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CHAPTER 6

Interstate Differences in Government Activity

Observation of the time of change, functional pattern of change, and shifts among types of government unit has contributed to our understanding of the trend of government activity and paved the way to further analysis of the factors underlying it. Something should be contributed also by seeing how government activity varies among the states, to which our attention has been drawn by the discussion in the preceding chapter.[1]

To avoid being diverted by differences among states in the division of responsibility among the several layers of government, we shall study state and local government in combination.[2] The government activity of a state will be measured by the aggregate of the expenditures or employment of the state and local governments in it.[3]

[1] Readers will discover that the following analysis is rather more technical (and tentative) than that in preceding chapters. It may be skipped without losing the main thread of the discussion.

[2] Expenditure data are available for each of the several types of government unit in each state as well as for each state as a whole. But the states vary among themselves in division of activity among the several types; in some states certain types of unit are entirely absent, or appear only rarely. For example, the percentage of nonschool state and local government employment on *state* government payrolls in April 1945 ranged from 11 in Wisconsin to 58 in West Virginia (*Government Employment, State Distribution of Public Employment in April 1945,* Vol. 6, No. 4, July 1946). The township and town type of government is not used at all in the southern and some western states; in some states there are no special school districts; some states go in for special districts for highways and sewers, others do not; etc.

Some of this variation in intrastate structure of government is associated with the very factors in which we are interested, e.g., urbanization: the percentages mentioned in the preceding paragraph and corresponding percentages of population in urban areas are negatively correlated.

[3] The expenditures analyzed are those on current operation alone, exclusive of outlays on capital assets and enterprises. Employment covers enterprises as well as operation.

Interstate Differences in per Capita Government Expenditure and Employment

Considerable variation among states in the volume of government activity is our first impression from Table 21. Whether we measure activity by per capita expenditure or by per capita employment, the disparity among states is large in both years covered. The extreme ranges are very wide, of course: total expenditures per capita in 1942, for example, ranged from $21 to $100; and employment per 10,000 population, from 167 to 417. But even the less erratic measure of variation given in the next to the last column, the interquartile range, shows wide dispersion in 1942: $21 per capita in the case of expenditures, 80 workers per 10,000 population in the case of employment.

When states vary so widely in level of activity according to these measures, it is proper to ask whether the differences are exaggerated by peculiarities of the measures. The dollar figures on expenditure, in particular, may seem suspect. For they are affected by state differences in price levels, and these price differences are positively correlated with dollar expenditures.[4] But the price differ-

[4] On price differences we have three major types of information. One relates to the urban-rural cost of living differential. According to N. Koffsky, "Farm and Urban Purchasing Power", *Studies in Income and Wealth, Volume Eleven* (National Bureau of Economic Research, 1949), p. 170, the cost of living on farms in 1941 was 77 to 88 percent of the corresponding cost of living in cities. The lower percentage relates to the goods and services customarily purchased by farmers; the higher, to goods and services purchased by city families. (Food price differentials contribute a good deal to these differences in price levels.)

The second type of data shows intercity differences in the cost of living. Taking the highest cost city as the reference base (100), the range for 59 cities in March 1935 extended to a low of 80 percent ("maintenance level" budget, 4-person manual worker's family, M. L. Stecker, "Intercity Differences in Costs of Living in March 1935, 59 Cities", WPA, *Research Monograph XII*, 1937, p. 5); for 33 cities on December 15, 1941, to 84 percent (the WPA budget carried forward, "Cost of Living in 1941", *BLS Bulletin 710*, 1942, p. 37); for 34 cities in June 1947 to 88 percent (the city workers "modest but adequate" budget, 4-person family, "Workers' Budget in the United States: City Families and Single Persons, 1946 and 1947", *BLS Bulletin 927*, 1948, p. 23). The interquartile range is much less, of course: 85 to 93 for the March 1935 date — the full range is 80 to 100. It should be noted that the cost of living is correlated with size of city.

