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Environmental and political correlates of appropriations for higher education in Virginia, 1950-1972

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ENVIRONMENTAL AND POLITICAL CORRELATES OF APPROPRIATIONS FOR HIGHER EDUCATION IN VIRGINIA, 1950-1972

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APPROVAL SHEET

We the undersigned do certify that we have read this dissertation and that in our individual opinions it is acceptable in both scope and quality as a dissertation for the degree of Doctor of Education.

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CHAPTER I

APPROPRIATIONS FOR HIGHER EDUCATION AS PUBLIC POLICY

In the period 1950-1972, General Fund appropriations for operating expenses in higher education in Virginia increased by 1,565 percent. Even when the appropriations were computed in 1967 constant dollars, the increase was still as much as 859 percent.[1] The purpose of this investigation was to determine which socio-economic and political variables were significantly correlated with that increase in appropriations for higher education in Virginia.

The postwar period represented a distinctive stage of development for higher education in Virginia. It marked the emergence of greater access to higher education, as exemplified by burgeoning enrollments, and the development of a formal system of statewide coordination of higher education. During this period, publicly supported institutions of higher education became predominant in the state.[2] These developments took place in the context of comparable changes in the growth of the public sector in Virginia as a whole, as demonstrated by an overall increase of 537 percent in all state General Fund appropriations for operating expenses between the 1950-1952 Biennium and the 1970-1972 Biennium.[3] Moreover, the rapid growth in appropriations for higher education in Virginia has paralleled that of

other states, and, to the extent that Virginia's experience has been similar to that of other states, the findings of this study may have significance beyond the Commonwealth.

Significant changes during the postwar period in Virginia were not limited to the field of higher education. They were equally dramatic in Virginia's social, economic, and political life. The state's economy became much more industrialized as the population increased and simultaneously became more metropolitan.[5] Politically, the Democratic Byrd Organization, which had dominated the state's politics since 1926, collapsed. Perhaps this collapse is best exemplified by the 1969 Republican gubernatorial victory--the first Republican gubernatorial victory since Reconstruction--and the 1970 election of Harry F. Byrd, Jr. to the United States Senate as an Independent. Clearly, the hegemony of the Democratic party over political decision-making in Virginia under Byrd had dissipated.[6] Equally important, Virginia, like many other states, responded to court order and adjusted its apportionment to the "one man, one vote" guideline handed down in the landmark case, Reynolds v. Sims, 377 U.S. 533 (1964), giving urban residents greater representation in the General Assembly. Similarly, blacks in the state exercised political power for the first time since Reconstruction as a result of federal legislation in the area of voting rights, culminating in the decisive Voting Rights Act of 1965. Hence, political decision-making in the state is operating in a vastly different environment in the 1970s.

Some of these social, economic, and political variables

accounted, at least in part, for the sharp increase in appropriations for higher education in Virginia. As previously pointed out, the basic purpose of this study was to determine the sources of this increase in appropriations in terms of the dynamics of the social, economic, and political environment of the Commonwealth. The basic approach of this research was to view appropriations as public policy--the end product of the political decision-making process.

More specifically, appropriations for higher education were viewed as an aspect of state educational policy since appropriations shape the scope and direction of change for higher education in the future. From this standpoint, the purpose of this research was to examine this particular manifestation of state policy for higher education--the appropriations for higher education from 1950 to 1972. The problem, therefore, was to ascertain which changes in the social, economic, and political characteristics of the state accounted for the changes in appropriations for higher education.

Policy Analysis

The empirical explanation of public policy has been the focus of policy analysis in political science. In policy analysis, the end product of political decision-making, public policy, is taken as the central issue in political science around which descriptive theory should be developed. As in all behavioral research, the focus is on "what is" rather than on "what ought to be." Robert Salisbury has pointed out that policy analysis is essentially Eastonian.[7] That is,

its theoretical foundations are rooted in the pioneering work of David Easton.[8] Easton viewed public policy as the product of demands, supports, and resources within the environment in which political decision-making takes place. He called his approach, "systems analysis."

Easton's approach to the study of political decision-making was,

> . . . to view political life as a system of interrelated activities. These activities derive their relatedness or systematic ties from the fact that they all more or less influence the way in which authoritative decisions are formulated and executed for society.[9]

These interrelated activities make up what is called the political process, which is essentially oriented toward goal achievement for the community. The outputs of the political system, decisions and policies, were seen as the result of the demands coming into the system from the environment (the social, economic, and political framework in which a political system operates), the supports provided for the political community, the regime, and the government, and the resources at the disposal of the political system. Decisions and policies, Easton argued, would subsequently become inputs for future outputs of the political system and this link in the political process he called "feedback." The basic input-output model is illustrated in Figure 1 and although it has undergone some refinement by Easton since the initial publication, it remains essentially the same today.[10]

One of the key assumptions that is made in systems theory is that the political system is an open system. An open system is subject

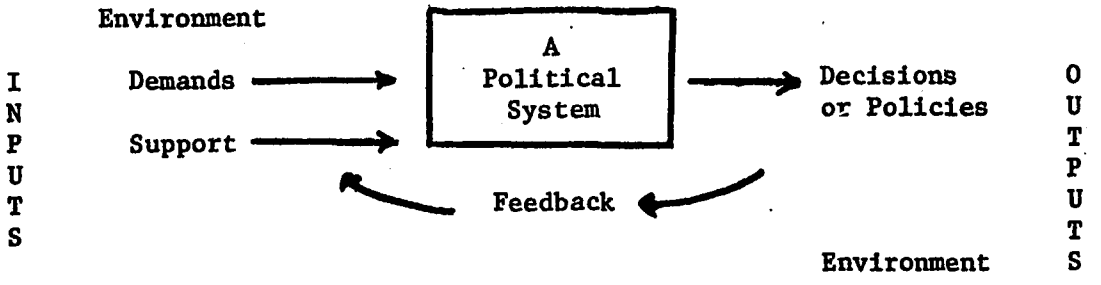

Fig. 1. Easton's political systems model.

to influence from the environment in which it operates. Therefore, the decisions and policies of a political system are the products of the interaction of the system with its environment.

Since the publication of Easton's systems model, the focus of theoretical research has been on the mechanisms that link environmental conditions to political behavior within the political system and that, therefore, link environmental conditions to the decisions and policies of the political system. As Thomas Dye has pointed out, the basic task of policy analysis today is to develop an explanatory model that will account for the forces that shape public policy and that, therefore, will provide an explanation of the key links in the decision-making process.[11] Such a model would not only aid in the explanation of political decision-making but would also serve as a heuristic device for policy analysis.

Contemporary theoretical debate in policy analysis centers around the relative importance of socioeconomic characteristics in

the environment, usually referred to as environmental variables, as opposed to the structural and procedural characteristics of the political system, usually referred to as political variables, in determining the decisions and policies of the political system. There are, essentially, two positions in the debate. One group argues that environmental variables essentially determine the substance of public policy with political variables playing a dependent role. This group has been dominated by economists. The second group argues that environmental variables provide the conditioning factors for policy decisions but that political variables operate independently to some extent in determining policy choices. Political scientists, not surprisingly, have primarily taken the second position.

The environmental determinists have generally viewed public expenditures as the output of the political system and have attempted to develop a statistical model to account for changes or variations in the expenditures in terms of social and economic variables. In his review of the literature, Paul Hartwig noted the economists' general failure to include political variables in their determinant models.[12] As the review of literature in the following chapter will document, the economists, in their research on combined state and local expenditures, found that generally economic variables were the most significant determinants. Since they were looking at essentially economic outputs, it is not too surprising that they found economic inputs to be significant.

Political scientists generally have argued for an

environmental-political linkage model but have differed extensively about the relative importance of the two sets of variables. In this model, the impact of environment on public policy is indirect in the sense that the environment shapes the political structure and process which then has a direct influence on the outputs of the political system.

The importance of environment to structure and process in political systems was one of the chief contributions of Seymour M. Lipset to comparative government. In 1960, he documented the significance of socioeconomic development to democratic government.[13] Since then, the relationship between socioeconomic development and other aspects of political structure and process has been the subject of much research.

In their early work, V. O. Key, Jr. and Duane Lockard concentrated on the effect of political characteristics on distinctive policy outputs in the states. They argued, for example, that party competition was directly related to more liberal welfare policies in the states.[14] Key and Lockard ignored the impact of socioeconomic development on state political systems. Similarly, research on policy differences between political parties suggested that different party control in state legislatures would result in different policy outputs.[15] Harmon Zeigler, in his research on interest groups in the states, however, was able to demonstrate the importance of socioeconomic development to party competition, party cohesion, and the strength of interest groups in the states.[16] In his model, socioeconomic development was a

conditioning factor for state political systems.

In a related area, political scientists have assumed apportionment of state and federal legislatures to be a particularly important system characteristic to policy output. As Dye has pointed out, malapportioned legislatures were attributed with an anti-urban bias. They were said to be responsible for "unfair distribution of state funds, conservative tax schemes, unprogressive education policies, and penny pinching welfare programs. . . ."[17] Yet, systematic research has failed to demonstrate this relationship.[18]

Voter participation has also been held to have important consequences for political decision-making. Certainly, voter turnout can have a decisive effect on the outcome of elections and, therefore, it is assumed that it can have an impact on public policy since it may help to determine who is elected. In addition, it is argued that low voter participation by certain groups has been responsible for their lack of influence over public policy. Fred Greenstein, in his research, has attempted to demonstrate the relationship between patterns of voter participation and voting patterns in the legislature.[19]

The linkage between system characteristics and public policy, which has been the subject of much of the political research on public policy, may not be as obvious as it seems. As the literature review in the following chapter will illustrate, systematic research on the relationship between environmental characteristics, political characteristics, and public policy generally has not supported the view that political characteristics have an independent impact on public

policy.

One of the interesting aspects of most of the policy analysis research that has been conducted has been the preoccupation with combined state-local expenditures as the policy output. From a systems standpoint, combining state and local expenditures as a policy output involves certain theoretical problems in that the two levels of government are assumed to be behaving as a single system. Equally important, previous research (see Chapter II) has preoccupied itself with developing theoretical models to explain the interstate variations in combined state-local expenditures.

In his research, Ira Sharkansky has chosen to use state expenditure measures rather than measures of combined state-local expenditures because he feels that, "the artificial aggregate of state and local government expenditures does not respond to measures of discrete state or local political processes."[20] Other researchers have argued for the need to focus on the policy changes in a given state over a period of time rather than to concentrate on explaining interstate variations at a given point in time.[21]

While Douglas Rose agreed that there may be some advantage to a single state analysis, he cautioned that any model that seeks to explain state decision-making must account for the national influences on state decision-making. He argued that a major source of state policy is the diffusion of policy from the national level.[22] Morton Grodzins carried this position a bit further. It was his thesis that the American federal system (he included all levels of government in

that system) is, "one government serving a common people for a common end."[23] From this perspective, any model of public decision-making would need to include all levels of government.

It will be the theoretical assumption of this research that policy analysis should focus on a distinct system level in developing its model (in this case the state), and that it is the change in policy outputs over a period of time, within a distinct political system, with which the explanatory model should deal. The influence of other system levels (i.e., the federal government) will be accounted for as governmental inputs from the environment within which the system operates. To the extent that political systems are similar in characteristics and processes, the model will have generalized significance.

Budgetary Theory

Many researchers in policy analysis have noted that different kinds of policy outputs generate unique policy-making subsystems.[24] Robert Salisbury and John Heinz explored the theoretical implications of differentiated policy outputs for policy analysis models. They concluded that allocative policy (such as appropriations) is likely to respond to a distinctive set of demands.[25] Similarly, Brian Fry and Richard Winters argued that environmental characteristics are more likely to be important in the allocation of rewards at that level.[26]

Hence, in developing an explanatory model for higher education appropriations in Virginia, the unique character of the appropriations

process must be taken into account. A review of budgetary theory as it relates to the budgetary decision-making process at the state level should provide some assistance in the construction of the model.

Two positions seem to stand out in the literature on the budgetary process. On the one hand, budgeting decisions are seen as a rational attempt to maximize the achievement of public policy goals. On the other hand, budgetary decisions are viewed as that policy on which all policy-makers agree, even though they do not agree on the basic aims or goals of the policy.

The first position is somewhat typical of the recent innovations in public budgeting as outlined by Allen Schick. Schick promotes the "Budgetary Man" concept: "In every instance, Budgetary Man would adopt the alternative that optimizes the use of public resources."[27] It is not clear whether Schick and others argue that Budgetary Man represents "what is" or "what ought to be."

Critics of the rational model of budgetary decision-making point out that the rational model simply does not conform to the realities of the process. Charles Lindblom, who has been one of the chief spokesmen of the "realist" school, promotes an "incremental" model for budgetary decisions (and for any other public policy decision, for that matter). From this viewpoint, the starting point for public policy is previous policy. New policy is the product of the necessary bargaining among policy-makers whose basic aim is to get agreement on means (policy) without necessarily agreeing on ends.

Rarely does the process result in any dramatic departure from previous policy, hence, the name "incremental decision-making."[28]

Aaron Wildavsky, in his well-known work on the budgetary process at the national level, has documented incrementalism with numerous examples. Wildavsky and the other incrementalists do not apologize for the realities of the budgetary process. Instead, they see great strengths:

> An incremental approach guards against radical departures most of the time, whereas agency advocacy and strategies designed to take advantage of emergent needs help insure flexibility. A basic conclusion of this appraisal is that the existing budgetary process works much better than is commonly supposed.[29]

Two policy analysis studies of state and combined state and local expenditures have demonstrated the role of incrementalism in expenditure decisions. Research by Ira Sharkansky, Harmon Zeigler and Karl F. Johnson has revealed that prior-year expenditures are very closely associated with current year expenditures.[30]

Incrementalism, however, does not necessarily rule out the importance of other environmental and political variables since decision-makers can, and presumably do, make marginal adjustments in the policy. Yet, there may be reason to question whether political variables will be very critical to the budgetary process. For one thing, with the advent of the executive budget in the early 1900s, the legislature has yielded a good deal of budgetary discretion to the chief executive. For another, state governors may not have many opportunities for budgetary initiative. As Thomas Anton points out, governors do not,

> . . . determine expenditures, in the sense of looking at most state activities and deciding to reduce, continue, or expand them. Rather, the exigencies of their situation force them to focus most of their attention on revenue, which typically must be increased just to keep pace with existing programs.[31]

Other researchers in higher education, and those who have studied the budgetary process in Virginia, have confirmed the importance of incrementalism. M. M. Chambers has complained about the impact of what he calls the "slicing the pie" approach to appropriations for higher education. As he sees it, policy-makers begin with a reliable estimate of revenues for the coming year and then simply allocate a slice of the pie to each spending area. Any increase by one area comes at the expense of other areas. He adds, "Major attention is, therefore, devoted to defending the allocations of the preceding fiscal period--the status quo."[32]

Sharkansky, in his study of the budgetary process in nineteen states, found incrementalism to play a dominant role in Virginia. His research showed that the legislature's appropriation as a percentage of the agencies' current expenditures was 114 percent. That increase was the product of the agencies' request being 120 percent of current expenditures and the governor's recommendation being 92 percent of the agencies' request. It is interesting to note, that in Virginia, the legislature's appropriation typically remained close to the governor's recommendation.[33]

Finally, with regard to budgeting for higher education in Virginia, Richard Kellogg noted the conservative outlook toward budgeting for higher education in Virginia. At one point he concluded,

the budgetary process "resembled closely what Wildavsky, Sharkansky, Schick, and others have termed incremental budgeting."[34]

The impact of incrementalism in Virginia was accentuated by the "pay-as-you-go" philosophy so typical of politics under the Byrd Organization. With no dramatic change in methods of taxing or borrowing in Virginia, there would be no radical change in the patterns of expenditures. Yet, one of the concerns of this research in the period 1950 through 1972 is whether the collapse of the Byrd machine and the alteration of Virginia's borrowing and taxing policy in the late sixties had any impact on appropriations for higher education. Two significant events mark this change in the state's financial policy. In 1966, Virginia, under the leadership of Governor Mills E. Godwin, adopted the general sales and use tax and, before the end of his term in 1969, had enacted the state's first general obligation bond issue--81 million dollars for college and mental health facilities.

The Appropriations Subsystem for Higher Education

There seems to be extensive justification for treating the budgetary process as a distinct policy-making subsystem at the state level. It is not clear, however, that higher education should be regarded as a distinct appropriations subsystem, separate from public elementary-secondary education.

Salisbury has argued that public higher education is politically separate from public elementary-secondary education. However, he did note that there is a tendency in the states to develop a perspective on

education that conditions the level of support for both areas. As evidence of this, he pointed to a .68 rank order correlation among the states on the two types of per capita expenditures (public elementary-secondary and higher education).[35] In contrast, he found that while public elementary-secondary expenditures are largely a function of income, higher education expenditures were largely unrelated to income.

Another major study of educational policy in the states tended to stress the convergence of the two areas. Michael Usdan, David Minar, and Emanuel Hurwitz predicted that, "the pressures toward political interaction of elementary-secondary and higher education will increase in the years ahead."[36] It was their view that there was no justification for separating these areas of public policy.

Recent developments in state budgeting for higher education would seem to suggest a distinctive policy process for higher education, at least in the future. J. L. Miller, Jr. has pointed to the increased reliance on formulas and cost-analysis in budgeting for higher education in the states.[37] The intended effect of these changes is to put budgetary decisions on a rational basis. Virginia is no exception to these trends as is indicated by the research of Kellogg. But, Kellogg notes that it was not until the 1968-1970 Biennium that Virginia really began to rely on formulas.[38] Formula budgeting certainly has not been dominant in the period under study in this research and should not affect any of the theoretical assumptions that have been made concerning the budgeting process.

