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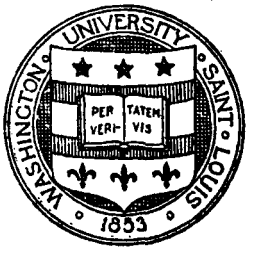

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A Model of the Distribution of Federal Expenditures Among States*

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This study explores factors associated with the allocation of federal expenditures by states and examines the relation of these expenditures to the state by state distribution of income. The allocation of federal expenditures is functionally oriented toward the objectives for which various government programs are set up. The geographical distribution of federal expenditures, therefore, was historically considered to be a problem incidental to government activity. Because of this, relatively little attention was given to the question of why some states receive more federal allocation than others.[1/] In addition, the implications of this pattern of allocation among states have not been intensively investigated.

Federal programs vary immensely in nature. Also, the allocation of federal expenditures to provide these programs is governed by principles specific to individual programs. In spite of the diversity of federal activity, few of the programs are explicitly directed at the reduction of the inequality of incomes among states. But, in fulfilling the functions for which federal programs are provided, these expenditures undoubtedly have effects on income distribution.

The plan of this paper is as follows: In Section I, previous studies in state-by-state distribution of federal expenditures are briefly described. Section II describes the nature of federal expenditures. The model is formulated in Section III. In Section IV we discuss the data and estimation procedures. Statistical results are analyzed in Section V. Section VI discusses the relation between net expenditures and incomes. Concluding remarks are presented in Section VII.

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*An earlier version of this paper was presented at the annual meetings of the American Statistical Association, December 1967. [3]

1/ For a recent study, see [7].

1. Review of Previous Studies

The distribution of federal expenditures by states has been a topic for several studies. In her pioneer work, Illustrative Estimates of Federal Expenditures and Revenues by States, [4] Selma Mushkin applies the concepts of benefits and incidence to estimate the distribution of federal expenditures among regions and states. With the cash budget of 1952, she found that the spread of per capita federal expenditures among states is narrower by use of a benefit measure than that which is obtained through an incidence measure. The dispersion of per capita expenditures among states ranged from a low of $403 to a high of $573 under the benefit measure in contrast with the respective limiting values of $204 and $780 with the incidence measure. Mushkin also found that, although per capita incidence tends to be higher in the wealthier states than in the poorer states, federal programs are relatively more important in the income flow of poorer states. Furthermore, poorer states receive the largest dollar excess of federal expenditures or benefits over revenues paid.

In contrast with Mushkin's study, Howard Schaller [5] analyzed the effect of federal grants-in-aid on the disparity in state per capita income using 1929, 1939 and 1949 data. His finding was that a tendency existed for grants-in-aid programs to reduce the disparity. He also notes that this importance appears to be slight because the amount involved in these programs constitutes only a small fraction of gross national product.

In his 1962 paper, I. M. Labovitz [2] reported his estimate of the incidence of taxation by state of origin and the allocation of expenditures by state of recipient or activity. His study is based on the average of 1958, 1959 and 1960 expenditures.

As compared with the studies described above, it is not the purpose of the present study to estimate the allocation of federal expenditures and sources of revenues by states. In this study, a model of the distribution of federal expenditures is developed and applied to a set of already estimated data in an attempt to explain

both government fiscal activity and its relation to the distribution of income. This study also differs from most other works in the area of government fiscal activity in that we develop an economic model for which we apply techniques of simultaneous equation estimation.

II. The Nature of Federal Expenditures

In attempting to find general principles which govern the allocation of federal expenditures among states, the objectives and functions of federal programs are examined. The objectives and functions of federal programs are many, but these can be generalized as (1) to provide a remedy for problems arising from social and economic development; (2) to foster or encourage the expansion of certain basic social services or maintain a certain minimum of these services; and (3) to procure goods and services for government.

By the implications of the objectives and functions of federal expenditures generalized above, the extent to which a state receives federal expenditures depends on the nature and magnitude of its social and economic problems; the need of a state to expand the basic social services and its ability to finance this expansion; and the ability and efficiency of a state's economy to supply the kind of goods and services demanded by federal government.