Third, to judge from census data on government payrolls and employment, government salary levels rise with the size of city. In cities of 25,000 to 50,000 the average salary seems to be about 80 percent of the average in cities of

(Footnote concluded on p. 116)

Table 21

INTERSTATE DIFFERENCES IN STATE AND LOCAL GOVERNMENT EXPENDITURES PER CAPITA BY FUNCTION (1903, 1942, AND CHANGE BETWEEN 1903 AND 1942); AND IN STATE AND LOCAL GOVERNMENT EMPLOYMENT PER CAPITA, SCHOOL AND NONSCHOOL (1942)

(Unit for expenditures is dollars per capita; for employment, number of workers per 10,000)

	Top State	*1st Quartile*	*2nd Quartile (Median)*	*3rd Quartile*	*Bottom State*	*Difference between 1st and 3rd Quartile*	*Coefficient of Variation*[a]
Expenditures[b]							
General control							
1903	8.4	3.0	2.2	1.4	.51	1.6	36
1942	14.4	6.0	4.7	3.9	2.0	2.1	22
Ratio, 1942 to 1903	5.0	3.0	2.2	1.8	.9	1.2	27
Public safety							
1903	3.4	1.2	.62	.30	.10	.85	69
1942	11.4	6.2	4.2	2.6	1.2	3.6	43
Ratio, 1942 to 1903	57.9	9.0	6.1	4.4	2.6	4.6	38
Highways							
1903	3.3	2.0	1.2	.81	.34	1.2	50
1942	16.4	8.3	6.5	5.1	2.9	3.2	25
Ratio, 1942 to 1903	19.4	7.4	5.6	3.8	1.9	3.6	32
Schools							
1903	10.0	4.7	3.7	2.7	.97	2.0	27
1942	27.5	20.7	19.0	14.3	8.3	6.4	17
Ratio, 1942 to 1903	12.9	6.0	5.0	4.0	2.4	2.0	20
Sanitation							
1903	1.8	.25	.14	.04	.00	.21	75
1942	3.3	1.4	.78	.52	.14	.86	55
Ratio, 1942 to 1903	*	12.0	7.0	4.6	.8	7.4	53
Health, hospitals & public welfare							
1903	3.3	1.4	.92	.66	.21	.72	39
1942	26.2	15.1	12.4	9.7	3.4	5.4	22
Ratio, 1942 to 1903	64.6	15.2	11.7	9.2	6.6	6.0	26
Other							
1903	4.5	.94	.62	.39	.16	.55	44
1942	11.7	6.6	5.3	3.5	1.9	3.1	29
Ratio, 1942 to 1903	17.4	11.5	8.6	6.2	1.8	5.3	31
Total							
1903	24.2	12.8	10.6	6.4	3.0	6.4	30
1942	99.8	65.1	54.3	43.7	21.4	21.4	20
Ratio, 1942 to 1903	9.7	6.4	5.4	4.5	3.1	1.9	18

	Top State	*1st Quartile*	*2nd Quartile (Median)*	*3rd Quartile*	*Bottom State*	*Difference between 1st and 3rd Quartile*	*Coefficient of Variation*[a]
Employment[c]							
Schools							
1942	171	131	107	93	76	38	18
Other							
1942	276	174	156	112	73	62	20
Total							
1942	417	297	260	217	167	80	15

* Denominator is zero.

[a] Semi-interquartile distance as a percentage of the median.

[b] For 1942 further details are available on expenditures, as follows (column headings have been omitted):

Public safety							
Police	6.0	3.1	2.1	1.4	.64	1.7	41
Fire	4.1	1.9	1.0	.68	.28	1.2	60
Other	3.0	1.2	.91	.54	.23	.65	36
Health, hospitals & public welfare							
Health & hospitals	8.9	4.4	3.4	2.3	1.4	2.1	31
Public welfare	21.8	11.0	9.1	4.9	2.0	6.1	34

[c] The employment data include part-time and temporary workers. For non-school functions we have a rough calculation of the full-time equivalent number as well as a calculation limited to permanent full-time employees:

Permanent full-time employees, 1942	175	125	100	76	56	49	24
Full-time equivalent employees, 1942	195	142	126	92	61	50	20

Expenditures include transfers to the public (except interest payments), but not outlays and expenditures of enterprises. Employment includes public enterprises.

ences are small compared with the expenditure differences and therefore could hardly account for much of the variation we find. Nor, it seems, is much trouble caused by the inclusion of transfers to the public (which swell the expenditure figures, especially in 1942), or by the exclusion of capital input. The variation in expenditures appears to be a good indication of the variation in real input. This conclusion is supported, in part at least, by the available data on government employment, for the latter are not questionable in the same way as the expenditure data.

