IMPACTS OF FEDERAL OUTLAYS ON

COUNTY DEVELOPMENT

by

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CHAPTER I

INTRODUCTION

Statement of the Problem

Creating more and better job opportunities, increasing incomes, improving the abilities of areas to attract and retain residents, improving housing, and providing higher quality community services for the people and communities of rural America are the broad goals behind recent governmental action to promote rural development. These goals might be put more concisely into one--the goal of increasing the "quality of life" in rural areas or increasing the feeling of "well-being" experienced by rural residents.

Why must the government be involved? On a personal level, each of us is constantly striving to increase his/her quality of life. The market helps in most cases as we strive for maximizing the income our talents and holdings generate. But in some cases the market has not helped--externalities cause some to gain while others lose and the non-exclusionary and nonrival nature of public goods would prevent their production were it not for government intervention in the marketplace. For example, the market allocates existing housing and determines when more should be built on the basis of supply and demand. But the market outcome, in which low-income groups live in blighted housing, may be socially unacceptable. Defense would not be provided because everyone

would wait for a "free ride" at the expense of someone else. Therefore, government supplements the market outcome at various levels with various kinds of programs.

Federal activities to influence growth in the quality of life have taken many forms over the years: grants and loans to state and local governments, individuals and firms, locations of federal installations, procurement of goods and services, construction of public works, taxation, credit management, technical assistance, and regulatory activities. The largest proportion of federal outlays in recent years have been made in metropolitan counties. For the program areas reported in Table I, 76.2 percent of the total $314,476.3 million 1976 expenditures was distributed in metropolitan counties and 23.8 percent in nonmetropolitan counties. However, the percentage of government outlays going to metropolitan and nonmetropolitan counties is roughly proportional to their corresponding populations. Per capita outlays for the same program areas are summarized in Table II. Residents of metropolitan counties received $1,555 per capita while nonmetropolitan county residents received $1,271 per capita. The federal government seemingly perceives that the need to improve the quality of life for citizens requires approximately equal outlays per capita in metropolitan and nonmetropolitan counties. But do equal dollar amounts of federal outlays imply fairness when needs differ among sectors of the economy?

Data in Table III summarizes some pertinent characteristics of the residents of metropolitan and nonmetropolitan counties. Differing needs are indeed apparent. The median income of families in nonmetropolitan counties was only 73 percent of the median income of the metropolitan counties. Dale Hathaway (13) has concluded that "the returns

TABLE I

DISTRIBUTION OF FEDERAL OUTLAYS FOR SELECTED PROGRAM AREAS FOR METROPOLITAN
AND NONMETROPOLITAN COUNTIES, FISCAL YEAR 1976

Program Area	U. S. Total	Metropolitan Counties	Nonmetropolitan Counties
	(1,000,000 dollars)	(% of total)	(% of total)
Human Resource Development	164,820.7	73.5	26.5
Housing	19,594.6	82.3	17.7
Community and Industrial Development	29,394.6	69.3	30.7
Agriculture and Natural Resources	8,895.4	40.4	59.6
Defense and Space	84,976.4	84.9	15.1
Justice and Law Enforcement	1,601.1	80.5	9.5
General Functions and Administration	5,193.5	94.7	5.3
Total	314,476.3	76.2	23.8
Population, 1975 (millions)	213.0	72.4	27.6

Source: (33, pp. 9-10).

TABLE II

PER CAPITA FEDERAL OUTLAYS FOR SELECTED PROGRAM AREAS, FOR METROPOLITAN
AND NONMETROPOLITAN COUNTIES, FISCAL YEAR 1976

Program Area	U. S. Total	Metropolitan	Nonmetropolitan
	(dollars per capita)		
Human Resource Development	774	786	742
Housing	92	105	59
Community and Industrial Development	138	132	153
Agriculture and Natural Resources	42	23	90
Defense and Space	399	468	219
Justice and Law Enforcement	8	9	3
General Functions and Administration	24	32	5
Total	1,476	1,555	1,271

Source: (33, pp. 13-14).

TABLE III

SELECTED CHARACTERISTICS OF THE POPULATION, BY COUNTY TYPE, 1970

County Characteristic	County Type	
	Metropolitan	Nonmetropolitan
Population, 1970 (thousands)	147,996	55,217
Median Family Income (dollars)	10,406	7,615
Population in Poverty, 1969:		
Total Number (thousands)	16,334	10,791
% of Total Population	11.3	20.2
Dependency Ratio,[a] 1970:		
Total	77.1	86.5
Youth	60.6	65.2
Aged	16.5	21.4
Population 14 Years and Older, Unemployed:		
Total (thousands)	2,612	978
% of Labor Force	4.3	4.7

Source: (16).

[a] Population under 18 (youth) and 65 years of age and older (aged) divided by population 18-64 years of age times 100.

for comparable labor would be about equal if the median income of farm families were 86 percent of nonfarm families" (13, p. 37). Indeed, all residents of nonmetropolitan counties are not farmers but their purchasing power is considerably less than that suggested by Hathaway to equate returns to labor. Population in poverty is almost nine percentage points larger in nonmetropolitan counties than in metropolitan counties.

The dependent population was a larger proportion of the 18 to 64 age group in nonmetropolitan counties than in metropolitan counties in 1970. This implies that more services geared to both the young and the aged are required in nonmetropolitan counties--educational facilities, day-care centers, health facilities, Social Security payments, and so forth. The unemployed population 14 years of age and older as a percentage of the labor force was slightly larger in nonmetropolitan counties. Based on these data, efforts to promote economic development would need to be greater in these counties than the metropolitan counties and could take the form of both human resource development and community and industrial development.

Evaluating the effects of federal programs has been the topic of much research. The results have been unimpressive, as testified by one researcher:

> The most impressive finding about the evaluation of social programs in the federal government is that substantial work in this field has been almost nonexistent. Few significant studies have been undertaken. Most of these carried out have been poorly conceived. Many small studies around the country have been carried out with such lack of uniformity of design and objective that the results rarely are comparable or responsive to the questions facing policy makers.
> The impact of activities that cost the public millions, sometimes billions, of dollars has not been measured. One cannot point with confidence to the difference, if any, that most social programs cause in the lives of Americans (48, p. 15).

Many of the recent suties have approached evaluation on a project-by-project basis, looking at how a water basin project or the construction of a new military installation will affect the surrounding area. Yet there may be many impacts on an area that are not expected or a program that had not been considered by the researchers may affect certain aspects of the area more than the program under evaluation. Generalization of results to other areas is highly suspect, also, since the degree of influence of federal spending varies across the nation.

Objective of the Study

The general objective of the study is to develop and apply a model for the evaluation of federal spending as it affects rural development goals. This model will determine how federal expenditures affect growth in the quality of life—or proxies thereof—across the United States, in metropolitan and nonmetropolitan counties. This objective may be restated as the determination of the cost effectiveness of federal programs or the goal attainment (income, employment, and so forth) achieved per unit of federal outlays.

Procedures and Organization

In Chapter II a brief historical view of federal spending is presented. It is divided into two sections—the period before 1900 and 1900 to the present.

Chapter III presents a theoretical framework for the model to be formulated. This chapter also contains brief summaries of recent studies pertinent to the objectives of this work. Data employed in the

analysis are described in Chapter IV.

The econometric model is presented in its two aspects--economic and statistical--in Chapter V. Generalizations are presented at the end of the chapter.

In Chapter VI the study is summarized. Conclusions are presented and the possibilities for further research are discussed.

CHAPTER II

FEDERAL SPENDING--PAST AND PRESENT

The Formative Years--1780's to 1900

Government spending to promote equity, efficiency, and stability

is an integral part of the national economy today. While promotion of

these objectives to improve the well-being of the nation's populace was

the intent of the increasing role of government in the economy, the

actual impact is far less clear. The forms and purposes of government

involvement have changed markedly over the years.

> . . . based on the available aggregate data, economic historians
> have suggested that the direct contribution of the government
> sector to economic development was quite modest during our
> nation's formative period. Largely, they have been satisfied
> with pointing out the government's contribution to the estab-
> lishment of an environment conducive to growth (23, p. 141).

Fiscal policies undertaken by the federal government during the

nineteenth century may appear haphazard by today's standards of govern-

ment. When demands for expenditures arose, Washington responded by

raising revenues through taxes or the sale of whatever was handy.

When surpluses appeared in the aggregate budget, attention was focused

on their effect on the nation's tariff policy and not in terms of fis-

cal impact. Most of the expenditures were dictated by military require-

ments and administrative expenses (see Table IV).

> When transfer payments, especially Civil War pensions, became
> important relative to total expenditures after the Civil War,
> political pressures rather than rational economic planning
> governed their control. Although it has been contended that

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TABLE IV

OUTLAYS OF THE FEDERAL GOVERNMENT, 1789 TO 1900, SELECTED YEARS

Year	Total	Department of the Army	Department of the Navy	Interest on the Public Debt	Other Total	Other Veterans' Compensation and Pensions
			(1,000 dollars)			
1789-91	4,269	633	1	2,349	1,286	176
1795	7,540	2,481	411	3,189	1,459	69
1800	10,786	2,561	3,449	3,375	1,402	64
1805	10,506	713	1,589	4,149	4,047	82
1810	8,157	2,294	1,654	2,845	1,363	84
1815	32,708	14,794	8,660	5,755	3,499	70
1820	18,261	2,630	4,388	5,126	6,116	3,208
1825	15,857	3,660	3,049	4,367	4,781	1,309
1830	15,143	4,767	3,239	1,914	5,223	1,363
1835	17,573	5,759	3,865	58	7,891	1,955
1840	24,318	7,097	6,114	175	10,932	2,604
1845	22,937	5,753	6,297	1,040	9,847	2,397
1850	39,543	9,400	7,905	3,782	18,456	1,870
1855	59,743	14,774	13,312	2,314	29,342	1,450
1860	63,131	16,410	11,515	3,177	32,029	1,103
1861	66,547	22,981	12,421	4,000	27,144	1,036
1862	474,762	394,368	42,668	13,190	24,535	853
1863	714,741	599,299	63,222	24,730	27,490	1,079
1864	865,323	690,792	85,726	53,685	35,119	4,984
1865	1,297,555	1,031,323	122,613	77,398	66,221	16,339
1866	520,809	284,450	43,324	133,068	59,968	15,605
1870	309,654	57,656	21,780	129,235	100,982	28,340
1875	274,623	41,121	21,498	103,094	108,912	29,456
1880	267,643	38,117	13,537	95,758	120,231	56,777
1885	260,227	42,671	16,021	51,386	150,149	56,102
1890	318,041	44,583	22,006	36,099	215,352	106,937
1895	356,195	51,805	28,798	30,978	244,615	141,395
1900	520,861	134,775	55,953	40,160	289,973	140,877

Source: (43).

the tax structure was not as regressive as has generally
been acknowledged, it can be said that the federal budget
did little or nothing to improve the size distribution
of income (23, p. 144).

From Table IV we see that military spending accounted for over 40

percent of total expenditures between 1815 and the Civil War. Admini-

strative expenses and debt service accounted for most of the remainder,

with veterans' compensation and pensions never exceeding ten percent of

the total.

After the Civil War, military spending quickly lost its dominant

role in total federal spending with veterans' pensions gaining in

importance. By 1895, 40 percent of government spending was for veterans'

compensation and pensions with the Army and Navy accounting for only 23

percent.

The regional distribution of government spending on a per capita

basis from 1816 until the turn of the century is shown in Table V. Both

the Mountain and Pacific regions received large subsidies throughout the

early period of their development. The mountain states in particular

benefited from exceptionally high military expenditures, and, even when

total military spending declined during the last quarter of the century,

the mountain states received a larger portion of the total. For exam-

ple, in 1880, with only two percent of the nation's population, the

region received 40 percent of total military spending (23, p. 148).

Summarizing for the nineteenth century, a few points are pertinent.

First, the decade of the 1860's produced a substantial and permanent

increase in the level of government activity. The Homestead Act of

1862, stipulating that a bona fide settler could receive title to 160

acres free and clear (320 acres if he were married) provided he lived

TABLE V

PER CAPITA AGGREGATE GOVERNMENT EXPENDITURES BY REGION, 1816-99, SELECTED YEARS

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
1816	7.58	9.77	11.20		6.05	.88	3.70		
1820	5.29	6.91	5.41		3.60	1.10	3.18		
1825	4.35	7.33	5.08	11.58	4.04	1.87	5.83		
1830	5.53	13.14	5.23	10.13	3.20	1.04	7.97		
1835	6.37	7.53	5.67	9.53	6.21	1.99	9.94		
1840	9.67	13.04	6.98	10.12	6.37	2.27	9.40		
1845	7.51	7.23	5.30	7.85	5.42	1.95	9.65	2.45	
1850	9.35	8.32	5.90	8.22	9.29	2.18	8.62	19.72	
1855	10.97	11.63	6.67	8.79	13.33	2.59	8.90	11.07	29.60
1859	10.15	10.14	6.99	10.17	11.61	3.48	9.29	29.16	24.61
1871	34.70	22.24	12.95	15.29	17.42	4.88	17.26	58.85	37.80
1875	24.74	17.52	12.34	13.61	15.30	4.93	11.94	51.52	30.48
1880	29.81	21.78	13.76	13.29	13.85	4.64	9.04	36.54	26.19
1885	27.53	18.82	13.99	14.38	15.78	5.72	8.26	29.46	26.05
1890	37.69	22.96	16.75	16.90	20.45	7.49	9.92	33.25	29.01
1895	36.04	21.38	17.08	17.16	18.29	6.88	8.79	25.27	28.34
1899	35.32	24.69	17.89	17.76	20.53	7.44	10.71	27.01	32.11

Source: (23, p. 159).

Note: Figures are three-year moving averages. All figures are in current dollars per capita.

on the land or cultivated it for five years, prevented the then-developing regions from subsidizing the remainder of the economy during periods of rapid growth (28, p. 120). Third, the high costs of pacifying the Indians undoubtedly resulted in the western regions being subsidized by the remainder of the economy. After Appomattox the northeast region of the country benefited for several decades due to the transfer payments received as a result of the Civil War.

The Twentieth Century

In the twentieth century the forces at work prior to 1900 were joined by new forces to continue the upward trend in government activity (see Tables VI and VII). Population changes in terms of density and age distribution, the end of the frontier, advancing science and technology, changes in agriculture, the increasing size of business establishment and enterprise, movement to the cities, higher incomes, swings of the business cycle, and developments in other parts of the world had all contributed.

The increasing density of the population led to economies in the use of public facilities, but the changing age distribution, with the increasing percentage of the elderly in the total population, led to more interest in providing services to this segment of the population—health and hospital services, in particular. The end of the frontier in 1890 turned many toward thoughts of conserving and developing the nation's natural resources.

Advancing science and technology helped stimulate growth in the economy and in government activity. The invention of the automobile led to road building and the improvement of existing roads, the creation of

TABLE VI

OUTLAYS OF THE FEDERAL GOVERNMENT, BY MAJOR FUNCTION,
1900-1939, SELECTED YEARS

Fiscal Year	Total	Major National Security	International Affairs and Finance	Veterans' Services and Benefits	Interest	All Other
			(1,000,000 dollars)			
1900	521	191	1/	141	40	149
1905	567	244	1/	142	25	156
1910	694	284	1/	161	21	228
1915	746	297	5	176	23	245
1916	713	305	6	171	23	208
1917	1,954	602	891	171	25	265
1918	12,662	7,110	4,748	235	198	371
1919	18,448	13,548	3,500	324	616	460
1920	6,357	3,997	435	332	1,024	569
1921	5,058	2,581	83	646	999	749
1922	3,285	929	10	686	991	669
1923	3,137	680	14	747	1,056	640
1924	2,890	647	15	676	941	611
1925	2,881	591	15	741	882	652
1926	2,888	586	17	772	832	681
1927	2,837	578	17	786	787	669
1928	2,933	656	12	806	731	728
1929	3,127	696	14	812	719	886
1930	3,320	734	14	821	697	1,054
1931	3,578	733	16	1,040	628	1,161
1932	4,659	703	19	985	619	2,333
1933	4,623	648	16	863	701	2,395
1934	6,694	540	12	557	770	4,815
1935	6,521	711	19	607	826	4,358
1936	8,494	914	18	2,350	756	4,456
1937	7,756	937	18	1,137	872	4,792
1938	6,792	1,030	19	581	933	4,229
1939	8,858	1,075	20	560	950	6,254

Source: (43).

1/ Included with "All Other" category.

TABLE VII

OUTLAYS OF THE FEDERAL GOVERNMENT, BY MAJOR FUNCTION, 1940 TO 1970

Fiscal Year	Total Outlays	National Defense	International Affairs and Finance	Space Research and Technology	Veterans' Benefits and Services	Health	Income Security	Education and Manpower	Agriculture and Rural Development	Natural Resources and Environment	Commerce and Transportation	Community Development and Housing	General Government	Interest
						(1,000,000 dollars)								
1940	9,589	1,504	52	3	628	48	1,460	73	1,580	481	2,643	28	354	1,049
1941	13,980	6,062	146	8	629	53	1,628	142	1,530	459	2,152	122	384	1,116
1942	34,500	23,970	1,841	12	603	61	1,454	188	1,833	541	3,549	207	480	1,263
1943	78,909	63,212	3,320	23	613	73	1,136	198	785	510	7,515	297	791	1,786
1944	93,956	76,874	3,642	30	709	152	1,080	197	1,228	412	7,740	307	886	2,544
1945	95,184	81,585	3,312	38	1,132	186	1,173	234	1,623	329	4,147	-191	758	3,549
1946	61,738	44,731	2,739	32	3,364	173	2,509	110	478	322	849	-579	885	4,694
1947	36,931	44,015	4,552	35	6,907	146	2,762	97	1,274	554	664	260	1,224	4,903
1948	36,493	13,015	4,651	38	6,445	150	2,782	171	604	770	1,063	100	1,294	5,135
1949	40,570	13,097	6,121	49	6,601	183	3,580	165	2,547	1,089	1,482	295	1,060	5,414
1950	43,147	13,119	4,775	54	8,837	252	4,707	219	2,818	1,246	1,618	250	1,174	5,744
1951	45,797	22,544	3,822	62	5,530	307	4,442	221	691	1,311	1,482	501	1,312	5,628
1952	67,962	44,015	2,954	67	5,350	330	5,206	322	1,086	1,409	1,807	589	1,463	5,834
1953	76,769	50,413	2,268	79	4,522	318	6,128	425	2,965	1,517	1,826	397	1,497	6,450
1954	70,890	46,645	1,503	90	4,341	288	7,760	437	2,373	941	1,118	639	1,247	6,012
1955	68,509	40,245	2,038	74	4,522	271	9,122	573	4,023	493	1,128	12	1,187	6,030
1956	70,460	40,305	2,181	71	4,810	342	9,789	674	3,991	251	1,791	80	1,331	6,292
1957	76,741	42,760	3,074	76	4,870	461	11,522	672	3,082	752	2,171	832	1,643	6,679
1958	82,575	44,371	3,063	89	5,184	540	15,016	820	3,224	870	3,033	109	1,243	6,944
1959	92,104	46,617	3,267	145	5,428	654	17,247	870	5,365	1,193	4,467	851	1,168	7,070
1960	92,223	45,908	3,054	401	5,426	756	18,203	1,060	3,322	1,002	4,790	971	1,327	8,299
1961	97,795	47,381	3,357	744	5,688	873	21,227	1,227	3,340	1,554	5,062	191	1,491	8,108
1962	106,813	51,097	4,492	1,215	5,625	1,130	22,530	1,406	4,122	1,675	5,430	589	1,650	8,321
1963	111,311	52,257	4,115	2,552	5,520	1,379	24,084	1,502	5,138	1,498	5,765	-880	1,810	9,215
1964	118,584	53,591	4,117	4,170	5,681	1,716	25,110	1,751	5,184	1,966	6,511	-185	2,040	9,810
1965	118,430	49,578	4,340	5,091	5,722	1,704	25,702	2,284	4,805	2,056	7,399	288	2,210	10,357
1966	134,652	56,785	4,490	5,933	5,920	2,509	29,016	4,258	3,676	2,036	7,171	2,644	2,292	11,285
1967	158,254	70,081	4,547	5,423	6,897	6,667	31,164	5,853	4,373	1,878	7,594	2,616	2,510	12,588
1968	178,833	80,517	4,619	4,721	6,882	9,608	34,108	6,739	5,940	1,722	8,094	4,076	2,561	13,744
1969	184,548	81,232	3,785	4,247	7,640	11,611	37,699	6,525	6,218	2,169	7,921	1,961	2,866	15,791
1970	196,588	80,295	3,570	3,749	8,677	12,907	43,790	7,289	6,201	2,568	9,310	2,965	3,336	18,312

Source: (43).

state and national parks--places to go in cars, and state police--people

to patrol the roads built for the cars. Advances in economic science

and statistics improved our knowledge of interstate and intrastate dif-

ferences in needs and capacities and increased the statistical and other

fact-finding activities of government. Growth of government work on

sanitation, garbage disposal, health, control of pests, and plant and

animal disease followed the advances in the chemical and biological

sciences.

Changes in agriculture have contributed much to the ways of this

nation.

> Decline in agriculture relative to other industries, already
> well on the way before 1900, turned into an absolute decline,
> in terms of employment, around 1910. Commercialization of
> agriculture was a parallel process of lessening self-sufficiency
> and increasing specialization. These trends, stimulated by
> important changes in technology in and out of farming, illus-
> trate a major theme and contribute to a minor theme of our
> history (10, p. 144).

The major theme is that of the growing economic interdependence that

came as farms became commercialized, as urban industries grew in rela-

tive importance, and as specialization of economic activities increased.

The increasing share of government activity devoted to agriculture be-

came a minor theme in our history. "Viewed as the seed bed of popula-

tion, the chief refuge of the independent spirit and a major segment of

the 'sound middle class' sustaining democracy, it enjoys a unique posi-

tion" (10, p. 144). Many of the increases noted in government activity

were, in one way or another, to aid the farmer far beyond the degree

prevailing in 1900.

Increase in the size of enterprise and fears of exploitation of

farmers by railroads and other industries dealt with in their buying

and selling activities led to the implementation of the Interstate Commerce Commission Act in 1887 and the Sherman Act in 1890. These paved the way for many other government measures to prevent, combat, or regulate industrial monopolies and public utilities. Urbanization directly influenced the need to provide services such as sanitation, waste removal, water supply, recreation and parks, and local transportation. Higher incomes and demands for human capital to provide technology and management for more complex industry provided the impetus for more and better educational services, among other things.

Swings in the business cycle motivated more government activity. The New Deal legislation to cope with problems generated by the Depression was one of the largest steps in the continuing upward trend. Later, prosperity played its part, also, by providing the means and motivation for greater economic security (i.e., Social Security) and equity (welfare program).

The onslaught of war caused a rapid increase of government expenditures for equipment, vehicles, and ships. The residual effects of war and preparation for or against it also had their influence on government activity: veterans' benefits and higher tariffs to protect war-born "infant industries."

This has been a brief summary of almost 200 years of federal spending in the United States. In the next chapter, the theoretical framework for a model to analyze government spending will be developed and previous studies in this area will be reviewed.

CHAPTER III

THEORETICAL FRAMEWORK OF THE MODEL AND

REVIEW OF PREVIOUS STUDIES

Theoretical Framework of the Model

According to Siebert (34), a policy problem is composed of three

elements: the goals the policy makers desire to attain, the actual

situation, and the set of instruments available for use in transforming

the actual situation into the desired one. For this study the goals

have been set down by the Secretary of Agriculture to the Congress in

the Third Annual Report on Rural Development Goals:

> Employment: Assist in the creation of a climate
> conducive to growth in the employment base of rural America,
> thereby providing a range of job opportunities for those
> who wish to live in rural areas.
> Income: Contribute to the development of job
> opportunities in rural areas which generate incomes equal
> in terms of effective purchasing power to those in metro-
> politan areas.
> Population: Support a 'balance' between rural and
> metropolitan populations compatible with the overall
> national quality of life and economic health.
> Housing: Facilitate the attainment of access to
> standard quality housing in rural areas equal to that in
> metropolitan areas.
> Community Services and Facilities: Aid local govern-
> ments and other entities to provide access to adequate
> community services and facilities in rural areas (5, p. 2).