Even though the issue is far from settled as to whether higher education represents a policy subsystem distinct from public elementary-secondary education, the model presented in Figure 2 represents the basic theoretical generalizations that have been made throughout this chapter and it will serve as the theoretical basis for explaining appropriations for higher education in Virginia. To what extent the model can be generalized to all educational appropriations or to the appropriations process in general, or to other state political systems, remains to be seen. The model assumes the following with respect to appropriations for higher education in Virginia:

1. Environmental characteristics shape the political characteristics of the system and, therefore, shape the size of output
2. The political characteristics shape the size of outputs but this is largely because of their relationship to the environmental characteristics
3. The force of incrementalism in the budgetary process will make prior-biennium appropriations for higher education largely responsible for current appropriations for higher education

These assumptions were then refined and tested, as reported in the following chapters.

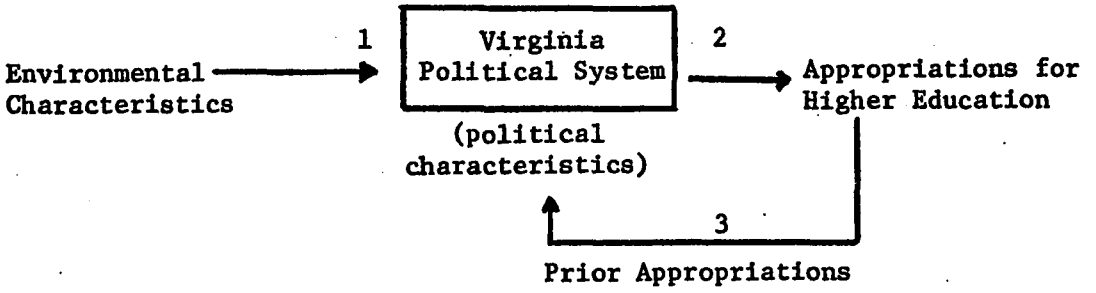

Fig. 2. Higher education appropriations subsystem for Virginia.

FOOTNOTES

[1]See data sources listed in Appendix.

[2]Francis G. Lankford, Jr., "Virginia College and University Enrollments: Past, Present, and Future," The University of Virginia News Letter 43 (April 1967): 29-32.

[3]Based on material from, Division of the Budget, "Functional Comparison of General Fund Appropriations," Data Covering 1950-1952 Biennium through 1970-1972 Biennium, Richmond, Virginia.

[4]For interstate data see, M. M. Chambers, A Record of Progress: Ten Years of State Tax Support of Higher Education, 1959-1960 through 1968-1969 (Danville, Illinois: Interstate, 1969).

[5]In 1950, 85 percent of Virginia's employment was in manufacturing, 58 percent of Virginia's population lived in metropolitan areas, and Virginia's population was approximately 3,315,000. By 1972, 96 percent of Virginia's employment was in manufacturing, 68 percent of Virginia's population lived in metropolitan areas and Virginia's population was approximately 4,764,000. See data sources listed in Appendix.

[6]For a brief review of the rise and fall of the Byrd Organization in Virginia see, George M. Kelley, "The Changing Style of Virginia Politics," The University of Virginia News Letter 45 (February 1969): 21-24.

[7]Robert H. Salisbury and John P. Heinz, "The Theory of Policy Analysis and Some Preliminary Applications," in Policy Analysis in Political Science, ed. Ira Sharkansky (Chicago: Markham, 1970), p. 39.

[8]David Easton, The Political System (New York: Alfred A. Knopf, 1953).

[9]David Easton, "An Approach to the Analysis of Political Systems," World Politics 9 (April 1957): 384.

[10]Ibid.

[11]Thomas R. Dye, Politics, Economics, and the Public Policy Outcomes in the American States (Chicago: Rand McNally, 1966), p. 3.

[12]Paul F. Hartwig, "Determinants of Change in State and Local Government Expenditures Per Pupil, 1940-1960" (Ed.D. dissertation, Northwestern University, 1972), p. 19.

[13]Seymour Martin Lipset, Political Man (New York: Doubleday, 1960).

[14]See V. O. Key, Jr., Southern Politics in State and National (New York: Alfred A. Knopf, 1949); and Duane Lockard, New England State Politics (Princeton, New Jersey: Princeton University Press, 1959).

[15]Herbert McClosky; Paul Hoffman; and Rosemary O'Hara, "Issue Conflict and Consensus Among Party Leaders and Followers," American Political Science Review 54 (June 1960): 406-27.

[16]Harmon Zeigler, "Interest Groups in the States," Politics in the American States, eds. Herbert Jacob and Kenneth Vines (Boston, Massachusetts: Little, Brown, 1965), pp. 101-47.

[17]Thomas R. Dye, Politics in States and Communities, 2d ed. (Englewood Cliffs, New Jersey: Prentice-Hall, 1973), p. 133.

[18]Ibid.

[19]Fred I. Greenstein, The American Party System and the American People, 2d ed. (Englewood Cliffs, New Jersey: Prentice-Hall, 1970).

[20]Ira Sharkansky, Spending in the American States (Chicago: Rand McNally, 1968), p. 10.

[21]Elliott R. Morss, "Some Thoughts on the Determinants of State and Local Governmental Expenditures," National Tax Journal 19 (March 1966): 98; Harmon Zeigler and Karl F. Johnson, The Politics of Education in the States (Indianapolis: Bobbs-Merrill, 1972), p. 190.

[22]Douglas D. Rose, "National and Local Forces in State Politics: The Implications of Multi-Level Policy Analysis," American Political Science Review 67 (December 1973): 1162-73.

[23]Morton Grodzins, The American System (Chicago: Rand McNally, 1966).

[24]See Herbert Jacob and Michael Lipsky, "Outputs, Structure, and Power: An Assessment of Changes in the Study of State and Local Politics," Journal of Politics 30 (May 1968): 510-38; Ira Sharkansky, "Environment, Policy, Output, and Impact: Problems of Theory and Method in the Analysis of Public Policy," Policy Analysis in Political Science, ed. Ira Sharkansky (Chicago: Markham, 1970), pp. 61-79.

[25]Salisbury and Heinz, p. 40.

[26]Brian Fry and Richard Winters, "The Politics of Redistribution," American Political Science Review 64 (June 1970): 511.

[27]Allen Schick, Budget Innovation in the States (Washington: Brookings, 1971), p. 165.

[28]Charles E. Lindblom, The Policy-Making Process (Englewood Cliffs, New Jersey: Prentice-Hall, 1968).

[29]Aaron Wildavsky, The Politics of the Budgetary Process (Boston, Massachusetts: Little, Brown, 1964), p. 178.

[30]Sharkansky, Spending in the American States; and Zeigler and Johnson.

[31]Thomas J. Anton, "Roles and Symbols in the Determination of State Expenditures," Policy Analysis in Political Science, ed. Ira Sharkansky (Chicago: Markham, 1970), p. 215.

[32]M. M. Chambers, "Current State Tax Support," Phi Delta Kappan 50 (October 1968): 113.

[33]Ira Sharkansky, The Politics of Taxing and Spending (Indianapolis: Bobbs-Merrill, 1969), p. 104.

[34]Richard A. Kellogg, "State Controlled Higher Education in Virginia and the Budgeting Process, 1950-1972: A Move toward Formal Methods" (Ed.D. dissertation, The College of William and Mary, 1974), p. 56.

[35]Robert H. Salisbury, "State Politics and Education," Politics in the American States, eds. Herbert Jacob and Kenneth Vines (Boston, Massachusetts: Little, Brown, 1965), p. 361.

[36]Michael Usdan, David Minar, and Emanuel Hurwitz, Jr., Education and State Politics (New York: Teachers College Press, 1969), p. 9.

[37]James L. Miller, Jr., State Budgeting for Higher Education: The Use of Formulas and Cost Analysis (Ann Arbor, Michigan: Institute of Public Administration, University of Michigan, 1964).

[38]Kellogg, p. 77.

CHAPTER II

SOCIAL, ECONOMIC AND POLITICAL CORRELATES OF PUBLIC POLICY: REVIEW OF LITERATURE

More than twenty-eight items of research are reviewed in the following pages. In these studies, measures of public spending are viewed as outputs of the political system, and a series of input variables are combined and analyzed to determine to what extent they can account for the changes in the output variable. Generally, the research can be divided into two broad categories: environmental studies and environmental-political interaction studies.

Researchers in the environmental group view spending decisions as the product of the economic and social changes in the environment of the political system. Economists have been dominant in this group of researchers and, not surprisingly, they have generally concentrated on the role of economic inputs. The studies can be characterized as cross sectional since their focus has been on the interstate variation in combined state and local spending. The purpose of the research has been to explain variation among the states in various categories of spending at one point in time. A few researchers have taken a longitudinal view of public expenditures in their studies.

On the other hand, political scientists see public expenditures

as the product of the interaction of the environment with the political system. From their standpoint, the structural and procedural characteristics of the political system are important determinants of the outputs of the system. Political scientists have attempted to locate and define those political variables which, in conjunction with the socioeconomic variables, explain interstate variation in public expenditures. In most cases, they have had to go beyond spending measures to demonstrate the significance of political variables. The purpose of their research has generally been to validate the independent impact of political structure and process on the outputs of the political system.

General educational expenditures, and in some few cases, expenditures for higher education, have received specific attention in the research literature. Economists and political scientists have reported some findings in this area although in most instances higher education has been peripheral to the central focus of the studies.

The purpose of this review of the literature was to select the socioeconomic and political variables that should be included in the research model outlined in the previous chapter and to develop the research hypotheses. In addition, the review provided the methodological framework to test the hypotheses.

Environmental Studies

Solomon Fabricant's analysis of government expenditures, published in 1952, is the pioneer work on the determinants of public

expenditures.[1] Fabricant used as his dependent variable the combined operating expenses of state and local government per capita for 1942 and regressed it on three socioeconomic variables: per capita income, population density, and percent of the population living in urban places. His purpose was to explain the interstate variation in state and local expenditures as a whole and by functional categories.

Through the use of multiple regression analysis, Fabricant found that the three socioeconomic variables explained 72 percent of the variation in the dependent variable. Throughout the functional categories, the three independent variables explained 29 to 85 percent of the interstate variation in expenditures, and for educational expenditures the coefficient of multiple determination was .59.[2]

Of the three socioeconomic variables, income had the highest explanatory value for all functional categories and it was positively correlated with the dependent variables. Therefore, Fabricant concluded that economic variables were the most significant determinants of combined state and local expenditures.

In 1961, Glenn Fisher replicated Fabricant's study using 1957 data except that he included capital outlay expenditures in the dependent variable.[3] Fisher found that the three socioeconomic variables explained somewhat less of the interstate variations in combined state-local expenditures for 1957 than Fabricant had reported for 1942 data. Yet, the coefficient of multiple determination increased from .59 in 1942 to .62 in 1957 for the category of educational expenditures.[4]

Later, using 1960 data, Fisher added to the number of

independent variables used by Fabricant and increased the explanatory value of the regression equation.[5] He selected seven independent variables: percent of families with income less than $2,000.; per capita yield of representative tax system as percent of U. S. average; population per square mile; percent of population living in urban places; percent increase in population, 1950-1960; index of two-party competition; and, percent of population over twenty-five with less than five years schooling. It is interesting to note that one of these is a political variable.

Fisher found that his seven variables explained 65 percent of the interstate variation in state-local expenditures for 1960 data while Fabricant's three variables explained only 50 percent. More importantly, Fisher reported a coefficient of multiple determination of .59 for expenditures for higher education using his seven variables.[6]

Standardized regression coefficients (beta coefficients) were used to measure the relative importance of each of the variables. Percent of families with income under $2,000. was the most important variable, although it was inversely related to combined state-local expenditures. With respect to expenditures for higher education, Fisher reported that wealth measures were not significant correlates and that only population density reflected a significant, although inverse, relationship to the expenditure category.

Finally, Fisher used multiple-partial regression analysis to include certain groups of variables in the regression equation while

controlling for the remaining variables. He found that demographic variables were more important than economic variables for educational expenditures and, for all categories, he found the political variable to be the least important.

In the same issue of the National Tax Journal, Seymour Sachs and Robert Harris explored the importance of federal and state grants to the levels of combined state and local expenditures in the states.[7] Using 1960 data, they added federal aid to the three socioeconomic variables employed by Fabricant and found that federal aid considerably increased the explanatory significance of the three variables. This was particularly true for welfare and highway spending. They concluded that, "where the federal government has large programs, federal aid is by far the most important determinant of expenditures as measured by beta weights."[8] However, using the same technique, Sachs and Harris found that income was the most significant correlate to local school expenditures.

In anticipation of the article by Sachs and Harris, Fisher had questioned the legitimacy of including federal aid in the regression equation since the relationship between federal aid and levels of expenditures was obviously very close because of the impact of the matching provision in most federal grants.[9]

The impact of federal grants on combined state-local expenditures was further explored by Jack Osman in 1966.[10] He sought to determine to what degree federal aid stimulated additional state and local spending in the functional category receiving the aid as well as

in all other categories not receiving the aid. Using 1960 data, Osman found that, "per capita expenditures for a function would rise with (1) increases in per capita federal aid to that function, and (2) with increases in per capita aid to all other functions."[11] When Osman looked specifically at state-local expenditures for education, he noted that federal aid to other expenditures was probably more important as a determinant than specific aid to education.

The importance of federal aid and other revenue measures to the levels of state-local expenditures received critical attention from Elliott Morss.[12] In somewhat tongue-in-cheek fashion, he added total per capita state and local tax collections to the list of independent variables already developed in the research literature and noted that it greatly improved the explanatory value of the regression equation. He reported that the new independent variable alone explained 72 percent of the interstate variation in 1960 state-local expenditures.

Morss' point was that the importance of revenue measures, including federal aid, is fairly obvious. He complained that researchers were simply adding variables to increase the coefficient of multiple determination without concerning themselves with the theoretical significance of their designs. His suggestion was that the studies of state-local expenditures should focus on time-series analyses and on individual state analyses.[13]

The focus of another group of environmentally oriented studies has been on expenditures for public elementary-secondary education in the states. In 1965, Lloyd Geiken examined the local expenditures per

pupil in average daily membership in 100 school districts for 1959-1960 and 1962-1963. Using measures of personal income, property valuation, enrollment, tax rates, salary, pupil-teacher ratio, and state aid, he found only tax rates and private-public enrollment ratio significant in accounting for expenditures.[14]

Two companion studies published in 1966 explored the relationship among taxpaying ability, demand for education, governmental arrangements, and educational expenditures per pupil. In one of the studies, Thomas James, James Kelley, and Walter Garmes used per pupil expenditures in 107 large city school districts, and in the other, David Evans used per pupil expenditures in a sample of medium-sized school districts.[15] Both studies found that measures of wealth, most notably median family income, were the most important correlates with per pupil expenditures and that only one governmental variable, school board elected/school board appointed, was significant. Moreover, these two studies, in conjunction with a third study by Werner Hirsch, demonstrated that the size of a school district is not significantly related to levels of educational expenditures per pupil.[16]

A final group of researchers focused on the changes in the levels of state-local expenditures, rather than on the levels themselves. The pioneering work in this area was done by Hirsch in 1959.[17] He did a time-series analysis of national expenditures for public education from 1900 to 1958 in which he compared the rate of economic development in the nation with the changes in expenditures for

public education. However, Hirsch did not systematically control for the relationship between the specific aspects of economic development and changes in expenditures for public education.

Roy Bahl and Robert Saunders were the first to explore systematically the relationship between changes in socioeconomic variables and changes in combined state-local expenditures.[18] The change in per capita expenditures for the period 1957 to 1960, including capital outlay, was used as the dependent variable in the study. The independent variables were the changes in per capita personal income, population density, urban population, per capita federal grants to states, and public school enrollment for the same period. Bahl and Saunders found that these five variables explained 46 percent of the variance in changes in state-local expenditures and that per capita personal income and per capita federal grants to states explained 42 percent of the variance in the dependent variable.[19] Changes in state-local expenditures for higher education, however, were primarily determined by changes in the urban population. Altogether, these five variables explained 56 percent of the changes in state-local expenditures for higher education.[20]

One of the more interesting aspects of this study was that the three basic variables used by Fabricant on 1942 data explained only 18 percent of the variations in state-local expenditures for the period 1957 to 1960. As Bahl and Saunders pointed out, this might suggest that the importance of these variables has diminished over time.[21] Yet, for the authors, the significant finding of the study was that, "it is the

changes in per capita federal aid to states which have the most prominent effect on the level of and changes in state-local expenditures."[22]

A year later, Bahl and Saunders refined their analysis of changes in per capita state-local expenditures by regressing the changes in expenditures between 1942 to 1962 on Fabricant's three basic variables plus per capita federal grants to states for the same period.[23] While federal aid again correlated significantly with combined per capita state-local expenditures, the relationship was greatly reduced when per capita expenditures net of federal aid were used.[24]

In contrast to their previous study, this research revealed that the importance of federal aid had not increased from 1942 to 1962. The authors also cautioned, as did previous researchers, that federal aid may be closely related to expenditures for the same reason that other revenue measures might be related--revenue levels obviously help to determine expenditure levels. They concluded, "consequently, it may be suggested that governmental expenditure levels are responding to an increasingly complex set of factors."[25]

Finally, Hartwig expanded and refined the change analysis employed by Bahl and Saunders using expenditures for public elementary-secondary education as the dependent variable.[26] Unlike Bahl and Saunders, Hartwig used per pupil expenditures, expanded the period from 1940 to 1960, and excluded capital outlay funds from his measure of public elementary-secondary education expenditures. Hartwig

regressed the rate of change in per pupil expenditures for public elementary-secondary education on the rate of change of ten socio-economic and governmental variables: personal income per capita, median years of schooling completed by adult population, percent engaged in manufacturing, percent employed in white collar occupations, percent negro, percent living in urban areas, average daily attendance in public schools, percent enrolled in private schools, state aid per pupil, and federal aid per pupil.