The nature and magnitude of a state's economic and social problems are characterized by the nature and extent of its industrialization and urbanization. For a state in an early stage of industrialization and urbanization, social overhead facilities have to be developed to make conditions conducive to economic development. In a state where industries have long matured and populations are concentrated in urban areas, problems posed by mature industrialized and urbanized society are in urgent need of remedy. The demand for funds to deal with social and economic problems therefore exists in both industrializing and urbanizing as well as industrialized and urbanized states. However, the nature of social and economic problems faced by states with different extents of industrialization and urbanization is different. In addition, there also exist differences in the financial ability of states to provide or maintain

the necessary social services. It is therefore reasonable to expect that the nature and magnitude of the demand for federal resources differ from one state to another.

With respect to the ability and efficiency of a state's economy to supply the kind of goods and services demanded by the federal government, a major portion of federal expenditures is for defense and NASA procurement, which depend on manufacturing capacity. On the assumption that efficiency is the most relevant consideration, industrialized and urbanized states may be expected to receive a large part of federal expenditures for defense-related activity.

Federal expenditures, then, may be broadly classified into three groups as: those which are welfare-oriented such as transfer payments; those which are efficiency-oriented such as defense research and development, and defense and NASA procurement; and those which are service-oriented such as military reserves and civil works. But expenditure categories such as civil and military salaries, aid to individuals, and aid to states and localities comprise more than one of the above functions.

III The Model

In this study, federal expenditures are broken down into seven major categories in accordance with the form in which data are available. These are:

E_1 = Military reserves and civil works.

E_2 = Defense research and development.

E_3 = Defense and NASA procurement.

E_4 = Transfer payments.

E_5 = Civilian and Military salaries.

E_6 = Aid to individuals.

E_7 = Aid to states and localities.

The basic model consists of eleven equations. There is one equation for each of the seven expenditure categories. Personal income and personal income taxes are explained separately and two definitional identities complete the model. Before presenting specific relations other variables are described as follows:

X_1 = Manufacturing employment as a per cent of total employment in 1960, as a measure of the extent of industrialization.

X_2 = Change in manufacturing employment as a per cent of total employment between 1950 and 1960, as a measure of recent changes in the extent of industrialization.

X_3 = Urban population as a per cent of total population in 1960, as a measure of the extent of urbanization.

X_4 = Change in urban population as a per cent of total population between 1950 and 1960, as a measure of recent changes in the extent of urbanization.

X_5 = Per capita value of new engineering construction contracts awarded during the years 1948 through 1957.

X_6 = Per cent of population over 65.

X_7 = Population per square mile.

X_8 = Per capita increases in elementary and secondary public school enrollment between 1950 and 1960.

X_9 and X_{10} = dummy variables representing the years 1960 and 1963 relative to 1957.

Y_d = Per capita disposable income in dollars.

Y_p = Per capita personal income in dollars.

T_p = Total per capita personal federal income tax collections in dollars.

T = Total per capita federal tax collections in dollars

D = Difference between T and T_p including corporate income and other federal tax collections.

The variables X_1 and X_3 are important in all our relations, for they reflect the different socio-economic problems at whose solution federal expenditures are aimed. They also provide a realistic framework within which we can measure the effects of other regressors. The rationale for other variables included in each relation is briefly described below.

In the case of military reserves and civil works (E_1), expenditures are made mostly by the Army Corps of Engineers for conservation and improvement construction. These expenditures are largely service-oriented and are concentrated in physically less developed areas. For this reason, recent changes in the extent of industrialization is included as an explanatory variable. We have:

$$(1) \quad E_1 = a_o + a_1 X_1 + a_2 X_2 + a_3 X_3 + a_4 X_9 + a_5 X_{10} + u_1 .$$

Defense research and development activity relies heavily on technology. It is efficiency-oriented and may be expect to center in urbanized and industrialized areas. In addition, this activity has gained importance since the end of World War II. Recent changes in industrialization and urbanization as well as new engineering construction are assumed to be associated with this development. The relation postulated is:

$$(2) \quad E_2 = b_o + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_9 + b_7 X_{10} + u_2$$

Defense and NASA procurement is similar to defense research and development because both rely on technology and industries. The difference between these two categories lies in the fact that the effects of procurement are much less selective. We thus assume the same statistical function, but expect the results to reveal the underlying differences:

$$E_3 = c_o + c_1 X_1 + c_2 X_2 + c_3 X_3 + c_4 X_4 + c_5 X_5 + c_6 X_9 + c_7 X_{10} + u_3$$