If a deviation exists between the actual and desired situations

and indications are that the system will not reach the goals by itself,

a change in government activity with respect to some of the goals may

be merited. Three problems then arise: (a) the need for information on all existing and politically feasible means; (b) knowledge of the effects of these policy measures on the relevant variables; and (c) the choice of instrument(s) best suited to the attainment of the desired situation.

Policy measures relating to regional growth problems control and influence a long-run phenomenon. Having an impact on the location of private activities, they represent an important determinant of the economic landscape and obtain effects which are usually irreversible in the short-run. These decisions on instrument variables for regional growth policy therefore require careful analysis. A hypothetical flow chart representation of a policy problem is presented in Figure 1.

Employing a model to explain phenomena of reality, one might initially concentrate on the functional relationships involved, ignoring targets and optimizing procedures for the present. A typical explication model takes into account only those functional relationships which exist between the central variables z_i (i = 1, 2, 3, ..., m) and the explanatory variables x_j (j = 1, 2, 3, ..., n). See relation (1) in Figure 2.

The set of explanatory variables x_j {x_1, x_2, x_3, ..., x_n} can be understood as a system of endogenous and exogenous variables being interdependent of each other. Some of the explanatory variables are "farther away" from the central variables than others. Thus x_n may not directly influence z_1, but z_1 may be a function of x_{10} which in turn may depend on x_n.

Expanding the framework of the model, relation (2) denotes the functional relationship between the set of instrument variables
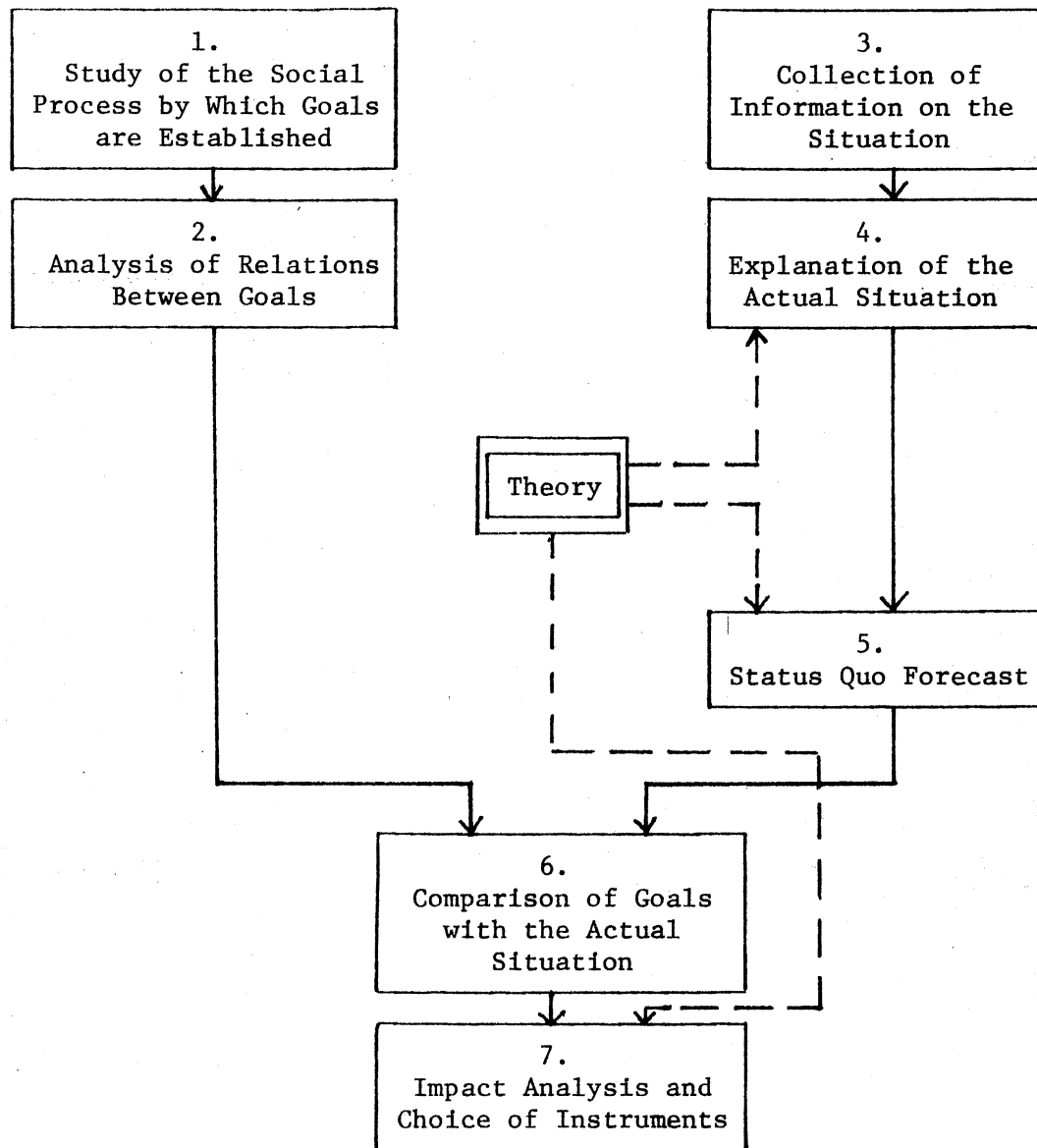
Source: (34, p. 162).

Figure 1. Flow Chart of a Policy Problem

Target Variables   Explanatory Variables   Instrument Variables

Z_1 $\xleftarrow{\text{relation } (1_1)}$ $\{x_1,\ x_2,\ x_3,\ \dots,\ x_n\}$ $\xleftarrow{\text{relation } (2_1)}$ $\{m_1,\ m_2,\ m_3,\ \dots,\ m_k\}$

Z_2 $\xleftarrow{\text{relation } (1_2)}$ $\{x_1,\ x_2,\ x_3,\ \dots,\ x_n\}$ $\xleftarrow{\text{relation } (2_2)}$ $\{m_1,\ m_2,\ m_3,\ \dots,\ m_k\}$

.   .   .

.   .   .

.   .   .

Z_m $\xleftarrow{\text{relation } (1_m)}$ $\{x_1,\ x_2,\ x_3,\ \dots,\ x_n\}$ $\xleftarrow{\text{relation } (2_m)}$ $\{m_1,\ m_2,\ m_3,\ \dots,\ m_k\}$
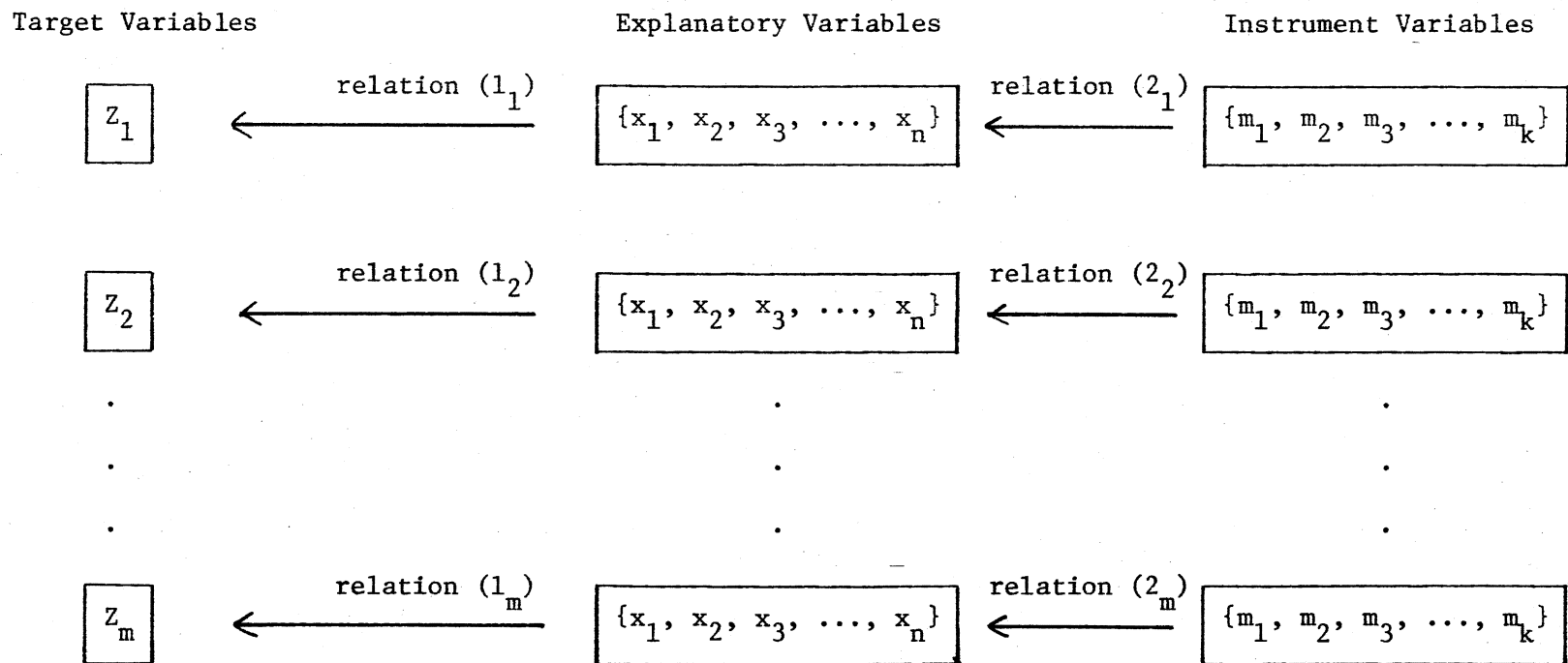
Figure 2. Theoretical Framework of the Model

$\{m_1, m_2, m_3, \ldots, m_k\}$ and the explanatory variables $\{x_1, x_2, x_3, \ldots, x_n\}$. Information on this relation is often called the impact analysis of instrument variables and is an important element for decision making. If information of this type is included in an explication model, the theoretical framework may be used to analyze the effects of changes in the instrument variables on the central (target) variables.

Tinbergen (36) has summarized the procedure of policy making into five stages: (1) ascertaining the actual state of affairs; (2) determining if this diverges from the desired situation; (3) estimating the effects of possible alternative economic policies; (4) making a decision; and (5) executing that decision. He further points out that economic analysis cannot provide a complete treatment of problems of economic policy due to the "extra-economic" elements involved (e.g., the choice of aims). It can, however, help to

> (a) judge the consistency of the aims assumed, and of the aims and means as a combination . . . By detecting inconsistencies it may (b) narrow down the possibilities and so contribute to the solution. Finally it can also . . . (c) determine the values of instrument variables in problems where targets or more general aims have been sufficiently specified and cannot be shown to be inconsistent (36, p. 9).

Therefore, a model such as that depicted schematically in Figure 2 would allow us to attain the goals of this study. Before this model is developed, however, it may be of use to review previous research into this policy problem.

Review of Previous Studies

Most prior literature analyzes the impacts of individual programs, in effect attempting to isolate the study area from other changes that

must be affecting it economically as well as in other ways just to determine the influence of a specific project (1, 2, 11, 25, 40, 49). Previous efforts at an analysis of the effects of aggregate categories of federal spending have been few.

Local Government Spending

George B. Pidot, Jr. (31) employed principal component analysis in an effort to explain local government fiscal patterns for 1962. Beginning with a large number of explanatory variables thought to be relevant a priori, principal component analysis was used to create a number of uncorrelated measures identified as describing certain basic characteristics of the core areas of the 80 largest SMSA's of the United States at that time. These indices were then used along with some specific fiscal measures as explanatory variables in regression analyses of the fiscal patterns.

Demographic variables were hypothesized to influence both demand for services and the difficulty of providing them. Population size and density were both included. Rate of population growth, both total and that due to migration, was hypothesized to affect expenditures for capital projects.

Age variables were included as proxies for the needs of specific groups, e.g., medical care for the aged and education for the young. To determine how the presence of large non-white populations affected spending patterns, the variable percent non-white was included. "These variables may be descriptive not only of objective conditions of need but also of attitudinal differences toward the role of the public sector in filling them" (31, p. 178).

Housing characteristics, descriptive of living conditions and, therefore, of demands on the public sector both for current services and for possible redevelopment, were included. Tenure was of particular importance, according to Pidot, since renters were hypothesized to be less sensitive to property taxes than owners and to have different ideas about the community's development, being more concerned with current services than long-term needs. The level of personal income was included under the hypothesis that it was likely to have an effect on the type of demands placed on the local government. Variables were included to measure state and federal outlays, with the expectation that where either outlay (or both) were higher, other things being equal, local ones would be lower. Two financial variables were included: "debt-owed" and "security holdings."

The set of independent variables was reduced to six relevant principal components: metropolitanism, wealth, size, age-poverty, commercial-residential, and stagnation. The degree of metropolitan development, the level of general wealth, and the index of size had widespread, substantial effects on expenditures, increasing per capita outlays for all but a few functions, and causing shifts in revenue patterns as well. State aid was seen to be highly stimulative for many local programs and for effort; federal aid was shown to have a similar but less clear-cut and narrower range of effects.

State and Local Government Spending

A 1968 study by Horowitz (20) was based on the hypothesis that interstate differences in the per capita quantity of public goods and services supplied by state and local governments combined are affected

by (1) interstate differences in need for such services, (2) differences from state to state in fiscal capacity, and (3) differences in the effort made to raise taxes by the various states and localities. The level of per capita personal income has traditionally been used as a measure of a state's fiscal capacity, that is, the ability of the state and local governments within a state to raise revenue for public purposes. Tax effort—taxes collected relative to fiscal capacity—was used as an indicator of a state's preferences or need for public goods and services, at least to the extent that the state's population is willing to pay for them. Other principal variables were demographic in character: size of population, population density, percent residing in urban areas, and percent non-white. Two measures of federal aid were included—overall revenue from the federal government per capita and per capita in-aid.

The study employed a simultaneous-equation approach because

many explanatory variables are themselves affected by the level of state and local expenditures and/or employment, and because revenue from the federal government, which is often treated as an exogenous variable, should be explained within the context of the model since federal aid represents a sizeable proportion of expenditures and is itself affected by many of the variables hypothesized to affect state and local expenditures and employment (20, pp. 474-475).

Principal findings include:

(1) the higher the level of per capita income, the higher were per capita state and local governmental expenditures and employment;

(2) the distribution of income as measured by a Gini coefficient was not very important as a determinant of governmental expenditures when the effects of other factors were taken into account;

(3) there was a positive relationship between the effort and the amount of public goods and services provided, as measured by both public

expenditures and employment;

(4) results for both urbanization and population size when income and tax effort were held constant indicate that there exist economies in the provision of public goods and services to large, as compared to small populations (these were negated, however, when the effects of federal assistance were considered);

(5) population per square mile was of little value in explaining interstate differences in overall public expenditures of public employment when the effects of other more important variables were taken into consideration, though it was useful in explaining interstate differences in expenditures for particular governmental functions; and

(6) it was estimated that for states with the same per capita income, tax effort, and distribution of income, state and local expenditures per capita increased by $1.26 for each increase of one dollar in per capita federal grants-in-aid and by only $1.01 for each one dollar increase in per capita revenue from the federal government.

> Evidence is presented that federal grants-in-aid do play an income equalization role. It is estimated that for two states which are similar with respect to state and local government expenditures per capita, the one with the lower level of per capita income receives an extra $.03 per capita in federal grants-in-aid for each one dollar difference in per capita income. The reduced form equation for per capita federal grants-in-aid conforms, however, with the findings of others that there is no statistically significant relationship between income and federal grants-in-aid. The reason for the difference between the structural and the reduced-form parameters appears to be that income affects other variables which in turn affect the level of federal assistance. As a result, when per capita federal grants-in-aid are regressed on per capita personal income without holding the other important determinants of federal aid constant, the relationship between income and federal grants is obscured (20, pp. 475-476).

Impact of Federal Aid on State and Local

Government Expenditures

Jack Osman (30) hypothesized a dual role for federal aid in its

impact on state and local government expenditures: possible stimulation

of expenditures on a particular function by aid to (1) that function,

and (2) all other functions. For the purposes of his study stimulation

was defined as an increase in state and local expenditures on a given

function from their own revenues as a result of federal aid to that

function.

> The finding of a positive relationship between aid to other
> functions and per capita outlay on a given function may be
> attributed either to the release of funds (income effect)
> or to the existence of complementarity between functions,
> or both (30, p. 371).

In his analysis, Osman (30) attempted to explain per capita general

expenditure by state and local governments on individual functions through

the use of the following independent variables: per capita income,

percent urban population, population density, the rate of population

growth, federal aid to the function (if applicable), and all other federal

aid. In addition, local public school attendance per 1,000 of population

and the percent of students in excess of capacity were considered for

total education and for local schools; mean temperature, elevation

range, and motor vehicles registered per 1,000 population, for highways;

and various measures of age distribution were considered for welfare,

and health and hospitals. His regression analysis results are summarized

in Table VIII, with the sampling error of the regression coefficient

appearing in parentheses below the respective coefficient.

From the first equation we see that for each $1.00 increase in per

capita personal income total general expenditures per capita increased

TABLE VIII

REGRESSION EQUATIONS FOR PER CAPITA GENERAL EXPENDITURES
BY SELECT FUNCTIONS: 1960

Function

(1) Total General

$R^2 = 0.789$

$$T/N = -2.60268 + \underset{(0.00955)}{0.09858} \ (Y/N) + \underset{(0.20239)}{1.93583} \ (F_T/N)$$

(2) Education: Total

$R^2 = 0.824$

$$E_T/N = -66.24166 + \underset{(0.00502)}{0.04106} \ (Y/N) + \underset{(0.09000)}{0.21875} \ (N_{SL})$$
$$+ \underset{(0.82952)}{5.11370} \ (F_E/N) + \underset{(0.09012)}{0.51923} \ (F_{T-E}/N)$$

(3) Local Schools

$R^2 = 0.809$

$$E_{LT}/N = -54.41263 + \underset{(0.00389)}{0.03682} \ (Y/N) + \underset{(0.64289)}{2.70713} \ (F_E/N)$$
$$+ \underset{(0.06985)}{0.33439} \ (F_{T-E}/N) + \underset{(0.06978)}{0.17965} \ (N_{SL})$$

(4) Higher Education

$R^2 = 0.677$

$$E_H/N = 3.81511 + \underset{(0.32709)}{2.59093} \ (F_E/N) + \underset{(0.03453)}{0.14579} \ (F_{T-E}/N)$$

(5) Highways

$R^2 = 0.830$

$$R_T/N = 47.09277 + \underset{(0.09660)}{1.37379} \ (F_E/N) - \underset{(0.10877)}{0.29879} \ (S_z)$$

(6) Public Welfare

$R^2 = 0.805$

$$W/N = -18.00123 + \underset{(0.04198)}{0.21422} \ (U) + \underset{(0.37340)}{1.29032} \ (A_{65})$$
$$+ \underset{(0.10882)}{1.37649} \ (F_W/N)$$

(7) Health and Hospitals

$R^2 = 0.474$

$$HH_T/N = 7.64708 + \underset{(0.00167)}{0.00432} \ (Y/N) - \underset{(0.15858)}{0.24723} \ (A_{21})$$
$$+ \underset{(1.28143)}{2.08672} \ (F_{HH}/N)$$

(8) General Control

$R^2 = 0.682$

$$GC/N = -2.99096 + \underset{(0.00078)}{0.00503} \ (Y/N) + \underset{(0.01478)}{0.07307} \ (F_T/N)$$
$$+ \underset{(0.01726)}{0.04828} \ (\Delta N/N)$$

TABLE VIII (Continued)

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(9) Interest $\quad$ $I/N = -9.13834 + 0.00665 \, (Y/N) - 0.04577 \, (F_T/N)$
$$ (0.00091) (0.01609)$$

$R^2 = 0.625$

$$+ 0.09516 \, (S_\%)$$
$$(0.03198)$$

Where:

$\qquad N$ = state population

$T, E_T, \ldots, I$ = expenditure on the indicated function, so that T/N, for example, is per capita total general expenditure

$\qquad Y/N$ = state personal income per capita

$F_T/N, \; F_E/N, \; \ldots \; F_{NN}/N$ = per capita federal aid to the indicated function

$\qquad F_{T-E}/N$ = per capita federal aid to functions other than education

$\qquad N_{SL}$ = number of students attending local public schools per 1000 of state population

$\qquad S_\%$ = percent of state and local revenue derived from state sources

$\qquad U$ = percent of population living in urban areas

$\qquad A_{65}$ = percent of population 65 years and over

$\qquad A_{21}$ = percent of population below 21 years

$\qquad \Delta N/N$ = percent increase in state population: 1950-1960

Source: (30, p. 366).

by nearly $0.10, while each $1.00 increase in federal aid per capita

was associated with a $1.94 increase in per capita state and local

outlay. "Since the regression coefficient of federal aid exceeds unity

(1.94 > 1.00), stimulation is implied" (30, p. 367). Each $1.00 of federal

aid was associated with a $0.94 increase in outlay from the state and

local governments' own revenue sources. In fact, total federal aid per

capita stimulated total educational expenditures, total highway expendi-

tures, welfare expenditures, and total health and hospital expenditures.

Osman (30) concluded that "federal spending has had the effect of stimu-

lating those functions to which it has been directed, and that the result

has not been merely to substitute federal for state and local funds" (30,

p. 371).

Looking at the impact of federal aid to other functions, two argu-

ments for the existence of a positive impact were presented: first,

federal aid to a given function could release resources for use in

other functions, for debt retirement and/or for tax reductions.

Secondly, the receipt of federal aid which, in general, will increase

outlay for the function to which it is directed, also may lead to in-

creased outlays for complementary functions. The equation for total

educational expenditures indicates that each $1.00 increase in federal

aid to all functions other than education was associated with a $.52

increase in educational expenditures. Each additional $1.00 of federal

aid to functions other than education increased total local school

expenditures by $.33 per capita, thus "indicating that funds were re-

leased from other functions to education, or that local school educa-

tion is a function complementary to other functions, or both" (30, p.

369).

Wallace E. Oates (29) took exception with Osman's procedures and interpretation. He contended that serious econometric bias existed in the estimated coefficients of the aid variables. Since most federal grant programs are of the matching variety, i.e., the amount of aid received depends on the level of spending undertaken, Osman's independent variable (aid received) was a function of his dependent variable (the level of spending on a particular function). In fact,

> . . . a major conclusion of his study, the dual effect of grants, is highly suspect, for one could hardly expect a significant stimulative effect on spending for one function if the funds are "leaking away" to other programs (29, p. 220).

Federal Expenditures-A 1963 Study

The basic approach of a study by Weidenbaum (47) was to select typical programs within each major category of federal expenditure and to compare their patterns of regional distribution among each other and with that for population and personal income in the United States. The data used were from fiscal year 1963. In the aggregate, the analysis accounted for the bulk of federal expenditures in that year and for representative programs in each major category, such as purchases of goods and services, grants-in-aid, transfer payments, subsidies, and direct government employment. Two measures of relative equality among the expenditure and income series were used: Gini coefficients and single percentage shares.

Federal programs were classified as progressive, proportional, or regressive "depending on their influence on regional income differential" (47, p. 176). The progressive programs were those tending to reduce the inequality in the distribution of personal income among regions.

Those having little or no effect on regional income distribution were labelled proportional, and the regressive were those tending to accentuate inequality in the geographic distribution of income. Results are presented in Table IX.

In the progressive category, there is an array of federal programs, ranging from grants-in-aid to subsidies to transfer payments. All of the civilian government programs analyzed fell in this group, except for NASA procurement and direct federal employment. Farm support payments ranked the highest, indicating they are more oriented to the low-income regions than the other categories of the study. The second ranking progressive program was the then-new aid to education program, which had a built-in anti-poverty orientation.