The ten independent variables explained 91 percent of the state by state variation in expenditures per pupil in 1940 and 1960.[27] However, the rate of change in the ten environmental characteristics explained 82 percent of the variation among the states in their rate of change in per pupil expenditures.[28] Among the ten environmental variables, the major determinants were the proportion of white collar workers and personal income payments per capita. Somewhat surprisingly, the percent engaged in manufacturing had a suppressing effect.[29]

Hartwig concluded that the changes in the environmental characteristics did result in the changes in per pupil expenditures for public elementary-secondary education, but he noted that six of the ten environmental variables had no independent effect in his longitudinal analysis.[30]

Environmental Studies: Summary

In summarizing the designs and findings of the studies in this

section, two aspects stand out: (1) all of the studies were inter-state or inter-school district studies, and (2) all of the studies used combined measures of state and local expenditures as the policy output measure, except for those dealing strictly with expenditures for public elementary-secondary education, which relied on local expenditures per pupil or per capita. Equally important, the studies dealt almost entirely with the importance of environmental variables to levels of expenditure. Political variables were not systematically explored and were included in only a few studies.

Generally, measures of wealth, usually per capita personal income or median family income, were the single most important correlates of combined state and local expenditures for all categories. For public elementary-secondary education, wealth measures again stood out as the single most significant independent variable. This was true for Hartwig's longitudinal study as well as for the cross sectional studies that were more typical.

In one of the two studies that reported results specifically for expenditures for higher education, Fisher found population per square mile to be the most significant independent variable of the seven he used. Interestingly, his wealth measure, percent of families with incomes under $2,000., was not significantly related to expenditures for higher education.[31] In the other study, Bahl and Saunders reported that the change in expenditures for higher education in the period 1957 to 1960 was primarily determined by the changes in the percent of the population living in urban areas.[32]

A few of the studies concentrated on the importance of federal aid to combined state and local expenditures and they were able to demonstrate its significance as an independent variable. In the only study involving federal aid and expenditures for higher education, federal aid was a significant correlate although it was not the most significant correlate.[33] However, federal aid did not demonstrate any independent effect in Hartwig's longitudinal study of per pupil expenditures for public elementary-secondary education.[34]

Finally, there was a general decline in the explanatory significance of the three basic socioeconomic variables--personal income, population density, and urbanization--to the measures of combined state and local spending. This may suggest, as Bahl and Saunders pointed out, that governmental expenditures were increasingly responding to a different set of variables.[35]

Environmental-Political Interaction Studies

The research conducted primarily by economists on the determinants of public expenditures tended to ignore political variables as important influences on expenditure decisions. It remained for political scientists to add, systematically, political variables to the explanatory model for combined state and local expenditures and to evaluate the relative importance of political variables, as opposed to environmental variables, to public expenditure decisions.

Richard Dawson and James Robinson were the first to explore the relationship between political variables and public policy while

controlling for the effects of environmental inputs.[36] The dependent variables, social welfare policies, were a series of nine revenue, tax, and expenditure measures. Three environmental variables--per capita income, percent of inhabitants engaged in occupations other than agriculture, forestry or fishing, and the percent of the state's population living in urban areas--and one political variable, an index of party competition made up of three dimensions--party dominance, duration of party dominance, and divided party control--were used as the independent variables.

The states were ranked on each of these measures and Spearman's rank order correlations were computed for each of the dependent variables with all of the independent variables. The findings revealed a significant and sizable relationship between party competition and the social welfare policies, but, an even more significant and sizable relationship between the environmental variables and social welfare policies. Of all the independent variables, per capita income was the strongest correlate.

Dawson and Robinson controlled for the impact of environmental variables by holding wealth constant. The states were divided into three groups based on personal income, and then rank order correlations were computed between party competition and social welfare policies. The correlations between the political variable and welfare policy were greatly diminished. The authors concluded, "interparty competition appears to be related to the extent of public social welfare policies through this joint relationship with per capita income."[37]

A second major political variable, malapportionment, was the subject of a study conducted by Herbert Jacob in 1964.[38] Jacob wanted to determine whether malapportionment was related to many of the political defects, such as lack of party competition and the poor distribution of funds, that had been suggested by researchers. Using three indexes of malapportionment--ratio of least populated district to most populated district, rural domination, and urban underrepresentation--as the independent variables, rank order correlations were computed with state rankings on party competition, frequency of divided government, urbanization, level of Old Age Assistance payments, percent of state funds spent on municipal extension of state roads, and per capita public health expenditures. Jacob found no measurable effect of malapportionment on the dependent measures and questioned whether reapportionment would reinvigorate state government.[39]

The importance of party competition, malapportionment, and divided party control to welfare policies was further explored by Richard Hofferbert in 1966.[40] Hofferbert, drawing on Dawson's and Robinson's nine measures of social welfare policies, used five measures, including per pupil expenditures for public education, in ranking the states on a composite index of welfare orientation. The measures of political structure were apportionment, party competition, and divided party control between governor and legislature. The remaining independent variables were three environmental measures: per capita income, percent urban, and percent in nonagricultural employment.

Hofferbert reported a significant and sizable rank order

correlation between party competition and the index of social welfare policies. He found no significant relationships between his remaining political variables and welfare orientation.

Hofferbert then combined his environmental measures in a composite index of industrialization and correlated this with his dependent variable. The rank order correlation was larger than the single significant relationship reported among the political variables, and he concluded that structural characteristics do not seem to explain the policy outputs of the system while environmental variables demonstrate a clear relationship to public policy.[41]

Hofferbert, however, failed to test the relationship between party competition and his measure of welfare orientation while controlling for the environmental variables as Dawson and Robinson had. Nevertheless, Hofferbert's results confirmed the weak relationship between political variables and policy measures that had been previously reported.

In the same year, Dye published a massive study of policy outputs in five areas, including education. His purpose was to investigate the relative importance of political and environmental variables to various public policy outcomes.[42] Dye's environmental variables consisted of four measures of socioeconomic development: percent of work force engaged in manufacturing, percent of population living in urban areas, median family income, and median school years completed by adults in the population. Dye utilized twelve distinct political variables grouped into four basic structural measures: level

of interparty competition, division of Democratic and Republican party control of state government, level of voter participation, and degree of malapportionment. For his dependent variables, Dye selected fifty-four measures of policy outcomes in five policy areas: education, welfare, highways, taxation, and the regulation of public morality. These output variables were measures of revenues, expenditures, services, and performance.

Unlike the previous political researchers, Dye relied on multiple regression analysis to build an explanatory model for public policy and utilized partial correlational and multiple-partial correlational analysis to control for one input variable or group of variables while testing the relationship between the others and the dependent variable.

In the field of education, per pupil expenditures were significantly related to measures of partisanship, divided party control, participation, and malapportionment. When controlling for the effects of the socioeconomic development variables, however, the relationship disappeared for all of the political variables. On the other hand, the relationships between the socioeconomic development variables and the educational policy outcomes did not disappear when the effects of the political variables were controlled for.

With respect to the socioeconomic development variables, urbanization, industrialization, income, and education were all significantly related to per pupil expenditures while only income and education were significantly related to per capita educational

expenditures. Median family income had the highest simple correlation with per pupil expenditures (.83) but, median school years completed by adults in the population had the highest simple correlation with per capita educational expenditures (.75).[43]

The results of the study in the field of education were certainly not atypical in comparison to the other four areas of public policy. This led Dye to conclude that, "The linkage between socio-economic inputs and policy outcomes is an unbroken one, and that the characteristics of political systems do not independently influence policy outcomes."[44] Yet, Dye's results did suggest an intervening effect of federal aid, even though he treated federal aid as an output variable. He noted, "perhaps it would be better to reconstruct our model so that we can consider federal policy as a separate kind of input variable, distinct from socioeconomic variables yet not a part of the state political system."[45]

A year later, Dye applied this same model to research on educational policy outcomes in sixty-seven large cities.[46] In this research, Dye wanted to explore the impact of the structure of city school systems on educational policy while taking the urban environment into account. Again, environmental variables, such as wealth, property value, and racial composition, were strongly related to policy outcomes while the structural characteristics of city school systems failed to demonstrate any independent impact.

Dye's finding in public education generally confirmed the conclusions of Salisbury in an earlier work dealing with educational

policy in the states.[47] Salisbury had computed rank order correlations for each of the states among spending measures of public elementary-secondary education, spending measures of higher education, and measures of income, urbanization, and party competition, averaged for the period 1960 to 1962.

Like Dye, Salisbury had found income the best predictor of per pupil expenditures for elementary-secondary education, although it was a somewhat less reliable predictor in urban states. When he had controlled for income, neither urbanization nor party competition had seemed to affect the level of per pupil expenditures.

Higher education, however, was not significantly related to income (although the relationship was somewhat stronger in the least urbanized states), not significantly related to party competition, and somewhat negatively related to urbanization. This led Salisbury to conclude that there were some major differences between the two areas of educational expenditures.[48] Yet, Salisbury reported a high rank order correlation among the states between per capita expenditures for elementary-secondary education and per capita expenditures for higher education.

In response to the accumulating evidence that political variables exhibited no independent effect on policy outcomes, particularly expenditure measures, several researchers set out to challenge these results and offer some evidence to the contrary. In 1968, Allan Pulsipher and James Weatherby used multiple regression analysis on 1962 and 1964 data to demonstrate their thesis that malapportionment and party competition are associated with policy

choices.[49] Their dependent variables were state and local per capita expenditures by function, including higher education. For their independent measures, they tried to select variables with little or no collinearity. Their environmental variables were per capita income, population density, percent urban, percent population over sixty-five, and percent population under seventeen. The political variables were Hofferbert's index of party competition (with some modification) and the apportionment score (one of the malapportionment variables used by Dye).

Pulsipher and Weatherby were able to report significant relationships between malapportionment, party competition, and expenditures for higher education, although the relationships were quite weak. The political variables were not, however, significantly related to expenditures for public elementary-secondary education. Per capita income was not significantly related to expenditures for higher education.

In 1970, in a wide ranging study, John Grumm reexamined Dawson and Robinson's study of welfare orientation, reviewed the research on the impact of apportionment, and introduced a new political variable, legislative professionalism, through the use of factor analysis.[50] In his reexamination of Dawson and Robinson's research, Grumm used Hofferbert's index of party competition and his index of welfare orientation. Grumm was able to show a moderate rank order correlation between welfare orientation and party competition among states with the lowest per capita income. That coefficient was only

slightly smaller among states in the middle level of per capita income. His review of the impact of apportionment was limited to pointing out that legislative roll-call analysis had suggested that school policy may be more sensitive to apportionment than other policy areas.

It was Grumm's use of factor analysis in developing his "professionalism index" which represented a truly new departure from previous research. In order to test the impact of his professionalism index on public policy, Grumm factor-analyzed thirty-one quantitative measures of policy areas and located five output factors: welfare-liberalism, governmental size, financial centralization, progressive taxation, and public safety. He then factor-analyzed forty-five measures of environmental variables and extracted four environmental factors: economic affluence, population expansion, urbanization, and federal support.

While Grumm's professionalism index exhibited little or no relationship to four areas of policy output, it did seem to be related to welfare-liberalism which encompassed educational policy in this formulation. Its relationship was very similar to the relationship of party competition to welfare orientation which he had earlier reported. Professionalism was most closely related to welfare-liberalism in those states which were neither affluent nor poor. Nevertheless, Grumm concluded that the structural effectiveness of political variables is largely a function of different environmental conditions.

In the same year, Fry and Winters hypothesized that political variables would have greater impact on those policy measures involving

the redistributive impact of revenues and expenditures. They argued,

> Though one would expect that environmental conditions would largely determine at what levels revenues and expenditures will be set, politics is likely to be pivotal in establishing the allocation of rewards and benefits at that level.[51]

They took at least two new approaches to the problem of evaluating the relative importance of political and environmental variables to policy outcomes in the states. First, they focused on a new dependent variable: the net redistributive impact of revenues and expenditures as represented by the ratio of expenditure benefits to revenue burdens for the same three lowest income classes in the states. Secondly, they restricted their analysis to state governments since they saw the two levels of government (state and local) as analytically distinct.

Using multiple regression analysis, Fry and Winters were able to show that the political variables did have an impact on redistributive policies and that the political variables accounted for a good deal more variance than the environmental variables. In a recomputation of their data, however, Bernard Booms and James Halldorson noted an "error" in procedure and the revised statistics enhanced the importance of the environmental variables and reduced the importance of the political variables, although the political variables still remained significant.[52]

The problem of changing relationships between environmental, political, and policy measures over time has also received some attention in the research literature. Drawing on the findings of many economists

that the relationship between socioeconomic variables and combined state-local expenditures has declined over time, Hofferbert hypothesized that environmental variables provide the basic support level for policy-making, but that once that support level is reached, political variables will play a critical role in policy choices.[53]

Hofferbert used the coefficient of relative variation to measure the variation among the states in terms of environmental and output measures over time. He found increasing similarity among the states over the period 1940 to 1963 in the output measures, as well as in the environmental measures. Equally important, he noted a decline in the policy-environment relationships over the same period. He concluded, "the data presented here indicate that with overall ecological advancement there is decreasing strength of connection between ecology and the policy outputs in the states."[54]

In a later exploration of the changing relationships between the environmental variables and political system outputs, Hofferbert used factor analysis to identify the dimensions of the environmental variables and the change or stability in the infrastructure of the dimensions over time.[55] Hofferbert factor-analyzed twenty-one socioeconomic variables for each census year from 1890 to 1960 and found relatively little variation in the factor loadings of these variables throughout the period. Two factors emerged which he named "industrialization" and "cultural enrichment." Industrialization essentially reflected patterns of economic and occupational activity while cultural enrichment reflected aspects of a modern and affluent society, e.g., property

values, educational attainment. Then he ranked the states according to their factor scores and correlated these rankings with the states' rankings on various spending and voting measures.

The findings revealed cultural enrichment as the more influential environmental variable in terms of its impact on political decision-making. This was particularly true for measures of educational spending. Cultural enrichment highly correlated with spending for education although that relationship declined slightly in the period from 1890 to 1960. In one of his concluding remarks, Hofferbert stressed the importance of longitudinal studies:

> . . . static social-structural political correlations are likely to lead to misleading results. When employed as independent variables in the analysis of certain features of state political systems, the explanatory power of the major social dimensions changed considerably.[56]

Finally, two major studies remain, which, because of their eclectic theoretical and methodological design will be treated separately. The study by Sharkansky is a broad analysis of public spending throughout the fifty states whereas the work of Zeigler and Johnson is a detailed study of two policy analysis models for public education.

In the first of these, Sharkansky made several departures from the design of previous research:

1. He used measures of state spending rather than measures of combined state and local spending
2. He expanded the political variables to include measures of legislative professionalism, federal aid, tax revenue, civil service

structure, and of the distribution of state-local responsibilities; the last four variables he called governmental variables

3. He included prior-year expenditures as a measure of budgetary incrementalism
4. He explored the relationship between socioeconomic and political variables and changes in state spending over a period of time.[57]

Sharkansky expected that his governmental variables would be particularly significant to state spending outputs because they were seen as measures of the structural and procedural parameters of the political system within which spending decisions are made in the states. These variables closely resemble what Easton has called "withinputs."[58] That is, they are inputs to the decision-making process that come from within the system.

The inclusion of prior-year expenditures represents the merging of budgetary theory with systems analysis and marks a truly new theoretical departure from the research on the determinants of state spending. Sharkansky noted that prior expenditures serve, "as the starting point for new calculations by those who ask for funds, and as the portion of a request that is most likely to be considered legitimate by those who review appropriations."[59] Simple-, partial-, multiple-, and multiple-partial correlation analyses were used to evaluate the impact of forty-one independent variables divided into three classes--socioeconomic variables, political variables, and governmental variables--on per capita general expenditures in the states in 1962.

Sharkansky found that prior-year expenditures were the most

closely correlated with current levels of spending followed by four other governmental variables: percentage of state revenues received through federal aid, percentage of residents' personal income paid in state taxes, number of state governmental employees per 10,000 population, and state percentage of state-local expenditures. Three of the governmental variables--prior-year expenditures, the state percentage of state-local revenue, and total local government expenditures per capita--explained 95 percent of the variance in spending between the states.[60] Three socioeconomic variables had a negative relationship with current spending: population, percentage of labor force employed in manufacturing, and percentage of population living in urban places. The political variables generally exhibited a weak to insignificant relationship to current spending.

When these forty-one independent variables were correlated with the changes in total expenditures per capita from 1962 to 1965, the political variables had a greater impact and the importance of the socioeconomic and governmental variables was diminished. The most powerful correlates in this analysis explained 50 percent of the interstate variation in change in total expenditures. Sharkansky concluded, "The findings about correlates of changes in spending, as opposed to current spending, warn that answers from a static analysis of expenditures do not transfer readily to an analysis of change."[61]

In the other study, Zeigler and Johnson examined two models of public decision-making as they related to educational policy: the economic model and the legislative model.[62] The economic model was

used to test the hypothesis so prevalent in previous research on education that economic variables determine educational policy. Zeigler and Johnson included prior expenditures in this model and greatly expanded the list of independent variables used in previous studies. Additionally, they did not limit themselves to measures of spending but used a full range of variables which dealt with all areas of educational outputs. In contrast, the legislative model was used to relate legislative attitudes to the various environmental characteristics of the states. This aspect of the research represents a more detailed attempt to investigate the interaction of the political system with the environment, but it is not directly relevant to the issues explored in this research.

Zeigler and Johnson utilized nine dependent variables, including per capita expenditures for higher education, in testing the impact of environmental characteristics on educational outcomes. The authors factor-analyzed 146 variables for the fifty states and uncovered two factors which they called the "progressive-liberalism factor" and the "federalism-and-concern factor." Using multiple regression analysis, Zeigler and Johnson regressed, among other variables, educational spending variables on the other variables within the factor.

Economic variables, most notably prior expenditures, emerged as the best predictors of educational expenditures, thus confirming much of the previous research. However, for other types of educational policy outcomes, other social and political variables were the best predictors.

With respect to per capita expenditures for higher education, previous expenditures explained about 80 percent of the variance among the states.[63] The only other variable substantially related to expenditures for higher education was the percentage of state and local revenues from the federal government.