Transfer payments are welfare-oriented expenditures and therefore can be assumed to be associated with age distribution and income. The variable for recent changes in urbanization is introduced in the relation since the characteristics of the population in a newly urbanized area are different from the characteristics of the beneficiaries

of federal transfer payments in general. This gives:

$$(4) \quad E_4 = d_o + d_1 X_1 + d_2 X_3 + d_3 X_4 + d_4 X_6 + d_5 X_9 + d_6 X_{10} + d_7 Y_d + u_4 .$$

Civilian and military wages considered here are the earned personal incomes of the employees of the federal government, and are therefore distributed according to the location of federal civilian employees and of defense establishments. On the assumption that civilian employees of federal government are located where their services are mostly needed -- in areas where there is economic activity and social problems, we have:

$$(5) \quad E_5 = e_o + e_1 X_1 + e_2 X_2 + e_3 X_3 + e_4 X_7 + e_5 X_9 + e_6 X_{10} + u_5 .$$

Aid to individuals constitutes direct federal payment to individuals and others under the Department of Agriculture conservation and subsidy, Department of Commerce grants, and various programs of the Department of Health, Education, and Welfare. We include age distribution, and density of population as additional variables giving:

$$(6) \quad E_6 = f_o + f_1 X_1 + f_2 X_3 + f_3 X_6 + f_4 X_7 + f_5 X_9 + f_6 X_{10} + u_6 .$$

Aid to states and localities takes the form of grants-in-aid provided for the purpose of fostering or maintaining certain social overhead services. This category of expenditures is often dependent on a state's financial ability to match these grants. But a major component of the expenditures, aid to education, is related to student population and is determined by a state's relative inability to provide these services. We include changes in student enrollment from 1950 to 1960 and engineering construction as explanation variables. Recent industrialization and urbanization are also included to indicate change in social and economic characteristics of states. This gives:

$$(7) \quad E_7 = g_o + g_1 X_1 + g_2 X_2 + g_3 X_3 + g_4 X_4 + g_5 X_5 + g_6 X_8 + g_7 X_9 + g_8 X_{10} + u_7 .$$

We now formulate a function to relate income to each of the seven expenditure categories. In this function we also include engineering construction, age

distribution, and time.

The relationship is:

$$(8)\quad Y_p = h_o + \sum_{i=1}^{7} h_i E_i + h_8 X_5 + h_9 X_6 + h_{10} X_9 + h_{11} X_{10} + u_8 \quad .$$

Personal income taxes are a function of personal income:

$$(9)\quad T_p = k_o + k_1 Y_p + u_9$$

To complete the model we have two definitional identities:

$$(10)\quad Y_d = Y_p - T$$

$$(11)\quad T = T_p + D$$

Our model reflects the fact that income and expenditures influence each other. Hence they (Y_p, Y_d , E_1 , ..., E_7 ,) must be considered endogenous to the model Since taxes (T, T_p) are dependent upon income, they too are endogenous. Corporate income taxes comprise the bulk of the difference between total and personal income tax collection. Corporations pay taxes in the state in which they are incorporated, and due to the differences in state corporate regulations, corporations often are incorporated in states with mild restrictions (such as Delaware) and earn the bulk of their incomes elsewhere. The variable D is therefore deemed to be exogenous. All other variables in the model, X_1 through X_{10} are assumed to be exogenous.

As a result the model contains eleven equations, eleven endogenous variables, and twelve exogenous variables, satisfying the rank condition for identification. Each of our equations meets the order condition for identifiability and each is in fact overidentified (with the exception of equation (8) which is exactly identified.

The model of federal expenditures presented above contains a number of conceptual limitations. These are: people earn income in one state and pay taxes in another; personal income within a state can result from expenditures in another; government expenditures leak in and out of a state. In the absence of data to deal with these problems, we assume that all leakages, including taxes and multiplier effects cancel out or are equal.

IV Data and Estimation Methods

The expenditure data used in this study are obtained from a United States Senate subcommittee report.[2/] The tax data used are obtained from the Annual Report of the Director of the Internal Revenue Service which lists revenue collection from each state. These tax collection data are the best proxy available on the contribution of each state to federal revenue. These data are therefore not regarded as indicating the true incidence of taxation to each state. Our exogenous variables are obtained from the appropriate yearly editions of Statistical Abstract of the United States, published by the Bureau of the Census.

The expenditures and tax collection data cover fiscal years 1957, 1960, and 1963. The state-by-state data are available for all fifty states but Alaska and Hawaii are excluded from the analysis because of their particular situation. In the estimation we combine cross-sectional data for these three fiscal years to yield the equivalent of a weighted average of three separate sets of relations. In this way we hope to minimize the effects of individual aberrations which occur within a given year. We thus have a total of 144 observations covering the three fiscal years.