When interest lies in interstate differences in government service per capita — output, rather than input — we need to ask also about the effect of possible differences in productivity. To the extent that there is interchange of information on methods and similarity of conditions and people through the country (even villages use motorized equipment and typewriters) variation in productivity will be kept down. But that interstate differences in productivity exist is certain. However, if the frequently expressed opinion that the rural county and small village are inefficient is grounded in fact, the correlation between productivity and level of per capita input is positive, not negative; for input rises with degree of urbanization and size of county and city. This would mean that interstate differences in input understate rather than exaggerate interstate differences in output or services.

We note, second, that the several functions are characterized by substantially different degrees of variation. For this comparison the

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(Footnote concluded from p. 113)

1,000,000 or more (with rough allowance for part-time workers; basic data from *Public Employment in the United States: January 1942,* State and Local Government Quarterly Employment Survey, Vol. 3, No. 5, Final General Summary for Jan. 1942, p. 40). (The data for cities under 25,000 are rendered almost useless for the present purpose by the very high proportion of part-time workers, for which a sufficiently precise reduction to a full-time equivalent basis is difficult.) Further allowance for the higher level of skill and training of workers in large cities would probably reduce this range.

It is clear that the price level of a state that is largely rural and whose cities are small will be lower than the price level of an urbanized state containing many big cities. But the difference will not be large compared with the difference between government expenditures. The lower quartile value of government expenditures, 1942, was two-thirds the upper quartile; and the bottom state's expenditures in 1942 was a fifth of the expenditures of the top state (Table 21). Further, while the price level is undoubtedly correlated with dollar expenditure, the correlation is not perfect.

best measure is a coefficient of variation expressing the semi-interquartile range as a percentage of the median. So measured, the largest degree of variation, in both 1903 and 1942, is in expenditures on sanitation and public safety; the least, in school expenditures.

Although our eyes are focused on differences among the states, rather than similarities, we cannot escape taking notice, next, of certain strong points of resemblance. Our third observation, then, relates to changes in the relative importance of the several functions. We have already seen (Chapter 4) what these were: the average change in health, hospitals and public welfare, for example, was large, while that in general control was small. In Table 21 this is indicated by the relative standing of the median ratios of 1942 to 1903.[5] Table 21 tells us further, however, that the relative standing of the average (median) change in a function is representative of the relative standing of the whole distribution of 48 changes it summarizes. In *most* states, expenditures on health and welfare rose very rapidly; in *most* states, expenditures on general control rose modestly:

Ratio of 1942 to 1903, expenditures per capita

	1st Quartile Value	*2nd Quartile Value*	*3rd Quartile Value*
Health, hospitals & public welfare	15	12	9.2
Other	12	8.8	6.2
Sanitation	12	7.0	4.6
Public safety	9.0	6.1	4.4
Highways	7.4	5.6	3.8
Schools	6.0	5.0	4.0
General control	3.0	2.2	1.8

The ranking in all three columns is almost identical. We may go further: as is demonstrated in Table 22, in which the individual states are presented, patterns of change are similar from state to state.

Even more striking is the change between 1903 and 1942 in the degree of variation among state levels of per capita expenditure on

[5] Each median ratio is the median of the 48 individual state ratios of 1942 to 1903 per capita expenditure, *not* the ratio of the median expenditure for 1942 to the median expenditure for 1903; and correspondingly for the quartiles and extremes.