Over-all, the lowest income regions (at the time of this study the Southeast and the Southwest) received 35 percent of federal civilian expenditures, compared to 30 percent of the population, and 23 percent of total personal income. Conversely, the two highest income regions--the Farm West and the Mideast--received only 30 percent of these federal civilian expenditures, compared to 34 percent of the population and 39 percent of the income. Thus, Weidenbaum (47) concluded that the spatial pattern of distribution of these federal nondefense programs tended to reduce regional income inequality.

Direct wage and salary payments to federal employees was the only "program" in the proportional category. The regressive category consisted of defense and NASA purchases from private industry. The Department of Defense purchases were less regressive. The slightly less regressive over-all position of military purchases "from the inclusion of a large amount of medical, office, ordnance, and similar

TABLE IX

RANKING OF FEDERAL EXPENDITURE PROGRAMS, 1963

Program	Gini Coefficient
Progressive	
Farm Price Support Payments	-.410
Aid to Elementary and Secondary Education	-.172
Nondefense Composite	-.071
Public Assistance	-.061
Highway Grants	-.048
Corps of Engineers Projects	-.046
Veterans Pensions and Compensations	-.035
Reclamation Projects	-.028
Proportional	
Government Employees Wages and Salaries	+.016
Regressive	
Defense Procurement	+.232
NASA Procurement	+.322

Source: (47, p. 175).

supplies provided by more traditional industries" (47, p. 175).

For each of the eight income regions identified by Weidenbaum (47), the federal program from which it received its largest share compared to all other programs is listed in Table X. The program from which a region obtained its smallest share is also listed.

The study indicated, in general, that the low income states tended to receive a larger than proportional share (in relation to a simple per capita distribution) of expenditures for the nondefense public programs. The high income states tended to receive a larger than proportional share of expenditures for defense and space programs,

> . . . reflecting the dependence on the high industrialized areas for the design and production of weapon and space systems. Hence, a shift in the federal budget from defense to nondefense activities--assuming no fundamental alteration in the geographic distribution pattern of individual public programs--would tend to narrow income inequality among the various regions of the U. S. Conversely, a shift to defense programs would tend to widen the range of income inequality among regions, at least under present conditions (47, p. 176).

A basic limitation of this analysis was that the data were limited to the geographic distribution of income and federal expenditures and did not directly shed light on questions of income-class distribution. That is, the finding that federal payments for farm subsidies went primarily to low income states would not signify that these funds necessarily go to low income individuals in any significant proportion. However, it would appear that a shift from defense to nondefense government spending might tend to reduce income class inequality because so much of defense spending is utilized for managerial, professional, and highly-skilled employees, dividend recipients, and similar above-average income groups. Much additional research needs to be done along these lines before any findings can be offered with confidence.

TABLE X

RANKING OF PROGRAMS IDENTIFIED AS LARGEST AND SMALLEST
SHARE RECEIVED BY REGION, 1963

Region	Program in Which it Obtains Largest Share	Program in Which it Obtains Smallest Share
Far West	NASA	Farm Subsidies
Mideast	Defense	Reclamation
New England	Defense	Reclamation
Great Lake	Highways	Reclamation
Plains	Farm Subsidies	Defense
Rocky Mountains	Reclamation	Corps of Engineers
Southwest	Reclamation	NASA
Southeast	Education	Reclamation

Source: (47, p. 175).

Federal Expenditures-A 1966 Study

The Committee on Government Operations published a report in 1966 in which they examined the regional and state distribution of aggregate flows of federal funds and of selected categories of federal programs in order to determine the relationships between these expenditures and the population and personal income within the states (41). Data for the years 1957, 1960, and 1963 were examined.

Tendencies picked up from the analysis include a strong, direct relationship between federal expenditures and population; states with more people tended to receive more federal expenditures. States with more personal income tended to receive more federal expenditures, also. After allowing for the impact of other federal expenditures, however, it was clear that per capita expenditures for military reserves and civil works, direct federal payments to individuals other than for wages and salaries, and grants to states and localities were inversely related to per capita income. Although richer states tended to receive more federal expenditures in general, and defense expenditures in particular, poorer states tended to receive more per person in aid to individuals, grants to states and localities, and spending for military reserves and civil works.

The Committee concluded:

> The generally direct relationship between per capita
> income and federal expenditures, then, indicate that this
> spending did not have an equalizing effect. This was par-
> ticularly true of per capita Defense and NASA procurement
> and per capita transfer payments . . . Therefore, the
> overall tendency was for the "richer" States to have
> greater shares of federal spending (aggregate and per
> capita) and to "prosper" more than the "poorer" States,
> with lower levels of per capita income (41, p. 60).

Development Policies--A Simulation Analysis

Clark Edwards and Rudolph DePass (8, 9) conducted two studies, one
an extension of the other, that dealt with improvement in nonmetropoli-
tan prospects for population, income, and employment. A simulation
model of 21 equations was developed, applying data for the metropolitan
and nonmetropolitan sectors of the U. S. economy as of 1960 and 1970.
Projections were run to 2020, with targets for balanced growth set for
1990. Alternative futures associated with various nonmetropolitan de-
velopment strategies were assessed.

The seven types of policies considered were limited migration,
reduced natural increase of population, labor force expansion, job crea-
tion, resource productivity improvement, capital stock accumulation,
and expansion of export markets for nonmetropolitan products. This
study simulated these activities as being pursued by the federal govern-
ment with the goal of closing the per capita income gap between the two
sectors by 1990. Most of the single strategies simulated attained the
target income. "In each instance, however, it was found that pursuing
a single strategy led to unwanted side effects" (8, p. 2). In meeting
the target income, for example, nonmetropolitan unemployment might rise
or the pace of outmigration might accelerate. Strategies to directly
inhibit outmigration from a lower income sector were found to further
depress the average level of income of that sector.

Examination of the results of the pure strategies suggested that
any mixed strategies tried should concentrate on combining elements of
labor force participation, job creation, productivity improvement, and
capital accumulation while excluding policies related directly to

population growth, migration, and export markets. Perhaps the study's

most important finding was that

> . . . an isolated strategy pursued by a single agency toward
> a narrow objective is likely to fail, even though the spe-
> cific target is met, because of unwanted side effects. Only
> mixed strategies coordinated among agencies toward balanced
> objectives are likely to lead to clear-cut nonmetro develop-
> ment (8, p. 1).

Summary Classification of Analyses

Robert H. Haveman (14) has identified four general types of analy-

sis that have been used in evaluating the impact of public policies on

regional welfare: (1) flow-of-funds impact; (2) benefit and cost

impact; (3) output and employment impact (current account)--"open economy"

and "closed economy;" and (4) output and employment impact (current and

capital account). He has defined a "counsel of perfection" as an ideal

toward which future analyses should be aimed. These are summarized in

Table XI.

In flow-of-funds analysis a particular program is viewed as trans-

ferring funds (command over resources) from one region of a country to

another. In addition to whatever empirical problems such a measurement

approach encounters, it is but a first step in measuring the full area

impact. While a federal program may generate indirect expenditures with-

in regions, stimulate additional investment spending, or induce shifts

in capital investment from one region to another, none of these effects

are captured by evidence on flow of funds. Such estimates provide no

indication of a wide range of other effects which may be induced by a

program: labor supply effects, population migration effects, effects on

costs or technology, environmental quality effects, educational invest-

ment effects, or the behavior responses of state and local governments

TABLE XI

SUMMARY CLASSIFICATION OF REGIONAL ANALYSES

Type of Analysis	Pros	Cons
1) Flow of Funds	Measures funds transferred from one region to another.	Does not measure: a) costs and benefits; b) labor supply effects; c) migration effects.
2) Benefit and Cost	Evaluation of direct benefits and direct costs imposed from a federal program.	Ignores indirect multiplier effects. Does not measure: a) dynamic investment spending effects; b) labor supply effects; c) migration effects; d) environmental effects; e) cost reduction effects.
3) Output and Employment Impact (Current Account)	Estimates direct and indirect demands on industry and occupations in location of project and other areas.	Does not measure: a) induced capital effects; b) impact on industrial costs; c) impact on location; d) migration effects; e) impact on labor decisions.
4) Output and Employment Impact (Current and Capital Account)	Estimates direct and indirect current account impacts on a) regional employment; b) output and income. Estimates induced capital investment effects on a) regional employment; b) output and income.	Comparative static framework used--dynamic leverage effects not captured. Does not measure a) migration effects; b) demographic effects; c) environmental effects.

(among others) to the program.

The evaluation of the direct benefits and direct costs imposed from a federal program lead to somewhat more comprehensive estimates of regional impact. Evaluation of these effects takes into account the productivity of a public program as well as the income losses imposed on a state or region from the program. The indirect or regional multiplier effects of the program, the dynamic investment spending effects, and the labor supply, migration, environmental, and cost reduction effects of the program are left unmeasured.

In an output and employment impact (current account) study, the direct and indirect effects of a policy on regional output and employment are analyzed. If the regional economy is assumed to be open, the expenditure of federal funds on a regional project is viewed as stimulating an increase in output and employment from industries and occupations in both the region of project location and in other regions. These output requirements in turn generate indirect output and employment demands from industries supplying inputs to the final producing sector. The total of both direct and indirect effects is taken to be the impact on the region in which it is located. If the economy is assumed to be closed, direct and indirect output impacts of the expenditure are estimated using an input-output model. While estimates which have been developed from closed models capture what have been called the regional multiplier effects of a program and, hence, extend the comprehensiveness of the regional evaluation framework, Haveman (14) suggests that they fail to capture other regional effects of the program which other frameworks do seek to measure.

A step beyond estimates based on such open and closed models entails estimation of the project-induced capital investment effects on employment, output and income, in addition to the direct and indirect current account impacts on these variables. The estimation of the models is typically done in a comparative static framework; that is, the dynamic leverage effects which are often discussed as the strategic purpose of regional development programs are not captured by models of this sort. Then, also, as with all of the other types of impact analyses, estimates of the migration, demographic, and environmental effects induced by the project are not included.

The "ideal" analytical framework is described below:

> A full evaluation of the welfare effects of a policy measure requires knowledge of the willingness to pay of each citizen for either the benefits of the measure or the avoidance of its costs. These estimates of willingness to pay should capture the present value of future effects as well as current effects and could be grouped by region, income class, or other socio-economic characteristics. Given the stipulation of either regional or individual welfare weights, the relationship of the gains and losses of reallocation from both a national and a regional point of view could be ascertained (14, p. 456).

The gap between the analyses performed and the "ideal" is quite large. Impacts that have not been measured include the discontinuous or strategic dynamic investment impacts of policies or programs and their income generation effects, the effects of policies and programs on regional and national socio-demographic behavior (labor supply, migration, human investment), the impact of policies or programs on industrial location, industrial cost structures, or industrial organization and the income generation effects of each, the impact of policies or programs on broader social and political variables, such as regional environmental quality, public service provision, or the public provision of

infrastructure and the value of these, and the impact of policies or programs on regional income distribution. Another potentially serious defect in existing analyses stems from the fact that typically one program at a time is evaluated, ignoring the interaction between programs and the impacts that may arise from this source.

CHAPTER IV

A DESCRIPTIVE ANALYSIS OF THE DATA

Federal Outlay Data

Data compiled for the Executive Office of the President and
published annually as the Federal Outlays series are used extensively
in this study (39). The outlay figures are reported separately for all
counties by program categories which number over one thousand. They
represent the only comprehensive set of data on federal program outlays
by geographical area.

Outlays are reported on the basis of obligations of government
administered funds, except deposit funds. In the federal government
budget accounting system, "obligations" are funds legally set aside
to be spent, but not actual expenditures. In some cases the dollar
amounts reported in this series for particular programs reflect obli-
gations incurred in the current fiscal year to be spent over a period
of several years. However, "most obligations reported as current fiscal
year outlays accurately represent the level of federal spending during
that year" (39, p. 2).

In some instances feedback on the final geographic distribution is
not sufficiently timely for the agencies to meet their reporting dead-
lines. This may happen where the outlays pass through state governments
or some other intermediaries, such as prime contractors, before reaching

their ultimate recipients.

> A timely and economically feasible means of tracking these
> outlays to the final recipient has not been developed. In
> such cases, the federal agency involved has used a statis-
> tical proration technique which they believe most nearly
> approximates the probable distribution of the funds on a
> geographic basis (39, p. 2).

There were 25 separate proration and allocation methods used in the

1975 data. Some of these were: allocation equally to counties within

a redevelopment district (e.g., Appalachia), allocation to the location

of the state agency or prime contractor's main office, allocation within

the state to counties on the basis of the proportion of the state's

population in the given county, proration on the basis of the fraction

of the state's special group population in a county (e.g., veterans),

proration to state and county by size of geographic area, or reported

in the county where the capital city is located.

Some counties receive larger shares of funds than others simply

because they contain public institutions--state government facilities,

universities, research centers--which are recipients of large amounts

of federal monies. The "county" encompassing the District of Columbia,

for example, receives the largest number of federal dollars for agricul-

tural and natural resource research largely because the United States

Department of Agriculture is located there. In this study, the District

of Columbia was excluded to avoid any bias its presence might cause.

The outlays are likely to report the initial direct federal payment

to the state administering agency or prime contractor. There is a large

probability, however, that much of the money will be transferred to

another location before actually being spent. Locus of impact will not

totally coincide with locus of expenditure, as often assumed in economic

analyses, but it may be hypothesized that first incidence results of the

expenditures are the most significant.

Additional points that deserve mention include:

(1)   outlays are reported <u>only</u> for the Executive Branch of the federal government;

(2)   reporting is incomplete at times for security purposes;

(3)   outlays for insured and guaranteed loan programs include the face value of the loans rather than the cost of the program's operation; and

(4)   information about the activities of certain agencies, boards, and commissions will be found in the report of the agency to which the funds were transferred, or which may have performed the accounting rather than the funding.

Federal spending has been increasing since 1970, consistent with the trends shown in the historical data of Chapter II.   Table XII traces government spending from 1970 through 1975 for each of the 48 states of the continental United States.   (Alaska and Hawaii have been excluded from this study due to inconsistencies in their "county" designations across data sources.)   In nominal terms spending increased 65 percent from 1970 to 1975.   Considering inflation would make the real increase considerably less.

California and New York led all states in money received from the federal government.   Delaware, Vermont, and Wyoming consistently received the least.   California received 11.8 percent of total outlays in 1975 and New York received 11.9 percent, while Delaware, Vermont, and Wyoming each received less than one percent.   Oklahoma's $4.05 billion represented only 1.3 percent of the 1975 total.

The outlays are reported for over 70 agencies (Appendix Table XXXVII)

TABLE XII

FEDERAL OUTLAYS BY STATE, CONTINENTAL UNITED STATES
1970-1975

State	1970	1971	1972	1973	1974	1975
	(1,000,000 dollars)					
Alabama	2,974.6	3,233.7	3,489.6	3,720.9	4,364.9	5,070.8
Arizona	1,830.6	1,993.6	2,320.1	2,621.8	3,002.4	3,710.5
Arkansas	1,564.1	1,695.8	1,827.5	2,041.5	2,338.5	2,627.9
California	22,412.7	23,453.1	25,616.5	28,417.9	31.380.2	36,781.8
Colorado	2,391.3	2,629.5	2,938.6	3,448.2	3,789.9	4,291.7
Connecticut	3,115.9	3,153.0	3,443.2	3,584.8	5,568.8	5,703.9
Delaware	381.8	437.5	475.6	572.9	703.0	685.4
Florida	5,774.1	6,401.0	7,574.4	8,381.2	9,469.4	11,732.4
Georgia	4,271.8	4,524.9	4,780.2	5,225.8	5,579.3	7,048.9
Idaho	839.2	767.3	826.8	925.7	966.9	1,140.9
Illinois	7,793.0	8,060.4	9,030.4	10,459.0	12,094.1	14,365.8
Indiana	3,557.9	3,782.8	4,094.4	4,499.8	4,912.2	5,762.6
Iowa	2,253.3	2,337.4	2,583.1	2,910.8	2,847.9	2,958.8
Kansas	2,247.3	2,351.4	2,544.9	2,771.6	2,856.8	3,290.6
Kentucky	2,348.2	2,813.0	2,931.0	3,440.7	3,961.5	4,648.9
Louisiana	2,633.2	2,932.7	2,985.5	3,516.9	3,907.8	4,799,7
Maine	672.5	784.9	847.1	1,025.2	1,157.1	1,319.3
Maryland	4,519.1	5,325.4	5,490.0	6,657.4	6,783.0	8,015.6
Massachusetts	4,938.9	5,500.5	5,991.8	7,199.9	7,642.9	8,723.1
Michigan	4,730.7	5,549.6	6,119.6	7,222.0	8,094.8	9,661.9
Minnesota	3,263.6	3,340.4	3,608.9	4,018.9	4,033.6	4,672.7
Mississippi	2,320.3	2,401.9	2,567.2	2,737.8	3,668.9	3,830.7
Missouri	4,551.7	5,027.8	6,168.0	6,131.6	6,798.0	7,358.9
Montana	816.1	858.9	1,092.3	987.6	1,044.5	1,163.9
Nebraska	1,408.9	1,513.0	1,618.0	1,813.9	1,736.3	1,925.0
Nevada	606.4	671.9	895.9	696.8	764.0	933.1
New Hampshire	591.6	912.0	775.9	889.9	896.0	1,175.8
New Jersey	6,593.1	7,249.7	7,911.7	9,330.4	10,200.4	11,603.4
New Mexico	1,492.0	1,575.2	1,715.4	1,856.3	2,031.6	2,310.3
New York	21,446.7	23,850.5	25,968.5	31,350.2	32,780.8	36,870.9
North Carolina	3,185.7	3,880.7	4,141.5	4,644.6	5,259.7	6,235.3
North Dakota	1,055.0	935.8	1,088.6	1,059.6	1,010.4	1,130.9
Ohio	6,755.2	7,526.9	7,672.4	9,155.5	9,837.0	11,345.8
Oklahoma	2,560.7	2,955.1	2,947.6	3,306.5	3,587.2	4,050.7
Oregon	1,730.9	1,813.7	1,995.8	2,319.0	2,526.9	3,015.2
Pennsylvania	8,497.5	9,363.2	9,908.4	10,419.7	15,948.3	15,181.6
Rhode Island	743.2	834.1	950.6	1,083.9	1,140.6	1,284.2
South Carolina	1,928.1	2,140.3	2,282.1	2,692.3	3,011.1	3,556.5
South Dakota	700.5	741.9	854.7	1,039.6	883.4	984.8
Tennessee	3,141.1	3,575.3	3,937.9	4,342.9	4,756.2	5,565.2
Texas	11,117.4	12,206.7	12,624.9	13,406.0	14,337.3	16,208.1
Utah	696.3	1,237.4	1,348.1	1,932.8	1,613.7	1,788.9
Vermont	330.2	348.0	408.7	455.5	531.0	659.6
Virginia	4,699.7	6,078.2	6,197.8	6,732.2	8,021.2	9,100.4
Washington	11,942.8	4,410.5	5,100.9	5,370.8	5,637.4	7,106.9
West Virginia	1,190.4	1,393.1	1,536.1	1,860.6	1,967.1	2,423.6
Wisconsin	2,649.0	2,898.2	3,226.0	3,657.4	4,047.3	4,712.2
Wyoming	326.8	364.5	403.9	613.3	491.6	604.8
TOTAL	187,591.3	198,832.5	214,858.4	242,550.0	269,983.0	309,140.4

under 84 function names (Appendix Table XXXVIII). For the purposes of this study those functions were aggregated into 15 categories. These categories were selected to delineate relatively homogeneous categories of spending for analyzing impacts on rural development goals. The expenditure categories are:

(1) farm income stabilization;

(2) rural housing and public facilities;

(3) agricultural land and water resources;

(4) agricultural research (including natural resources);

(5) pollution control;

(6) business advancement and regulation;

(7) area and regional development;

(8) community development (including community planning and management plus urban community development revenue sharing);

(9) housing (including low and moderate income housing aids and maintenance of the housing mortgage market);

(10) health (including development of health resources, providing or financing medical services, and the prevention and control of health problems);

(11) income security (including retirement and social insurance, public assistance, and social and individual services);

(12) education (including vocational education and manpower training);

(13) defense and space;

(14) transportation (including ground, air, and water transportation); and

(15) general government (including general government, interest,

Postal Service, international affairs and finance, general revenue

sharing, and undistributed intra-budgetary transactions).

The breakdown for the 1975 fiscal year is presented in Table XIII.

Income security made up 38 percent of total spending for that year.

Defense and space spending was the next largest category, making up

26 percent of the total. Housing was the smallest category with .03

percent of the total.

Regional summaries for the 15 categories are also presented in

Table XIII. These regions are depicted in Figure 3. The southern region

received the most money from the federal government in 1975, $95.6 bil-

lion. The northeastern region fell into second place, followed by the

northcentral and western regions.