Rather than deflate the data to provide expenditures and tax collection in constant dollars we include dummy variables for time, as described earlier, in an attempt to account for changes in price level. The time variables are such that they capture other changing institutional and political factors.

Ordinarily, individual relationships such as Equations (1) - (9) are estimated using ordinary least squares methods. An inherent assumption in this procedure is that the error term in a given relationship is stochastically independent of the regressors. But in a case such as this, where one or more of the regressors in a relation is an endogenous variable, this assumption does not hold. Lack of independence implies that ordinary least square estimates of the parameters will not only be biased, but will not be consistent. The problems associated with the use of endogenous variables as regressors may be partially overcome by one of a number of procedures.

2/ See [6]

The procedure which we use is the one commonly referred to as "two-stage least squares." 3/

V. The Results

The results of two-stage least squares estimation of Equations (1) - (7) are presented in Table 1. We include the estimated coefficients for X_9 and X_{10} although the magnitude and sign of these coefficients are of little interest for our purposes.

As Table 1 shows, the proportion of variance explained ranges from a low of .19 for the expenditure relation on civilian and military salaries (E_5) to a high of .69 for the relation on transfer payments. (E_4) These R^2's, even though not very high in absolute terms, are statistically significant. The low R^2 obtained for the expenditure relation on civilian and military salaries probably reflects the fact that the location of federal employment is not associated with economic activity -- at least it cannot be explained satisfactorily by the economic variables in our model. It should also be added that we assume away an important determinant of the distribution of federal expenditures -- the role of politics.

On the question of the influence of specific variables, we note that the extent of industrialization(X_1)is inversely related to all seven expenditure categories. This indicates that the higher the degree of industrialization, the smaller the per capita expenditures. However, the negative coefficient of this variable is not significant in the expenditure relations for defense research and development and that for defense and NASA procurement.

In contrast with the negative relation between expenditures and the extent of industrialization (X_2) is positive in the expenditure relation of defense research and development as well as defense and NASA procurement. The positive coefficients are consistent with our hypothesis that many of the new highly technological defense industries in this country developed during the post WW II period. These industries

3/ For an explanation of this method, see [1], pp. 258-260.

Table 1

STATISTICAL ESTIMATION OF EQUATIONS (1) - (7)

Dependent Variable	Intercept	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	Y_d	R^2	S_e
E_1	33.534	-.254 (.078)	-.250 (.387)	-.284 (.054)	*	*	*	*	*	3.368 (1.827)	4.011 (1.827)	*	.30	9.0
E_2	-50.915	-.564 (.343)	3.521 (1.154)	1.129 (.162)	-1.163 (.859)	.003 (.006)	*	*	*	8.130 (5.216)	13.551 (5,216)	*	.33	25.6
E_3	-68.036	-.756 (.797)	3.400 (2.679)	2.633 (.376)	-4.664 (1.995)	.030 (.015)	*	*	*	13.853 (12.115)	14.557 (12.115)	*	.41	59.4
E_4	23.535	-.583 .253	*	.531 (.168)	-3.014 (.752)	*	5.036 (1.069)	*	*	25.101 (3.912)	49.181 (4.542)	.004 (.008)	.69	18.4
E_5	108.368	-3.170 (.732)	-3.834 (3.071)	1.300 (.501)	*	*	*	.055 (.045)	*	7.796 (14.441)	23.314 (14.441)	*	.19	70.8
E_6	12.049	-.715 (.125)	*	-.179 (.084)	*	*	2.275 (.639)	.010 (.008)	*	-1.550 (2.460)	2.231 (2.460)	*	.30	12.0
E_7	66.681	-1.262 (.265)	-.258 (.919)	-.214 (.161)	-.425 (.683)	.009 (.005)	*	*	7.798 (99.366)	19.009 (3.970)	27.269 (3.970	*	.48	19.450

receive the bulk of defense and NASA expenditures on research, development, and procurement. Recent changes in the extent of industrialization is also entered to explain expenditures on military reserves and civil works, civilian and military salaries, and aid to states and localities. The results show that these expenditures are negatively related to recent changes in the extent of industrialization.

