.0001	— 0.9486	Pocahontas	— 0.0005	— 0.8691
Gilmer	— 0.0006	— 0.6582	Preston	— 0.0004	— 0.7645
Grant	0.0009	0.0100	Putnam	0.0006	0.3169
Greenbrier	— 0.0003	— 0.6663	Raleigh	— 0.0001	— 0.9227
Hampshire	— 0.0023	0.6659	Randolph	— 0.0004	— 0.8566
Hancock	0.0010	0.9173	Ritchie	— 0.0011	— 0.7310
Hardy	— 0.0010	— 0.2675	Roane	— 0.0004	— 0.9260
Harrison	0.0003	0.9333	Summers	— 0.0003	— 0.7767
Jackson	0.0006	0.8521	Taylor	— 0.0006	— 0.9522
Jefferson	0.0007	0.8268	Tucker	— 0.0007	— 0.7898
Kanawha	— 0.0003	0.8701	Tyler	— 0.0008	— 0.2559
Lewis	— 0.0005	— 0.1750	Upshur	— 0.0008	— 0.5405
Lincoln	0.0006	— 0.8649	Wayne	0.0010	0.4238
Logan	0.0001	— 0.9246	Webster	— 0.0002	— 0.9752
McDowell	— 0.0008	— 0.9540	Wetzel	— 0.0012	— 0.6194
Marion	— 0.0003	— 0.8662	Wirt	— 0.0011	— 0.4019
Marshall	0.0011	0.7532	Wood	0.0003	0.8971
Mason	0.0011	0.8255	Wyoming	— 0.0004	— 0.9637
Mercer	— 0.0004	— 0.9338			

*The regression is linear.

APPENDIX TABLE B-7

ELASTICITY AND CORRELATION COEFFICIENTS BETWEEN THE CONSUMER PRICE INDEX (CPI) AND PER CAPITA INCOME (Y) DERIVED FROM SIMPLE TIME SERIES REGRESSIONS FOR WEST VIRGINIA COUNTIES, 1951-1964

COUNTY	Elasticity Coefficient	Correlation Coefficient	$(c-b_1)$*	COUNTY	Elasticity Coefficient	Correlation Coefficient	$(c-b_1)$*
Barbour	0.3144	0.9749	0.5582	Mineral	0.2015	0.9303	0.0169
Berkeley	0.5130	0.9720	0.5038	Mingo	0.5998	0.5506	—0.5893
Boone	0.3485	0.9248	1.0234	Monongalia	0.3145	0.9246	0.3631
Braxton	0.2917	0.9050	0.1665	Monroe	0.3972	0.9175	0.4163
Brooke	0.6851	0.7234	0.2385	Morgan	0.4756	0.8507	—0.1856
Cabell	0.4217	0.9602	0.4582	Nicholas	0.2928	0.9286	0.3103
Calhoun	0.3937	0.9187	0.7231	Ohio	0.3793	0.9452	0.6676
Clay	0.1682	0.9054	1.6177	Pendleton	n.c.	n.c.	n.c.
Doddridge	0.3605	0.9600	—0.6431	Pleasants	0.3522	0.9527	0.4108
Fayette	0.4617	0.9023	0.6154	Pocahontas	0.3065	0.9176	—0.5198
Gilmer	0.2986	0.9889	—0.2348	Preston	0.3321	0.8994	—0.2154
Grant	0.3731	0.9559	1.8622	Putnam	0.2778	0.8776	0.4910
Greenbrier	0.2973	0.9665	—0.3799	Raleigh	0.2867	0.9338	0.7048
Hampshire	0.4164	0.9651	3.1683	Randolph	0.3293	0.9679	1.0876
Hancock	0.3881	0.9658	0.3177	Ritchie	0.3284	0.9496	1.6562
Hardy	0.5606	0.9722	0.4891	Roane	0.2520	0.9852	0.3791
Harrison	0.3635	0.9558	0.6059	Summers	0.4410	0.9486	0.2638
Jackson	0.1485	0.8475	0.2967	Taylor	0.3952	0.8872	0.1162
Jefferson	0.3177	0.9618	0.9246	Tucker	0.2491	0.9236	1.3861
Kanawha	0.3923	0.9684	1.3093	Tyler	0.3549	0.9638	0.6066
Lewis	0.5618	0.9767	0.3725	Upshur	0.3185	0.9352	0.2290
Lincoln	0.3484	0.9461	0.9189	Wayne	0.3003	0.9699	0.6796
Logan	0.3844	0.8050	—0.8336	Webster	0.3196	0.9038	0.2341
McDowell	0.5782	0.6991	—0.2673	Wetzel	0.2649	0.9548	0.7527
Marion	0.3306	0.9426	0.2900	Wirt	0.3413	0.9146	—0.2864
Marshall	0.4651	0.8804	—0.4583	Wood	0.4094	0.9667	1.4440
Mason	0.4472	0.9278	—0.3516	Wyoming	0.2748	0.8680	0.4139
Mercer	0.4780	0.8529	—0.4499				

* See text, page 37.
n.c.—Not calculated.