Environmental-Political Interaction Studies: Summary

Like the studies in the preceding section, this research was entirely interstate in character but unlike the previous research, these studies tended to concentrate on the impact of political variables on public policy. Investigators in this section did not limit themselves to expenditures but explored many different measures of policy output.

While most of the researchers failed to demonstrate any independent impact of political variables on public expenditures, at least one managed to add a new dimension to the input variables which was essentially political and to underscore its importance in public decision-making. Sharkansky introduced a group of variables he called governmental variables which could best be viewed as system "withinputs." These variables represent demands and supports within the political system and generally reflect various characteristics of the budgetary process within the states. Sharkansky found five of these variables to be better predictors of spending in the states than the socioeconomic variables. One of these, prior-year expenditures, was also reported as the single most important correlate of educational expenditures by

Zeigler and Johnson.

Three political variables--party competition, malapportionment, and divided party control--were extensively investigated and, where controls for the effects of environmental variables on public expenditures were instituted, the political variables generally failed to demonstrate any independent effect. While the studies generally confirmed the importance of environmental variables to expenditure outputs, Sharkansky found his socioeconomic variables to be negatively related to spending measures.

Expenditures for higher education received specific attention in three studies. Salisbury found higher education expenditures unrelated to income and only moderately and inversely related to urbanization. He did note, however, that expenditures for higher education were highly correlated with expenditures for public elementary-secondary education. Pulsipher and Weatherby found a very weak relationship between malapportionment, party competition, and higher education expenditures and no significant relationship between per capita income and higher education expenditures. Finally, Zeigler and Johnson reported prior-year expenditures for higher education and the percentage of state and local revenues from the federal government to be substantially related to current expenditures for higher education.

With respect to the changing relationship between the environmental characteristics and political system outputs over time, Hofferbert confirmed the findings of the economists that the strength of that relationship had been declining through the years. This led

Hofferbert to conclude that there was a certain threshold at which increased socioeconomic development would have diminishing effects on policy outcomes. This would, of course, imply an increasing role for political system characteristics in the future.

Since all of the studies, with the exception of the two by Hofferbert, were cross sectional studies, it is not clear if the relationships uncovered in them will hold up in a longitudinal analysis.[64] Sharkansky managed to shed some light on the problem when he noted that an analysis of expenditure change generally diminished the importance of his socioeconomic and governmental variables and enhanced the importance of his political variables. More importantly, a significant decline in the explanatory power of his model was noted.

One of the important gaps in the research literature has been the absence of any longitudinal studies of political systems. Also, limited attention has been given to expenditures for higher education. This, of course, is the gap that this study proposes to partially close. The analysis of appropriations for higher education in Virginia for the period 1950 through 1972 should provide an opportunity to see if the basic relationships among environmental characteristics, political characteristics, and system outputs that have been uncovered in cross sectional studies, and for spending in higher education, will hold up in a longitudinal study.

FOOTNOTES

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[49]Allan G. Pulsipher and James L. Weatherby, "Malapportionment, Party Competition, and the Functional Distribution of Governmental Expenditures," American Political Science Review 62 (December 1968): 1207-19.

[50]John Grumm, "Structural Determinants of Legislative Output," Legislatures in Developing Perspectives, eds. Allan Kornberg and Lloyd Musolf (Durham, North Carolina: Duke University Press, 1970), pp. 429-59.

[51]Brian Fry and Richard Winters, "The Politics of Redistribution," American Political Science Review 64 (June 1970): 511.

[52]Bernard Booms and James H. Halldorson, "The Politics of Redistribution: A Reformulation," American Political Science Review 67 (September 1973): 924-33.

[53]Richard I. Hofferbert, "Ecological Development and Policy Change in the American States," Midwest Journal of Political Science 10 (November 1966): 464-83.

[54]Ibid., p. 480.

[55]Richard I. Hofferbert, "Socioeconomic Dimensions of the American States," Midwest Journal of Political Science 12 (August 1968): 401-18.

[56]Ibid., p. 418.

[57]Ira Sharkansky, Spending in the States (Chicago: Rand McNally, 1968).

[58]David Easton, A Framework for Political Analysis (Englewood Cliffs, New Jersey: Prentice-Hall, 1965), p. 114.

[59]Sharkansky, p. 12.

[60]Ibid., p. 68.

[61]Ibid., p. 147.

[62]Harmon Zeigler and Karl F. Johnson, The Politics of Education in the States (Indianapolis: Bobbs-Merrill, 1972).

[63]Ibid., p. 80.

[64]Hofferbert, "Ecological Development and Policy Change in the American States"; and Hofferbert, "Socioeconomic Dimensions of the American States."

CHAPTER III

ENVIRONMENTAL AND POLITICAL CORRELATES OF APPROPRIATIONS FOR HIGHER EDUCATION IN VIRGINIA: PROCEDURES

The theoretical relationships between environmental characteristics, political characteristics, and appropriations for higher education, developed in Chapter I, were converted into research hypotheses by selecting a series of environmental and political input variables from the research literature, by evaluating the theoretical propositions in light of the findings in the review of the literature, and by reformulating them as empirical propositions. Appropriate statistical procedures were then selected to test the research hypotheses.

Selection and Definition of Variables

The selection of the environmental and political input variables and the spending output variable was based on the following criteria: (1) the measures should be representative of those phenomena that were identified in systems and budgetary theory and that were demonstrated in previous research to be related to appropriations for higher education in Virginia; (2) the measures should be valid and reliable; and (3) the measures must be obtainable for Virginia from

1950 through 1972. Of the three criteria, the last was clearly the most difficult to satisfy. Many variables that were identified and refined in the research literature were not available for Virginia throughout the period. Some of the measures were available only for two or three years within the period and others, while available throughout the period, had been redefined at some point in the period making the measures inconsistent and generally invalid. In some instances, it was possible to construct new variables and to compute their values throughout the period. In other cases, comparable measures were used for those that were unavailable.

Eleven independent variables and one dependent variable were finally selected. Four of the independent variables were measures of environmental characteristics and the remaining seven were political measures. Four of the seven political measures were reflections of state and federal budgetary policy, and closely resembled what Sharkansky had called, "governmental variables."[1] The remaining political variables were measures of citizen access to public policy decisions. The dependent variable was appropriations for higher education in Virginia.

Environmental Variables

Wealth

In virtually every study exploring the impact of socioeconomic development on public policy, measures of wealth were used. Previous research findings had indicated the importance of wealth to combined

state and local spending and to spending for public elementary-secondary education. With respect to spending for higher education, no study had reported a significant relationship between measures of wealth and spending. Wealth was selected as a variable in this study because of the key role it plays in socioeconomic development and because findings about the relationship of wealth and spending for higher education in cross sectional studies may not be indicative of the findings in a longitudinal study. More importantly, it seemed reasonable to assume that as Virginia became more wealthy, the state would realize more income and that this increase might be reflected in larger appropriations for higher education.

Median family income, per capita income, and per capita personal income were the standard measures of wealth used in previous research. Only personal income was available for Virginia from 1950 through 1972. Most of the previous studies had controlled for population since it is fairly obvious that increases in population will result in increases in spending; however, since none of the studies had to contend with the effects of inflation (it was automatically controlled for in interstate studies since inflation would presumably have had the same effect in all states), constant dollars were not used.

Per capita personal income in 1967 constant dollars was selected as the measure of wealth in this study since it would control for population growth in the state and for the effects of inflation. In a longitudinal study of a single state, it was important to control for inflation since the declining value of the dollar would have made the

state spend more just to maintain the same level of services.

Industrialization

Like wealth, industrialization was a standard measure of socio-economic development in previous research. The researchers, however, reported mixed results with respect to the relationship between industrialization and spending measures. Hartwig and Sharkansky found industrialization negatively related to public spending whereas Dye reported a positive relationship between the two.[2] In none of the studies involving spending for higher education did industrialization emerge as a significant correlate.

Because findings in cross sectional studies were not necessarily indicative of findings in longitudinal studies and because industrialization is an important measure of environmental characteristics, it was selected as a variable in this study. From a theoretical standpoint, industrialization would seem to be an important correlate with state appropriations for higher education since increased industrialization would increase the need for more technical and vocational education. The development of a statewide comprehensive community college system in Virginia in 1966 would seem to have been a response to that need, and the creation of that system would obviously be reflected in significant increases in appropriations for higher education.

Generally, previous researchers used the percent of the work force engaged in manufacturing or the percent of the work force in occupations other than agriculture, fishing, or forestry as the measure

of industrialization. The percent of the work force engaged in nonagricultural employment (a comparable measure), was available for Virginia and was selected as the measure of industrialization.

Metropolitanization

In previous research, urbanization, like industrialization, was found to have mixed relationships with various measures of spending. In one study, Bahl and Saunders reported that urbanization was the primary determinant of expenditures for higher education.[3] More importantly, Bahl and Saunders used the change in state and local spending for higher education from 1957 to 1960 as the dependent variable in their study. Measures of change in expenditures for higher education would more nearly approximate the dependent variable in this study than a cross sectional study of expenditures for higher education at one point in time.

While urbanization was a widely used measure of socioeconomic development in previous research, it was not available for use in this research. First, the Bureau of the Census changes its definition of urbanization about midway through the period under investigation and secondly, it was not available for every year of the period. Even so, it was felt that some measure of urbanization should be included among the environmental variables in this study because of its significance in the Bahl and Saunders study and because of its importance as a measure of socioeconomic development. The problem was to find a satisfactory replacement for urbanization.

The percent of Virginia's population living in metropolitan areas was selected as the measure of the urban phenomenon in Virginia. In fact, this measure was felt to be a better measure of the concentration of population in Virginia around urban centers since it focuses on the percent of population in Virginia's major cities and surrounding suburbs, whereas urbanization simply reflects the percent of population living in an area of 2,500 or more inhabitants, which, of course, includes small towns.

Since the number of Standard Metropolitan Statistical Areas in Virginia designated by the Bureau of the Census has steadily increased since 1950, it was necessary to designate a fixed number of metropolitan areas in Virginia to use throughout the period and then to compute the percent of Virginia's population in those areas from 1950 to 1972. Ten metropolitan areas defined in a report by the Virginia Metropolitan Areas Study Commission were used as the metropolitan areas in this study.[4] The Commission generally followed the Bureau of the Census' criteria in designating a metropolitan area, although they included areas that would not meet those criteria until 1980. The ten metropolitan areas are defined in Appendix A.

College Age Population

This last environmental variable represented an addition to the list of variables used in previous research. Since none of the previous studies had dealt exclusively with expenditures for higher education, college age population apparently was not deemed of sufficient importance

to include as a determinant of levels of spending in the states. In a study of appropriations for higher education, however, it would seem that a steady increase in the proportion of the college age population would put additional pressure on the public policy-makers to increase expenditures for higher education.

The percentage of Virginia's population eighteen to twenty-one years of age was selected as the measure of the college age population variable. Even though the eighteen to twenty-one age group has generally been the standard designation of college age population, the variable was used with some reluctance. Increasingly, higher education is serving a much broader constituency in terms of age, given the increased emphasis on the concept of education for life. Nevertheless, statewide studies of the demand for higher education in Virginia relied on the eighteen to twenty-one age group as the statistical measure of college age population and, to the extent that these studies had an impact on state policy for higher education, this age group was seen as the appropriate one to use in selecting the measure.[5]

Political Variables

Malapportionment

Malapportionment was used as a variable in almost all of the previous research exploring the relationship between political system characteristics and public policy. With one exception, however, none of the researchers reported a significant relationship between measures of malapportionment and public spending when the effects of the

environmental variables were controlled for. Only Pulsipher and Weatherby found a relationship between malapportionment and state-local expenditures for higher education, and that relationship was quite weak.[6]

From a theoretical standpoint, there was reason to believe that the reapportionment of the Virginia General Assembly in the sixties, in compliance with the Supreme Court guideline of "one man, one vote," handed down in Reynolds v. Sims, 377 U.S. 533 (1964), had increased the influence of Virginia's urban residents. This strengthened urban voice in the legislature might have had a positive effect on appropriations for higher education.

Three indexes of malapportionment were used by previous researchers. Of the three, the Dauer-Kelsay Index was generally found to be the best measure of malapportionment in a state legislature. Dye felt that of the three, the Dauer-Kelsay Index was the best measure of malapportionment and Sharkansky found that among the three indexes, the Dauer-Kelsay Index was the most powerful correlate of expenditures for education.[7] This index is a measure of the theoretical percentage of the state's population that can elect a majority in each house of the legislature.[8] The state's legislative districts in each house are ranked by population for each year; then the population of the two lowest quartiles of legislative districts are added; and that total is then taken as a percentage of the state's population.

The Dauer-Kelsay Index was used, with some slight modification, as the measurement of malapportionment in this research. The resulting

measure was the percentage of Virginia's population that could elect a majority in the Senate in the Virginia General Assembly. Only one house was used in computing the variable because the Constitution of Virginia has never differentiated between the bases for apportioning the legislative districts in each chamber. The same standard presumably applied to both, although the Constitution was not specific as to that standard prior to the revisions approved in 1971. The Senate was used rather than the House of Delegates because the Senate membership was considerably smaller than that of the House of Delegates.

Party Competition

Along with malapportionment, party competition was used in most of the previous research on the impact of political structure and process on public policy in the states, and, as in the case of malapportionment, only Pulsipher and Weatherby reported a significant relationship between this system characteristic and measures of public expenditures when controls were used for environmental variables. Pulsipher and Weatherby found a weak but significant relationship between party competition and state-local expenditures for higher education.

It was argued in the first chapter that the collapse of the Democratic Byrd Organization in the late sixties dramatically changed the political climate in Virginia and that Republicans for the first time since Reconstruction were making major inroads in the heretofore Democratic stronghold. A measure of party competition in the legislature, then, was deemed an appropriate variable to include in this

research to test the impact of this political change on appropriations for higher education.

Of the many measures of party competition available in the research literature, only one was appropriate for a longitudinal study of this type. The average of the percentage of Democratic members in each house of the Virginia General Assembly was selected as the measure of party competition for this research. Other measures such as divided party control and Democratic percentage of votes for governor would not have provided a regular measure of party competition from 1950 through 1972.

Participation

Voter turnout was the most frequently used measure of political participation in the research literature. Only a few researchers explored the relationship between voter turnout and public expenditures and none of them found a significant relationship between voter turnout and spending in the states when controls were used for the influence of environmental variables.

Even though previous research failed to identify any significant relationships between expenditures and voter turnout, it was felt that a measure of political participation should be included in this study because of the potential impact of voting rights legislation, beginning with the Civil Rights Act of 1957 and culminating in the Voting Rights Act of 1965, on the level of voter turnout in Virginia, particularly among blacks. Significant increases in the levels of voting by blacks

might have been at least partially a demand for increased educational opportunity in higher education and the increased appropriations for higher education might have been, in part, a system response to that demand.

Measures of voter turnout in all statewide elections, however, would not provide valid measures of participation in a longitudinal study of this type. Voter turnout for General Assembly elections is much heavier when there is a gubernatorial contest on the same ballot. Hence, there is a built-in cycle of voter turnout over time that has nothing to do with increased levels of citizen participation. Instead, this cycle is simply a function of the makeup of the statewide ballot.

In view of the difficulties encountered when voter turnout is used in a longitudinal study, the percent of Virginia's population registered to vote was selected as the measure of participation. A preferable measure of participation would have been the percent of eligible voters registered to vote in Virginia but no reliable estimate of the number of eligible voters was available for Virginia from 1950 through 1972. The percent of the population registered to vote did provide an adequate measure of increased levels of participation since the proportion of Virginia's population registered to vote did not change radically during the period. It was not until 1972 that the age group eighteen to twenty-one was given the franchise in Virginia with the adoption of the Twenty-Sixth Amendment to the Constitution of the United States.

Tax Effort

Tax effort was one of Sharkansky's governmental variables that had a significant and sizable relationship with state expenditures. It was included as a variable in this research not only because of the significance of the variable in Sharkansky's work but also because of the dramatic changes in Virginia's taxing policy in the late sixties. The adoption of the sales tax in Virginia in 1966 greatly expanded the state's tax base. Moreover, as outlined in Chapter I, it was one of the purposes of this research to explore the impact of the change in the state's taxing policy on appropriations for higher education.

The measure of tax effort used by Sharkansky, and the one selected in this research, was the percent of Virginia's aggregate personal income of the state's revenues from taxes. It is a measure of the proportion of the state's wealth collected in tax revenue.

Appropriations for Public Elementary-Secondary Education

Appropriations for public elementary-secondary education had not been used as an input variable in previous research. It was included in this research in order to explore the relationships between expenditures for higher education and expenditures for public elementary-secondary education in Virginia. Salisbury noted in his research on the politics of education in the states, that there was a high rank order correlation among the states between state spending for higher education and state spending for elementary-secondary education.[9]

Similarly, Usdan, Minar, and Hurwitz argued that these two levels of educational expenditures are increasingly converging in terms of their political prospects in the state legislatures.[10] The implication of the findings of these two studies was that as appropriations increased for public elementary-secondary education they would also increase for higher education. This variable was included to determine to what extent that relationship holds for educational spending decisions in Virginia.

Per capita appropriations from the General Fund for public elementary-secondary education in 1967 constant dollars was selected as the measure of this variable. Controls for population and inflation were used in the computation of this variable for the reasons previously cited. Special fund appropriations were excluded because these represented revenues which were earmarked for specific expenditure categories and, hence, were not subject to any discretionary influences.

Federal Aid to Higher Education

A number of researchers have concluded that federal aid is an important determinant of the levels of public expenditure in the states. Sharkansky reported that federal aid to state governments was the second most important correlate of state expenditures among his forty-one independent variables. With respect to state-local expenditures for higher education, Zeigler and Johnson found federal aid to state and local governments an important correlate to this spending category.[11]

In fact, almost all researchers who explored the impact of federal aid on public expenditures found it to be an important predictor of state and local spending. The authors of a few studies, however, cautioned against the inclusion of federal aid in research on the determinants of state and local spending because it was so closely linked to state and local spending.[12] They argued that under the matching provisions in most federal grants, states are required to appropriate from state funds a certain percentage of the federal grant before it will be approved. Hence, they point out that it is not surprising that the two variables are closely related.