With the exception of the expenditure category aid to states and localities, the relation of the extent of urbanization (X_3) to all seven major categories of federal expenditures is significant. But the relation is negative in the expenditure equations for military reserves and civil works, aid to individuals, and aid to states and localities, and is positive in other expenditure relations. The evidence that more urbanized states receive a larger amount of expenditures on defense research and development and defense and NASA procurement is very interesting because it implies that these expenditures are awarded to defense firms whose headquarters are located in urbanized areas, although this does not imply that economic activity takes place completely in these areas.

Recent changes in the extent or urbanization (X_4) is entered to explain expenditures on defense R & D, defense and NASA procurement, transfer payments, and aid to states and localities. The result indicates newly urbanized areas receive smaller amounts of each of these expenditures.

The amount of engineering construction (X) is introduced to explain defense research and development, defense and NASA procurement, and aid to states and localities for the reason it represents new types of industries and the structure of the economy. This relation is supported by the empirical results in the case of defense and NASA procurement. A possible explanation for the absence of a significant relationship between engineering construction and expenditures for defense research and development is that this expenditure category represents a very selective type of activity. New engineering construction, however, consists of diversified investment and is therefore not sufficiently specific to reflect the amount spent on highly specialized

facilities needed for the performance of defense research and development.

The proportion of population over 65 (X_6) is introduced on the assumption that it indicates characteristics of population useful in explaining transfer payments and aid to individuals. The results indicate a significant positive relation between the explanatory variable and each of the expenditures. This finding is consistent with our hypothesis.

Population density (X_7) is assumed to be related to expenditures on civilian and military salaries, and aid to individuals. The coefficients are not statistically significant although the sign is in the expected direction.

We assumed that expenditures on aid to states and localities are related to increases in student enrollment (X_8), but the coefficient, although positive, is not significantly different from zero.

The coefficient of disposable income (Y_d) is positive in the expenditure relation on transfer payments but not statistically significant. This implies that the level of disposable income is not related to transfer payments, although we had expected a negative relationship because of the welfare nature of such payments.

The results of estimation of Equations (8) and (9) are respectively: [4/]

$$\hat{Y}_p = 733.108 \underset{(9.515)}{-85.667E_1} \underset{(4.201)}{-25.641E_2} \underset{(2.511)}{+12.201E_3} \underset{(4.033)}{-7.631E_4} \underset{(1.147)}{-1.750E_5}$$

$$+37.226E_6 +3.227E_7 +.553X_5 +109.305X_6 + 707.342X_9 +803.507X_{10}$$

$$R^2 = .85 \qquad S_e = 183.35$$

$$\hat{T}_p = -289.337 \underset{(.014)}{+ .268Y_p} \underset{(13.825)}{-14.018X_9} \underset{(14.707)}{-34.301X_{10}}$$

$$R^2 = .74 \qquad S_e = 66.69$$

[4/] The tax function is reformulated to estimate a relation in which a different intercept and slope is provided for each year as:

$$T_p = \underset{(.024)}{-.244.720 + .244Y_p^{57}} \underset{(.024)}{+ .261Y_p^{60}} \underset{(.024)}{+ .299^{63}_{p}} \underset{(68.186)}{-44.230X_9} \underset{(72.148)}{-148.831X_{10}}$$

This is the equivalent of a separate relation for each of the three years. It enables us to observe changes in the marginal propensity to tax over the period under consideration.

Equation (8) is estimated here predicts personal income. From equations (8), (9), and (10), we obtain an estimated relation for disposable income as:

$$\hat{Y}_d = 247.30 \ -62.71E_1 \ -18.77E_2 + 8.93E_3 \ -5.59E_4 \ -1.28E_5 + 27.25E_6$$
$$+2.36E_7 + .40X_5 + 80.01X_6 + 503.75X_9 + 553.87X_{10} .$$

In examining the personal income relation, we note that welfare-oriented expenditures such as transfer payments and service-oriented expenditures such as military reserves and civil works are, as expected, negatively related to income. Low income states receive more of these expenditures and vice versa. Expenditures on defense and NASA procurement which are efficiency-oriented, on the other hand, are positively related to income -- high income states receive a larger amount of these expenditures. However, expenditures on defense research and development have negative coefficients. This probably reflects the particular nature of defense research and development which has to be conducted in sparsely populated areas. In fact, many new military research installations are now constructed in the South and Southwest -- both low income areas. The coefficient of expenditures on aid to individuals is positive and significant. The coefficients of expenditures on aid to states and localities and civilian and military salaries are not significantly different from zero, indicating that there are offsetting or compensating factors at work among the specific components of each of these two types of expenditures.