APPENDIX TABLE B-8

AVERAGE ANNUAL CHANGE AND AVERAGE ANNUAL PER CENT CHANGE IN REAL AMOUNTS OF PER CAPITA EXPENDITURES FROM LOCAL SOURCES (X_1), PER CAPITA INCOME (X_2), AND PER CAPITA ASSESSED VALUE (X_3) FOR WEST VIRGINIA COUNTIES, 1951-1964

COUNTY	AVERAGE ANNUAL CHANGE			AVERAGE ANNUAL PER CENT CHANGE		
	X_1	X_2	X_3	X_1	X_2	X_3
Barbour	0.0006	0.0004	0.0003	0.1215	0.0050	0.0037
Berkeley	0.0011	0.0002	0.0006	0.1872	0.0024	0.0064
Boone	0.0021	0.0003	0.0007	0.3383	0.0028	0.2614
Braxton	0.0005	0.0003	0.0003	0.1661	0.0042	0.0040
Brooke	0.0011	0.0005	0.0004	0.1228	—0.0008	—0.0003
Cabell	0.0024	0.0003	0.0009	0.1966	0.0037	0.0109
Calhoun	0.0006	0.0004	0.0008	0.1213	0.0049	0.0090
Clay	0.0006	0.0001	0.0003	0.1707	0.0015	0.0040
Doddridge	0.0006	0.0003	0.0002	0.0998	0.0031	0.0036
Fayette	0.0016	0.0002	0.0004	0.2859	0.0018	0.0047
Gilmer	0.0006	0.0004	0.0003	0.1298	0.0043	0.0031
Grant	0.0032	0.0004	0.0004	0.4351	0.0048	0.0044
Greenbrier	0.0008	0.0004	0.0009	0.1667	0.0051	0.0097
Hampshire	0.0024	0.0002	0.0004	0.3077	0.0027	0.0045
Hancock	0.0034	0.0004	0.0008	0.3018	0.0045	0.0101
Hardy	0.0013	0.0002	0.0006	0.2690	0.0019	0.0077
Harrison	0.0021	0.0004	0.0001	0.2790	0.0047	0.0018
Jackson	0.0030	0.0001	0.0011	0.4514	0.0123	0.0132
Jefferson	0.0016	0.0005	0.0003	0.2254	0.0052	0.0041
Kanawha	0.0033	0.0004	0.0008	0.3267	0.0043	0.0089
Lewis	0.0019	0.0001	0.0006	0.3089	0.0014	0.0072
Lincoln	0.0010	0.0002	0.0001	0.1979	0.0026	0.0017
Logan	0.0001	0.0002	0.0002	0.1853	0.0023	0.0031
McDowell	0.0015	—0.0003	0.0003	0.2429	—6.0005	0.0040
Marion	0.0018	0.0004	0.0007	0.2242	0.0051	0.0085
Marshall	0.0036	0.0002	0.0012	0.3872	0.0030	0.0144
Mason	0.0017	0.0002	0.0006	0.2278	0.0031	0.0064
Mercer	0.0020	0.0001	0.0006	0.2671	0.0018	0.0075
Mineral	0.0010	0.0006	0.0003	0.1715	0.0071	0.0030
Mingo	0.0019	—0.0007	0.0005	0.2750	—0.0008	0.0064
Monongalia	0.0013	0.0004	0.0002	0.1825	0.1406	0.0618
Monroe	0.0002	0.0002	0.0003	0.0377	0.0022	0.0042
Morgan	0.0018	0.0001	0.0002	0.2413	0.0020	0.0076
Nicholas	0.0001	0.0004	0.0003	0.2412	0.0044	0.0041
Ohio	0.0024	0.0004	0.0001	0.1957	0.0056	0.0022
Pendleton	0.0009	0.0005	0.0004	0.2989	0.0056	0.0046
Pleasants	0.0014	0.0003	—0.0003	0.1405	0.0036	0.0031
Pocahontas	0.0005	0.0003	0.0004	0.1301	0.0043	0.0054
Preston	0.0014	0.0002	0.0004	0.2372	0.0026	0.0058
Putnam	0.0025	0.0003	0.0011	0.3904	0.0039	0.0129
Raleigh	0.0018	0.0004	0.0004	0.3385	0.0051	0.0048
Randolph	0.0010	0.0003	0.0005	0.2618	0.0039	0.0066
Ritchie	0.0016	0.0003	0.0003	0.2011	0.0040	0.0034
Roane	0.0006	0.0005	0.0002	0.1285	0.0059	0.0024
Summers	0.0007	0.0002	0.0003	0.1482	0.0023	0.0038
Taylor	0.0013	0.0002	0.0002	0.2245	0.0025	0.0035
Tucker	0.0015	0.0004	0.0005	0.3274	0.0055	0.0067
Tyler	0.0017	0.0003	0.0001	0.2608	0.0033	0.0020
Upshur	0.0010	0.0003	0.0005	0.2373	0.0034	0.0060
Wayne	0.0015	0.0003	0.0004	0.2389	0.0036	0.0052
Webster	0.0008	0.0003	0.0005	0.2359	0.0027	0.0050
Wetzel	0.0019	0.0006	0.0007	0.2114	0.0066	0.0077
Wirt	0.0007	0.0002	0.0003	0.1026	0.0032	0.0033
Wood	0.0027	0.0003	0.0003	0.3633	0.0039	0.0039
Wyoming	0.0019	0.0003	0.0005	0.2445	0.0033	0.0058