In addition to the extensive support in the research literature for the impact of federal aid on state and local spending, there were good a priori grounds for hypothesizing the influence of federal aid. Since 1950, several major programs of aid to higher education have been enacted by the federal government, including, but not limited to, the National Defense Education Act (1958), the Vocational Education Act (1963), and the Higher Education Act (1965). It certainly was a strong possibility that this legislation had a stimulating effect on state spending for higher education.

In order to test the impact of federal aid on state appropriations for higher education, and in an attempt to overcome the objections of those researchers who criticized its use, per capita federal expenditures for higher education in 1967 constant dollars was selected as the measure of federal aid. The chief attribute of this measure was that it did not utilize state revenues from the federal

government, which would be tied directly to the matching provisions in some programs, but that instead it relied on aggregate federal expenditures as a reflection of the increasing role of the federal government in higher education. In addition, the measure controlled for the effects of increasing population and inflation on state spending. Finally, student loans, as well as direct expenditures for higher education, were included in the measure.

Incrementalism

The importance of incrementalism to the budgetary process at the state and federal level was underscored by budgetary theorists and by researchers investigating the determinants of state and local spending. For example, Zeigler and Johnson reported that the most important correlate of expenditures for higher education in the states was prior-year expenditures for higher education. Sharkansky found that prior-year expenditures were the most important determinant for all categories of state spending. In two other studies, Ira Sharkansky and Richard Kellogg analyzed the budgetary process in Virginia and both of them found incrementalism to be decisive in state budgetary decision-making.[13] Importantly, Kellogg dealt exclusively with the budgetary process for higher education.

The measure of incrementalism used in this research was per capita prior-year appropriations for higher education in 1967 constant dollars. As was the case with all previous monetary variables, this measure controlled for increases in population and for the impact of

inflation. Incrementalism was included as a variable in the research not only because it was assumed to be an important determinant of appropriations in Virginia, but also because it could be used to control for the effects of incrementalism in state budgeting for higher education so that the importance of other variables in addition to incrementalism could be evaluated.

Dependent Variable

Appropriations for Higher Education

The measure selected for the dependent variable in this research was per capita appropriations from the General Fund for operating expenses in higher education in 1967 constant dollars. Since it was a monetary variable, the same controls for population and inflation that were used previously were relied on in this measure. Equally important, this spending measure excluded certain types of appropriations for higher education. Capital outlay appropriations were excluded from this measure because they are, at least partially, a function of specific sources of revenue such as revenue bonds and federal aid for classroom and laboratory construction. Appropriations from the special funds for operating expenses were also excluded because the purpose of this study was to determine what environmental and political characteristics accounted for the sharp increase in appropriations from a fund that was not earmarked for a special purpose and by definition, appropriations from the special funds come from revenues which are designated for those spending categories. For example,

revenue from tuition and fees is credited to a special fund which is earmarked for the institution that was the source of the revenue. The determinants of appropriations from the special funds are fairly obvious.

Research Hypotheses

The theoretical relationships stated in Chapter I were reformulated as research hypotheses after an evaluation of the research literature and an assessment of the variables selected for this study. Generally, each of the independent variables was assumed to have had a significant and positive impact on the level of appropriations for higher education in Virginia (either on a priori grounds or on the basis of previous research). The pattern of interaction among the independent and dependent variables and the general combined significance of the independent variables were hypothesized as follows:

1. Among the eleven independent variables, incrementalism would be the most important correlate of appropriations for higher education in Virginia
2. When controlling for the effects of incrementalism on the dependent variable, federal aid, followed by tax effort and appropriations for elementary-secondary education, would be the most important correlates of appropriations for higher education in Virginia
3. The environmental variables as a group would be more important correlates of appropriations for higher education in Virginia than would the remaining three political variables: malapportionment,

party competition, and political participation

4. A combination of the eleven independent variables would be a highly reliable predictor of the appropriations for higher education in Virginia.

Statistical Procedures

The statistical analysis of data proceeded in four stages: computation of variables, analysis of simple relationships, analysis of independent impact of variables, and analysis of the explanatory power of the model. In the first stage, the measures of the eleven independent variables and one dependent variable were computed. Measures of the variables were obtained for each year from 1950 through 1972; thus, there were twenty-three cases for each one of the variables. (The data sources for each of the variables are listed in Appendix B.)

In the next stage, the strength and the direction of the relationship between each of the independent variables and the dependent variable were analyzed through regression analysis. Specifically, Pearson product-moment correlations were computed for every possible pair of independent and dependent variables.[14] The coefficient of correlation indicated the strength and direction of the simple relationships between the measures of environmental and political characteristics and appropriations for higher education. This procedure provided the test of the first hypothesis--that incrementalism was the single most important correlate of appropriations for higher education.

The third stage consisted of isolating those environmental and

political variables which were independently related to appropriations for higher education. Specifically, the purpose of this stage was to uncover any spurious relationships between the independent and dependent variables. (A spurious relationship is a relationship between an independent and a dependent variable that exists primarily because the independent variable is strongly related to another independent variable which is highly correlated with the same dependent variable.) Two research hypotheses were being tested:

1. Three of the political variables--federal aid, tax effort, and appropriations for elementary-secondary education--would remain as the most important correlates of appropriations for higher education after the effects of incrementalism on the dependent variable were controlled for
2. The remaining three political variables--malapportionment, party competition, and participation--would not be significant correlates of appropriations for higher education when the effects of the environmental variables on the dependent variable were controlled for, i.e., the relationships between the political variables and appropriations for higher education were due to the common relationship that the political variables and the dependent variable shared with the environmental variables.

Partial correlation analysis was the statistical technique used to locate any spurious relationships between the independent and dependent variable and, hence, to provide a test of the hypotheses. The partial correlation procedure enables the researcher to get a single

measure of the relationship between two variables while adjusting for the effects of one or more additional variables. The coefficient of partial correlation is interpreted in the same manner as the simple coefficient of correlation.

The partial correlation analysis proceeded as follows:

1. Coefficients of partial correlation were computed for each of the environmental and political variables with higher education appropriations while controlling for the effects of incrementalism
2. Coefficients of partial correlation were computed for each of the environmental variables with appropriations for higher education while controlling for the effects of the three political variables: malapportionment, party competition, and political participation
3. Coefficients of partial correlation were computed for each of the political variables with appropriations for higher education while controlling for the effects of the environmental variables.

The purpose of the final stage of tne statistical analysis was to assess the overall explanatory power of the eleven independent variables with respect to appropriations for higher education and to delineate the relative contribution of each of the independent variables to the explanatory power of the entire group. The purpose of this stage, then, was to test the final hypothesis that the eleven environmental and political variables would be highly reliable predictors of the levels of appropriations for higher education in Virginia.

The statistical procedure used in this stage was stepwise

multiple regression. The output statistic of the procedure is the coefficient of multiple correlation (R), which is a measure of the relationship between a set of independent variables and a dependent variable while controlling for the interrelationships between the independent variables. In addition, the stepwise procedure selects that independent variable with the strongest product-moment correlation (r), with the dependent variable and then, in subsequent steps, selects the independent variables that, when combined with the previously selected variables, will provide the best possible prediction of the dependent variable. The procedure continues until all the independent variables are added to the prediction equation or until no other variable will make a significant contribution to the equation. The square of the coefficient of multiple regression, known as the coefficient of multiple determination (R^2), indicates the percentage of variation in the dependent variable that is explained by the combination of independent variables.

A stepwise multiple regression analysis was made for the eleven environmental and political variables with appropriations for higher education to determine the overall explanatory power of the independent variables as measured by the coefficient of multiple determination and to determine the relative contribution of each of the independent variables to the dependent variable as measured by the standard partial regression coefficients (or beta weights) of each of the independent variables. The beta weights should be interpreted cautiously, however, since their value is not absolute. It will change

as the size of the sample changes and as variables are added to or subtracted from the prediction equation.[15] In other words, the relative importance of each of these variables could be assessed only for this sample (1950 through 1972) and for this set of variables.

FOOTNOTES

[1]Ira Sharkansky, Spending in the American States (Chicago: Rand McNally, 1968), p. 58.

[2]See Paul F. Hartwig, "Determinants of Change in State and Local Government Expenditures Per Pupil, 1940-1960" (Ed.D. dissertation, Northwestern University, 1972); Ira Sharkansky, Spending in the American States (Chicago: Rand McNally, 1968); and Thomas R. Dye, Politics, Economics, and the Public: Policy Outcomes in the American States (Chicago: Rand McNally, 1966).

[3]Roy W. Bahl, Jr. and Robert J. Saunders, "Determinants of Changes in State and Local Government Expenditures," National Tax Journal 18 (March 1965): 50-57.

[4]Virginia Metropolitan Areas Study Commission, Projections (Richmond, Virginia: Virginia Metropolitan Areas Study Commission, 1967), p. 7.

[5]See James R. Connor, Statewide Pattern of Higher Education in Virginia (Richmond, Virginia: Virginia Higher Education Study Commission, 1965), p. 51; and State Council of Higher Education for Virginia, Population and Higher Education Enrollments in Virginia, 1970-1980 (Richmond, Virginia: State Council of Higher Education for Virginia, 1972).

[6]Allan Pulsipher and James Weatherby, "Malapportionment, Party Competition, and the Functional Distribution of Governmental Expenditures," American Political Science Review 62 (December 1968): 1207-19.

[7]See Dye, Politics, Economics, and the Public: Policy Outcomes in the American States, p. 64; and Sharkansky, Spending in the American States, p. 71.

[8]Manning J. Dauer and Robert G. Kelsay, "Unrepresentative States," National Municipal Review 44 (December 1955): 551-75.

[9]Robert H. Salisbury, "State Politics and Education," Politics in the American States, eds. Herbert Jacob and Kenneth Vines (Boston, Massachusetts: Little, Brown, 1965), pp. 321-69.

[10]Michael D. Usdan, David W. Minar, and Emanual Hurwitz, Jr., Education and State Politics (New York: Teachers College Press, 1969).

[11]Harmon Zeigler and Karl Johnson, The Politics of Education in the States (Indianapolis: Bobbs-Merrill, 1972).

[12]See Glenn W. Fisher, "Interstate Variation in State and Local Government Expenditures," National Tax Journal 17 (March 1964: 72; and Elliott R. Morss, "Some Thoughts on the Determinants of State and Local Governmental Expenditures," National Tax Journal 19 (March 1966): 98.

[13]See Richard Kellogg, "State Controlled Higher Education in Virginia and the Budgeting Process, 1950-1972: A Move toward Formal Methods" (Ed.D. dissertation, The College of William and Mary, 1974); and Ira Sharkansky, The Politics of Taxing and Spending (Indianapolis: Bobbs-Merrill, 1969).

[14]Norman Nie, Dale H. Bent, and C. Hadlai Hull, Statistical Package for the Social Sciences (New York: McGraw-Hill, 1970), utilized for all statistical computations.

[15]For a discussion of this problem see, Fred N. Kerlinger, Foundations of Behavioral Research, 2d ed. (New York: Holt, Rinehart & Winston, 1973), pp. 624-26.

CHAPTER IV

THE ENVIRONMENTAL AND POLITICAL CORRELATES OF APPROPRIATIONS FOR HIGHER EDUCATION IN VIRGINIA

The results of the statistical analysis of the data gathered in this research are exhibited in the following tables. In order to make the statistical results as clear as possible, they are, in many cases, supplemented by descriptive data in the form of frequency distributions and trend tables. The findings are presented as they relate to each of the hypotheses outlined in Chapter III.

Simple Correlations of Variables

The significant and sizable coefficients of correlation found for each of the independent variables with the dependent variable (as presented in Table 1) would seem to justify, at least initially, the inclusion of each of these variables in a policy model for appropriations for higher education in Virginia. Even the variable with the weakest relationship to higher education appropriations, metropolitanization, had a coefficient of determination (r^2) of .7064. The fact that each of these variables exhibited such a strong relationship with appropriations for higher education suggests, however, that there

TABLE 1

COEFFICIENTS OF CORRELATION FOR THE DEPENDENT VARIABLE: APPROPRIATIONS FOR HIGHER EDUCATION

Independent Variables	Appropriations for Higher Education (Y_1)
x_1 Wealth	.9665*
x_2 Industrialization	.8491*
x_3 College age population	.8625*
x_4 Metropolitanization	.8405*
x_5 Malapportionment	.9028*
x_6 Party competition	.9275*
x_7 Participation	.9644*
x_8 Tax effort	.9411*
x_9 Appropriations for Public elementary-secondary education	.9862*
x_{10} Federal aid	.8550*
x_{11} Incrementalism	.9857*

*Significant at the .05 level.

is a good deal of multicollinearity among the independent variables. This problem will be dealt with later.

It was hypothesized that, among the independent variables, incrementalism would be the strongest correlate with the dependent variable. The data in Table 1, however, does not confirm the hypothesis since appropriations for public elementary-secondary education were found to be the single most important correlate with appropriations for higher education, although it was closely followed by incrementalism.

The very high correlation between these two areas of educational spending would seem to suggest either that appropriations for public elementary-secondary education and appropriations for higher education share a common fate in the budgetary process or that all areas of state spending share a common fate, even though only two areas were examined here. At least one researcher had reported previously that there was a high correlation among the states between these two types of educational expenditures.[1] One explanation for that high correlation, suggested by some auxillary findings in this research, is that both types of appropriations are influenced similarly by the same set of variables. A comparison of the coefficients of correlation for each of the independent variables with these two categories of appropriations is presented in Table 2. While the rank order of the independent variables is slightly different for each of the dependent variables, the overall pattern of relationships is very similar.

The nature of the relationships among various categories of state spending is illustrated in Table 3 through a comparison of the annual

TABLE 2

COEFFICIENTS OF CORRELATIONS FOR THE INDEPENDENT VARIABLES WITH APPROPRIATIONS FOR HIGHER EDUCATION AND WITH APPROPRIATIONS FOR PUBLIC ELEMENTARY-SECONDARY EDUCATION

Independent Variables	Appropriations for Higher Education (y_1)	Appropriations for Public Elementary-Secondary Education (y_2)
x_1 Wealth	.9665*	.9837*
x_2 Industrialization	.8491*	.9090*
x_3 College age population	.8625*	.8738*
x_4 Metropolitanization	.8405*	.8986*
x_5 Malapportionment	.9028*	.8684*
x_6 Party competition	.9275*	.8950*
x_7 Participation	.9644*	.9755*
x_8 Tax effort	.9411*	.9547*
x_9 Appropriations for public elementary-secondary education	.9862*	. . . . .
x_{10} Federal aid	.8550*	.8808*
x_{11} Incrementalism	.9857*	.9762*

*Significant at the .05 level.

TABLE 3

ANNUAL RATE OF CHANGE IN APPROPRIATIONS FROM THE GENERAL FUND FOR OPERATING EXPENSES BY SELECTED FUNCTIONAL CATEGORIES IN 1967 CONSTANT DOLLARS, 1950-1970

Functional Categories	Percent
Higher education	11.54
Elementary-secondary education	9.78
Other education	7.47
Mental health	8.02
Public health	7.08
Public welfare	7.78
Vocational rehabilitation	27.03
Administration of justice	9.03
Resource and economic development	6.87

SOURCE: Commonwealth of Virginia, Division of the Budget, Functional Comparison of General Fund Appropriations, data covering 1950-52 Biennium through 1970-72 Biennium. Richmond, Virginia: Division of the Budget.

rate of change in the spending categories from 1950 through 1972. Appropriations for higher education and for elementary-secondary education underwent the largest annual rates of change of any of the categories, except appropriations for vocational rehabilitation. The annual rate of change in appropriations for vocational rehabilitation is misleading because in the 1950-1952 Biennium it received only negligible appropriations; therefore, any increase would show up as a dramatic change. The relatively small variation among the rates of change of the various categories of state spending tends to suggest that many of the spending categories would have been correlated with appropriations for higher education, although it is unlikely that any of these categories of spending would have been as strongly related to the dependent variable as appropriations for public elementary-secondary education. Most importantly, except for vocational rehabilitation, higher education had the highest annual rate of change of all the categories of state appropriations.

The importance of incrementalism to levels of appropriations for higher education in Virginia was, however, supported by the findings. While it was not the strongest correlate, it closely followed appropriations for public elementary-secondary education. The relationship between current- and prior-biennium appropriations is further illustrated in Table 4. Throughout the period 1950 through 1972, current biennium appropriations from the General Fund for operating expenses were typically 124 percent of prior biennium appropriations. The mean would have been somewhat lower were it not for the major

TABLE 4

PERCENT OF PRIOR BIENNIUM APPROPRIATIONS FROM THE GENERAL FUND FOR OPERATING EXPENSES IN HIGHER EDUCATION OF CURRENT BIENNIUM APPROPRIATIONS FROM THE GENERAL FUND FOR OPERATING EXPENSES IN HIGHER EDUCATION, IN 1967 CONSTANT DOLLARS

Biennium	Current Biennium Appropriations ($)	Prior Biennium Appropriations ($)	Percent
1950-52	24,809,975	22,805,938	108.79
1952-54	31,416,135	24,809,975	126.63
1954-56	38,798,295	31,416,135	123.50
1956-58	43,642,749	38,798,295	112.49
1958-60	53,029,303	43,642,749	121.51
1960-62	63,122,034	53,029,303	119.03
1962-64	75,564,455	63,122,034	119.71
1964-66	83,875,421	75,564,455	111.00
1966-68	128,920,605	83,875,421	153.71
1968-70	179,431,713	128,920,605	139.18
1970-72	226,775,569	179,431,713	126.39
Mean			123.81

deviations from prior biennium allocations in the 1966-1968 Biennium and the 1968-1970 Biennium. The increases reported in these two bienniums would presumably be attributable to the establishment of the statewide system of comprehensive community colleges in 1966. It should be noted that the differences between current biennium appropriations and prior biennium appropriations would have been greater if actual appropriations were used rather than appropriations in constant dollars. These additional increments, however, would not suggest any new commitments above and beyond prior biennium appropriations. They would suggest only the need to increase spending to keep pace with the cost of living and it is for that reason that constant dollars were used.