VI. Net Expenditures and Incomes

The model presented in the previous sections was formulated to explain major categories of federal expenditures and to identify the relationship of these expenditures to incomes. No attempts were made to explain why the distribution of net federal expenditures within a state --the difference between federal expenditures in a state and the state's tax contribution to financing the particular expenditures. This section takes up a study of this problem.

In order to study the relation of net expenditures to income and other variables, we need to know the amount of each state's contribution to specific types of federal programs. Since no such data are available, an estimate of this amount is made under the following simplifying assumption: the amount which a state contributes to a particular program is proportional to the allocation of the total federal expenditures for the program. In the years 1957, 1960, and 1963, the total federal expenditures were allocated for various programs in the proportion shown below:

Table II

Distribution of Federal Expenditures by Programs

Types of Programs	1957	1960	1963
Military Reserve and Civil Works	.0202	.0206	.0194
Defense Research and Development	.0512	.0680	.0599
Defense and NASA PRocurement	.3083	.2799	.3011
Transfer Payments	.2215	.2506	.2612
Civil and Military Salaries	.3120	.2744	.2539
Aid to Individuals	.0204	.0156	.0166
Aid to States and Localities	.0666	.0909	.0880
Total	1.0000	1.0000	1.0000

Under the assumption by which Table II is computed, each dollar of tax contribution made by a given state in 1957, 2.02 cents went to military reserves and civil works, 5.12 cents went to defense research and development, 30.83 cents went to defense and NASA procurement, 22.15 cents went to transfer payments, etc. The amount a state contributes to each type of program is given by the product of the proportion shown in Table II and the amount of taxes which the state pays during the particular year.

Having obtained the necessary data on a state's contribution to specific federal programs, we manipulate the relationships contained in the previous section to relate net federal expenditures to income and other variables. Taking a simple average of the proportions given in Table II for the three years, we multiply estimates of equation (9) by each of these average proportions to yield $T_{p_1}, T_{p_2}, \ldots T_{p_7}$. We then subtract each of these seven tax contribution equations, $(T_{p_1}, T_{p_2}, \ldots T_{p_7})$ from the corresponding

expenditure relations (E_1, E_2,... E_7 in Equations 1-7). This gives net expenditure relation for ($E_1 - T_{p_1}$), ($E_2 - T_{p_2}$), ... ($E_7 - T_{p_7}$). Since we are mainly interested in the relation of net expenditures to incomes, only the income coefficients are shown:

Expenditure Category	Coefficient of Y_p
E_1	-.005
E_2	-.016
E_3	-.079
E_4	-.061
E_5	-.075
E_6	-.005
E_7	-.022

We see that the coefficient of Y_p is negative in every relation. These results suggest that net expenditures are related inversely to incomes. In other words, low income states receive a larger amount of net federal expenditures while high income states receive a smaller amount. The negative relationship is consistent with Mushkin's result described earlier.

The negative relationship between net expenditures and incomes is expected, given the hypotheses on which our model is developed. That is, personal income taxes are a direct positive function of personal income, but not a single type of expenditure is a direct function of income, although one of these expenditures (transfer payments) is assumed to be indirectly related to income. The income coefficients in the relation of net expenditures therefore are negative.

It can be reasonably assumed that personal taxes represent leakage while expenditures generate incomes. We can then draw the inference that federal fiscal programs have equalizing effects on income distribution among the states. For certain types of expenditures such as defense and NASA procurement, high income

states may receive more in federal expenditures. But these states pay even more in taxes supporting these programs. The effect is therefore equalizing.

VII Conclusion

The statistical model presented in this paper was developed on the assumption that the distribution of federal expenditures is governed by the objectives and functions of federal programs to deal with social and economic problems and to procure goods and services for government. Social and economic problems as well as the ability of a state to function as a supplier to the federal government are assumed to be associated with the extent of its industrialization, urbanization and other factors. These factors are thus incorporated in our statistical model to explain the distribution of federal expenditures. The results in general are consistent with the hypotheses.

The simultaneous equation approach is still in its infancy as an analytic tool for government fiscal activity. For this reason, the statistical model developed and applied here should be considered as an exploratory one. But the study illustrates that this research methodology can be fruitfully applied to the investigation of the distribution of federal expenditures among regions and states.

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