Table 22

Change in the Functional Distribution of Government Expenditures per Capita, 1903-1942

Individual States

STATE AND LOCAL GOVERNMENT EXPENDITURES PER CAPITA, RATIO OF 1942 TO 1903 AND RANK OF RATIO

	General Control	*Public Safety*	*Highways*	*Schools*	*Health, Hospitals, & Public Welfare*	*Sanitation*	*Other*
Alabama	3.1(7)	10.0(3)	8.9(5)	6.7(6)	9.2(4)	14.3(1)	11.0(2)
Arizona	1.5(7)	7.4(3)	6.4(5)	5.7(6)	16.0(2)	*(1)	6.5(4)
Arkansas	2.1(7)	7.2(4)	3.7(6)	4.7(5)	12.4(2)	14.0(1)	11.8(3)
California	1.6(7)	4.0(3)	2.2(6)	2.6(5)	9.3(1)	4.0(4)	6.0(2)
Colorado	1.2(7)	2.6(5)	3.4(4)	2.4(6)	19.0(1)	3.4(3)	4.2(2)
Connecticut	3.8(5)	5.1(4)	3.2(7)	5.6(3)	9.9(1)	3.5(6)	8.1(2)
Delaware	3.0(7)	6.1(3)	4.0(6)	5.8(4)	12.9(2)	5.2(5)	13.8(1)
Florida	4.2(7)	12.1(3)	6.1(6)	7.3(5)	15.0(1)	9.6(4)	13.7(2)
Georgia	3.7(6)	5.3(5)	3.0(7)	7.0(4)	7.4(3)	7.4(2)	9.4(1)
Idaho	1.1(7)	28.0(2)	6.0(5)	3.2(6)	15.3(3)	*(1)	14.6(4)
Illinois	2.2(7)	3.7(5)	3.4(6)	5.2(4)	16.8(1)	7.2(3)	9.7(2)
Indiana	1.6(7)	5.2(4)	4.3(5)	3.8(6)	12.5(1)	6.1(3)	10.1(2)
Iowa	1.7(7)	5.0(6)	5.7(5)	6.4(4)	9.2(2)	6.9(3)	10.1(1)
Kansas	1.7(7)	4.5(6)	6.9(4)	5.1(5)	15.3(1)	8.2(2)	7.1(3)
Kentucky	2.3(7)	4.4(4)	3.9(5)	3.5(6)	7.4(1)	4.6(3)	6.3(2)
Louisiana	3.0(6)	6.6(5)	7.1(3)	10.0(2)	25.7(1)	.8(7)	6.7(4)
Maine	1.8(7)	4.6(5)	7.0(3)	4.8(4)	7.2(2)	3.1(6)	12.9(1)
Maryland	2.2(7)	4.1(6)	4.5(5)	5.0(4)	11.7(1)	6.2(3)	7.5(2)
Massachusetts	2.1(4)	3.2(3)	1.9(5)	3.9(2)	7.0(1)	1.3(7)	1.8(6)
Michigan	2.3(7)	6.1(5)	6.9(4)	4.9(6)	14.7(1)	10.0(3)	10.7(2)
Minnesota	1.8(7)	4.1(6)	4.3(4)	4.2(5)	15.7(1)	7.0(2)	6.2(3)
Mississippi	3.0(7)	6.0(5)	12.5(2)	5.8(6)	9.5(4)	15.5(1)	12.0(3)