Another aspect of incremental budgeting, noted by Chambers, is the tendency to begin with estimates of revenue for the budget period and then to distribute the revenues into the spending categories in the same proportion used in the previous budget.[2] Chambers called this the "slicing the pie" approach to state budgeting and he noted that any proportional increase by one area of spending would come at the expense of other areas of spending.[3] The data in Table 5 illustrates this aspect of incremental budgeting in Virginia. The proportion of the General Fund operating budget allocated to higher education increased more than any other category of spending in the table. In fact, the net percentage gain for higher education was almost seven times that of the next most successful spending category, elementary-secondary education. The gains made by higher education, elementary-secondary education and vocational rehabilitation, however, would seem

TABLE 5

PERCENT OF THE APPROPRIATIONS FROM THE GENERAL FUND FOR OPERATING EXPENSES FOR SELECTED FUNCTIONAL CATEGORIES, 1950-52 AND 1970-72

Functional Categories	1950-52 (%)	1970-72 (%)	Gain/ Loss (%)
Higher education	11.47	16.00	+4.53
Elementary-secondary education	46.49	47.21	+0.73
Other education	00.48	00.32	-0.16
Mental health	8.63	6.34	-2.29
Public health	5.12	3.16	-1.96
Public welfare	6.13	4.31	-1.82
Vocational rehabilitation	0.02	0.33	+0.31
Administration of justice	7.68	6.80	-0.88
Resource and economic development	4.23	2.63	-1.61

SOURCE: Commonwealth of Virginia, Division of the Budget, Functional Comparison of General Fund Appropriations, data covering 1950-52 Biennium through 1970-72 Biennium. Richmond, Virginia: Division of the Budget.

to have come at the expense of the other six categories of state spending, thus, supporting Chambers' "slicing the pie" theory.

Partial Correlations: Controlling for Incrementalism

It was hypothesized that when the effects of incrementalism on the dependent variable were controlled for through the technique of partial correlation analysis, federal aid, tax effort, and appropriations for public elementary-secondary education would be the most important correlates with appropriations for higher education among the independent variables. The coefficients of partial correlation for each of the independent variables are listed in Table 6.

It was found that two of the three political variables were the most important correlates of appropriations for higher education as measured by the coefficients of partial correlation: appropriations for public elementary-secondary education and tax effort. The other political variable, federal aid, followed participation and wealth in the strength of its relationship with the dependent variable. The coefficients of partial correlation were statistically significant for each of these variables.

In view of the previous findings on appropriations for public elementary-secondary education, it was not surprising that this variable emerged as the most important correlate of appropriations for higher education when the effects of incrementalism were controlled for. Tax effort was the second most important correlate as hypothesized, but federal aid was much less important than was postulated. Figure 3

TABLE 6

COEFFICIENTS OF PARTIAL CORRELATION FOR APPROPRIATIONS FOR HIGHER EDUCATION: CONTROLLING FOR INCREMENTALISM

Independent Variables	Appropriations for Higher Education (y_1) by Incrementalism (x_{11})
x_1 Wealth	.458*
x_2 Industrialization	.187
x_3 College age population	.195
x_4 Metropolitanization	.197
x_5 Malapportionment	-.099
x_6 Party competition	-.023
x_7 Participation	.484*
x_8 Tax effort	.515*
x_9 Appropriations for public elementary-secondary education	.654*
x_{10} Federal aid	.430*

*Significant at the .05 level.

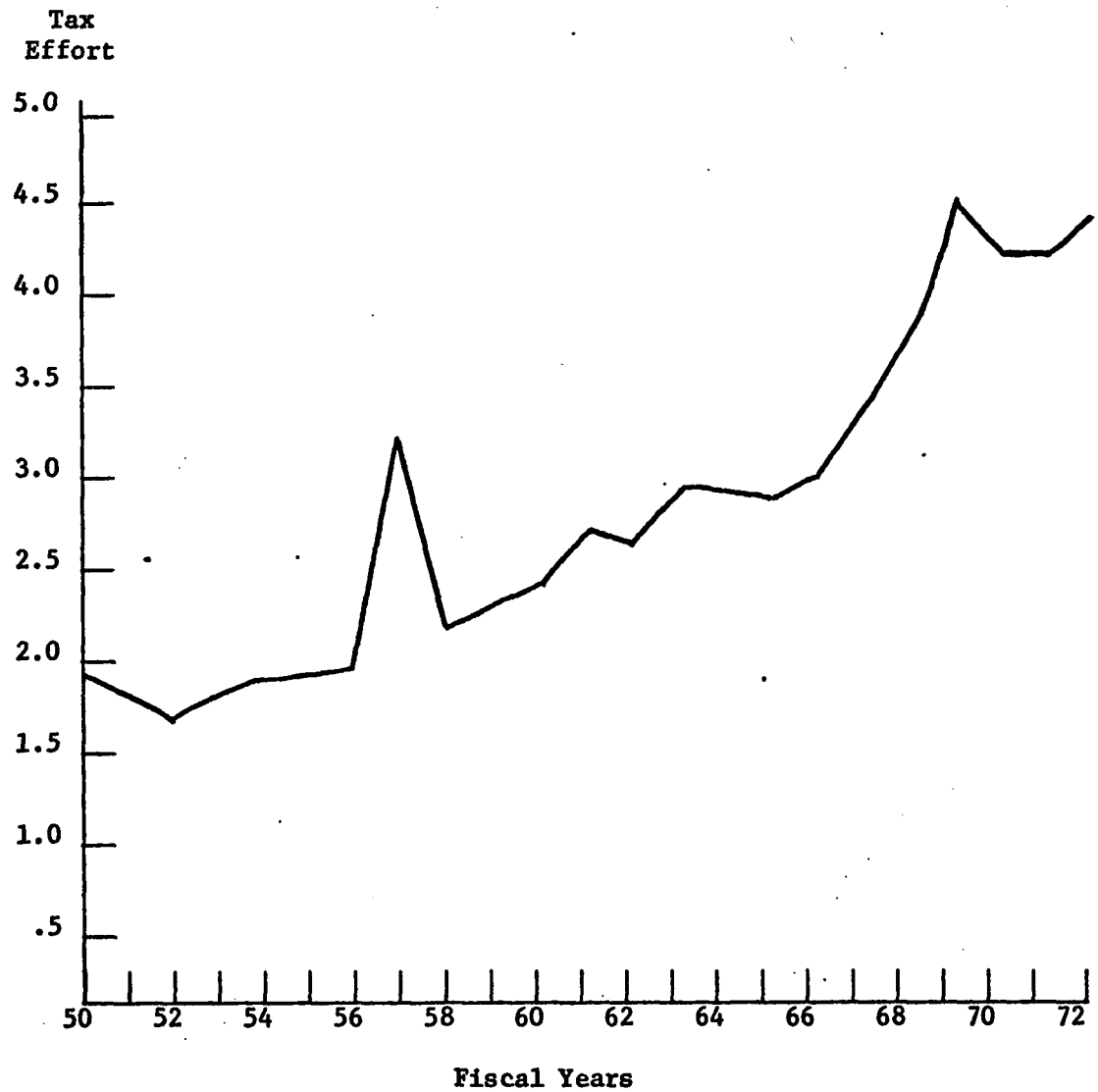


Fig. 3. Tax effort in Virginia, 1950-1972.

illustrates the dramatic increase in tax effort in Virginia with a particularly sharp rise beginning around 1966 and levelling off somewhat after 1970. This data would seem to support the a priori argument made in Chapter I that the expansion of the tax base, which occurred in 1966 with the enactment of a state sales tax, provided the necessary revenue to support increased state appropriations, particularly in higher education. The strength of the relationship between tax effort and appropriations for higher education found in this study provided empirical support for that argument.

The relatively weak, although not insignificant relationship between federal aid and appropriations for higher education can be better understood with reference to Figure 4. The sharp rise in federal expenditures began in 1963 and reached its peak in 1967. It was during this period, as noted in Chapter I, that a number of major federal aid programs for higher education were enacted. Yet, the weak coefficient of partial correlation for federal aid would seem to suggest that appropriations in Virginia did not respond directly or immediately to changes in the levels of federal expenditures. It should be noted that the weak relationship between federal aid and the dependent variable found in this research, in contrast to the strong relationship found in previous research, could probably be attributed to the use of state revenue from the federal government as the measure of federal aid in previous research whereas this research relied on a direct measure of federal expenditures (for reasons previously cited). The importance of wealth and participation to the levels of

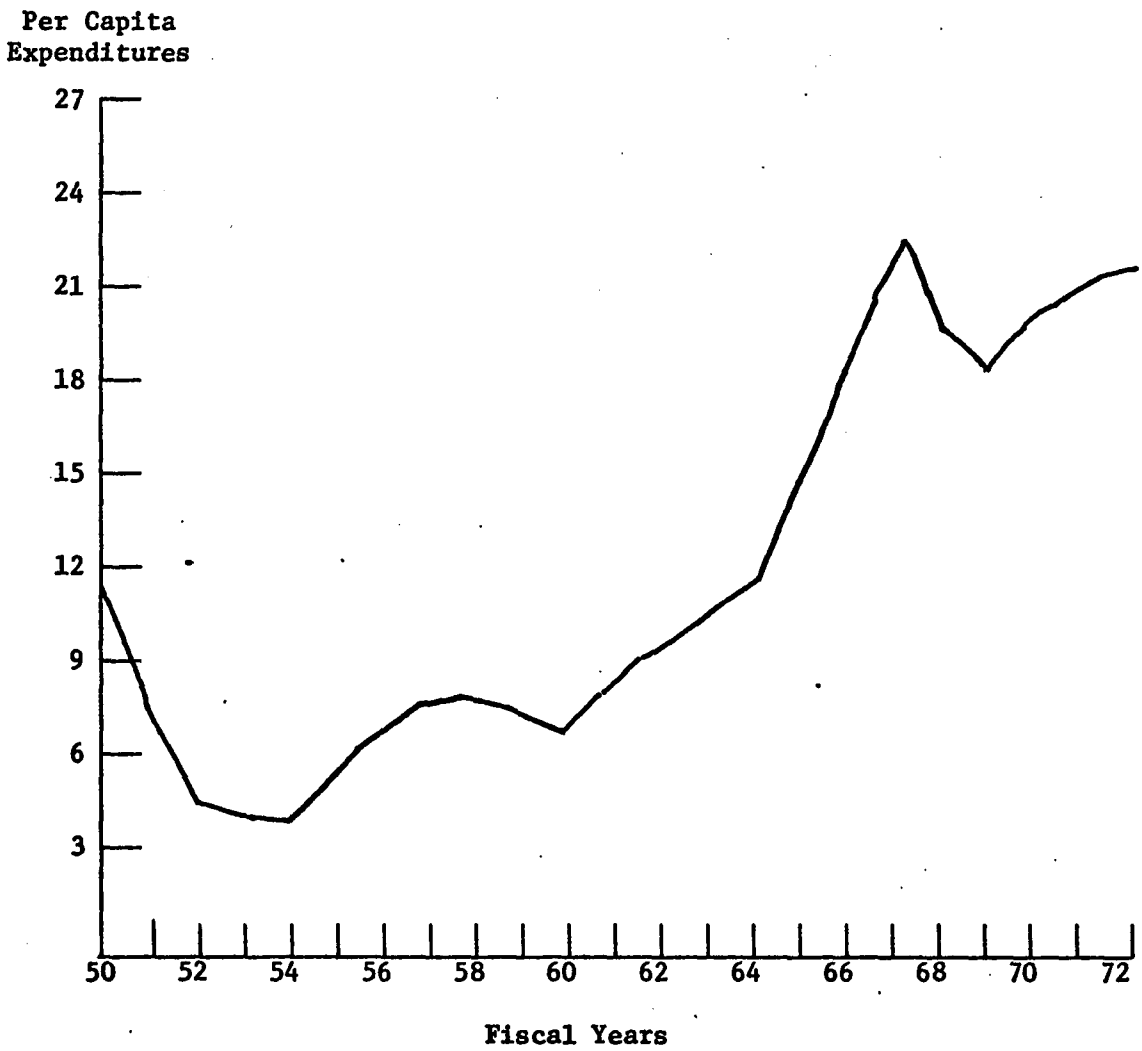


Fig. 4. Federal aid for higher education: Per capita expenditures for higher education in 1967 constant dollars, 1950-1972.

appropriations for higher education will be dealt with in the following section.

The Interaction of the Environmental and Political Variables

The environmental variables--wealth, industrialization, college age population, and metropolitanization--were hypothesized to be more important correlates of appropriations for higher education than the remaining political variables--malapportionment, party competition, and participation. Coefficients of partial correlation were computed for each of the independent variables with the dependent variable--first, while controlling for the effects of the environmental variables and secondly, while controlling for the effects of malapportionment, party competition and participation. The results of the statistical analysis are reported in Table 7.

It was found that malapportionment, party competition, and participation were not statistically significant correlates of appropriations for higher education when the effects of the environmental variables on the dependent variable were controlled for, but, all but one of the environmental variables (college age population) were statistically significant correlates of appropriations for higher education when the effects of the political variables were taken into account. The coefficient of partial correlation for federal aid was also not statistically significant when the impact of the environmental variables was removed from the relationship. Tax effort, appropriations for public elementary-secondary education, and incrementalism, however, were statistically significant correlates and they were more important

TABLE 7

COEFFICIENTS OF PARTIAL CORRELATION FOR APPROPRIATIONS FOR HIGHER EDUCATION: CONTROLLING FOR THE ENVIRONMENTAL VARIABLES AND CONTROLLING FOR THE POLITICAL VARIABLES

Independent Variables	Appropriations for Higher Education (y_1) by x_1, x_2, x_3, x_4	Appropriations for Higher Education (y_1) by x_5, x_6, x_7
x_1 Wealth		.417*
x_2 Industrialization		.390*
x_3 College age population		.055
x_4 Metropolitanization		.400*
x_5 Malapportionment	.336	
x_6 Party competition	-.355	
x_7 Participation	.234	
x_8 Tax effort	.564*	.501*
x_9 Appropriations for public elementary-secondary education	.887*	.824*
x_{10} Federal aid	-.352	-.052
x_{11} Incrementalism	.762*	.728*

*Significant at the .05 level.

correlates than any of the environmental variables. The importance of these three variables was, of course, to be expected in view of the findings reported in the previous section.

The index of malapportionment, which was computed for every year from 1950 through 1972, is illustrated by the solid line in Figure 5. The dotted line in the same figure depicts the index of malapportionment for the Virginia Senate for the years following the first Senate election after a reapportionment of the General Assembly. The difference between the two lines reflects the effects of demographic changes between reapportionments. The figure clearly reflects the effects of the landmark decision of Reynolds v. Sims 377 U.S. 533 (1964). After 1964, the Virginia Senate became markedly more representative. By 1972, 50 percent of the members of the Virginia Senate were elected by 48.4 percent of the population of the state. This is in contrast to the situation in 1950 when 35.9 percent of the population of the state elected 50 percent of the members of the Senate. The simple relationship between malapportionment and appropriations for higher education, however, seems to be a function of the relationship that malapportionment shares with the environmental variables since the coefficient of partial correlation for malapportionment with the dependent variable, when removing the effect of the environmental variables, was statistically insignificant.

Figure 6 illustrates the increasing pattern of party competition in the Virginia General Assembly since 1950. The average of the percent of Democrats in each house of the General Assembly declined from

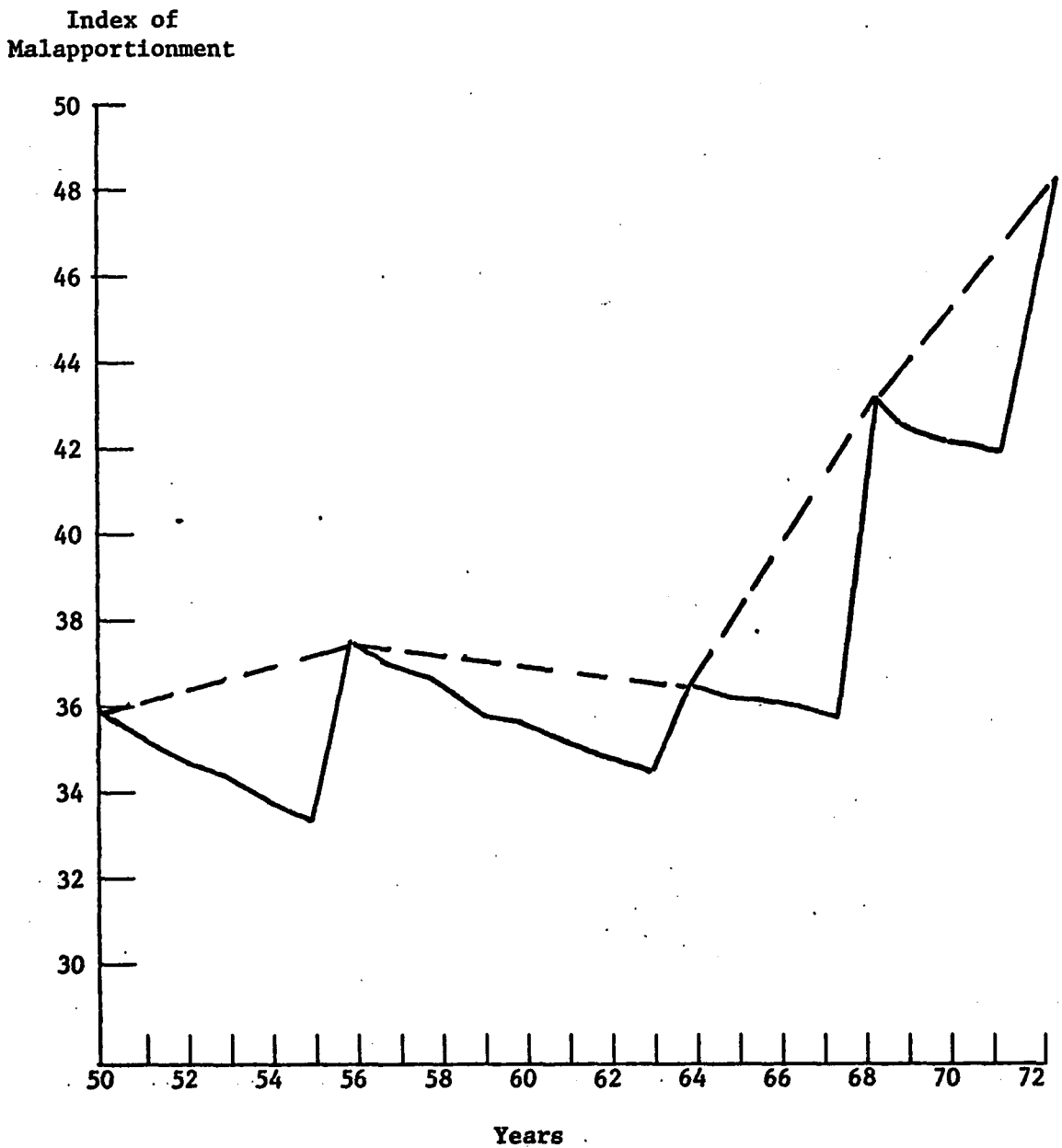


Fig. 5. Index of malapportionment in the Virginia Senate, 1950-1972.