The breakdown of outlays for metropolitan and nonmetropolitan

counties is illustrated in Table XIV. Summarizing briefly, metropolitan

counties received $238.7 billion from the federal government in fiscal

1975 while the nonmetropolitan counties received $70.5 billion. Within

these broad categories, distinctions by county population and contiguity

to a standard metropolitan statistical area (SMSA) have been utilized

to identify nine sub-groups (16):

    (a) Metropolitan Counties

        (1) large--county of a metropolitan area with population of

               1,000,000 or more;

        (2) medium--county of a metropolitan area of 250,000 to

               999,999 population;

        (3) lesser--county of a metropolitan area of 50,000 to

               249,999 population;

TABLE XIII

FEDERAL SPENDING, BY SPECIFIC CATEGORIES, FOR REGIONS OF THE CONTINENTAL
UNITED STATES, FISCAL YEAR 1975

Expenditure Cateogry	Region				
	Continental USA	Northeastern USA	Northcentral USA	Southern USA	**Western** USA
	(1,000,000 dollars)				
Farm Income Stabilization	2,919.7	176.7	1,163.1	1,085.1	494.8
Rural Housing and Public Facilities	454.1	48.1	121.4	226.7	57.9
Agricultural Land and Water	453.8	32.9	146.2	191.3	83.4
Agricultural Research	6,285.5	782.0	1,018.7	2,137.3	2,347.5
Pollution Control	4,524.1	1.307.3	1,472.8	1,044.4	699.6
Business Advancement and Regulation	1,210.6	238.8	189.4	539.9	242.5
Area/Regional Development	879.3	112.7	129.8	360.8	276.0
Community Development	2,805.7	873.2	675.4	813.0	444.1
Housing	101.2	$6.0	63.2	8.5	$23.5
Health	20,469.6	5,312.0	5,905.2	5,730.2	3,522.2
Income Security	117,587.3	29,767.7	30,029.5	37,430.4	20,359.7
Education	11,400.2	2,775.8	2,755.0	3,387.9	2,481.5
Defense and Space	80,431.3	15,392.5	12,014.7	29,378.5	23,645.6
Transportation	11,761.8	2,343.4	2,744.3	4,196.9	2,477.2
General Government	47,870.8	23,352.5	9,741.4	9,084.2	5,692.7
TOTAL FEDERAL EXPENDITURES	309,155.0	82,521.6	68,170.1	95,615.1	62,848.2
POPULATION, 1975 (million persons)	211.1	49.4	57.7	67.4	36.6

Western   Northcentral   Northeastern

Southern
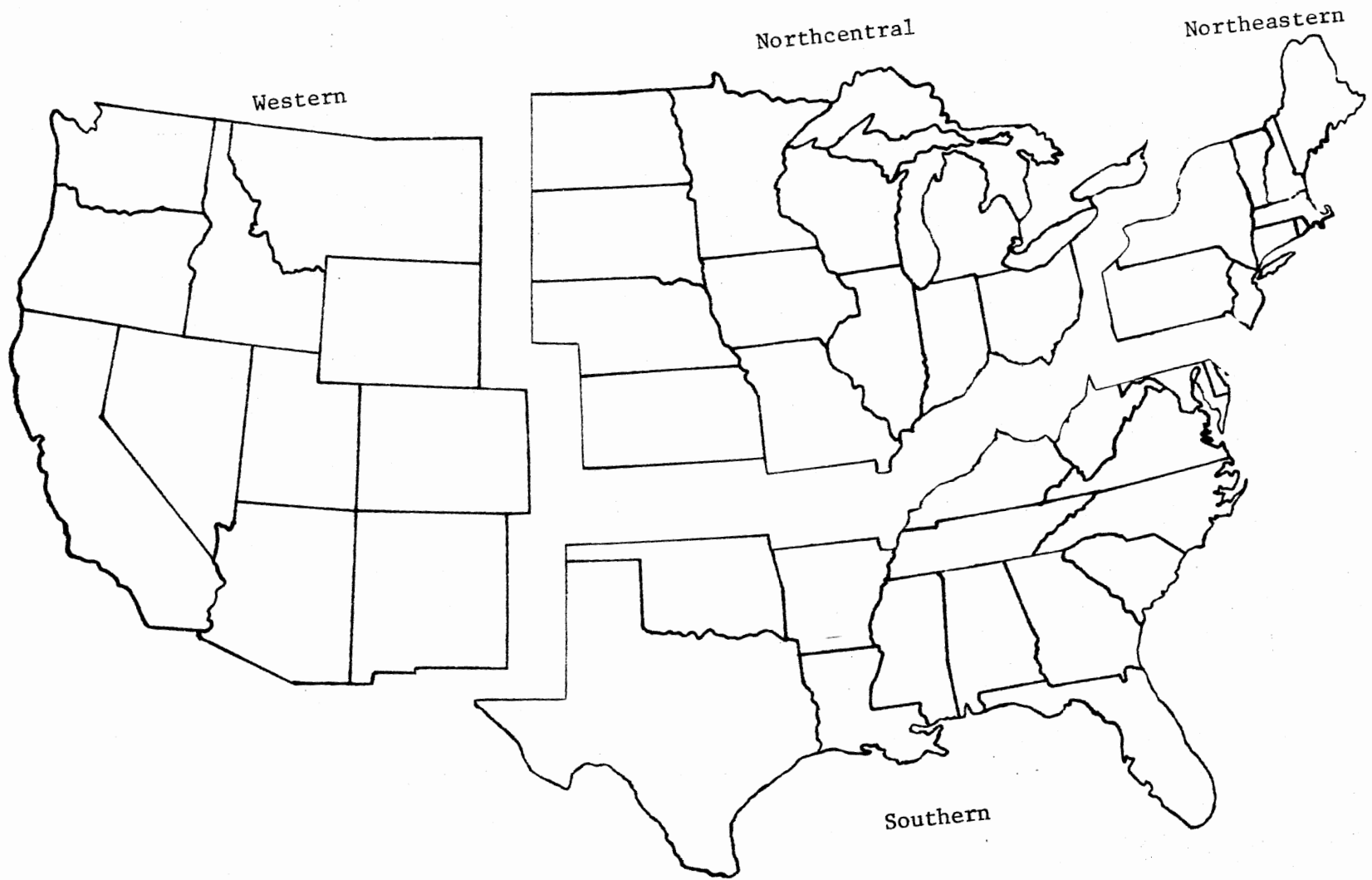
Figure 3. Regions of the Continental United States

TABLE XIV

FEDERAL SPENDING, BY SPECIFIC CATEGORIES, FOR COUNTY SIZE-CONTIGUOUS
GROUPINGS OF THE CONTINENTAL UNITED STATES, FISCAL YEAR 1975

	County Size-Contiguity Grouping								
	Metropolitan			Nonmetropolitan					
				Urbanized		Less Urbanized		Thinly Populated	
Expenditure Category	Large	Medium	Lesser	Adjacent	Not Adjacent	Adjacent	Not Adjacent	Adjacent	Not Adjacent
	(1,000,000 dollars)								
Farm Income Stabilization	654.3	388.0	229.5	204.4	203.7	424.1	486.3	100.1	229.3
Rural Housing and Public Facilities	32.8	56.2	31.7	48.3	24.7	95.0	89.2	19.7	56.5
Agricultural Land and Water	31.2	53.2	42.5	34.5	32.4	75.5	101.2	21.4	61.9
Agricultural Research	2,215.4	1,219.2	573.8	427.8	430.5	338.9	718.0	70.5	291.5
Pollution Control	2,090.9	1,250.0	418.8	391.9	92.4	103.0	135.8	12.3	29.1
Business Advancement and Regulation	705.7	241.2	90.3	59.8	36.8	29.4	30.2	4.2	12.8
Area/Regional Development	90.9	147.6	74.0	78.4	96.6	102.2	149.5	18.0	121.9
Community Development	1,332.7	788.8	297.3	130.7	98.6	61.9	83.8	3.4	8.5
Housing	73.9	23.1	4.0	.1	a/	a/	a/	0.0	0.0
Health	10,571.6	3,921.0	1,477.8	1,150.4	568.1	1,078.7	1,108.3	187.2	406.5
Income Security	48,969.6	25,820.9	10,215.9	8,043.7	4,258.9	7,765.6	8,329.8	1,457.1	2,725.9
Education	4,454.4	3,475.6	1,220.7	762.5	382.3	371.2	442.5	75.6	215.4
Defense and Space	37,808.1	20,088.3	9,345.3	5,520.7	4,296.9	1,468.9	1,323.9	323.2	255.9
Transportation	4,755.0	2,413.8	1,181.0	535.7	496.0	787.7	974.5	211.7	406.5
General Government	26,026.8	10,979.1	2,792.4	2,559.0	1,037.1	1,866.1	1,732.5	281.7	596.2
TOTAL FEDERAL EXPENDITURES	139,813.3	70,866.0	27,995.0	19,947.9	12,055.0	14,568.2	15,705.5	2,786.1	5,417.9
POPULATION (million persons)	85.6	48.3	18.7	15.0	8.0	14.2	14.2	2.5	4.6

a/Amount too small to round to one-tenth of a unit.

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(b) Nonmetropolitan Counties

   (1) urbanized, adjacent to an SMSA—county contiguous to an
       SMSA and having 20,000 or more urban residents (residents
       of a place or township, incorporated or unincorporated,
       of 2,500 or more population);

   (2) urbanized, not adjacent to an SMSA—county not contiguous
       to an SMSA and having 20,000 or more urban residents;

   (3) less urbanized, adjacent to an SMSA—county contiguous
       to an SMSA with less than 20,000 but 2,500 or more urban
       residents;

   (4) less urbanized, not adjacent to an SMSA—county not con-
       tiguous to an SMSA and having less than 20,000 but 2,500
       or more urban residents;

   (5) thinly populated, adjacent to an SMSA—county having less
       than 2,500 urban residents and contiguous to an SMSA;
       and

   (6) thinly populated, not adjacent to an SMSA—county not
       contiguous to an SMSA and having less than 2,500 urban
       residents.

In terms of total federal spending, the metropolitan counties, in
order of their population, received the largest amounts. Within the
nonmetropolitan grouping, the urbanized and adjacent to an SMSA category
received the largest amount, almost $20 billion. Ranking second was
the less urbanized and not adjacent to an SMSA grouping with almost
$16 billion. The smallest dollar amount went to the thinly populated,
adjacent to an SMSA category with approximately $3 billion.

For every county size-contiguity grouping except one, the largest category of federal spending was for income security. That exception was the urbanized, not adjacent to an SMSA category where defense and space spending was slightly larger than spending for income security. It is of interest to note that farm income stabilization spending is largest in the large metropolitan group, with less urbanized nonmetropolitan counties not far behind.

Perhaps a more realistic comparison can be made by examining per capita outlays of the federal government. Table XV presents per capita spending for the four regions of the continental United States presented above. The western region received more on a per capita total outlays basis than any other region. The northeast was second, followed by the southern and northcentral regions. In every region except the west, income security expenditures per capita were the largest. In the western region, defense and space spending was almost $100.00 per capita larger. Agricultural research spending per capita was largest in the western region.

Looking at the metropolitan-nonmetropolitan breakdown in per capita terms, metropolitan residents received $1,564.22 per capita versus $1,205.13 per capita for nonmetropolitan residents. Table XVI presents per capita spending for the above-defined county size-contiguity groupings. The large metropolitan counties fare the best. The urbanized, not adjacent to an SMSA counties received the second largest amount on a per capita basis, followed by the lesser metropolitan and medium metropolitan counties. The less urbanized, adjacent to an SMSA counties received the smallest per capita total. Income security spending per capita was the largest category of federal spending for each grouping

TABLE XV

PER CAPITA FEDERAL SPENDING, BY SPECIFIC CATEGORIES, FOR REGIONS
OF THE CONTINENTAL UNITED STATES, FISCAL YEAR 1975

Expenditure Category	Region			
	Northeastern USA	Northcentral USA	Southern USA	Western USA
	(dollars per capita)			
Farm Income Stabilization per capita	3.58	20.16	16.10	13.52
Rural Housing and Public Facilities per capita	.97	2.10	3.36	1.58
Agricultural Land and Water per capita	.66	2.53	2.84	2.28
Agricultural Research per capita	15.83	17.66	31.71	64.14
Pollution Control per capita	26.46	25.52	15.50	19.11
Business Advancement and Regulation per capita	4.83	3.28	8.01	6.62
Area/Regional Development per capita	2.28	2.25	5.35	7.54
Community Development per capita	17.68	11.70	12.06	12.13
Housing per capita	.12	1.10	.13	.64
Health per capita	107.53	102.34	85.02	96.23
Income Security per capita	602.58	520.44	555.35	556.28
Education per capita	56.19	47.75	50.26	67.80
Defense and Space per capita	311.59	208.23	435.88	646.05
Transportation per capita	47.44	47.56	62.27	67.68
General Government per capita	472.72	168.83	134.78	155.54
TOTAL PER CAPITA OUTLAYS,	1,670.46	1,181.45	1,418.62	1,717.14
NUMBER OF COUNTIES	213	1,055	1,385	411

TABLE XVI

PER CAPITA FEDERAL SPENDING, BY SPECIFIC CATEGORIES, FOR COUNTY SIZE-CONTIGUITY
GROUPINGS OF THE CONTINENTAL UNITED STATES, FISCAL YEAR 1975

Expenditure Category	County Size-Contiguity Grouping								
	Metropolitan			Nonmetropolitan					
				Urbanized		Less Urbanized		Thinly Populated	
	Large	Medium	Lesser	Adjacent	Not Adjacent	Adjacent	Not Adjacent	Adjacent	Not Adjacent
	(dollars per capita)								
Farm Income Stabilization per capita	7.64	8.03	12.27	13.63	25.46	29.87	34.25	40.04	49.85
Rural Housing and Public Facilities per capita	.38	1.16	1.70	3.22	3.09	6.69	6.28	7.88	12.28
Agricultural Land and Water per capita	.36	1.10	2.27	2.30	4.05	5.32	7.13	8.56	13.46
Agricultural Research per capita	25.88	25.24	30.68	28.52	53.81	23.87	50.56	28.20	63.37
Pollution Control per capita	24.43	25.88	22.40	26.13	11.55	7.25	9.56	4.92	6.33
Business Advancement and Regulation per capita	8.24	4.99	4.83	3.99	4.60	2.07	2.13	1.68	2.78
Area/Regional Development per capita	1.06	3.06	3.96	5.23	12.08	7.20	10.53	7.20	26.50
Community Development per capita	15.57	16.33	15.90	8.71	12.32	4.36	5.90	1.36	1.85
Housing per capita	.86	.48	.21	.01	a/	a/	a/	0.00	0.00
Health per capita	123.50	81.18	79.03	76.69	71.01	75.96	78.05	74.88	88.37
Income Security per capita	572.07	534.59	546.30	536.25	532.36	546.87	586.60	582.84	592.59
Education per capita	52.03	71.96	65.28	50.83	47.79	26.14	31.16	30.24	46.83
Defense and Space per capita	441.68	415.91	499.75	368.05	537.11	103.44	93.23	129.28	55.63
Transportation per capita	55.55	49.98	63.16	35.71	62.00	55.47	68.63	84.68	88.37
General Government per capita	304.05	227.31	149.33	170.60	129.64	131.42	122.01	112.68	129.61
TOTAL FEDERAL EXPENDITURES PER CAPITA	1,633.30	1,467.20	1,497.07	1,329.87	1,506.87	1,025.93	1,106.02	1,114.44	1,177.82
NUMBER OF COUNTIES	169	257	178	191	135	564	714	245	611

except the urbanized, not adjacent group where defense and space spending
per capita was nearly $5.00 per capita larger. Farm income stabilization
spending was largest in the thinly populated, not adjacent nonmetropoli-
tan county grouping with $49.85 per capita. This spending decreased
as county population increased.

Human Resource Profile Data

Data from the 1970 Census of Population, extracted and summarized
into the "Human Resource Profile" tape, were utilized in this study to
correct for socio-demographic differences that might exist between
counties. Although the data are from 1970 and some changes in the
characteristics of the population are almost certain to have taken
place by 1975, this was the only source of such data at the county
level available for use.

Table XVII presents a regional summary of key variables for the
3,064 counties constituting the continental United States (minus the
District of Columbia). In the continental United States about 73 per-
cent of the residents were classified as urban in 1970. In each region
except the south, the urban population made up at least 70 percent of
the total population. The racial make up of the population in 1970
was 88 percent white, 11 percent black, and less than one-half of one
percent Indian.

The "dependent population" in 1970--those under eighteen years of
age and those 65 years of age and older--totaled 83.2 million. Among
the regions, the southern had the largest dependent population, 27.7
million, followed by the northcentral with 25.6 million. The north-
eastern region had the third largest total with 21.3 million and the

TABLE XVII

CHARACTERISTICS OF THE POPULATION FOR REGIONS OF THE CONTINENTAL UNITED STATES

Characteristic	Region				
	Continental USA	Northeastern USA	Northcentral USA	Southern USA	Western USA
Total Population, 1970 (millions)	201.3	49.0	56.6	62.0	33.7
Urban-Rural Breakdown, 1970					
% Urban	73.4	80.4	71.6	64.2	83.4
% Rural	26.6	19.6	28.4	35.8	16.6
Racial Breakdown, 1970					
% White	87.8	90.4	91.2	80.8	91.4
% Black	11.0	8.8	8.1	18.5	5.0
% Indian	.4	1.0	.4	.3	1.2
Dependent Population, 1970					
Under 18 (millions)	69.3	16.1	19.9	21.7	11.6
65 and over (millions)	13.9	5.2	5.7	6.0	3.0
Educational Attainment of Adults					
Attended High School (millions)	66.4	17.0	19.0	18.4	12.0
College Graduates (millions)	11.6	3.1	2.9	3.2	2.4
Poverty Count, 1970					
Total (millions)	27.0	4.8	6.0	12.3	3.9
Percent of Population (%)	13.4	9.8	10.6	19.8	11.6
Number Unemployed, 1970	3,557,284	789,974	982,344	942,676	842,290

western region had the smallest dependent population with 14.6 million.

The educational attainment of the adult population (those 26 years of age and older), summarized in Table XVII, indicates that 66 million adults in the continental United States had attended some years of high school while 11.6 million were college graduates as of 1970. The southern region had the largest number of college graduates, 3.2 million, but the western region had the largest percentage of college graduates, 7.1 percent.

In 1970, 27 million Americans in the continental United States lived in poverty. That amounted to 13.4 percent of the total population. Among the regions, the southern had the largest number in poverty, 12.3 million, and the largest incidence of poverty, 19.8 percent. The northeastern region had the smallest number, 4.8 million, and the smallest percentage, 9.8 percent, of population in poverty.

Of the 1970 population 14 years of age and older, 3.6 million were unemployed in the continental United States. Among the regions, the northcentral had the largest number of unemployed while the northeastern had the smallest.

These same characteristics are summarized for the above-defined county size-contiguity groupings of counties of the continental United States in Table XVIII. As expected, urban population percentage decreased from metropolitan to nonmetropolitan groupings. In all groupings at least 85 percent of the population was white.

For all county size-contiguity groupings the dependent population made up at least 43 percent of the total population in 1970. The largest deviation from this figure was for the nonmetropolitan, thinly populated,

TABLE XVIII

CHARACTERISTICS OF THE POPULATION FOR COUNTY SIZE-CONTIGUITY GROUPINGS OF THE CONTINENTAL UNITED STATES

Characteristic	County Size-Contiguity Grouping								
	Metropolitan			Nonmetropolitan					
				Urbanized		Less Urbanized		Thinly Populated	
	Large	Medium	Lesser	Adjacent	Not Adjacent	Adjacent	Not Adjacent	Adjacent	Not Adjacent
Total Population, 1970 (millions)	83.7	45.4	17.3	14.0	7.5	13.3	13.5	2.3	4.3
Urban-Rural Breakdown, 1970									
% Urban	92.2	80.0	72.2	52.8	60.0	33.8	39.2	.8	.1
% Rural	7.8	20.0	27.8	47.2	40.0	66.2	60.8	99.2	99.1
Racial Breakdown, 1970									
% White	85.8	89.2	89.6	91.4	89.3	88.0	88.9	84.7	90.0
% Black	12.7	10.1	9.8	7.1	10.7	11.3	9.6	14.4	7.9
% Indian	.2	.2	.2	.6	.6	.7	.7	.8	1.9
Dependent Population, 1970									
Under 18 (millions)	28.2	15.9	6.0	4.8	2.6	4.7	4.7	.8	1.5
65 and Over (million)	7.9	4.1	1.6	1.4	.7	1.6	1.7	.3	.6
Educational Attainment of Adults									
Attended High School (millions)	29.0	15.1	5.6	4.5	2.3	4.1	4.0	.6	1.2
College Graduates (millions)	5.8	2.6	1.0	.7	.4	.4	.5	.1	.1
Poverty County, 1970									
Total (millions)	8.2	5.4	2.5	2.0	1.3	2.7	3.0	.6	1.6
Percent of Population (%)	9.8	11.9	14.4	14.3	17.3	20.3	22.2	26.1	37.2
Number Unemployed, 1970	1,510,890	765,284	310,992	243,301	146,014	223,227	245,482	39,395	72,699

not adjacent counties where 48.8 percent of their population was
dependent.

The largest percentage of college graduates was in the large
metropolitan counties where 6.9 percent of the adult population had
graduated from college in 1970. The smallest percentage, 2.3 percent,
was in the thinly populated, not adjacent, nonmetropolitan counties.
In all groupings at least 25 percent of the adult population had
attended high school.

Large metropolitan counties had the largest number of people living
in poverty in 1970, 8.2 million, but the smallest percentage of total
population in poverty, 9.8 percent. Almost two million people lived in
poverty in the thinly populated, not adjacent nonmetropolitan grouping,
or 37.2 percent of their total population.

In the metropolitan counties in 1970, over 2.5 million people 14
years of age and over were unemployed. Less than one million were unem-
ployed in the nonmetropolitan counties. Among the metropolitan cate-
gories, the large grouping had slightly over 1.5 million unemployed.
Among the nonmetropolitan counties, the largest number of unemployed
people was in the less urbanized, not adjacent grouping, with 245,482.

<center>Other Data Utilized</center>

Local Area Personal Income

Personal income, as defined by the Bureau of Economic Analysis
(BEA) of the United States Department of Commerce, is the current income
of residents of an area from all sources (44). It is measured after
deduction of personal contributions to Social Security, government re-
tirement, and other personal taxes. It includes income received from

business, federal, state, and local governments, households, institutions, and foreign governments.

For the measurement of personal income on a regional basis, BEA assigns the income flows to the state, county or SMSA in which the individual resides. However, BEA also presents labor and entrepreneurial income in industrial detail by place of work since the bulk of labor and proprietor's income is reported by industry at the point of disbursement (establishment location). In the contract construction industry, point of disbursement may or may not be the actual work site. Therefore, the wage and salary estimates for the construction industry do not necessarily reflect the county of work. This is the only industry where this distinction is of importance. Income is then adjusted to a place-of-residence basis at an all-industry level. A more precise residence adjustment may be achieved by computing adjustment factors for each major industry group, thus reflecting industrial differentials in commuting flows. The information needed to effect a detailed industry-by-industry adjustment, however, is not available.

The bulk of the source materials used to prepare the estimates is taken from the administrative records of federal and state government programs, with the remainder of the data coming from the various censuses and from nongovernmental sources. Several of the more important sources of administrative record information include data generated as the by-product of the state unemployment programs of the Bureau of Labor Statistics, the insurance programs of the Social Security Administration, and the federal tax program of the Treasury Department. Two of the more important censuses utilized are the Censuses of Agriculture and Population. The data obtained from these sources yield more than 90 percent

of the data needed for the preparation of state and county income estimates. The use of administrative records is both reliable and economical because the data are usually subject to internal review by the agency administering the program, and it costs much less to use data collected by other agencies for other purposes than to conduct regional surveys.

Table XIX presents the results of the BEA's estimation for the United States for 1975. Total personal income by place of residence was estimated to be $1,257,535 million, or $5,903 per capita.

Contract Construction Industry Income

In estimating total personal income by place of residence, the Bureau of Economic Analysis disaggregates the total by industry type. In this study these estimates for the contract construction industry are used to proxy the level of private investment at the county level. Table XX presents a summary of this income for the continental United States and its four regions as delineated above. Income in the continental United States for this industry totaled $50,732.30 million, or $240.32 per capita.

The contract construction industry was quite active in the southern region in 1975, based on total dollars of income for that industry. The northcentral region ranked second in terms of total dollars, followed by the northeastern and western regions, respectively. Per capita income reorders the regions somewhat. The western region's contract construction industry income was $268.03 per capita followed by the southern region with $248.32 per capita. The northcentral region was third in this ordering followed by the northeastern region.

TABLE XIX

PERSONAL INCOME BY MAJOR SOURCES FOR THE UNITED STATES, 1975

	(1,000,000 $)
Total Labor and Proprietors' Income by Place of Work	
By Type	
Wage and Salary Disbursements	799,620
Other Labor Income	58,813
Proprietors' Income	92,585
Farm	28,618
Nonfarm	63,967
By Industry	
Farm	33,878
Nonfarm	917,140
Private	743,816
Manufacturing	243,271
Mining	13,377
Contract Construction	53,835
Wholesale and Retail Trade	159,347
Finance, Insurance and Real Estate	50,372
Transportation, Commerce and Public Utilities	68,294
Services	152,137
Other Industries	3,183
Government	173,324
Federal, Civilian	42,248
Federal, Military	20,400
State and Local	110,676

Derivation of Personal Income by Place of Residence

Total Labor and Proprietors' Income by Place of Work	951,018
Less: Personal Contributions for Social Insurance by Place of Work	49,914
Net Labor and Proprietors' Income by Place of Work	901,104
Plus: Residence Adjustment	
Net Labor and Proprietors' Income by Place of Residence	901,104
Plus: Dividends, Interest, and Rent	182,653
Plus: Transfer Payments	173,778
Personal Income by Place of Residence	1,257,535
Per Capita Income (dollars)	5,903

Source: (44).

TABLE XX

CONTRACT CONSTRUCTION INDUSTRY INCOME FOR REGIONS
OF THE CONTINENTAL UNITED STATES, 1975

Contract Construction Industry Income	Continental USA	North-eastern USA	North-central USA	Southern USA	Western USA
	(dollars)				
Total (millions)	50,732.30	10,748.70	13,437.20	16,736.60	9,809.30
Per Capita	240.32	217.58	232.88	248.32	268.03

Table XXI presents the breakdown of construction income by the county size-contiguity groupings defined above. The metropolitan counties accounted for 80 percent of this income, $40,709.1 million. The thinly populated, adjacent to an SMSA counties received the smallest amount of this income, $343.9 million.

On a per capita basis, each of the metropolitan groupings received more income than the continental United States average. All nonmetropolitan counties received less than $200 per capita except those in the urbanized, not adjacent to an SMSA grouping.

Census of Governments Variables

Every five years the Census Bureau publishes data on both state and local government finances (42). The report is based primarily on data from surveys and from mail canvassing of both levels of government. Effort is made to see that this reported data are complete and internally consistent.