Missouri	2.3(6)	3.5(3)	3.4(4)	5.2(2)	15.2(1)	2.8(5)	2.0(7)
Montana	1.1(7)	2.6(6)	4.9(2)	3.4(5)	7.4(1)	3.9(4)	4.6(3)
Nebraska	2.0(7)	6.2(5)	6.5(4)	4.6(6)	16.4(2)	17.2(1)	12.3(3)
Nevada	1.7(7)	57.9(1)	19.1(3)	3.1(6)	6.6(5)	45.5(2)	9.0(4)
New Hampshire	2.0(7)	5.7(4)	5.2(5)	5.9(3)	8.3(2)	5.0(6)	11.2(1)
New Jersey	3.6(7)	5.3(4)	3.8(6)	5.1(5)	10.5(1)	6.4(3)	9.1(2)
New Mexico	1.8(7)	9.4(4)	19.4(2)	12.9(3)	20.4(1)	6.0(6)	6.4(5)
New York	2.1(7)	3.3(5)	2.4(6)	4.1(3)	9.1(1)	3.5(4)	5.7(2)
North Carolina	5.0(7)	16.4(1)	7.3(6)	12.9(2)	9.2(4)	12.4(3)	9.1(5)
North Dakota	.9(7)	9.4(3)	6.0(4)	3.5(5)	12.3(1)	12.3(2)	3.4(6)
Ohio	2.4(7)	4.5(4)	4.4(5)	4.2(6)	9.6(1)	5.7(3)	6.9(2)
Oklahoma	3.0(7)	17.5(2)	9.7(4)	6.1(6)	64.6(1)	14.0(3)	6.4(5)
Oregon	2.0(7)	9.2(2)	4.4(5)	3.3(6)	12.9(1)	4.6(4)	8.1(3)
Pennsylvania	2.7(6)	3.6(4)	2.6(7)	5.0(3)	11.3(1)	3.4(5)	5.1(2)
Rhode Island	3.2(5)	3.4(4)	2.0(7)	4.5(3)	8.9(1)	2.5(6)	5.2(2)
South Carolina	3.2(7)	8.6(6)	8.8(5)	10.3(4)	11.6(2)	10.5(3)	17.4(1)
South Dakota	1.9(7)	14.3(2)	12.3(3)	3.7(6)	11.7(4)	340.0(1)	10.2(5)
Tennessee	2.9(7)	7.4(5)	8.5(3)	8.5(2)	13.3(1)	7.8(4)	6.9(6)
Texas	2.7(7)	9.1(3)	7.4(4)	4.7(6)	10.7(1)	9.6(2)	5.4(5)
Utah	1.9(7)	6.5(3)	4.5(6)	7.1(2)	29.0(1)	4.8(5)	6.2(4)
Vermont	3.9(7)	11.3(3)	5.6(5)	4.6(6)	11.7(2)	7.0(4)	14.9(1)
Virginia	4.2(7)	8.8(3)	7.9(4)	6.7(5)	9.1(2)	5.6(6)	12.1(1)
Washington	1.5(7)	7.6(3)	2.4(6)	3.2(5)	21.0(1)	11.7(2)	5.2(4)
West Virginia	2.9(7)	7.6(5)	9.8(4)	5.2(6)	13.3(2)	11.0(3)	13.3(1)
Wisconsin	2.0(7)	5.2(5)	5.8(4)	5.2(6)	12.7(2)	15.7(1)	9.0(3)
Wyoming	1.7(7)	6.1(5)	8.1(3)	5.4(6)	7.1(4)	11.8(2)	14.1(1)
Average Rank	6.8	4.0	4.7	4.6	1.7	3.4	2.9

* Denominator is 0.

Figure in parentheses is the rank of each ratio.

each function. The coefficients of variation were reduced for every function listed in Table 21 as well as for the total. Indeed, the average cut was about a third. For the total, moreover, the coefficient of variation that can be calculated for 1932 lies between the coefficients for 1903 and 1942, and the coefficient for 1890 is above the one for 1903. The figures for 1903 and 1942 lie on a downward sloping trend line.[6] There appears to have been appreciable leveling-out of government services provided by the 48 states.

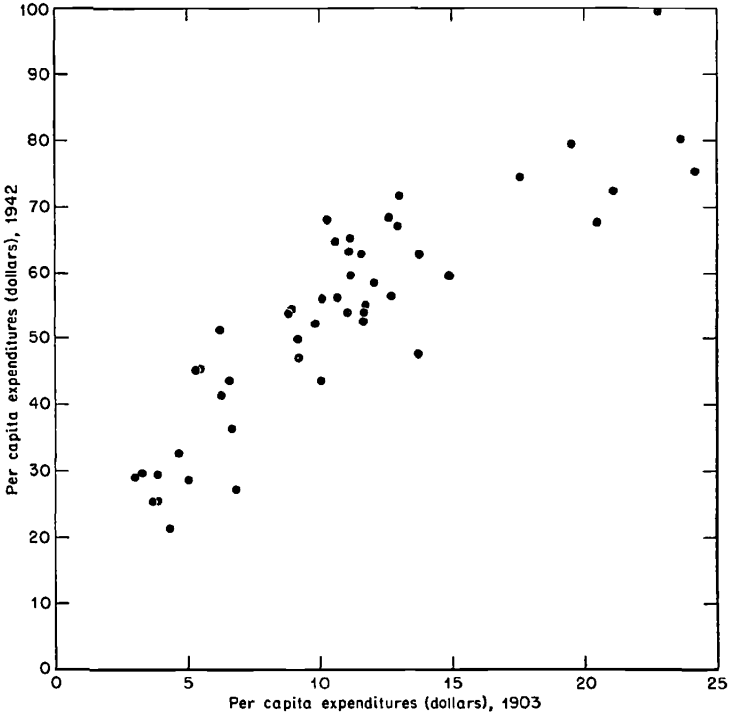
We know that every state expanded practically every one of its services.[7] The leveling-out process therefore meant faster than average increases by states that were backward in 1903. It is apparent in Chart 16 that a state with a per capita expenditure of $4 in 1903 had, on the average, multiplied its expenditures about 6.5-fold by 1942; one with an expenditure of $10 in 1903, about 5.5-fold; and a state in the upper ranks of 1903, say with an expenditure of $20, less than 4-fold. Corresponding pictures for the several individual functions would be similar. The vanguard states of 1903 moved ahead and kept their relatively advanced positions. The rearguard states also moved ahead but remained in the rear. The relative distance between the front and rear was reduced in