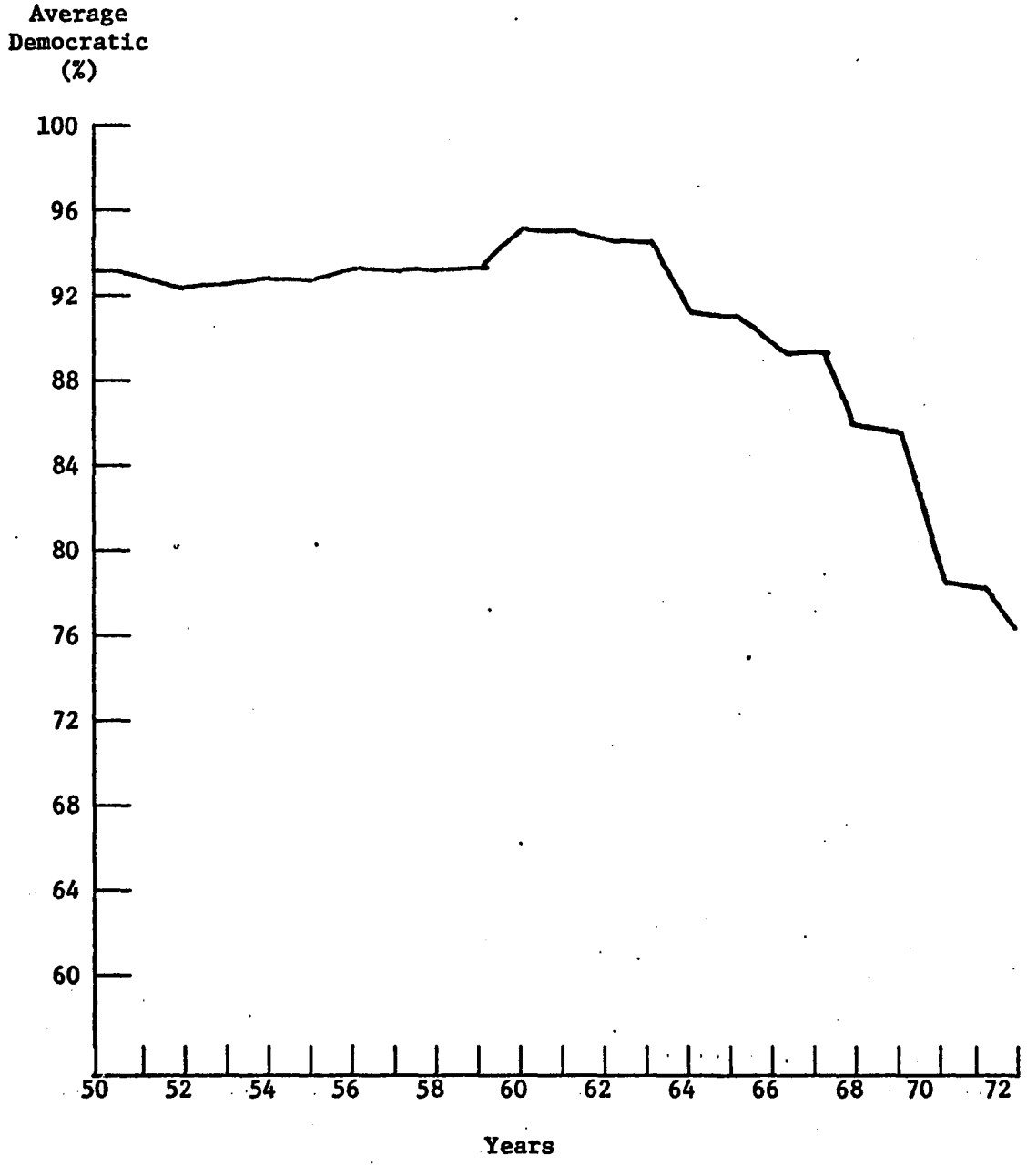


Fig. 6. Average percent of Democratic membership in each house of the Virginia General Assembly, 1950-1972.

93 percent in 1950 to 76.8 percent in 1972. Democrats had their maximum control of the General Assembly from 1960 through 1963 when the average for the two chambers was 95 percent. The insignificant coefficient of partial correlation for party competition with appropriations for higher education might be explained in part by the fact that the increase in party competition has not been substantial--Democrats still control both houses of the General Assembly and by sizable margins. For example, in 1972 there were seventy-one Democrats, twenty-five Republicans, and four Independents in the House of Delegates; the comparable figures for the Senate were thirty-three, seven, and zero, respectively. Like malapportionment, the simple relationship between party competition and appropriations for higher education seems to be a function of the relationship that both party competition and appropriations for higher education shared with the environmental variables.

Political participation in Virginia, as measured by the percent of the state's population registered to vote, increased from a low of 20.5 percent in 1951 to a high of 39.5 percent in 1972, with the sharp increases beginning in 1964 (see Figure 7). Between 1964 and 1966 the index jumped by 7.2 percent, almost twice the increase of the preceding fourteen years. This sharp increase coincides with the passage of the Civil Rights Act of 1964 and the Voting Rights Act of 1965; presumably the increase in participation which followed 1964 was at least partially due to the registration of many blacks for the first time in Virginia.

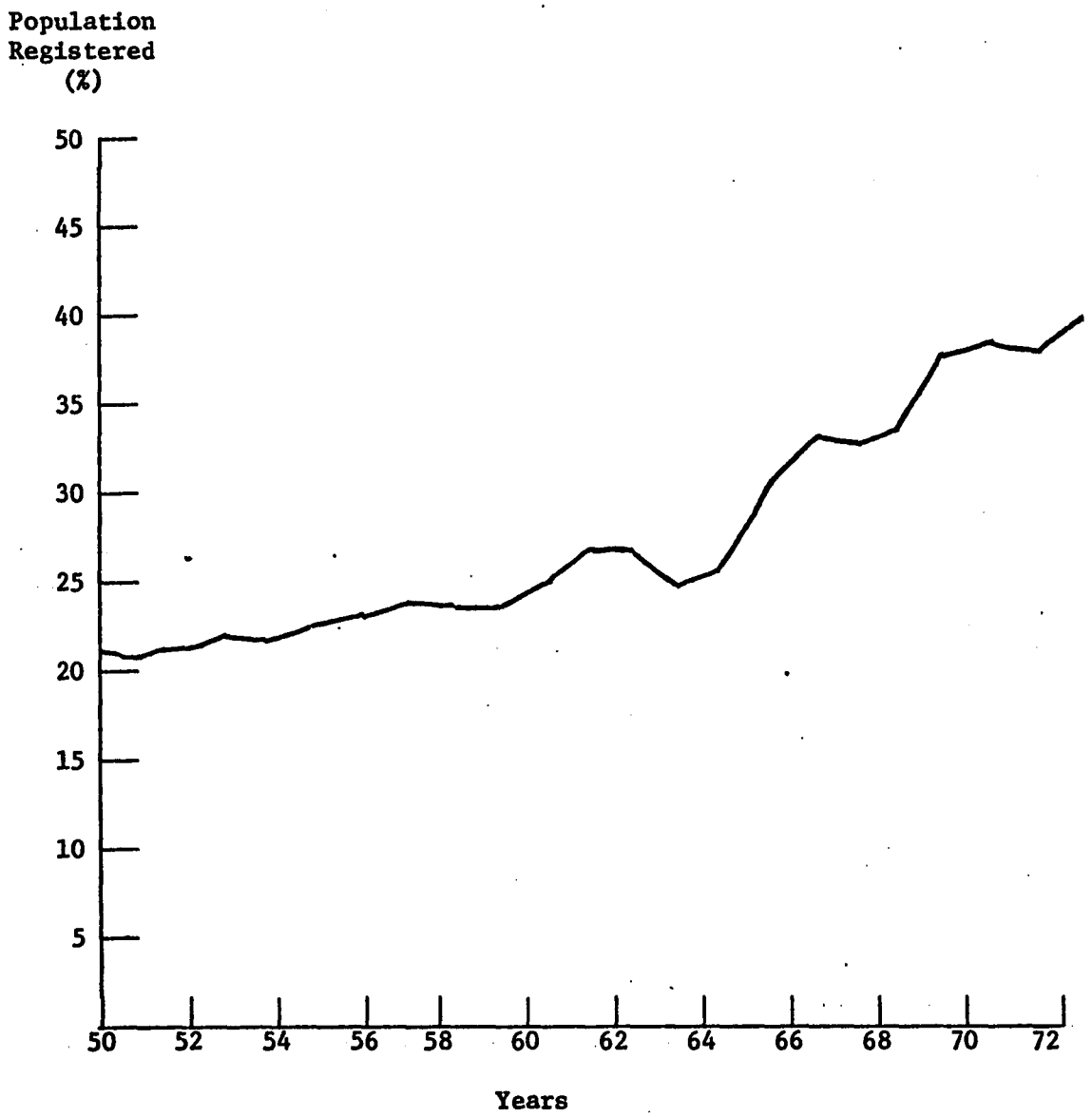
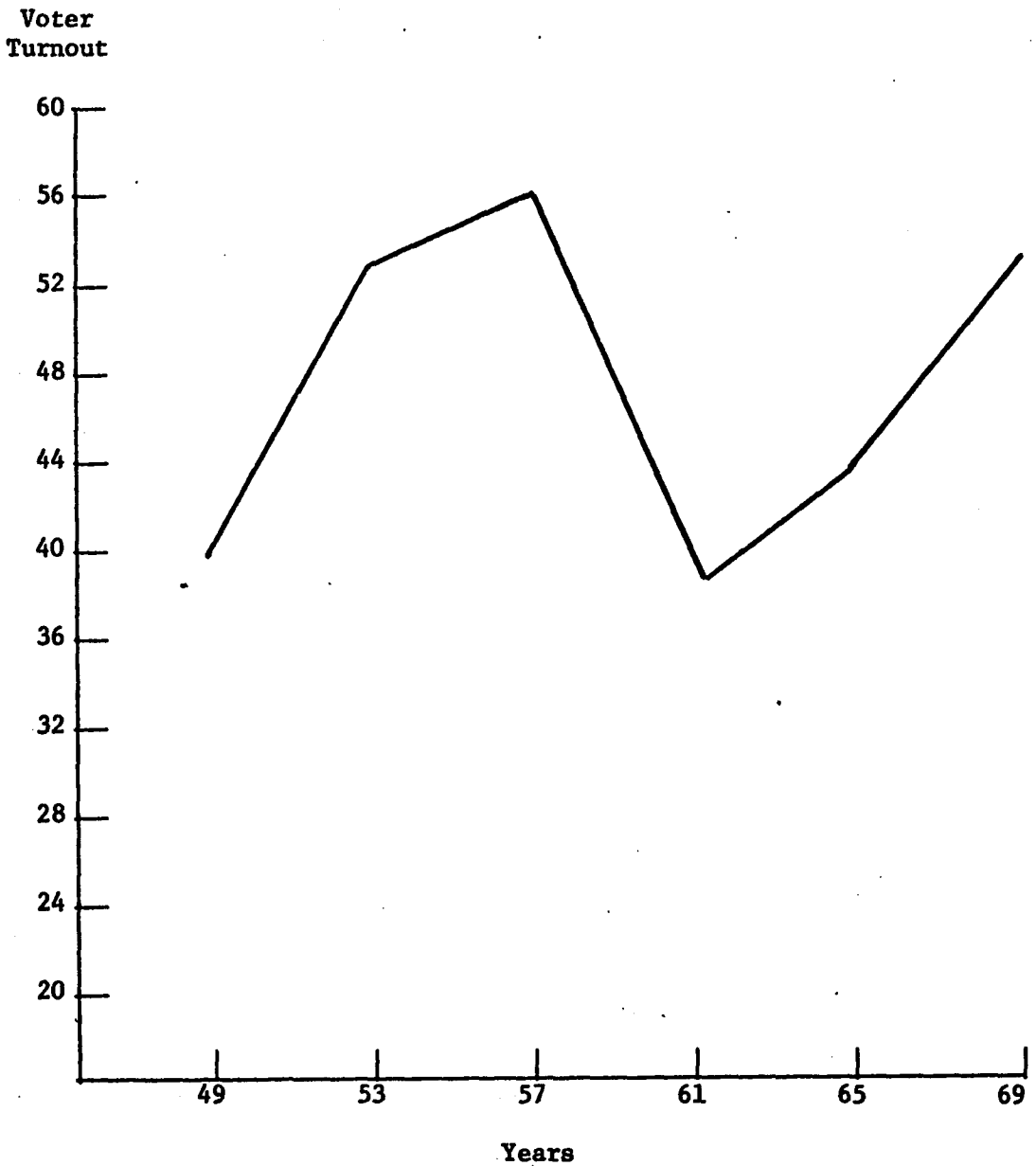


Fig. 7. Percent of the population of Virginia registered to vote, 1950-1972.

The data presented in Figure 8, however, suggests that increased numbers of registered voters did not necessarily mean increased numbers of citizens who actually voted in the Commonwealth. Voter turnout for gubernatorial elections from 1949 to 1969 was erratic. The highest voter turnout in the period was in 1957 when 55.2 percent of the registered voters turned out. Even the hotly contested election in 1969, in which the Republicans managed to elect their first governor since Reconstruction, had a turnout of only 52.7 percent. In any event, participation, like malapportionment and party competition, was not independently related to appropriations for higher education. As with the previous political variables, the relationship between participation and the dependent variable was largely a function of the common relationship that the dependent variable and participation shared with the environmental variables.

Federal aid, like the other three political variables discussed in this section, was not a significant correlate of appropriations for higher education when the common relationship that each of these variables shared with the environmental variables was removed. This finding, together with the findings in the previous section concerning the importance of federal aid to the dependent variable led to a rejection of part of the second hypothesis: that federal aid would be the most important correlate of appropriations for higher education when the influence of incrementalism was controlled for.

With respect to the third hypothesis, the findings of the partial correlation analyses confirmed the proposition that the environmental



SOURCE: Ralph Eisenberg, Virginia Votes, 1924-1968 (Charlottesville, Virginia: Institute of Government, 1971); and L. Stanley Hardaway, "Votes Cast" (Richmond, Virginia: Commonwealth of Virginia, 1969) [pamphlet].

Fig. 8. Percent of registered voters voting for Governor of Virginia, 1949-1969.

variables would be more important correlates of appropriations for higher education than malapportionment, party competition and participation. Among the environmental variables, wealth was the most important correlate with the dependent variable followed by metropolitanization and industrialization. College age population, as previously noted, was not a significant correlate with appropriations for higher education when the effects of the political variables were controlled for.

In general, the multicollinearity among the independent variables that was noted at the outset in this chapter, was revealed in the partial correlation analysis. When that common variance was controlled for, a good many of the relationships between the independent variables and the dependent variable were either diminished or became statistically insignificant.

Explanatory Power of the Independent Variables

The results of the stepwise multiple regression analysis of the eleven independent variables with appropriations for higher education are presented in Table 8. It was hypothesized that the combination of the eleven independent variables would be a highly reliable predictor of the levels of higher education appropriations in Virginia. It was found that the eleven independent variables accounted for 99.3 percent of the variation in the levels of appropriations for higher education from 1950 through 1972. A separate stepwise multiple regression analysis of nine of the eleven independent variables (excluding incrementalism

TABLE 8

STEPWISE MULTIPLE REGRESSION: APPROPRIATIONS FOR HIGHER EDUCATION WITH THE INDEPENDENT VARIABLES

Independent Variables	R	R^2	beta
x_9 Appropriations for public elementary-secondary education . .	.98616	.97251	.738*
x_2 Industrialization	.99267	.98540	-.305
x_{11} Incrementalism	.99443	.98889	.401
x_3 College age population . .	.99478	.98960	-.144
x_1 Wealth	.99569	.99139	.549*
x_6 Party competition	.99606	.99214	.178
x_4 Metropolitanization . . .	.99624	.99250	-.176
x_8 Tax effort	.99638	.99277	.068
x_{10} Federal aid	.99642	.99285	.031*
x_7 Participation	.99645	.99291	-.045
x_5 Malapportionment	.99645	.99292	-.014

*Significant (1.5 times the standard error).

and appropriations for public elementary-secondary education) with the dependent variable revealed that these nine variables accounted for 97.5 percent of the variation in the dependent variable throughout the period (see Table 9). In both of the analyses, all of the variables were included in the prediction equation.