TABLE XXI

CONTRACT CONSTRUCTION INDUSTRY INCOME FOR COUNTY SIZE-CONTIGUITY
GROUPINGS OF THE CONTINENTAL UNITED STATES, 1975

| County Size- | Contract Construction Industry Income | |
Contiguity Grouping	Total	Per Capita
	(1,000,000 dollars)	(dollars)
Metropolitan		
Large	23,360.3	272.90
Medium	12,746.9	263.91
Lesser	4,601.9	246.09
Nonmetropolitan		
Urbanized		
Adjacent	2,818.0	187.87
Not Adjacent	1,827.3	228.41
Less Urbanized		
Adjacent	2,157.5	151.95
Not Adjacent	2,299.3	161.92
Thinly Populated		
Adjacent	343.9	137.56
Not Adjacent	577.1	125.46

The data on the sources of revenue and expenditures of state and local governments are of special interest to this study. Table XXII presents a listing of the sources of revenue for two reporting years, 1966-67 and 1971-72. As might be expected, the largest single source of revenue for all levels of government was taxes. Indeed, they made up 68.8 percent of the total governmental revenue in 1971-72. Figure 4 shows the breakdown of tax revenue by type of tax and level of government for that fiscal year. The largest source of revenue for the federal government was the individual income tax followed by corporate income taxes. The largest source of revenue for state governments was the sales and gross receipts taxes and the largest source at the local level was the property tax.

Public spending for general government purposes totaled $323.1 billion in fiscal 1971-72, or 49.0 percent more than five years before when it totaled $216.9 billion. Table XXIII presents a summary comparison of 1966-67 and 1971-72 amounts. National defense and international relations was the largest functional category for both fiscal years reported although education spending grew during the five-year time period to almost equal defense spending by 1971-72. Figure 5 depicts the breakdown of this general expenditure by level of government for all categories except national defense and international relations.

State and local government expenditures, both total and per capita, are summarized for the continental United States and its four above-defined regions in Table XXIV. The total, $105 billion, is divided among the regions so that the northeastern state and local governments spent the largest amount while the western spent the smallest. On a per capita basis the northeastern region again spent the largest amount while the southern region spent the smallest amount.

TABLE XXII

SOURCES OF REVENUE FOR THE FEDERAL GOVERNMENT AND FOR
STATE AND LOCAL GOVERNMENTS, 1971-72

Source of Revenue	Amount	
	1971-72	1966-67
	(1,000,000,000 dollars)	
Total Governmental Revenue	382.8	252.6
Federal Sources	223.4	161.4
State and Local Sources	159.5	91.2
General Revenue	308.3	206.7
Taxes	263.3	176.1
Income	146.5	103.5
Sales and Gross Receipts	57.6	36.3
Property	42.9	26.0
All Other	16.3	10.2
Charges and Miscellaneous General Revenue	45.0	30.6
Current Charges	31.4	21.1
All Other	13.6	9.5
Utility and Liquor Stores Revenue	9.8	6.9
Insurance Trust Revenue	64.7	39.0

Source: (42, p. 2).

Billions
of
Dollars
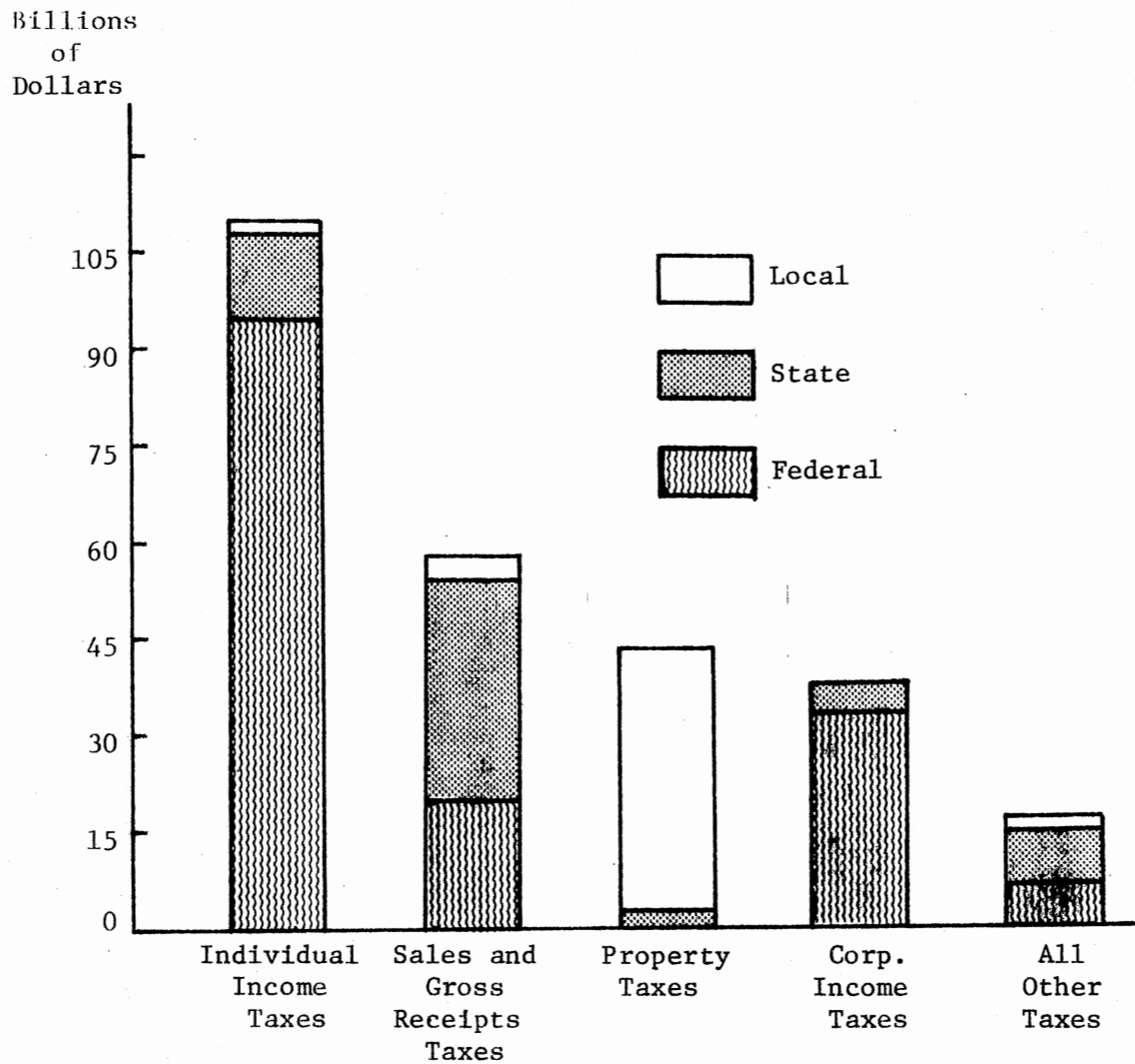
Source: (42, p. 18).

Figure 4.   Tax Revenue by Type of Tax and Level of
Government: 1971-72

TABLE XXIII

GENERAL EXPENDITURE BY GOVERNMENTAL LEVEL AND BY
FUNCTIONAL CATEGORIES, 1971-72

Expenditure Category	Amount	
	1971-72	1966-67
	(1,000,000,000 dollars)	
Total General Expenditure[a/]	323.1	216.9
By Level of Government:		
Federal Government	188.1	138.6
Direct General Expenditure	154.5	123.5
Intergovernmental Expenditure	33.6	15.0
State and Local Governments	168.5	93.4
By Function:		
National Defense and International Relations	79.3	74.6
All Other Functions	243.8	142.3
Education	70.9	40.2
Interest on General Debt	23.1	13.4
Highways	19.5	14.0
Health and Hospitals	17.2	9.5
Natural Resources	14.2	10.1
Postal Service	9.4	6.2
All Other	89.5	48.8

Source: (42, p. 5).

[a/] Net of intergovernmental expenditure, to avoid duplication.

| 25 | 20 | 15 | 10 | 5 | 0 | | | 0 | 5 | 10 | 15 | 20 | 25 |

Inter Governmental

Direct

{ Local Schools
  Other Education

Natural Resources

Highways

Interest on General Debt

Health and Hospitals

Public Welfare

Veterans Services
Not Elsewhere Classified   *

Postal Service   *

Police and Fire Protection

Financial Administration
and General Control

Housing and Urban Renewal

All Other Functions

$46.7

*Not applicable

Source: (42, p. 18).

Figure 5. General Expenditure of the Federal Government and of State and Local
          Governments, Other Than for National Defense and International
          Relations, by Function: 1971-72

TABLE XXIV

SELECTED CENSUS OF GOVERNMENTS VARIABLES FOR REGIONS
OF THE CONTINENTAL UNITED STATES

Census of Governments Variables	Region				
	Continental USA	Northeastern USA	Northcentral USA	Southern USA	Western USA
	(dollars)				
State and Local Government Expenditures, 1971-1972					
Total (millions)	105,199.9	32,719.6	27,503.5	23,900.5	21,076.3
Per Capita	498.34	662.34	476.66	354.61	575.86
Taxes, 1971-1972[a]					
Total (millions)	49,093.0	15,961.0	13,868.0	8,946.0	10,318.0
Per Capita	232.56	323.10	240.35	132.73	281.91

[a] Includes taxes that are a source of revenue for state and local governments, primarily property taxes.

Looking at the metropolitan-nonmetropolitan breakdown presented in Table XXV, state and local governments of the metropolitan counties spent sbout $82.7 billion versus $22.5 billion spent by nonmetropolitan counties. On a per capita basis, the large metropolitan counties spent more than other county size-contiguity groupings. Among the other groupings, the medium metropolitan counties government spending per capita was largest but it was not much larger than the per capita government spending of the nonmetropolitan, thinly populated, not adjacent counties.

The principal revenue source for local governments is the property tax, which accounted for 84 percent of all local tax revenue in 1971-72. There is no one tax that is so predominant for the states. However, sales and gross receipts taxes--including not only those of general application but also selective taxes on sales of motor fuels, tobacco products, and other particular commodities or services--altogether provided nearly 56 percent of all state tax revenue in 1971-72. The regional breakdown of these taxes for the continental United States is presented in Table XXIII. The southern region collected the least taxes in total and per capita. The northeastern region collected the most on either basis. Based on the county size-contiguity groupings presented in Table XXV, more total taxes were collected by metropolitan county governments than nonmetropolitan. On a per capita basis, the large and medium metropolitan counties' governments collected more than any of the others.

TABLE XXV

SELECTED CENSUS OF GOVERNMENTS VARIABLES FOR COUNTY SIZE-CONTIGUITY
GROUPINGS OF THE CONTINENTAL UNITED STATES

County Size-Contiguity Grouping	Census of Governments Variables			
	State and Local Government Expenditures		Taxes	
	Total	Per Capita	Total	Per Capita
	(1,000,000 dollars)	(dollars)	(1,000,000 dollars)	(dollars)
Metropolitan				
Large	53,749.1	627.91	27,310.0	319.04
Medium	21,517.3	445.49	9,865.0	204.24
Lesser	7,398.9	395.66	3,171.0	169.57
Nonmetropolitan				
Urbanized				
Adjacent	6,379.4	425.29	2,581.0	172.07
Not Adjacent	3,023.6	377.95	1,185.2	148.15
Less Urbanized				
Adjacent	5,048.8	355.55	1,929.7	135.89
Not Adjacent	5,256.8	370.20	2,030.2	142.97
Thinly Populated				
Adjacent	798.6	319.44	301.6	120.66
Not Adjacent	2,027.6	440.78	718.5	156.20

CHAPTER V

THE MODEL FOR THE EVALUATION OF

FEDERAL SPENDING

Econometric Model

An econometric model has two components: an economic model and a

statistical model. Each is developed below for the policy problem of

evaluating federal spending. Generalizations are drawn at the end of

this chapter. Conclusions will be presented in Chapter VI.

Economic Model

The basic ingredients of economic growth are attitudes of people,

natural resources, and institutions (38, p. 59). These is turn influence

savings, investment, and efficiency. Savings invested efficiently will

lead to the formation of human and material capital, which generates more

income from which future savings can occur. The creation of more economic

options, including higher real incomes to support community services,

institutions, and energy development is then possible through additional

investments. This cycle of economic growth is depicted in Figure 6. It

occurs at the local level as well as the national level.

Given the goals of the rural development policy of this country with

their emphasis on income and employment, Keynesian-based growth theory

with its stress on aggregate saving, investment, and exports aided in the

ATTITUDES	NATURAL RESOURCES	INSTITUTIONS
goals values	soil climate coal oil	government law finance

SAVINGS	INVESTMENT	EFFICIENCY technical economic

CAPITAL ACCUMULATION

ECONOMIC GROWTH

efficiency   equity

UTILITY

satisfaction   well-being
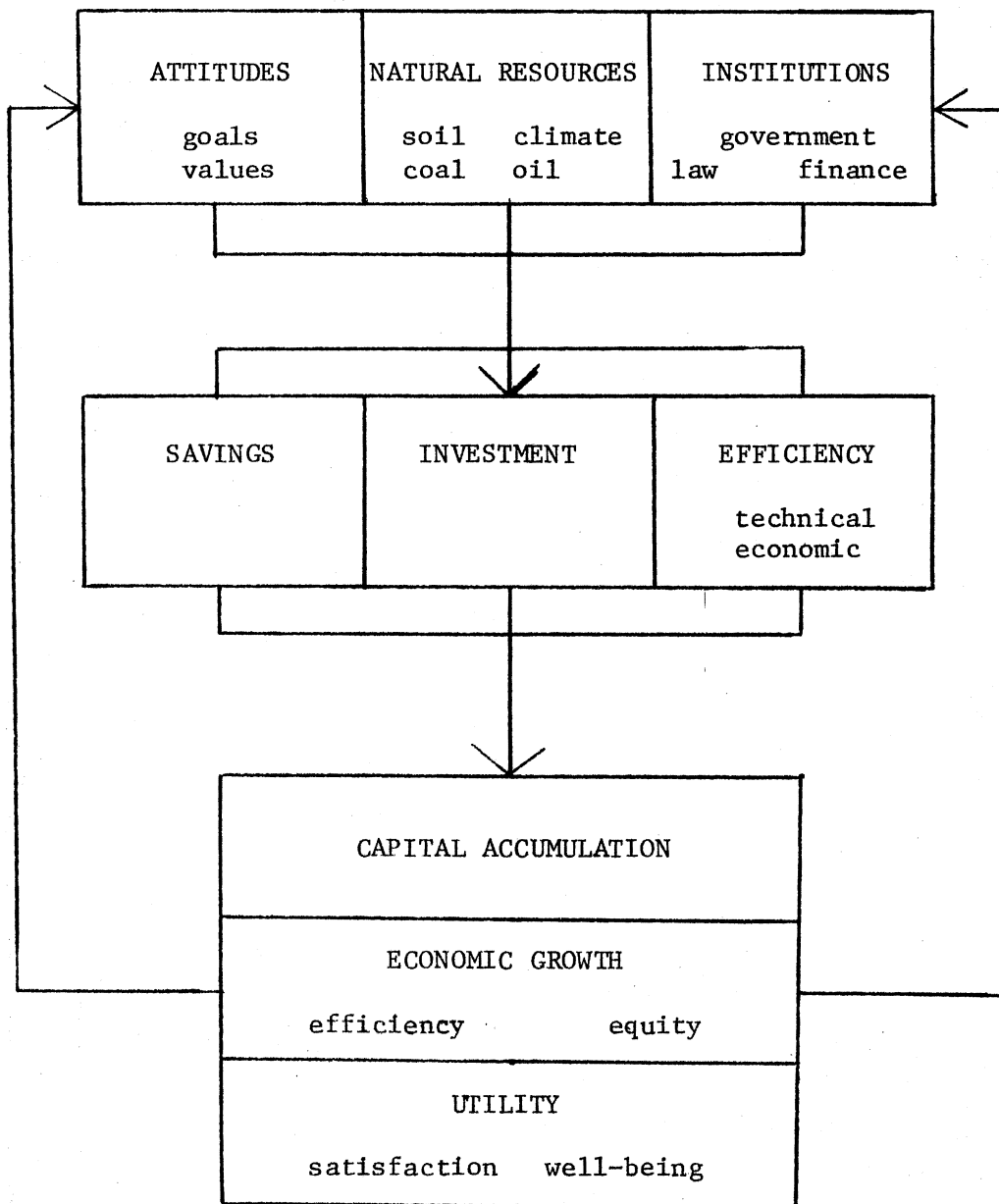
Source: (38, p. 60).

Figure 6. The Cycle of Economic Growth

formulation of the economic model. A basic concept of export-base theory is that an area's income is determined by the level of exports from that area to other areas. Alternatively, export industries can be defined as activities which bring dollars in from outside regions. As such, federal government outlays for welfare, military installations, and other purposes can be regarded as export industries. Many areas seek to expand export industries and hence local income by encouraging growth of federal government outlays in their areas or private export firms. Secondary industries exist because of the basic export industries. In the Harrod-Domar model, the contributions of saving and investment to growth are stressed. In a simple summary of this model, investment equals saving (I = S) where investment (I) is defined as change is capital K (I = ΔK). The marginal and average ratio of output (Y) to capital is a measure of efficiency, g. The marginal propensity to save (s) is equal to the ratio of saving S to income Y. The rate of growth, r, in income or output is then

$$r = \frac{\Delta Y}{Y} = \frac{I}{K} = \frac{S}{K} = \left(\frac{Y}{K}\right)\left(\frac{S}{Y}\right) = g\ s \qquad (5.1)$$

A high propensity to save and invest leads to high rates of economic growth. Combining the conclusions of the export-base theory and the Harrod-Domar model results in a joint emphasis on external and internal sources of area growth which is the basis for the model developed here.

Economic development may be defined as an increase in the well-being of people. Well-being is not easily measured. There are many means to this "ultimate" goal, however--employment opportunities, income equality, balanced population growth between areas, "standard quality" housing, and "adequate" community services and facilities, for example. Economic

development should measure all these things, but practical considerations

often dictate the use of income and other measurable ends as proxies.

In this study those proxies are personal income per capita of the county,

the county's employment rate--the number employed as a percent of total

county population, private investment per capita--as proxied by per

capita contract construction industry income in the county, and popula-

tion change for the county over time.

A model to evaluate the effects of federal spending on the well-

being of county residents can be formulated into the system of equations

outlined below:

State and Local Government Outlays:

$$O_{L,t} = f_L \left(\sum_i O_{F_i}, t-1 , Y_t, E_t, Taxes_t, S_t, Rurality \right) \tag{5.2}$$

Federal Government Outlays:

$$O_{F_i,t} = f_{F_i} (O_{L,t}, Y_t, S_t, Rurality, Region), \tag{5.3}$$
$$i = 1, 2, \ldots, n$$

Change in Investment:

$$\Delta K_t = f_K(O_{L,t}, \sum_i O_{F_i,t}, Y_t, K_{t-1}, C_t, Rurality) \tag{5.4}$$

Investment Identity:

$$K_t = K_{t-1} + \Delta K_t \tag{5.5}$$

Migration Identity:

$$M_t = N_t - N_{t-1} - Births_t + Deaths_t \tag{5.6}$$

Employment Rate:

$$E_t = f_E(O_{L,t}, \sum_i O_{F_i,t}, K_t, C_t, S_t, Rurality) \tag{5.7}$$

Per Capita Income:

$$Y_t = f_Y(O_{L,t}, \sum_i O_{F_i,t}, E_t, \Delta K_t, S_t, Rurality) \tag{5.8}$$

Change in Population:

$$\Delta N_t = f_N \left(O_{L,t}, \sum_i O_{F_i,t}, E_{t-1}, \Delta K_t, M_t, S_t \right) \tag{5.9}$$

Variables in this model are defined as:

$O_{L,t}$ = state and local government outlays in the county in period t;

$O_{F_i,t}$ = federal government outlays for program i in the county in period t;

ΔK_t = change in capital stock from investment activity in the county from period t-1 to period t;

M_t = migration from the county from period t-1 to period t;

E_t = employment rate, the number employed as a percentage of total county population, in period t;

Y_t = per capita personal income in period t for county residents;

ΔN_t = change in county population from period t-1 to period t;

Taxes_t = state and local government taxes collected in the county in period t;

S_t = selected socio-demographic characteristics of the county's population in period t;

C_t = selected economic conditions in period t;

Rurality = a measurement of county size and closeness to or remoteness from urban areas; and

Region = region of the United States.

The system of equations determines the values of the eight endogenous variables: state and local government outlays O_L; federal government outlays for each program i O_{F_i}; net investment ΔK; total investment K; migration M; the employment rate E; income per capita Y; and population

change ΔN. Other variables in the system are predetermined--either exogenous, determined outside the workings of the system, or lagged values of the endogenous variables.

The quality of life experienced in an area is both directly and indirectly influenced by federal spending. Federal spending has a direct short-term effect on income and a more long-term effect on investment. It is hypothesized that federal outlays increase income, investment, and employment opportunities at the county level unless their effects are offset by the effects of taxes in the area. Tax effects may be so large, in fact, as to entirely offset the positive effects of federal spending and lead to coefficients not significantly different from zero.

The impacts of the federal government outlays are hypothesized to have different effects among programs. Transfer payments (Social Security, Aid to Families with Dependent Children, and so forth) are largely made for consumption purposes and will have direct, short-term effects on income. Other programs' outlays are made for investment purposes. It is hypothesized that these programs will have long-term effects by creation of human and material capital providing an income stream over time. Such investment programs are expected to have greater income and employment effects over time than are transfer payments for consumption purposes.

Federal outlays are highly correlated with population of counties. All the analysis was done on a per capita basis to allow concentration on effects other than population. Equations to explain the federal outlays per capita were included, in part, to provide information of interest in analyzing elements that determine spending of the federal

government. They were included, also, to provide input into the simul-
taneous equation system concerning the demand for services of the federal
government in the county. Socio-demographic characteristics of the
county population and economic conditions existing in the county serve
as indicators of need for services in the model. The distribution of
federal funds in this country depends in part on political considerations
not easily measured and hence not included in this analysis. If the
outlays are allocated according to population, these explanatory factors
should not be significant. Much state and local government spending is
for education, but these governments also are involved in federal pro-
grams requiring "matching funds" on their part. A variable is included
for state and local government spending to determine the effects of
spending at these levels of government.

Statistical Model

The proxies for well-being identified above are interrelated.
Enhancing the rural economic base through the provision of basic employ-
ment, for example, generates employment and income which in turn reduces
outmigration to metropolitan areas and also increases the tax base to
improve community services, facilities, and housing (37, p. 8). Using
single-equation OLS models to estimate the models' parameters shows the
increase in income or employment, for example, per unit of federal
government outlay in each category of spending. This simple regression
procedure may not show indirect and simultaneous effects that exist.
Other elements not included or controlled for in the regression are
likely to account for some growth and may be positively or negatively
assocaited with variables in the models, biasing the coefficients
accordingly.

To circumvent the problems implied with the use of OLS estimation on a series of single-equation models, a more comprehensive simultaneous equation model was estimated. Several estimation methods lead to consistent estimators of the structural coefficients of an equation belonging to a general interdependent system of equations. A widely used method is two-stage least squares (2SLS). Suppose the (identified or overidentified) structural equation in question is the first equation of the system:

$$\underset{\sim}{y}_1 = Y_1 \, \underset{\sim}{\beta}_1 + X_1 \, \underset{\sim}{\gamma}_1 + \underset{\sim}{u}_1 \tag{5.10}$$

where $\underset{\sim}{y}_1$ is the (Tx1) vector of the endogenous variable whose coefficient in the first equation has been set to equal one, Y_1 is the $[Tx(G^{\wedge}-1)]$ matrix of the remaining endogenous variables in the first equation, X_1 is the (TxK*) matrix of the predetermined variables in the first equation, $\underset{\sim}{\beta}_1$ is the $[(G^{\wedge}-1)x1]$ vector of structural coefficients associated with variables in Y_1, $\underset{\sim}{\gamma}_1$ is the (K*x1) vector of structural coefficients associated with the variables in X_1, and $\underset{\sim}{u}_1$ is the (Tx1) vector of disturbances in this equation.