[6] The coefficients of variation in total per capita expenditures are as follows: 1890, 37 percent; 1903, 30 percent; 1932, 27 percent; 1942, 20 percent. The 1890 coefficient is derived from data given in *Wealth, Debt, and Taxation, 1890;* that for 1932, from data in *Historical Review of State and Local Government Finances,* pp. 31-2 (both, Census Bureau). The 1890 data exclude Oklahoma and otherwise are not quite comparable with those for later years. However, the coefficient for 1903 based on data comparable with those for 1890 is barely different from the coefficient above.

These changes too could have been influenced by the price and productivity factors mentioned earlier. It is quite likely, e.g., that reduced difference in degree of urbanization (over a half, measured by the interquartile coefficient of variation, between 1900 and 1940) helped lessen price disparities; but it could also have lessened productivity disparities, which may be inversely correlated with price disparities. The net effect is likely to have been small compared with the changes in Table 21.

[7] Table 21 shows that the *lowest* 1942/1903 ratio for some functions was under 2. Prices rose by a ratio of 2 or more, which would suggest a decline in per capita real input (of labor and purchased goods and services) by some states. On the other hand, productivity probably rose. There seems to be hardly any exception to the statement in the text, and any exception that appears might well result from deficiencies in the statistics, especially with respect to classification of expenditures by functions.

Chart 16
States Classified by Total Expenditures on Current Operations Per Capita in 1903 and 1942



every function listed.[8]

This might easily be interpreted in terms of a diffusion of standards: at given levels of ability to pay or need for government service (e.g., urbanization) there may have developed more uni-

[8] Decline in degree of difference as measured by the coefficient of variation does not, of course, mean decline in absolute difference. If we measure the latter by the difference between the first and third quartiles the absolute difference rose, from 1903 to 1942, in every function except general control and schools. (The comparison has to be in constant prices; for this purpose we used price indexes of 206.5 for nonschool expenditures, 350.8 for school expenditures, and 245.4 for total expenditures, 1942 relative to 1903; see App. D.) The interquartile difference for total expenditures rose from $6.4 to $8.7 (measured in 1903 prices), or 36 percent. It is sensible, however, to compare this with the rise in the median — which of course is what our coefficients of variation do.

formity in levels of service provided. But there could also be another factor: ability to pay or need for service might have become more uniform too. This poses the question of the factors affecting government activity, which is the problem of the next section.

Factors Affecting Interstate Differences in Government Expenditure in 1942

Tracing relationships between government activity and the factors affecting it involves a good deal of speculation. To help keep our feet on the ground, let us start by taking advantage of the quantitative information made possible by our system of government. For each of the 48 more or less independent jurisdictions there are, as we have seen, separate statistics on aggregate state and local government activity in 1942 — only a part of total government activity in this country, it is true, but a substantial part.