Not only was the hypothesis confirmed, but, the explanatory power of these independent variables leaves very little unexplained variation. Presumably, this finding suggests that very little political influence on the part of policy-makers was involved in setting appropriations for higher education in Virginia from 1950 through 1972.

Using the beta weights as measures of the relative contribution of each of the independent variables to the prediction equation, appropriations for public elementary-secondary education, wealth, and incrementalism were the most important contributors to the first equation (Table 8) and wealth, tax effort, and party competition were the most important contributors to the second equation (Table 9).[4] This is not to say that these variables are the most important correlates with the dependent variable, but that they are the most important contributors to the prediction equation when taken in conjunction with the previously included variables. From this standpoint, these findings do not alter any of the previous conclusions made about the importance of the environmental and political variables as correlates with appropriations for higher education.

TABLE 9

STEPWISE MULTIPLE REGRESSION: APPROPRIATIONS FOR HIGHER EDUCATION WITH SELECTED INDEPENDENT VARIABLES

Independent Variables	R	R^2	beta
x_1 Wealth	.96645	.93402	.786*
x_6 Party competition	.97747	.95545	-.201
x_8 Tax effort	.98481	.96985	.314
x_{10} Federal aid	.98653	.97324	-.136
x_2 Industrialization	.98696	.97409	-.055
x_3 College age population . .	.98724	.97464	-.084
x_5 Malapportionment	.98733	.97482	.036
x_4 Metropolitanization . . .	.98739	.97494	-.126
x_7 Participation	.98742	.97500	.044

*Significant (1.5 times the standard error).

FOOTNOTES

[1]Robert H. Salisbury, "State Politics and Education," Politics in the American States, eds. Herbert Jacob and Kenneth Vines (Boston, Massachusetts: Little, Brown, 1965).

[2]M. M. Chambers, "Current State Tax Support," Phi Delta Kappan 50 (October 1968): 113-16.

[3]Ibid., p. 113.

[4]While the beta weights were relatively large for incrementalism in Table 8 and for tax effort and party competition in Table 9, these variables were not statistically significant.

CHAPTER V

CONCLUSIONS

The purpose of this research was to determine which socio-economic and political changes in the Commonwealth were significantly related to the sharp increase in appropriations for higher education that took place between 1950 and 1972. In theoretical terms, the research was designed to assess the relative importance of environmental and political changes to budgetary decisions for higher education in Virginia.

The policy model for higher education budgeting in Virginia was illustrated in Figure 1. In that model, the outputs of the policy subsystem, appropriations for higher education, were the product of the influence of environmental characteristics, political system characteristics, and prior-year appropriations. It was assumed in the model that prior-year appropriations provided the base from which current year appropriations were set. Any incremental change in the level of appropriations from one year to the next would be attributed to the influence of environmental and political changes on the budgeting process. Changes in the environment of the policy subsystem would influence various structural and procedural characteristics of the political system which would then have an impact on the size of the incremental change in the appropriations. The research problem was to

isolate the influence of each of these changes on the policy output and then to determine which of the changes were the most critical to budgetary decisions for higher education.

Four measures of the environmental characteristics of the policy subsystem and seven measures of the characteristics of the political system were selected as the independent variables in this research. Prior-year appropriations (incrementalism) were considered as a political system characteristic in the list of variables. The results of the statistical analysis of the interrelationships among the variables was discussed in Chapter IV. In this chapter, the implications of the findings for the theoretical model and for policy analysis research will be considered.

Environmental Inputs to Spending Decisions for Higher Education

According to the findings in this research, increases in the appropriations for higher education in Virginia were directly related to the level of socioeconomic development in the Commonwealth. Among the four environmental variables, wealth was unquestionably the best predictor of appropriations for higher education. Wealth remained a significant and independent correlate when statistical controls for incrementalism and for three political variables--malapportionment, party competition, and participation--were used. More importantly, the stepwise regression analysis of the combined explanatory power of the eleven independent variables revealed that wealth followed appropriations for public elementary-secondary education in its contribution

to the explanatory power of the prediction equation.

As for the other three environmental variables, their relationships with the dependent variable did not remain statistically significant when the influence of incrementalism and the influence of the three political variables was controlled for, nor were they statistically significant contributors to the power of the prediction equation in the stepwise analysis.

The finding in this research that wealth is a statistically significant, sizable, and independent correlate with appropriations for higher education challenges the results reported by previous researchers that expenditures for higher education, unlike expenditures for public elementary-secondary education, have not been related to wealth. It should be noted that previous research in this area was interstate and cross sectional in design. The findings in a longitudinal study of one state may not have any significance for interstate models of spending for higher education.

Since virtually all of the previous research on combined state and local spending for all categories, combined state and local spending for public elementary-secondary education, and state spending for public elementary-secondary education indicated that wealth was an important determinant of public spending, the finding in this research that wealth is an important predictor of approriations for higher education was not unexpected. The explanation for the relationship would seem to be fairly simple: as the economic resources of a state increase, its revenues are increased and, so are levels of spending.

Political Inputs to Spending Decisions for Higher Education

Among the seven political variables used in this research, three (malapportionment, party competition, and participation) were measures of citizen access to public decision-making, three were measures of various aspects of the budgetary process (federal aid, tax effort, incrementalism) and one (appropriations for public elementary-secondary education) was a measure of a policy output.

It was found that the measures of citizen access to public decision-making were not directly and independently related to appropriations for higher education but that they, like the dependent variable, were directly related to the environmental characteristics of the political system, especially to wealth. In other words, the increased influence of urban residents in the General Assembly through reapportionment, the trend toward two-party politics in Virginia, and the increased proportion of citizen participation in state politics as measured by voter registration, apparently had no independent and direct impact on the increase in appropriations for higher education. Increased wealth, and to some extent metropolitanization and industrialization, was directly related to these political changes and to the changes in appropriations for higher education.

Of the three political measures dealing with characteristics of the budgetary process, incrementalism and tax effort were found to be important and independent correlates of appropriations for higher education. Federal aid, like malapportionment, party competition, and

participation did not have an independent impact on the dependent variable, when the influence of the environmental variables and incrementalism was removed. Incrementalism was the second most important correlate of appropriations for higher education and its impact was clearly independent of the environmental variables. Tax effort was the fourth most important correlate of the dependent variable (it followed wealth) and it also clearly had a significant impact on state appropriations for higher education in addition to incrementalism and the environmental variables. Since the measure of tax effort used as its base the measure of wealth, it is not surprising that the two were so closely related. What is important to note, however, is that budgetary decisions for higher education in Virginia were related not only to the wealth of the state but also to the willingness of the state to collect some of that wealth in the form of taxes. Tax effort and wealth were secondary to prior-year appropriations in their impact on the level of state appropriations for higher education.

The most important correlate of appropriations for higher education was appropriations for public elementary-secondary education. From a theoretical standpoint, the significance of this finding would seem to be that these two categories of appropriations seem to be treated similarly in the budgetary process; the same influences seem to affect both of these categories in very much the same way. From this perspective, appropriations for public elementary-secondary education should not be viewed as an input to appropriations for higher education but rather should be regarded as a companion output.

The high correlation between these two outputs would suggest that the same set of variables would be highly correlated to each of these spending areas. The findings listed in Table 2 support this hypothesis. As far as Virginia is concerned, the same policy subsystem would seem to apply to both categories of spending.

In summary, the results of this research led to the following conclusions about the policy-making process for appropriations for higher education in Virginia from 1950 through 1972:

1. The level of appropriations in a given year were highly dependent on the level of appropriations in the previous year
2. The increase in appropriations beyond the level of the previous year was dependent on an increase in the state's wealth, and on the state's willingness to collect increasing proportions of that wealth in the form of revenue from taxes
3. Changes in the pattern of political activity in Virginia--specifically legislative reapportionment, increased party competition, and increased levels of participation--and increases in the level of federal expenditures for higher education, did not have an influence on the levels of appropriations independent of the factors listed above
4. The environmental and political influences on budgetary decisions on higher education were not very different from those on public elementary-secondary education.

Significance of the Research

The findings reported in this research are important not only because they provide empirical evidence for a theory of higher education budgeting in Virginia, but also because they help to integrate that theory into the field of policy analysis in political science and because they provide a link between budgeting theory and the theory of the policy-making process. The findings in this research reinforce the findings of previous researchers that the socioeconomic development of a state (particularly wealth) is an important determinant of the levels of spending in that state and that changes in the structure of political influence in the states have not had a dramatic effect on spending decisions in the states. In addition to socioeconomic development, the characteristics of the budgetary process in a state seem to be the remaining determinants of state spending decisions.

The design of this research has added a new dimension to policy analysis research: it is the first policy analysis research of a single state political system over time. While the difficulties encountered in a longitudinal study are considerable (e.g., the lack of consistently gathered data or the infrequency of data tabulation), the rewards in terms of theory development are considerable since the focus of policy analysis should be on a discrete political system and on the explanation of the outputs of that political system over time. Interstate studies of combined state and local expenditures have assumed the existence of a political system that does not conform to the reality of the policy-making process in the states.

Similar studies of other state political systems in other spending areas would provide an empirical basis for the construction of a policy analysis model of the budgetary process in the states. The importance of this research and of the previous research that combined budgetary theory with policy analysis is that it will take the theory of budgeting in the states out of its institutional orientation and integrate it with the political and social environment in which it operates.

Finally, this research has developed an empirically oriented policy model for appropriations for higher education in Virginia. The model needs to be further refined through the addition of new independent variables that take into account the effects of the introduction of formulas in the budgetary process for higher education in Virginia. Such a model would be a significant analytical tool for state budget and planning agencies. The model should also be expanded to include the impact of appropriations on the quality of public services in higher education so that state officials could better evaluate the effectiveness of the system of higher education in Virginia.

APPENDICES

APPENDIX A

VIRGINIA'S METROPOLITAN AREAS

1. The City of Bristol and the County of Washington
2. The cities of Alexandria, Fairfax, and Falls Church and the counties of Arlington, Fairfax, Loudoun, and Prince William
3. The City of Charlottesville and the County of Albemarle
4. The City of Danville and the County of Pittsylvania
5. The City of Lynchburg and the counties of Amherst and Campbell
6. The cities of Newport News, Hampton, and Williamsburg and the counties of James City and York
7. The cities of Norfolk, Portsmouth, Chesapeake, Suffolk, and Virginia Beach and the County of Nansemond
8. The cities of Petersburg, Hopewell, and Colonial Heights and the counties of Dinwiddie and Prince George
9. The City of Richmond and the counties of Chesterfield, Goochland, Hanover, Henrico, and Powhatan
10. The cities of Roanoke and Salem and the counties of Botetourt and Roanoke

APPENDIX B

DATA SOURCES

1. Per Capita Personal Income in 1967 in Constant Dollars
[Computed as aggregate personal income in the state divided by population of the state; the quotient was then multiplied by the Purchasing Power of the Dollar, where 1967 = 1.00.]

   1a. Aggregate Personal Income
   Source: U. S. Department of Commerce, Office of Business Economics, Survey of Current Business, April 1969 and August 1973.

   1b. Population of Virginia
   Source: 1950-1960
   U. S. Department of Commerce, Bureau of the Census, Current Population Reports, series P-23, No. 7.

   1961-1970
   University of Virginia, Bureau of Population and Economic Research, Selected Population Characteristics of Virginia, 1970, August 1971.

   1971-1972
   University of Virginia, Tayloe-Murphy Institute, Estimates of the Population of Virginia Counties and Cities: July 1, 1971 and July 1, 1972, June 1973.

   1c. Purchasing Power of the Dollar
   Source: U. S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1973, p. 346.

2. Percent of Workforce Engaged in Non-Agricultural Employment
[Computed as nonagricultural employment (yearly average) divided by total employment (yearly average).]

   2a. Non-Agricultural Employment
   Source: Virginia Employment Commission, Estimated Workforce Components in Virginia by Months, 1950-1972.

2b. Total Employment
Source: Ibid.

3. Percent of Virginia's Population Living in Metropolitan Areas [Computed as the sum of the population of each county and city in each metropolitan area divided by the total population of the state.]

3a. Population of Counties and Cities
Source: See 1b.

3b. Population of Virginia
Source: See 1b.

4. Percent of Virginia's Population Eighteen to Twenty-One Years of Age

Source: 1950-1970
James R. Conner, Statewide Pattern of Higher Education in Virginia, Virginia Higher Education Study Commission, 1965, p. 51.

1970-1972
State Council of Higher Education for Virginia, Population and Higher Education Enrollments in Virginia, 1970-1980, 1972, pp. 13-14.

5. Percent of Virginia's Population that Could Elect a Majority in the Senate in the Virginia General Assembly [Computed as the sum of the population of the bottom two quartiles of Senatorial districts, ranked by population, divided by the total population of the state.]

5a. Senatorial Districts
Source: General Assembly of Virginia, Acts, 1952 (Extra Sess.), Ch. 17; 1958, Ch. 333; 1962, Ch. 635; 1964 (Extra Sess.), Ch. 1; 1968, Ch. 57; 1971 (Extra Sess.), Ch. 116.

5b. Population of Counties and Cities in Virginia
Source: See 1b.

6. Average of the Percentage of Democratic Members in Each House of the Virginia General Assembly

Source: General Assembly of Virginia, Manual of the Senate and House of Delegates, Sessions 1950-1972.

7. Percent of Virginia's Population Registered to Vote [Computed as the number of registered voters in Virginia divided by the population of the state.]

    7a. Number of Registered Voters
    Source: State Board of Elections, Number of Registered Voters in Virginia, 1950-1972.

    7b. Population of Virginia
    Source: See 1b.

8. Percent of Virginia's Aggregate Personal Income of the State's Revenue from Taxes

    8a. Aggregate Personal Income
    Source: See 1a.

    8b. Revenue from Taxes
    Source: Commonwealth of Virginia, Department of Accounts, Report of the Comptroller to the Governor of Virginia for the Fiscal Year, 1949-1973.

9. Per Capita Appropriations from the General Fund for Public Elementary-Secondary Education in 1967 Constant Dollars [Computed as appropriations (regular and supplemental appropriations to the State Department of Education and related items in appropriations to the Office of the Governor) divided by the population of the state; the quotient was then multiplied by the Purchasing Power of the Dollar, where 1967 = 1.00.]

    9a. Appropriations from the General Fund for Public Elementary-Secondary Education
    Source: General Assembly of Virginia, Acts, 1948, Ch. 552; 1950, Ch. 578; 1952, Ch. 716; 1954, Ch. 708; 1956, Ch. 716; 1958, Ch. 642; 1960, Ch. 610; 1962, Ch. 640; 1964, Ch. 658; 1966, Ch. 719; 1968, Ch. 806; 1970, Ch. 461.

    9b. Population of Virginia
    Source: See 1b.

    9c. Purchasing Power of the Dollar
    Source: See 1c.

10. Per Capita Federal Expenditures for Higher Education in 1967 Constant Dollars [Computed as federal expenditures (higher education and loans) divided by population of the United States; the quotient was then multiplied by the Purchasing Power of the Dollar, where 1967 = 1.00.]

10a. Federal Expenditures for Higher Education
Source: Albert Munse, National Center for Educational Statistics (unpublished statistics obtained in a telephone call, March 5, 1974).

10b. Population of the United States
Source: U. S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1972, p. 5.

10c. Purchasing Power of the Dollar
Source: See 1c.

11. Per Capita Appropriations for Higher Education in 1967 Constant Dollars [Computed as appropriations from the General Fund for operating expenses for higher education divided by the population of the state; the quotient was then multiplied by the Purchasing Power of the Dollar, where 1967 = 1.00.]

11a. Appropriations from the General Fund for Operating Expenses in Higher Education
Source: FY 1949, FY 1950
General Assembly of Virginia, Acts, 1948, Ch. 552.

FY 1951-1972
Commonwealth of Virginia, Division of the Budget, Functional Comparison of General Fund Appropriations, Fiscal Years 1951-1972.

11b. Population of Virginia
Source: See 1b.

11c. Purchasing Power of the Dollar
Source: See 1c.

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ABSTRACT

ENVIRONMENTAL AND POLITICAL CORRELATES OF APPROPRIATIONS FOR HIGHER EDUCATION IN VIRGINIA, 1950-1972

The purpose of this research was to determine which environmental and political changes in Virginia were significantly related to the dramatic rise in appropriations for higher education in the Commonwealth from 1950 through 1972. The study utilized four measures of the environmental characteristics of the state--wealth, industrialization, metropolitanization, and college-age population--and seven measures of the political characteristics of the Commonwealth--malapportionment, party competition, political participation, tax effort, appropriations for public elementary-secondary education, federal aid, and prior-year appropriations for higher education. It was hypothesized that appropriations for higher education would be most significantly related to four of the political variables--prior-year appropriations for higher education, federal aid, tax effort, and appropriations for public elementary-secondary education, in that order--followed by the environmental characteristics of the state.

Measures for each of the variables were obtained for every year, 1950 through 1972. Simple-, partial-, and multiple-correlations were computed for the eleven independent variables and the one dependent variable to determine their interrelationships.

It was found that the most important correlate with appropriations for higher education was public elementary-secondary education followed by prior-year appropriations for higher education, wealth, participation, and tax effort. Among the independent variables, appropriations for public elementary-secondary education, prior-year appropriations for higher education, tax effort, and wealth were independently related to appropriations for higher education. The combination of the eleven independent variables accounted for 99.3 percent of the variation in the levels of appropriations for higher education from 1950 through 1972.

The results of the research led to the following conclusions: that budgetary decisions for public elementary-secondary education were closely related to budgetary decisions for higher education, that the levels of appropriations for higher education in a given year were highly dependent on the levels of appropriations for the previous year, and that the increase in appropriations for higher education beyond the level of the previous year was dependent on an increase in the state's wealth and on the state's willingness to collect that wealth in the form of taxes.