In the first stage of 2SLS, values of Y_1 are predicted from the predetermined variables X; i.e.,

$$\hat{Y}_1 = X(X'X)^{-1} X'Y_1 \tag{5.11}$$

In the second stage these predicted values of Y_1, $\hat{Y}_1$, are used to estimate the structural parameters through the equation

$$\begin{bmatrix} \hat{\underset{\sim}{\beta}}_1 \\ \hat{\underset{\sim}{\gamma}}_1 \end{bmatrix} = \begin{bmatrix} \hat{Y}_1' \, \hat{Y}_1 & \hat{Y}_1' \, X_1 \\ X_1' \, \hat{Y}_1 & X_1' \, X_1 \end{bmatrix}^{-1} \begin{bmatrix} \hat{Y}_1' \, \underset{\sim}{y}_1 \\ X_1' \, \underset{\sim}{y}_1 \end{bmatrix} \tag{5.12}$$

These estimators of β and γ are consistent. In general, however, they

are not asymptotically efficient if the structural disturbances are correlated among equations (21, 35).

Estimation of the model went through many phases before being summarized here. Theoretical considerations and preliminary ordinary least squares (OLS) models were estimated to determine socio-demographic and economic variables to be included in final system estimations. Previous years of the federal spending data were analyzed. Models incorporating lagged values of the outlay variables were attempted but problems with mutlicollinearity were encountered. Estimations with time series and cross sectional pooling were attempted, also. These efforts did not improve results.

Final results of the OLS estimations are reported below with the four variables of special interest as dependent variables and the OLS estimations for the federal and state and local government spending variables. Following that, the several approaches to the full system estimation are summarized: approach one—all federal outlay variables exogenous; approach two—all federal outlay variables endogenous; and approach three—selected federal outlays variables endogenous. Two-stage least squares (2SLS) was the technique used to estimate the parameters in all simultaneous equation systems. All equations were over-identified. Therefore, coefficient estimates are not unique.

OLS Estimations. In this study, coefficients for the four equations of special interest were first estimated by OLS. The resulting estimates, though statistically inconsistent, provide benchmarks for comparison with the later-reported 2SLS estimates.

The 15 categories of federal spending per capita were included as independent variables in each of the OLS models. Other independent variables were included and will be described as the analysis for each variable is reviewed. Appendix Table XXXIX displays correlation coefficients for these variables.

The federal outlay variables, state and local government spending per capita, contract construction income per capita, and percent unemployed in the county were included as independent variables in the equation for per capita income. Dummy variables for the regions were added to correct for regional differences in the labor market, wage level, propensity to invest, and so forth. Under the scheme utilized throughout this study, the effects of the western region are included in the intercept when the regional variables appear in an equation. The other dummy variables for the regions are defined as

$$
\text{Northeastern U. S.} = \begin{cases} 1, & \text{county in the northeastern region} \\ 0, & \text{county not in the northeastern region} \end{cases}
$$

$$
\text{Northcentral U. S.} = \begin{cases} 1, & \text{county in the northcentral region} \\ 0, & \text{county not in the northcentral region} \end{cases}
$$

$$
\text{Southern U. S.} = \begin{cases} 1, & \text{county in the southern region} \\ 0, & \text{county not in the southern region} \end{cases}
$$

Coefficients of several variables were statistically significant in the OLS estimation of the model summarized in Table XXVI. If farm income stabilization spending increased by one dollar per capita, personal income per capita increased by $1.91, _ceteris paribus_. Other federal spending variables having positive, significant coefficients were agricultural land and water, business advancement and regulation, community development, housing, income security, defense and space, and

TABLE XXVI

RESULTS OF THE ORDINARY LEAST SQUARES ESTIMATION
OF PERSONAL INCOME PER CAPITA, 1975

Independent Variables	$\hat{\beta}$	t for H_o: $\beta = 0$
Farm Income Stabilization per capita, 1975	1.9135	7.34**
Rural Housing/Public Facilities per capita, 1975	-5.1468	-4.29**
Agricultural Land and Water per capita, 1975	22.9652	10.52**
Agricultural Research per capita, 1975	.0928	.54
Pollution Control per capita, 1975	.4390	.73
Business Advancement and Regulation per capita, 1975	3.4734	1.95*
Area/Regional Development per capita, 1975	-1.0112	-2.44**
Community Development per capita, 1975	14.2942	6.87**
Housing per capita, 1975	153.1305	3.10**
Health per capita, 1975	.7785	1.37
Income Security per capita, 1975	1.0825	6.08**
Education per capita, 1975	-.9748	-3.71**
Defense and Space per capita, 1975	.4312	15.02**
Transportation per capita, 1975	-.1838	-2.16**
General Government per capita, 1975	1.4964	6.26**
State and Local Government per capita, 1972	.1212	2.92**
Contract Construction Income per capita, 1975	2.3004	17.79**
Unemployed (%)	-225.2180	-6.34**
Northeastern U. S.	-350.0070	-2.74**
Northcentral U. S.	-150.5331	-1.73*
Southern U. S.	-103.4116	-11.93**
Intercept	3,922.8167	27.92**

N = 2,741

R^2 = .3750

*Statistically significant at the ten percent level.

**Statistically significant at the five percent level.

general government. State and local government spending per capita had

a positive, significant coefficient as did contract construction income

per capita, the proxy for net investment. A higher percentage of unem-

ployed people in the county was associated with a lower per capita

personal income. Per capita personal income was significantly lower

for all regions of the continental United States when compared to the

western region, other things equal. The northeastern region's personal

income per capita was $350 lower.

The R^2-value indicates that the model explained 37.5 percent of the

variation in per capita personal income among counties in 1975. Disclo-

sure problems for the "investment" variable caused the number of counties

in the model to be reduced by 323. This may bias the results.

The 15 federal spending categories were included in the model

formulated to explain the variation in the employment rate--the number

employed as a percent of total county population. Other explanatory

variables present in the model were state and local government spending,

"investment" (contract construction industry income), percent unemployed

in the county, income per capita for 1974, percent of the population

nonwhite, percent of the adult population who had attended high school,

and percent of the adults who had graduated from college. Higher levels

of educational attainment are hypothesized to increase the number of

employed and, therefore, the employment rate of the county unless jobs

requiring higher levels of education are unavailable in the county.

Underemployment may then result   with unemployment as the search

for suitable employment ensues. Results of the OLS estimation of this

model are summarized in Table XXVII.

TABLE XXVII

RESULTS OF THE ORDINARY LEAST SQUARES ESTIMATION
OF THE EMPLOYMENT RATE, 1975

Independent Variables	$\hat{\beta}$	t for H_o: $\beta = 0$
	(%)	
Farm Income Stabilization per capita, 1975	-.0012	-.98
Rural Housing/Public Facilities per capita, 1975	.0239	3.93**
Agricultural Land and Water per capita, 1975	.1049	9.37**
Agricultural Research per capita, 1975	.0041	4.93**
Pollution Control per capita, 1975	-.0039	-1.43
Business Advancement and Regulation per capita, 1975	-.0178	-2.17**
Area/Regional Development per capita, 1975	-.0036	-1.94*
Community Development per capita, 1975	.0556	6.04**
Housing per capita, 1975	-.1580	-.70
Health per capita, 1975	.0115	4.40**
Income Security per capita, 1975	.0009	1.15
Education per capita, 1975	.0006	.49
Defense and Space per capita, 1975	.0008	5.40**
Transportation per capita, 1975	.0011	2.74**
General Government per capita, 1975	-.0028	-2.88**
State and Local Government per capita, 1972	.0001	.47
Contract Construction Income per capita, 1974	.0028	3.75**
Unemployed (%)	-.8775	-5.71**
Income Per Capita, 1974	4.7968	47.16**
Nonwhite (%)	.0034	.43
High School (%)	-.0800	-3.78**
College (%)	-.1612	-2.52**
Intercept	21.1842	27.18**

N = 2,828

R^2 = .6029

*Statistically significant at the ten percent level.

**Statistically significant at the five percent level.

If per capita spending for community development increased by $1.00, the county employment rate would increase by .06 percent. Other federal spending variables having positive, significant coefficients in this model were rural housing and public facilities, agricultural land and water, agricultural research, health, defense and space, and transportation. As investment in the previous year increased in dollars per capita, the employment rate of the county increased. The coefficient for the per capita 1974 income variable was positive and significant while the coefficient on percent of the population nonwhite was not significantly different from zero. Both education variables had coefficients that were negative and statistically significant.

Of the 3,064 counties in the continental United States, 2,828 were included in this model. Again, the problem of disclosure in reporting contract construction income caused the remaining 236 counties to be left out of the analysis by the computerized OLS routine. The R^2-value indicates that 60 percent of the variation in the county employment rate was explained by this model.

A third variable under scrutiny in this study was investment spending, as proxied by contract construction industry income for a county. The model to explain this variable included several independent variables: the 15 categories of per capita federal spending, state and local government per capita spending, per capita income for 1974, percent unemployed, the regional dummies, and investment for 1974.

Table XXVIII summarizes the OLS results for this model. Investment increased by $1.00 when per capita spending for agricultural land and water increased by $1.00. Two other federal spending variables had positive, significant coefficients--health, and defense and space.

TABLE XXVIII

RESULTS OF THE ORDINARY LEAST SQUARES ESTIMATION OF
CONTRACT CONSTRUCTION INCOME PER CAPITA, 1975

Independent Variables	$\hat{\beta}$	t for H_o: $\beta = 0$
	(dollars)	
Farm Income Stabilization per capita, 1975	-.0344	-1.22
Rural Housing/Public Facilities per capita, 1975	.1444	1.05
Agricultural Land and Water per capita, 1975	.9978	3.71**
Agricultural Research per capita, 1975	-.0165	-.82
Pollution Control per capita, 1975	-.0021	-.04
Business Advancement and Regulation per capita, 1975	-.3063	-1.73*
Area/Regional Development per capita, 1975	-.0073	-.17
Community Development per capita, 1975	-.0241	-.12
Housing per capita, 1975	-1.1841	-.24
Health per capita, 1975	.1067	1.88*
Income Security per capita, 1975	-.0214	-1.17
Education per capita, 1975	-.0019	-.07
Defense and Space per capita, 1975	.0057	1.84*
Transportation per capita, 1975	.0126	1.50
General Government per capita, 1975	-.0068	-.29
State and Local Government per capita, 1972	.0013	.31
Income Per Capita, 1974	.2128	.10
Unemployed (%)	4.0566	1.13
Northeastern U. S.	-13.2122	-1.04
Northcentral U. S.	1.4769	.17
Southern U. S.	.6692	.07
Contract Construction Income per capita, 1974	.9306	54.71**
Intercept	6.7484	.39

N = 2,706

R^2 = .5817

*Statistically significant at the ten percent level.

**Statistically significant at the five percent level.

The model was dominated by the effect of the lagged value of the dependent variable used as an independent variable. Although autocorrelated disturbances can bias OLS estimates of coefficients in equations containing lagged values of the dependent variable, the bias declines for large sample sizes as used here (35). The coefficient on this lagged variable indicated that as per capita contract construction income in 1974 increased by $1, per capita construction income for 1975 increased by $.93. This is a short-run coefficient, as are all the coefficients in this type of model. Long-run coefficients may be determined by dividing the short-run coefficients by an adjustment factor. In this model the adjustment factor is .07(= 1 - .93). In part because adjustment rates are likely to vary among independent variables and in part because of possible statistical bias in the estimation of the adjustment rate, the long-term coefficient estimates are especially unreliable. However, the low magnitude of the adjustment rate suggests that the long-term effects may be much greater than the short-term effects shown.

The model for analyzing change in county population included as explanatory variables the 15 categories of per capita federal spending, state and local government per capita spending, contract construction income per capita, the county employment rate, percent of the population under 18 years of age, and percent of the population 65 years of age and older.

The coefficient for housing expenditures had a large and positive sign in the OLS regression results for the dependent variable population change, 1974 to 1975, summarized in Table XXIX. It is cautioned that increased housing outlays may be caused by increased population, and

TABLE XXIX

RESULTS OF THE ORDINARY LEAST SQUARES ESTIMATION
OF THE CHANGE IN POPULATION, 1974 TO 1975

Independent Variables	$\hat{\beta}$	t for H_o: $\beta = 0$
Farm Income Stabilization per capita, 1975	-.1832	-.26
Rural Housing/Public Facilities per capita, 1975	-1.7970	-.57
Agricultural Land and Water per capita, 1975	-4.9311	-.85
Agricultural Research per capita, 1975	-.1025	-.24
Pollution Control per capita, 1975	1.3053	.82
Business Advancement and Regulation per capita, 1975	1.5419	.32
Area/Regional Development per capita, 1975	-.9882	-.89
Community Development per capita, 1975	-4.0208	-.70
Housing per capita, 1975	926.4833	7.04**
Health per capita, 1975	.4898	.31
Income Security per capita, 1975	-.4247	-.86
Education per capita, 1975	1.3421	1.92*
Defense and Space per capita, 1975	.1200	1.48
Transportation per capita, 1975	-.2246	-1.00
General Government per capita, 1975	-1.5804	-2.77**
State and Local Government per capita, 1972	.0062	.06
Contract Construction Income per capita, 1975	1.4284	3.99**
Employment Rate, 1975	-2,556.4063	-3.13**
Youth (%)	-70.1586	-3.35**
Elderly (%)	-110.5217	-4.37**
Intercept	5,544.8067	5.34**

N = 2,741

R^2 = .0517

*Statistically significant at the ten percent level.

**Statistically significant at the five percent level.

the two variables may, in fact, be jointly determinant. The same can be concluded for the relationship between the investment and population variables: as investment per capita increased, population increased. Employment rate, youth, and elder variables all had significant, negative coefficients.

In the estimation of this variable, migration was not included. This exclusion sacrificed information that would help in explaining population change. The R^2-value of .0517 indicates that much of the variation is left unexplained in this model.

The OLS estimations of the equations for the per capita federal spending variables are summarized in Table XXX. All equations contained some significant coefficients, but the variables did a better job of explaining the variation in the dependent variable in some equations than in others as evidenced by the R^2-values. The model here includes an equation for state and local government spending with the specification based on prior research (20, 29, 30, 31). Coefficients are significant for four variables: percent of the population in poverty, percent of the population under 18, state and local taxes per capita, and the employment rate for 1975. Since much of the spending of state and local governments goes to education purposes, the more young people in the county would increase state and local government outlays as the model indicates. More revenue in the form of taxes collected is expected to be associated with state and local government spending. A higher employment rate in the county is expected to provide a greater tax base which leads to more state and local government spending.

In estimating the equation for the farm income stabilization spending category, the percentage of farmers in the county had a highly

TABLE XXX

RESULTS OF THE ORDINARY LEAST SQUARES ESTIMATION OF EQUATIONS FOR GOVERNMENT OUTLAY VARIABLES

Explanatory Variables	Endogenous Variables				
	State and Local Government Per Capita, 1975	Farm Income Stabilization Per Capita, 1975	Rural Housing/ Public Facilities Per Capita, 1975	Agricultural Land and Water Per Capita, 1975	Agricultural Research Per Capita, 1975
	(dollars)				
Z of Population Farmers		13.4734 (.4918)	.0845 (.1056)	1.7264 (.0468)	-3.9139 (.7618)
Z of Population in Poverty	-5.2157 (1.2778)		.0594 (.0396)	-.0193 (.0166)	
Youth (Z)	6.3293 (3.9071)				
Elderly (Z)	2.5439 (4.2837)				
High School (Z)					
College (Z)					
Unemployed (Z)					
Nonwhite Population (Z)					
State and Local Taxes per capita, 1972	308.3664 (275.5334)				
Sum of Federal Outlays per capita, 1974	.0064 (.0136)				
Northeastern U. S.		7.7295 (7.1238)	-1.1996 (1.3100)		-183.2751 (10.8331)
Northcentral U. S.		.5574 (5.0345)	-.6526 (.8090)	-3.2596 (.3377)	-174.7285 (7.6477)
Southern U. S.		21.5165 (4.8532)			-165.7083 (7.6286)
Medium Metropolitan County	-56.7302 (59.0914)		-2.6408 (1.1454)		
Lesser Metropolitan County	-65.8654 (65.1025)		-2.7412 (1.3421)		
Nonmetro County, Adjacent to SMSA	-48.6008 (63.7613)				
Nonmetro County, Not Adjacent to SMSA	-60.2174 (70.5827)				
Lesser Urbanized Nonmetro County, Adjacent to SMSA	-48.8307 (56.2907)				
Lesser Urbanized Nonmetro County, Not Adjacent to SMSA	-30.3632 (56.4533)			1.6366 (.3632)	22.2799 (5.8876)
Thinly Populated Nonmetro County, Adjacent to SMSA	-48.4343 (66.8722)	-9.2383 (6.0480)		2.8627 (.5669)	
Thinly Populated Nonmetro County, Not Adjacent to SMSA	42.0962 (62.3636)	-28.7078 (4.7392)	4.0642 (.9742)	5.5642 (.4721)	59.1056 (7.5566)
Income Per Capita, 1975			-.0010 (.0002)	.0002 (.0001)	.0020 (.0017)
Employment Rate, 1975	349.9694 (147.7088)				
Intercept	117.8682 (186.5026)	-16.9166 (4.5494)	9.3791 (1.7965)	.7311 (.7454)	183.7907 (11.5562)
R^2	.0287	.2504	.0289	.4742	.1949
N	3,064	3,064	3,064	3,064	3,064

TABLE XXX (Continued)

Explanatory Variables	Pollution Control Per Capita, 1975	Business Advancement and Regulation Per Capita, 1975	Area/Regional Development Per Capita, 1975	Community Development Per Capita, 1975	Housing Per Capita, 1975
			(dollars)		
% of Population Farmers	-.7167 (.2308)			-.5107 (.0744)	-.0056 (.0026)
% of Population in Poverty			.7865 (.1627)	.1420 (.0320)	
Youth (%)		.2051 (.0663)	.8168 (.4148)		
Elderly (%)			-1.1514 (.4367)		
High School (%)				-.1894 (.0505)	
College (%)		1.2698 (.1347)		.5933 (.1340)	
Unemployed (%)			4.8790 (1.5861)		
Nonwhite Population (%)					
State and Local Taxes per capita, 1972					
Sum of Federal Outlays per capita, 1974				3.5388 (.9050)	
Northeastern U. S.					
Northcentral U. S.	-7.4799 (2.2428)				
Southern U. S.	-12.4127 (2.0888)	1.1467 (.5352)	-9.5433 (3.2781)		
Medium Metropolitan County	12.3203 (2.8122)			3.5498 (.8293)	.0839 (.0338)
Lesser Metropolitan County	9.3708 (3.3166)			5.4788 (.9686)	.1559 (.0400)
Nonmetro County, Adjacent to SMSA	8.0547 (3.1746)				
Nonmetro County, Not Adjacent to SMSA				5.2871 (1.0744)	
Lesser Urbanized Nonmetro County, Adjacent to SMSA					
Lesser Urbanized Nonmetro County, Not Adjacent to SMSA					
Thinly Populated Nonmetro County, Adjacent to SMSA					
Thinly Populated Nonmetro County, Not Adjacent to SMSA			11.8491 (3.3065)	-1.8930 (.6996)	
Income Per Capita, 1975				.0018 (.0002)	a/ (a/)
Employment Rate, 1975					
Intercept	19.8878 (1.9857)	-9.4480 (2.5363)	-27.3740 (18.0811)	-1.0888 (2.1697)	-.0835 (.0325)
R^2	.0342	.0331	.0405	.1124	.0165
N	3,064	3,064	3,064	3,064	3,064

TABLE XXX (Continued)

Explanatory Variables	Endogenous Variables					
	Health Per Capita, 1975	Income Security Per Capita, 1975	Education Per Capita, 1975	Defense and Space Per Capita, 1975	Transportation Per Capita, 1975	General Government Per Capita, 1975
	(dollars)					
% of Population Farmers		-12.0161 (.6852)		-17.0004 (4.6236)		2.5596 (.6710)
% of Population in Poverty	.5907 (.1371)	5.0676 (.2941)	1.3847 (.3252)			.8574 (.2696)
Youth (%)		.0097 (.7670)		-19.8085 (5.2226)	-2.9299 (1.8433)	
Elderly (%)	5.2162 (.2756)	23.8837 (.8434)	-.9191 (.6604)	-41.7896 (5.9873)	-9.4401 (2.1773)	
High School (%)	-.9188 (.2237)		-1.9450 (.5194)	-8.4347 (2.8656)	5.4199 (1.1637)	
College (%)	6.2342 (.4933)	-3.3720 (1.2542)	9.6203 (1.1265)	4.4272 (8.9929)		7.6856 (1.2532)
Unemployed (%)	3.0506 (1.1745)	16.8541 (2.9832)	10.4747 (2.7461)			8.1773 (2.9570)
Nonwhite Population (%)						
State and Local Taxes per capita, 1972						
Sum of Federal Outlays per capita, 1974						
Northeastern U. S.	10.8472 (3.3621)				-153.9421 (25.7811)	202.7633 (8.6344)
Northcentral U. S.		-49.0145 (6.0105)			-138.6040 (18.8345)	26.3242 (5.4304)
Southern U. S.	-12.4170 (2.2407)	-34.8265 (6.9118)	-23.8392 (5.2602)		-124.9362 (20.1691)	
Medium Metropolitan County			20.9831 (7.3415)			27.3140 (7.5909)
Lesser Metropolitan County			18.2520 (8.5352)	93.2423 (61.7786)		
Nonmetro County, Adjacent to SMSA			18.2156 (8.1217)			
Nonmetro County, Not Adjacent to SMSA				213.3914 (68.8111)		
Lesser Urbanized Nonmetro County, Adjacent to SMSA		-14.8412 (5.1359)			41.4362 (17.0554)	
Lesser Urbanized Nonmetro County, Not Adjacent to SMSA					62.1780 (16.4663)	-9.0158 (5.0647)
Thinly Populated Nonmetro County, Adjacent to SMSA				190.8834 (56.8242)	129.7779 (23.9854)	
Thinly Populated Nonmetro County, Not Adjacent to SMSA					130.4029 (19.2517)	
Income Per Capita, 1975	.0043 (.0007)	.0242 (.0017)		.1247 (.0126)		.0110 (.0018)
Employment Rate, 1975						
Intercept	-11.8003 (8.4101)	116.5360 (36.8425)	31.5534 (19.0757)	1,073.8311 (258.0113)	188.8620 (94.7667)	-6.7514 (13.8875)
R^2	.2198	.4386	.0658	.1177	.0677	.2461
N	3,064	3,064	3,064	3,064	3,064	3,064

[a]/Less than .0005 of one unit.

significant, positive coefficient. The regional variables' parameters indicate that, other things equal, the southern region received $21.52 per capita more for this purpose than the western region. The thinly populated nonmetropolitan counties received significantly less than the large metropolitan counties (whose effect is included in the intercept), ceteris paribus. In explaining the variation in rural housing and public facilities spending, a higher percentage in poverty was associated with more dollars per capita received by that county. Medium and lesser metropolitan counties received significantly less than the large metropolitan counties, other things equal, and the thinly populated, not adjacent to an SMSA counties received significantly more. The higher the per capita personal income of the population, the lower the dollars per capita received for rural housing and public facilities.

Agricultural land and water spending was significantly explained by the variables: percent of the population farmers, the northcentral region of the U. S., lesser urbanized nonmetropolitan, nonadjacent and thinly populated nonmetropolitan counties, and income per capita. If a county was located in the northcentral region it received $3.26 less for this purpose than counties in the western region, ceteris paribus. All of the other significant variables had positive coefficients. More spending for agricultural research was in counties with smaller percentages of the population farmers. The western region received more money for agricultural research than any other region, other things equal. Lesser urbanized and thinly populated nonmetropolitan, nonadjacent counties received more federal funds per capita for this purpose than the large metropolitan counties, other things equal. The location of the land-grant system schools may be affecting these results.

Pollution control was best explained by the variables for regions and the larger county size categories. These indicated that, other things equal, the northcentral and southern regions received less money per capita, than the western region for this purpose and the medium and lesser metropolitan counties and the nonmetropolitan counties adjacent to SMSA's receive more per capita than do the large metropolitan counties, <u>ceteris paribus</u>. As the percentage of the population in farming increased by one percent, federal funding for pollution control decreased by $.72 per capita, other things equal. Counties with higher percentages of the population under 18, larger percentages of the adult population with college degrees, and in the southern region of the U. S. received more per capita for business advancement and regulation, <u>ceteris paribus</u>.

As percentage of the population in poverty increased by one percent, federal spending for area and regional development increased by $.79 per capita. Other significant variables in explaining this category of spending were percentage of the population under 18, percentage of the population 65 years of age and older, the southern region of the U. S., and thinly populated nonmetropolitan counties, not adjacent to SMSA's. All these had positive coefficient estimates except the elderly population and the southern region. More dollars per capita for community development went to counties with a larger percentage of the population in poverty, a higher per capita income, more of the adult population with college degrees, and located in the northeastern region of the U. S. Medium and lesser metropolitan counties and nonmetropolitan counties, not adjacent to SMSA's, received more per capita than large metropolitan counties for this purpose, other things equal. The

coefficients on the variables percent of the population in farming, adult population with some high school education, and thinly populated nonmetropolitan counties, not adjacent to an SMSA were negative and significant.

Housing outlays were significantly affected by only two of the variables: percent of the population in farming and the medium metro-politan county dummy. The larger the percentage of farmers in the county, other things equal, the less received per capita for housing. If the county were a medium metropolitan county, it would receive more per capita for housing than the large metropolitan counties, ceteris paribus.

Variation in health outlays per capita was explained by several variables. If the percentage of the county population 65 years of age or older increased by one percent, health spending by the federal government increased by $5.22 per capita. Other variables having positive, significant coefficients in this equation were percent of the population in poverty, percent of the adult population with college degrees, percent of the population unemployed, the northeastern region of the U. S., and per capita personal income for 1975. Variables with negative, significant coefficients were percent of the adult population with some high school education and the southern region of the U. S.

Per capita federal spending for income security increased by $5.01 when the percentage of the county population in poverty increased by one percent, other things equal. As the percentage of the population 65 years of age and older increased by one percent, federal spending for this purpose increased by $23.88 per capita. Population unemployed and per capita income variables also had positive, significant

coefficients in the equation for income security spending per capita. Those explanatory variables with negative, significant coefficients were percent of the county population in farming, percent of the adult population with college degrees, the northcentral and southern regions of the U. S., and the lesser urbanized nonmetropolitan counties, adjacent to SMSA's. As the elderly population increased by one percent, federal spending for education decreased by $.92 per capita. Adult population with some high school education and the southern region variables also had negative, significant coefficients in the equation for education spending. Variables with positive, significant coefficients were population in poverty, adult population with college degrees, percent unemployed, medium and lesser metropolitan counties, and the nonmetropolitan counties adjacent to SMSA's.

Defense and space outlays per capita decreased in counties having larger percentages of the population in farming, higher percentages under 18, higher percentages 65 or older, and more of the adult population with some high school education. Nonmetropolitan counties, not adjacent to an SMSA received $213.39 per capita more for this purpose than the large metropolitan counties, ceteris paribus. Variables with positive, significant coefficients also included thinly populated nonmetropolitan counties, not adjacent to an SMSA and income per capita.

Transportation spending was less per capita in counties with larger percentages of the population dependent (under 18 or 65 and over). All regions received less per capita for transportation than the western region. Lesser urbanized and thinly populated nonmetropolitan counties and counties with higher percentages of the adult population with some high school education received more per capita federal dollars for this purpose.

Counties in the northeastern region received $202.76 more per capita for general government purposes than counties in the western region, other things equal. Other variables with positive, significant coefficients in this equation included population in farming, population in poverty, adult population with college degrees, percent unemployed, the northcentral region, medium metropolitan counties, and income per capita.

2SLS Estimations. Three simultaneous equation approaches were used to estimate the impact of federal outlays. In the first approach, the system was made up of the four equations estimated with OLS above. The four dependent variables of those regression equations became the endogenous variables of the system with all the "independent" variables becoming predetermined. The model and the 2SLS estimates of the structural parameters are summarized in Table XXXI. This system's estimations would be identical to the OLS estimations except for the two endogenous variables appearing in the population equation. Because the simultaneous approach considers the interrelationships of the endogenous variables, the estimates of the coefficients were slightly different throughout the system when compared to the OLS estimates. One change makes this system estimation better align with the cycle of economic growth: the employment rate variable had a positive coefficient in the equation for population change. More job opportunities in an area should attract people to that area and lead to less outmigration, causing the population to increase.

The second system approach attempted to correct for the demand or need factors in estimating the "supply" effects of the federal outlays.

TABLE XXXI

TWO-STAGE LEAST SQUARES ESTIMATES OF THE STRUCTURAL PARAMETERS OF THE SIMULTANEOUS EQUATION SYSTEM, ALL FEDERAL OUTLAY VARIABLES EXOGENOUS

Selected Explanatory Variables	Endogenous Variables			
	Income Per Capita, 1975	Employment Rate, 1975	Change in Contract Construction Income Per Capita, 1974-75	Population Change, 1974-75
	(dollars)	(percent)	(dollars)	(actual numbers)
Farm Income Stabilization per capita, 1975	2.4075 (.2840)[a/]	-.0016 (.0013)	-.0259 (.0266)	-.6461 (.8154)
Rural Housing/Public Facilties per capita, 1975	-7.1414 (1.4712)	.0204 (.0067)	-.0052 (.1363)	-1.8878 (4.0278)
Agricultural Land and Water per capita, 1975	-1.0822 (2.7311)	.0966 (.0123)	1.0902 (.2524)	-20.4020 (9.3723)
Agricultural Research per capita, 1975	.3921 (.2053)	.0046 (.0009)	-.0176 (.0190)	-.1780 (.5126)
Pollution Control per capita, 1975	.5176 (.5987)	-.0044 (.0027)	-.0145 (.0053)	1.5598 (1.6382)
Business Advancement and Regulation per capita, 1975	2.8571 (1.8094)	-.0158 (.0083)	-.3549 (.1673)	1.3543 (5.2817)
Area/Regional Development per capita, 1975	-.9527 (.4287)	-.0027 (.0020)	-.0004 (.0396)	-.7579 (1.1883)
Community Development per capita, 1975	16.5401 (2.1027)	.0607 (.0098)	-.0286 (.1967)	-6.4604 (6.0170)
Housing per capita, 1975	165.6029 (49.1891)	-.1338 (.2253)	-1.9502 (4.5559)	916.5550 (135.1460)
Health per capita, 1975	2.4109 (.5781)	.0111 (.0026)	.1173 (.0535)	.3971 (1.7448)

TABLE XXXI (Continued)

Selected Explanatory Variables	Endogenous Variables			
	Income Per Capita 1975	Employment Rate, 1975	Change in Contract Construction Income Per Capita, 1974-75	Population Change, 1974-75
	(dollars)	(percent)	(dollars)	(actual numbers)
Income Security per capita, 1975	.2124 (.1867)	.0010 (.0008)	-.0167 (.0172)	-.9116 (.5851)
Education per capita, 1975	-1.0851 (.2629)	.0004 (.0012)	-.0071 (.0244)	1.4877 (.7183)
Defense and Space per capita, 1975	.3790 (.0308)	.0006 (.0001)	.0065 (.0029)	.0701 (.0948)
Transportation per capita, 1975	-.0490 (.0864)	.0011 (.0004)	.0061 (.0080)	-.1449 (.2374)
General Government per capita, 1975	1.3515 (.2393)	-.0030 (.0010)	-.0038 (.0222)	-1.8915 (.5973)
State and Local Government per capita, 1972	.1220 (.0414)	-.0001 (.0002)	.0015 (.0038)	-.0138 (.1137)
Income Per Capita, 1974		4.8856 (.1026)	-3.6225 (1.9312)	
Unemployed (%)	-247.0849 (36.7882)	-.8814 (.1618)	3.0501 (3.4179)	
Change in Contract Construction Income Per Capita, 1973-74	2.0372 (.3089)	.0024 (.0014)	-.1500 (.0288)	
Nonwhite Population (%)		.0019 (.0085)		

TABLE XXXI (Continued)

Selected Explanatory Variables	Endogenous Variables			
	Income Per Capita 1975	Employment Rate, 1975	Change in Contract Construction Income Per Capita, 1974-75	Population Change, 1974-75
	(dollars)	(percent)	(dollars)	(actual numbers)
High School (%)		-.0842 (.0219)		
College (%)		-.1411 (.0664)		
Youth (%)				-45.0007 (23.2432)
Elderly (%)				-86.3369 (28.9763)
Northeastern U. S.	-553.8769 (129.3390)		-13.5654 (11.9805)	
Northcentral U. S.	-297.9335 (89.4329)		.2765 (8.2860)	
Southern U. S.	-1,209.6509 (88.5018)		-3.0667 (8.4715)	
Change in Contract Construction Income Per Capita, 1974-75				-1.2595 (5.1043)
Employment Rate, 1975				1,183.5173 (1,142.0111)
Intercept	5,025.9584 (145.1434)	21.4138 (.8127)	8.7451 (16.1487)	3,631.2046 (1,201.0478)

a/Values in parentheses are the standard deviations of the estimates.

In correcting for these factors, the 15 federal spending variables were assumed endogenous to the system and modeled as in the OLS equations reported above. Also endogenous in this approach were the four variables proxying well-being and the state and local government per capita spending variable. The four equations for the variables of special interest to this study are presented in Table XXXII.

In this approach all variables lost their significance. Including the outlay variables as endogenous could have led to this result. Many of the equations for the outlay variables had low R^2-values implying that much of the variation in them was left unexplained. The specification errors imply much loss of information when these variables become endogenous in this system approach. The use of equations not adequately specified results in statistical inefficiency and possible bias in the simultaneous system.

This specification problem was particularly acute for seven outlay variables: rural housing and public facilities, pollution control, business advancement and regulation, area and regional development, housing, education, and transportation. In the final approach taken in this study, these variables were treated as exogenous to the system. The low R^2-values, loss of information, and potential specification errors suggested merit in making the variables exogenous. The remaining eight federal outlay variables were assumed endogenous and are modeled as above.

The results for the four equations of special interest as estimated in this approach are summarized in Table XXXIII. Comparing these results with those of the first approach, in the "net investment" equation the coefficients of both housing variables became positive. Housing outlays

TABLE XXXII

TWO-STAGE LEAST SQUARES ESTIMATES OF THE STRUCTURAL PARAMETERS OF SELECTED
EQUATIONS OF THE SYSTEM, ALL FEDERAL OUTLAY VARIABLES ENDOGENOUS

Explanatory Variables	Endogenous Variables			
	Income Per Capita, 1975	Employment Rate, 1975	Change in Contract Construction Income, Per Capita, 1974-75	Population Change, 1974-75
	(dollars)	(percent)	(dollars)	(actual number)
Farm Income Stabilization per capita, 1975	4.6110 (45.5283)a/	.2090 (.4885)	-.0908 (2.9142)	12.3114 (20.4847)
Rural Housing/Public Facilities per capita, 1975	-123.7110 (275.8032)	-1.3035 (4.0179)	-7.1857 (17.8678)	1.9366 (149.0833)
Agricultural Land and Water per capita, 1975	-39.4738 (296.8507)	-1.4791 (2.5308)	-.1251 (18.9161)	-76.2099 (149.9722)
Agricultural Research per capita, 1975	-.5392 (50.0707)	.1103 (.2397)	-.2844 (2.8283)	3.8894 (4.9260)
Pollution Control per capita, 1975	-219.7293 (294.1770)	-.5711 (2.3222)	-14.2208 (16.1939)	79.5280 (59.8849)
Business Advancement and Regulation per capita, 1975	-236.0548 (324.7682)	.0453 (3.9312)	-18.9834 (20.0726)	365.1258 (234.5346)
Area/Regional Development per capita, 1975	130.3995 (142.3370)	-.8492 (.9868)	-7.4005 (9.7612)	16.7553 (76.7424)
Community Development per capita, 1975	-9.6522 (197.7617)	1.6924 (1.6984)	-1.0902 (12.2975)	-35.3232 (148.6835)
Housing per capita, 1975	5,473.3050 (12,241.1693)	-19.5312 (67.3730)	355.2656 (777.1840)	4,515.5594 (3,723.9860)
Health per capita, 1975	-79.9520 (97.7849)	-.1503 (.4796)	-4.6308 (7.1847)	-34.0448 (49.6115)

TABLE XXXII (Continued)

Explanatory Variables	Endogenous Variables			
	Income Per Capita, 1975	Employment Rate, 1975	Change in Contract Construction Income, Per Capita, 1974–75	Population Change, 1974–75
	(dollars)	(percent)	(dollars)	(actual number)
Income Security per capita, 1975	12.5429 (14.8617)	.0139 (.1084)	.6278 (1.1661)	-.8817 (4.8351)
Education per capita, 1975	71.8437 (95.6668)	.3815 (.6589)	4.4425 (5.7349)	.7958 (21.1436)
Defense and Space per capita, 1975	.0942 (1.6987)	-.0101 (.0123)	.0149 (.1029)	-.3583 (.8301)
Transportation per capita, 1975	-6.0698 (9.4643)	.0099 (.1384)	-.3312 (.5880)	.4602 (5.6593)
General Government per capita, 1975	10.8814 (37.3292)	-.0269 (.1854)	.8451 (2.3590)	-3.9551 (6.7608)
State and Local Government per capita, 1972	25.2248 (21.1432)	.1437 (.1685)	1.5316 (1.7351)	-2.3057 (6.8758)
Income Per Capita, 1974		.2213 (8.1217)	-56.5603 (65.5810)	
Change in Contract Construction Income Per Capita, 1973–74	-2.3137 (7.2211)	.0133 (.0485)		
% of Population Farmers				
% of Population in Poverty				
Youth (%)				-53.9333 (193.3707)

TABLE XXXII (Continued)

Explanatory Variables	Endogenous Variables			
	Income Per Capita, 1975	Employment Rate, 1975	Change in Contract Construction Income, Per Capita, 1974-75	Population Change, 1974-75
	(dollars)	(percent)	(dollars)	(actual number)
Elderly (%)				264.7010 (348.7080)
High School (%)		-.1781 (1.3686)		
College (%)		-4.0428 (10.8316)		
Unemployed (%)	-961.9020 (1,820.5519)	-10.3923 (12.4413)	-47.7010 (117.2146)	
Nonwhite Population (%)		-.1521 (.5162)		
State and Local Taxes per capita, 1972				
Sum of Federal Outlays per capita, 1974				
Northeastern U.S.	-3,069.5288 (9,935.2796)		-244.1943 (631.7542)	
Northcentral U.S.	-2,493.2916 (6,979.0486)		-184.3172 (397.3544)	
Southern U.S.	-2,453.9704 (5,792.2584)		-158.7406 (337.5577)	
Medium Metropolitan County				

TABLE XXXII (Continued)

Explanatory Variables	Endogenous Variables			
	Income Per Capita, 1975	Employment Rate, 1975	Change in Contract Construction Income, Per Capita, 1974-75	Population Change, 1974-75
	(dollars)	(percent)	(dollars)	(actual number)
Lesser Metropolitan County				
Nonmetro County, Adjacent to SMSA				
Nonmetro County, Not Adjacent to SMSA				
Lesser Urbanized Nonmetro County, Adjacent to SMSA				
Lesser Urbanized Nonmetro County, Not Adjacent to SMSA				
Thinly Populated Nonmetro County, Adjacent to SMSA				
Thinly Populated Nonmetro County, Not Adjacent to SMSA				
Income Per Capita, 1975				
Employment Rate, 1975				-1,019.2948 (5,889.6548)
Change in Contract Construction Income Per Capita, 1974-75				-.7583 (6.2486)
Intercept	-320.6067 (7,415.0503)	14.8030 (74.2044)	-8.2227 (471.1837)	2,154.2171 (7,070.8564)

a/Values in parentheses are the standard deviations of the estimates.

TABLE XXXIII

TWO-STAGE LEAST SQUARES ESTIMATES OF THE STRUCTURAL PARAMETERS OF SELECTED EQUATIONS OF THE SYSTEM, SELECTED FEDERAL OUTLAY VARIABLES ENDOGENOUS

Explanatory Variables	Endogenous Variables			
	Income Per Capita, 1975	Employment Rate, 1975	Change in Contract Construction Income, Per Capita, 1974-75	Population Change, 1974-75
	(dollars)	(percent)	(dollars)	(actual number)
Farm Income Stabilization per capita, 1975	21.0735 (9.7837)[a/]	-.0326 (.0220)	-.4280 (.2462)	-1.4649 (5.4553)
Rural Housing/Public Facilities per capita, 1975	-2.8695 (8.7656)	.0149 (.0175)	.0185 (.1934)	.0646 (5.0475)
Agricultural Land and Water per capita, 1975	-126.6174 (77.0657)	.3508 (.1451)	3.5216 (1.8100)	3.2547 (28.4354)
Agricultural Research per capita, 1975	12.9001 (12.8362)	-.0037 (.0131)	-.4126 (.2859)	5.8040 (2.3048)
Pollution Control per capita, 1975	-3.7371 (4.2726)	.0033 (.0073)	.0579 (.0962)	1.2070 (2.0547)
Business Advancement and Regulation per capita, 1975	.8919 (12.7601)	-.0514 (.0251)	-.2584 (.2822)	-6.0146 (7.7232)
Area/Regional Development per capita, 1975	5.5766 (4.2840)	-.0241 (.0083)	-.0860 (.0994)	-2.3167 (2.5835)
Community Development per capita, 1975	159.0728 (46.4129)	.0375 (.1591)	-3.8242 (1.4323)	176.1507 (45.5728)
Housing per capita, 1975	-46.3433 (290.4599)	-.3960 (.5930)	.3132 (6.4240)	821.2932 (171.8270)
Health per capita, 1975	-10.6055 (13.4930)	.0967 (.0345)	.1612 (.3072)	7.0898 (10.2531)

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TABLE XXXIII (Continued)

Explanatory Variables	Endogenous Variables			
	Income Per Capita, 1975	Employment Rate, 1975	Change in Contract Construction Income, Per Capita, 1974-75	Population Change, 1974-75
	(dollars)	(percent)	(dollars)	(actual number)
Income Security per capita, 1975	4.1398 (3.0928)	-.0181 (.0083)	-.0602 (.0722)	-6.9931 (2.2570)
Education per capita, 1975	-7.6264 (3.8041)	-.0020 (.0070)	.1770 (.0923)	-3.6050 (1.7051)
Defense and Space per capita, 1975	-.6842 (.4973)	.0012 (.0007)	.0264 (.0114)	-.0300 (.1768)
Transportation per capita, 1975	-.5839 (.8369)	.0010 (.0013)	.0252 (.0185)	-.6441 (.3522)
General Government per capita, 1975	8.5435 (10.8880)	-.0172 (.0085)	-.1276 (.2425)	-5.624 (2.4244)
State and Local Government per capita, 1972	10.5733 (3.7880)	-.0205 (.0125)	-.1210 (.1109)	1.4345 (2.8754)
Income Per Capita, 1974		5.8462 (.6918)	11.1948 (6.0555)	
Change in Contract Construction Income Per Capita, 1973-74	1.7412 (1.7799)	-.0001 (.0037)		
% of Population Farmers				
% of Population in Poverty				
Youth (%)				35.1018 (50.3360)

TABLE XXXIII (Continued)

Explanatory Variables	Endogenous Variables			
	Income Per Capita, 1975	Employment Rate, 1975	Change in Contract Construction Income, Per Capita, 1974-75	Population Change, 1974-75
	(dollars)	(percent)	(dollars)	(actual number)
Elderly (%)				113.3877 (99.4010)
High School (%)		-.0353 (.0669)		
College (%)		-.3302 (.3127)		
Unemployed (%)	-965.3455 (592.0783)	.6440 (.8961)	23.4925 (13.7630)	
Nonwhite Population (%)		.0327 (.0310)		
State and Local Taxes per capita, 1972				
Sum of Federal Outlays per capita, 1974				
Northeastern U.S.	-1,609.8730 (2,348.7859)		-12.6214 (52.7894)	
Northcentral U.S.	894.0885 (1,425.0168)		-35.2482 (31.4096)	
Southern U.S.	598.3572 (1,052.9832)		-30.9219 (23.2059)	
Medium Metropolitan County				

TABLE XXXIII (Continued)

Explanatory Variables	Endogenous Variables			
	Income Per Capita, 1975	Employment Rate, 1975	Change in Contract Construction Income, Per Capita, 1974-75	Population Change, 1974-75
	(dollars)	(percent)	(dollars)	(actual number)
Lesser Metropolitan County				
Nonmetro County, Adjacent to SMSA				
Nonmetro County, Not Adjacent to SMSA				
Lesser Urbanized Nonmetro County, Adjacent to SMSA				
Lesser Urbanized Nonmetro County, Not Adjacent to SMSA				
Thinly Populated Nonmetro County, Adjacent to SMSA				
Thinly Populated Nonmetro County, Not Adjacent to SMSA				
Income Per Capita, 1975				
Employment Rate, 1975				-4,493.4447 (3,072.7354)
Change in Contract Construction Income Per Capita, 1974-75				.5182 (6.5254)
Intercept	-1,723.9602 (1,603.7600)	27.4105 (4.3376)	46.2549 (37.9190)	2,293.1175 (2,128.7273)

a/Values in parentheses are the standard deviations of the estimates.

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were expected to stimulate private investment so these results are in
line with _a priori_ hypotheses. Many more of the outlay variables had
positive coefficients in the population change equation, indicating
that higher outlays for these categories were either encouraging people
to move into these counties or to remain there. These variables with
significant, positive coefficients were rural housing and public facili-
ties, agricultural land and water, agricultural research, and community
development.

Generalizations

The results of the various estimations of the model merit some
perusal. Only the significant effects on income per capita, the employ-
ment rate, net investment, and population change will be examined in
detail here.

Federal Outlay Variables

In examining the performance of the federal spending variables in
the OLS estimations of the four equations, many more variables had
significant coefficients in the per capita income and employment rate
equations than in the equations for net investment and population
change (see Tables XXXIV and XXXV). Two variables--agricultural land
and water and defense and space--had consistent positive effects on per
capita income, the employment rate, and net investment. Business
advancement and regulation had negative effects on the employment rate
and net investment. The regulation spending acts to impede economic
growth and overshadows the effects of the advancement programs. Area
and regional development had negative effects on income per capita and

TABLE XXXIV

SUMMARY OF THE PERFORMANCE OF FEDERAL OUTLAY VARIABLES IN ALL ESTIMATIONS:
POSITIVE AND SIGNIFICANT COEFFICIENTS

| Equation | OLS Estimations | Systems Estimations | |
		All Exogenous	Selected Endogenous
Income Per Capita	Farm Income Stabilization Agricultural Land and Water Business Advancement and Regulation Defense and Space General Government Community Development Housing Income Security	Farm Income Stabilization Community Development Housing Health Defense and Space General Government	Farm Income Stabilization Community Development
Employment Rate	Rural Housing/Public Facilities Agricultural Land and Water Agricultural Research Community Development Health Defense and Space Transportation	Rural Housing/Public Facilities Agricultural Land and Water Agricultural Research Community Development Health Defense and Space Transportation	Agricultural Land and Water Health
Net Investment	Agricultural Land and Water Health Defense and Space	Agricultural Land and Water Health Defense and Space	Education Defense and Space
Population Change	Housing Education	Housing Education	Agricultural Research Community Development Housing

TABLE XXXV

SUMMARY OF THE PERFORMANCE OF FEDERAL OUTLAY VARIABLES IN ALL ESTIMATIONS:
NEGATIVE AND SIGNIFICANT COEFFICIENTS

| Equation | OLS Estimations | Systems Estimations | |
		All Exogenous	Selected Endogenous
Income Per Capita	Rural Housing/Public Facilities Area/Regional Development Education Transportation	Rural Housing/Public Facilities Area/Regional Development Education	Education
Employment Rate	Business Advancement and Regulation Area/Regional Development General Government	General Government	Business Advancement and Regulation Area/Regional Development Income Security General Government
Net Investment	Business Advancement and Regulation	Business Advancement and Regulation	Community Development
Population Change	General Government	Agricultural Land and Water General Government	Income Security Education General Government

the employment rate. Regional development funds may be directed to counties with lagging economies. This effect on the "demand" for outlays may not be properly controlled for in the model and overshadow the "supplying" of outcomes such as income that may contribute to development. Of course, it is possible that the funds are spent for purposes that detract from economic progress.

As community development spending in the county increased, income per capita and the employment rate of the county both increased. Housing outlays had positive effects on income per capita and population change. Health spending had a positive effect on the employment rate and net investment, while expenditures for general government purposes had negative effects on the employment rate and population change. General government outlays may entail regulation and administration activities which do not add to the economic base and hence do not increase employment or population.

In the 2SLS estimation of the system when all outlay variables were assumed exogenous, the results were similar to the OLS estimations of the separate equations. More federal spending variables were significant in the equations for income per capita and the employment rate than in the other two. Health spending had positive coefficients in the equations for net investment, the employment rate, and income per capita. This was true for defense and space spending, also. Net investment and the employment rate were both positively affected by agricultural land and water spending. The community development variable had positive coefficients in the equations for the employment rate and per capita income. Housing expenditures positively affected per capita income and population change. A negative effect was estimated for both the ·

employment rate and population change as spending for general government purposes increased.

When the system was expanded to make federal outlay variables and the state and local government spending variable endogenous, all outlay variables lost their significance. Many changed sign in this estimation of the system when compared to the results of the estimation on the smaller system discussed above. Loss of statistical efficiency as indicated by the poor fit of many of the equations explaining the outlay variables may account for the insignificant coefficients.

In the final estimation of the system, when eight of the outlay variables were assumed endogenous and the remaining seven exogenous, significance of some variables again resulted. The only federal outlay variable that had positive coefficients in more than one equation of the four under scrutiny here was community development. It affected both per capita income and population change. Education spending was estimated to have a negative effect on both per capita income and population change, while both income security and general government variables had negative coefficients in the equations for the employment rate and population change.

In comparing the two variations of the system approach which resulted in some significance among the variables, net investment in both versions was positively affected by defense and space spending. Income per capita was significantly affected in both by three federal outlay variables. Farm income stabilization and community development had positive coefficients while education had a negative coefficient. Three different outlay variables were significant in the estimation of the employment rate equation. Agricultural land and water and health

spending were positive while general government spending was negative. Population change was positively affected in both estimations by housing and negatively affected in both by general government.

Other Explanatory Variables

Among the other variables used in the OLS estimations of the four equations, the coefficient of state and local government spending was consistently positive but was significant only in the equation for per capita income. The lagged value of net investment had a positive and significant coefficient in the three equations in which it appeared: income per capita, the employment rate, and net investment. The percent of the population 14 and older unemployed had negative effects on both the employment rate and per capita income.

In the system based on the assumption that federal outlay variables were exogenous, only two of the other explanatory variables had significant coefficients in the 2SLS estimation. The lagged value of net investment had positive coefficients in the equations for net investment and per capita income. The employment rate and income per capita were both negatively affected by the percent unemployed variable.

As with the federal outlay variables, the other variables in the second approach did not have significant coefficients in the four equations examined in this section. Again, the poor fit of some of the equations explaining the federal outlay variables, causing a general loss of information due to specification errors, may have brought about these results.

When the system contained some federal variables as endogenous and others exogenous only two of the other explanatory factors had

significant coefficients. State and local government spending had a positive coefficient in the equation for per capita income and the employment rate was positively affected by the lagged value of per capita income.

Finally, in comparing the system estimations of the model, only two of the other explanatory factors had significant effects across variations of the model. State and local government spending had a positive coefficient in the per capita income equation and the lagged value of per capita income had a positive effect on the employment rate.

CHAPTER VI

SUMMARY AND CONCLUSIONS

This study develops and applies a model to evaluate the contribution of federal expenditures to rural development goals. A system of equations is presented and several variations of this system are estimated. Data employed include the Federal Outlays, a comprehensive set of data on federal program outlays at the county level. In addition, data from the Human Resource Profile (a subset of the 1970 Census of Population), the 1972 Census of Governments, and the Local Area Personal Income series compiled by the Bureau of Economic Analysis are utilized. The sample consists of the 3,064 counties, or county equivalents, of the continental United States.

Summary

The analysis undertaken results in the selection of 15 categories for the federal spending programs reported in the Outlays series, a system of equations estimated in several variations, and an overview of the performance of the federal outlay variables in the equations for income per capita, the employment rate, net investment, and population change.

Spending Categories

From program categories numbering over one thousand under 84

function names in the original data source, this study aggregated these

separate entries into a final 15 categories. They include: farm income

stabilization, rural housing and public facilities, agricultural land

and water resources, agricultural research, pollution control, business

advancement and regulation, area and regional development, community

development, housing, health, income security, education, defense and

space, transportation, and general government. These were selected to

delineate relatively homogeneous categories of spending for analyzing

impacts on rural development goals with the county as the unit of

observation.

Systems of Equations

Rural development policy of the United States has defined qualita-

tive goals concerning employment, income, population, housing, and

community services and facilities. Because these goals are interrelated,

a system of equations was formulated around these goals (see Chapter V).

That is, three of the endogenous variables are taken directly from the

stated goals--employment rate, income per capita, and population change.

A fourth endogenous variable--net investment--is included because it is

an integral part of development (38, p. 60).

Ordinary least squares (OLS) regression equations were estimated

for each of the four variables listed above, in part to provide a bench-

mark for comparison to the system estimates. The 15 federal spending

variables were included on a per capita basis as independent variables

in each equation. State and local government spending and selected

socio-demographic characteristics of the population and economic condi-

tions in the county were also included as independent variables.

Equations to explain the federal outlays per capita were included to provide information of interest in analyzing elements that determine spending of the federal government and to provide input into the simultaneous equation system concerning the demand for services of the federal government in the county. Socio-demographic characteristics of the county population and economic conditions existing in the county, independent variables in these equations, served as indicators of demand for services. These equations were estimated with OLS.

The first approach to the system estimated using the two-stage least squares (2SLS) technique was a four-equation system with the four variables listed above endogenous. The independent variables of the OLS estimations became the predetermined variables of this system. The system approach allows the interrelationships of the endogenous variables to be taken into account. 2SLS estimates of the structural parameters are statistically consistent.

The second system approach attempted to correct for the demand factors in estimating the supply effects of the federal outlays on income, employment, investment, and population distribution. In correcting for these factors, the 15 federal spending variables were assumed endogenous to the system and modeled as in the OLS estimated equations. Many of the equations had low R^2-values implying that much of the variation in these variables was left unexplained. The specification errors imply much loss of information when these variables become endogenous in this system approach.

The specification problem was particularly acute for the seven outlay variables: rural housing and public facilities, pollution control, business advancement and regulation, area and regional

development, housing, education, and transportation. In the third, and

final, approach taken, these variables were assumed exogenous to the

system. The low R^2-values, loss of information, and potential specifi-

cation errors suggested some merit in this assumption. The remaining

eight outlay variables were assumed endogenous and were modeled as

above.

Performance of the Federal Outlay Variables

Few of the outlay variables had consistently significant positive

or negative coefficients across estimations of the system approaches.

More of these variables were significant in the first approach than the

other two. In fact, none at all were significant in the second approach

where they were all included as endogenous to the system.

In the variations where some of the variables were significant,

few performed with consistency. Income per capita was increased as

farm income stabilization payments increased in the county, while

increasing education spending decreased per capita personal income. In-

creasing educational opportunities could serve as an incentive to

decrease time in the labor force, and, therefore, decrease income while

investing time in human capital improvement. The employment rate was

positively affected by spending for health and negatively affected by

spending for general government purposes.

Defense and space spending had a positive effect on net investment

in a county. Expansion of housing expenditures was consistently associ-

ated with population increases. Finally, general government spending

was estimated to have a negative effect on population. These outlays

may entail regulation and administrative activities which detract from

the economic base and hence do not increase employment or population.

Areas for Further Research and Model

Development

The Federal Outlays series used extensively in this study has limitations and needs to be improved. Standardized program definitions would help as well as improved allocation techniques. Over one-third of the 1976 outlays, expenditures for 28 programs, were allocated to county areas based on the size of the target population the funds are intended to serve (17). Improving on this procedure will be a huge task but quite probably worth the effort to improve evaluation.

With an improved set of data on federal spending, the selection of categories for analysis might be made easier. Certainly standardized definitions and more details on aims of programs should lead to categories of a more homogeneous nature.

With regard to the model itself, improving the specification of the equations for the federal outlay variables may greatly improve the analysis. Indeed, improved indicators of the demand for federal government services should be valuable information in determining the contributions of federal dollars to supplying additional income, employment, and other development outcomes. The inclusion of migration data could improve the estimation of the population equation. Including measures of price differences that may occur among the counties or county size-contiguity county groupings and measures of underemployment as well as unemployment may further improve the estimation of the system. Also, use of the state capital county as a dummy variable would improve results. A measure for taxes paid to state and federal governments,

too, could raise the precision of the empirical model.

Conclusions

The efforts of this study have not resulted in a definitive model for the evaluation of federal spending toward rural development goals. However, an initial framework has been provided upon which future researchers may build.

Indications are provided as to spending categories which may add to the economic base of a county and, therefore, increase the well-being of its residents. Increases in farm income stabilization and community development spending increased per capita personal income. As agricultural land and water and health outlays increased, the employment rate of the county increased. Net investment increased as the federal government spent more for defense and space purposes. Finally, housing outlays had a positive effect on population. It must be cautioned, however, that increased housing outlays may be caused by increased populations.

Increasing educational opportunities may act as an incentive to investment in human capital. If this is true, the negative effect of these outlays on per capita income may be a short-run effect. Further research into the long-run consequences is of merit. General government spending had negative effects on both the county employment rate and population. This category includes regulation and administrative activities which may detract from the economic base and do not increase employment or population. Programs in these categories should be examined to determine if their objectives are met. The variables of this study may not accurately measure their effects and, hence, they appear

to be nonbeneficial when that may not be the case. All other categories of federal spending might be labeled neutral.

On the whole, this analysis provides no basis for rejecting the general hypothesis that federal spending does not significantly contribute to the goals of rural development. Of course, failure to reject the hypothesis does not necessarily mean that the hypothesis is true. Additional research using more refined data and methods is necessary before making firm conclusions. However, it is well to recognize many previous less comprehensive studies tend to be consistent with the above hypothesis. Even with its shortcomings, the model used in this study could be expected to detect major impacts of federal programs if in fact they are present. Based on results of this and previous research, it appears that federal programs are not highly effective in promoting goals examined herein and ways need to be explored to improve their performance.

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APPENDIX

TABLES

TABLE XXXVI

SIMPLE STATISTICS FOR VARIABLES APPEARING IN EQUATIONS OF MODELS

Variable	Number	Mean	Standard Deviation	Minimum Value	Maximum Value
Farm Income Stabilization per capita, 1975	3,064	$42.99	$105.45	$0.00	$2,057.67
Rural Housing/Public Facilities per capita, 1975	3,064	$7.16	$21.79	$0.00	$629.80
Agricultural Land and Water per capita, 1975	3,064	$9.31	$14.09	$0.00	$387.78
Agricultural Research per capita, 1975	3,064	$49.59	$167.55	$0.00	$4,431.66
Pollution Control per capita, 1975	3,064	$10.88	$39.26	$0.00	$1,146.68
Business Advancement and Regulation per capita, 1975	3,064	$3.19	$12.96	$0.00	$370.06
Area/Regional Development per capita, 1975	3,064	$9.43	$61.19	$0.00	$1,941.17
Community Development per capita, 1975	3,064	$5.60	$12.83	$0.00	$193.15
Housing per capita, 1975	3,064	$ .03	$ .46	$0.00	$13.87
Health per capita, 1975	3,064	$79.31	$47.65	$0.00	$1,395.05
Income Security per capita, 1975	3,064	$557.19	$156.63	$127.81	$3,487.65
Education per capita, 1975	3,064	$36.83	$101.30	$0.00	$2,244.78
Defense and Space per capita, 1975	3,064	$184.33	$804.58	$0.00	$23,729.81
Transportation per capita, 1975	3,064	$83.00	$295.16	$0.00	$6,912.48
General Government per capita, 1975	3,064	$140.01	$116.99	$39.00	$1,956.92
State and Local Government per capita, 1972	3,064	$393.84	$575.29	$0.00	$29,190.48
Income Per Capita, 1975	3,064	$4,684.96	$1,557.60	$1,669.61	$29,622.81
Population Change, 1974 to 1975	3,064	533.56	3,221.46	-22,410.00	69,446.00
Employment Rate, 1975	3,064	.40	.09	.14	.97
% in Poverty	3,064	20.54	11.11	2.22	67.12
Contract Construction Income per capita, 1975	2,741	$184.06	$186.57	$0.00	$3,133.20
Population, 1975	3,064	68,904.87	259,821.95	178.00	7,567,824.00

TABLE XXXVII

NAMES AND CODES OF AGENCIES REPORTING EXPENDITURES
FOR FEDERAL OUTLAY REPORTS

Agency Name	Agency Code
Department of Agriculture	010
Department of Commerce	020
Department of Defense	030
Department of Health, Education and Welfare	040
Department of Housing and Urban Development	050
Department of the Interior	060
Department of Justice	070
Department of Labor	080
Post Office Department	090
Department of State	100
Department of Transportation	110
Treasury Department	120
ACTION	125
Advisory Commission on Intergovernmental Relations	130
Agency for International Development	140
Alaska Development Committees	150
American Battle Monuments Commission	160
Appalachian Regional Commission	170
Atomic Energy Commission	180
Office of Management and Budget	190
Civil Aeronautics Board	200
Civil Service Commission	210
Commission on Civil Rights	220
Council of Economic Advisers	230
Domestic Council	235
Environmental Protection Agency	237
Equal Employment Opportunity Commission	240
Export-Import Bank of Washington	250
Farm Credit Administration	260
Federal Coal Mine Safety Board of Review	270
Federal Communications Commission	280
Federal Home Loan Bank Board	290
Federal Maritime Commission	300
Federal Mediation and Conciliation Service	310
Federal Power Commission	320
Federal Radiation Council	330
Federal Trade Commission	340
Foreign Claims Settlement Commission	350
General Services Administration	360
Indian Claims Commission	370

TABLE XXXVII (Continued)

Agency Name	Agency Code
Interstate Commerce Commission	380
National Aeronautics and Space Administration	390
National Aeronautics and Space Council	400
National Capital Housing Authority	410
National Capital Planning Commission	420
National Capital Transportation Agency	430
National Council/Comm. on Marine Res. and Engr. Dev.	440
National Foundation on Arts and Humanities	450
National Labor Relations Board	460
National Mediation Board	470
National Science Foundation	480
National Security Council	490
Office of Economic Opportunity	500
Office of Emergency Preparedness	510
Office of Science and Technology	520
Panama Canal	530
Peace Corps	540
Public Land Law Review Commission	550
Railroad Retirement Board	560
Renegotiation Board	570
Securities and Exchange Commission	580
Select Comm. on Western Hemisphere Immigration	590
Selective Service System	600
Small Business Administration	610
Smithsonian Institution	620
Special Representative for Trade Negotiations	630
Subversive Activities Control Board	640
Tariff Commission	650
United States Tax Court	660
Tennessee Valley Authority	670
The White House	680
U. S. Arms Control and Disarmament Agency	690
U. S. Information Agency	700
U. S. Soldiers Home	710
Veterans Administration	720
Waters Resources Council	730

TABLE XXXVIII

FUNCTION NAMES AND CODES FOR FEDERAL OUTLAY
REPORTS

Function Name	Function Code
National Defense	050
Department of Defense-Military	051
Military Assistance	057
Atomic Energy	058
Defense-Related Activities	059
International Affairs and Finance	150
Conduct of Foreign Affairs	151
Economic and Financial Assistance	152
Foreign Information and Exchange Activities	153
Food for Peace	154
Space Research and Technology	250
Manned Space Flight	251
Space Science and Application	252
Space Technology	253
Aeronautical Technology	254
Supporting Space Activities	259
Agriculture and Rural Development	350
Farm Income Stabilization	351
Rural Housing and Public Facilities	352
Rural Community Development Revenue Sharing	353
Agricultural Land and Water Resources	354
Research and Other Agricultural Services	355
Natural Resources and Environment	400
Water Resources and Power	401
Land Management	402
Mineral Resources	403
Pollution Control and Abatement	404
Recreational Resources	405
Other Natural Resources	409
Commerce and Transportation	500
Air Transportation	501
Water Transportation	502
Ground Transportation	503
Transportation Revenue Sharing	504
Postal Service	505
Advancement of Business	506
Area and Regional Development	507
Regulation of Business	508
Community Development and Housing	550
Community Planning, Management and Development	551
Urban Community Development Revenue Sharing	552
Low and Moderate Income Housing Aids	555
Maintenance of the Housing Mortgage Market	556

TABLE XXXVIII (Continued)

Function Name	Function Code
Education and Manpower	600
Elementary and Secondary Education	601
Higher Education	602
Vocational Education	603
Education Revenue Sharing	604
Other Education Aids	605
General Science	606
Manpower Training and Employment Services	607
Other Manpower Aids	609
Health	650
Development of Health Resources	651
Providing or Financing Medical Services	652
Prevention and Control of Health Problems	653
Income Security	700
Retirement and Social Insurance	701
Public Assistance	702
Social and Individual Services	703
Veterans Benefits and Services	800
Income Security for Veterans	801
Veterans Education, Training and Rehabilitation	802
Veterans Housing	803
Hospital and Medical Care for Veterans	804
Other Veterans Benefits and Services	809
Interest	850
Interest on the Public Debt	851
Interest on Refunds of Receipts	852
Interest on Uninvested Funds	853
General Government	900
Legislative Functions	901
Judicial Functions	902
Executive Direction and Management	903
Central Fiscal Operations	904
General Property and Records Management	905
Central Personnel Management	906
Law Enforcement and Justice	908
National Capital Region	909
Other General Government	910
General Revenue Sharing	940
Undistributed Intrabudgetary Transactions	950
Government Contributions for Employee Retirement	951
Interest Received by Trust Funds	952

TABLE XXXIX

SIMPLE CORRELATION COEFFICIENTS FOR VARIABLES APPEARING IN EQUATIONS OF MODELS

Variables	Farm Income Stabilization per capita, 1975	Rural Housing/ Public Facilities per capita, 1975	Agricultural Land and Water per capita, 1975	Agricultural Research per capita, 1975	Pollution Control per capita, 1975	Business Advancement and Regulation per capita, 1975	Area/Regional Development per capita, 1975	Community Development per capita, 1975	Housing per capita, 1975	Health per capita, 1975	Income Security per capita, 1975
Farm Income Stabilization per capita, 1975	1.0000										
Rural Housing/Public Facilities per capita, 1975	.0256	1.0000									
Agricultural Land and Water per capita, 1975	.3300	.0567	1.0000								
Agricultural Research per capita, 1975	-.0412	.2532	.0930	1.0000							
Pollution Control per capita, 1975	-.0361	-.0212	-.0501	.0220	1.0000						
Business Advancement and Regulation per capita, 1975	.0186	-.0080	-.0105	.0171	.0093	1.0000					
Area/Regional Development per capita, 1975	-.0116	.0336	.0372	.0152	-.0128	.0382	1.0000				
Community Development per capita, 1975	-.0415	-.0573	-.1079	-.0016	.0682	.0553	.0575	1.0000			
Housing per capita, 1975	-.0186	-.0177	-.0347	-.0067	.0168	.0122	-.0073	.0616	1.0000		
Health per capita, 1975	.0375	.0175	.0927	-.0299	.0146	.1406	.2704	.1382	.0596	1.0000	
Income Security per capita, 1975	.0110	.0414	.2430	-.0176	-.0277	-.0329	.0076	.1077	.0119	.2784	1.0000
Education per capita, 1975	-.0404	-.0300	-.0271	.0631	.0808	.3598	.2968	.2933	.0250	.3006	.0681
Defense and Space per capita, 1975	-.0561	-.0131	-.0889	.0067	.0410	.0425	.0040	.0551	.0152	-.0437	-.1150
Transportation per capita, 1975	.0143	.0070	.1107	.1647	.0554	.0437	.0012	-.0147	-.0030	-.0001	-.0422
General Government per capita, 1975	.0333	-.0139	.0550	.0190	.1406	.0150	-.0040	.2147	.0345	.2269	.0884
State and Local Government per capita, 1972	.0290	-.0088	.0400	.0284	.1021	.0110	-.0160	.0130	.0055	.0520	.0133
Income Per Capita, 1975	.1805	-.0751	.2448	.0226	.0640	.0500	-.0516	.1226	.0720	.1310	.0640
Population Change, 1974 to 1975	-.0553	-.0279	-.0836	-.0026	.0315	.0188	-.0092	.0109	.1373	-.0371	-.0802
Employment Rate, 1975	.1881	-.0033	.2434	.0786	.0265	.0342	-.0302	.1520	.0509	.1460	.0031
% in Poverty	.1143	.0939	.1358	-.0656	-.1144	-.0524	.1184	-.0264	-.0386	.0148	.3320
Contract Construction Income per capita, 1975	-.0526	-.0176	-.0558	.0536	.0522	.0298	-.0043	.0807	.0466	.0240	-.0854
Northeastern U. S.	-.1031	-.0457	-.1361	-.0624	.0915	.0218	-.0214	.1036	.0004	.0642	.0029
Northcentral U. S.	.0682	-.0322	.0537	-.1245	-.0232	-.0445	-.0135	-.0677	-.0040	.1349	-.1111
Southern U. S.	.0106	.0397	-.0791	-.1237	-.0785	.0027	-.0120	.0227	-.0064	-.1586	.1344

TABLE XXXIX (Continued)

Variables	Education per capita, 1975	Defense and Space per capita, 1975	Transportation per capita, 1975	General Government per capita, 1975	State and Local Government per capita, 1975	Income Per Capita, 1975	Population Change, 1974 to 1975	Employment Rate, 1975	% in Poverty	Contract Construction Income per capita, 1975	North-eastern U.S.	North-central U.S.	Southern U.S.
Farm Income Stabilization per capita, 1975													
Rural Housing/Public Facilities per capita, 1975													
Agricultural Land and Water per capita, 1975													
Agricultural Research per capita, 1975													
Pollution Control per capita, 1975													
Business Advancement and Regulation per capita, 1975													
Area/Regional Development per capita, 1975													
Community Development per capita, 1975													
Housing per capita, 1975													
Health per capita, 1975													
Income Security per capita, 1975													
Education per capita, 1975	1.0000												
Defense and Space per capita, 1975	.0139	1.0000											
Transportation per capita, 1975	.0191	-.0124	1.0000										
General Government per capita, 1975	.2715	.0005	.0308	1.0000									
State and Local Government per capita, 1972	-.0084	.0037	.0155	.0855	1.0000								
Income Per Capita, 1975	.0053	.2148	.0379	.2179	.0996	1.0000							
Population Change, 1974 to 1975	.0296	.0644	-.0186	-.0467	-.0077	.0248	1.0000						
Employment Rate, 1975	.0327	.1962	.0793	.1469	.0798	.7371	-.0375	1.0000					
% in Poverty	.0586	-.1034	-.0433	-.1570	-.0662	-.4400	-.0905	-.2916	1.0000				
Contract Construction Income per capita, 1975	.0291	.0563	.0725	.0312	.0240	.3025	.0836	.2773	-.2099	1.0000			
Northeastern U. S.	.0110	.0092	-.0374	.4258	.0466	.0699	-.0337	-.0430	-.2413	.0121	1.0000		
Northcentral U. S.	-.0266	-.0645	-.0486	.0351	.0443	.1797	-.0946	.1598	-.3386	-.0203	-.1981	1.0000	
Southern U. S.	-.0252	.0153	-.0800	-.2465	-.1036	-.3136	.0395	-.1966	.5740	-.0786	-.2482	-.6582	1.0000

VITA

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Doctor of Philosophy

Thesis: IMPACTS OF FEDERAL OUTLAYS ON COUNTY DEVELOPMENT

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