These data reveal considerable interstate differences in government activity. How are these interstate differences in amount and kind of activity associated with three measurable factors to which previous work in the field points: income, urbanization, and density of population?[9]

[9] Arnold Brecht, "Three Topics in Comparative Administration — Organization of Government Departments, Government Corporations, Expenditures in Relation to Population", *Public Policy* (Harvard University Press, 1941); an article by members of Gerhard Colm's seminar at the New School for Social Research, "Public Expenditures and Economic Structure in the United States", *Social Research,* February 1936; and J. Berolzheimer, "Influences Shaping Expenditure for Operation of State and Local Governments", *Bulletin of the National Tax Association,* March, April, May, 1947. We have benefited also from reading a draft of Carol P. Brainerd's doctoral dissertation, "Non-federal Governments and their Growth, 1909-1948" (University of Pennsylvania).

Other measurable factors might be listed, e.g., industrialization and size of government unit. But there is a limit to what our data can stand — there are only 48 observations — and to what we can do. On the other hand, these factors are usually correlated with the three we have selected for analysis and are therefore more or less represented by them. Indeed, as we shall see, there is a question whether anything is gained by including urbanization.

To avoid the influence of short-run fluctuations in income, we take the average of income in 1938-42 to be the measure of this factor. Government activity in a given year is influenced more by the average income of the preceding five years than by the current level of income.

Note that the measure of urbanization, the percentage of the population in communities of over 2,500, tells us nothing of the distribution by community size above this limit; and that the measure of density reflects only average density per square mile, not irregularities of population distribution associated with barren mountain areas, etc.

These three factors together account for a little over 70 percent of the variance among states in per capita total expenditures (Table 23).[10] In the variables selected we have the major factors, or representatives of them, involved in interstate differences in government activity.

Of the three variables, income is the most important. This is indicated most simply by the elasticity coefficient which may be derived from the equations (Table 24). Thus a 1 percent increase in income (urbanization and density unchanged) was associated in 1942 with a slightly smaller percentage increase in expenditures, about .9. The corresponding changes in expenditures when urbanization or density is raised 1 percent (the other two variables held constant) are much smaller: about .1 percent in the case of urbanization; only —.07 percent in the case of density. Indeed, the figure for urbanization is not significantly different from zero, as is indicated by the standard error of the urbanization coefficient in the equation. On the other hand, the standard error for the density term is small.[11]

The actual effect on a dependent variable of variation in an independent variable will depend not only on the magnitude of the elasticity but also on the range of variation of the independent variable. Thus the coefficients of variation (semi-interquartile range as a percentage of the median) of the three independent variables are: income, 24; urbanization, 26; density, 67. If we take these measures to indicate the relative ranges of variation of the three independent variables, income is still most important. This may be illustrated by asking how expenditures would change

[10] The fraction of variance accounted for equals the square of the multiple correlation coefficient ($.85^2 = .72$).

[11] When the urbanization term is dropped, the multiple correlation coefficient is not appreciably lowered. The equation for total expenditures excluding the urbanization variable is:

$$\text{Per capita expenditures} = 4.5 + \underset{(.008)}{.089}\ \text{Income} - \underset{(.010)}{.033}\ \text{Density}.$$

For some of the individual functions, however, the urbanization factor is significant. On the other hand, the density and income factors are not significant for others. We could, of course, have dropped terms from every equation to which they did not contribute anything, but it did not seem worth while to go through the additional computations.

Table 23

STATISTICAL RELATIONS BETWEEN GOVERNMENT EXPENDITURES PER CAPITA OF THE 48 STATES IN 1942 AND THEIR RESPECTIVE LEVELS OF INCOME PER CAPITA, URBANIZATION, AND DENSITY

DEPENDENT VARIABLE *Expenditure per Capita (1942)*	REGRESSION COEFFICIENT OF INDEPENDENT VARIABLE				COEFFICIENT OF MULTIPLE CORRELATION
	CONSTANT TERM	*Per Capita Income (1938-42)*	*Urbanization (1940)*	*Density (1940)*	
General control	.31	.0119 (.0017)	—.0456 (.0216)	—.0010 (.0019)	.77
Public safety					
Police	—1.02	.0042 (.0008)	.0173 (.0097)	.0015 (.0008)	.90
Fire	—.80	.0012 (.0005)	.0284 (.0064)	.0015 (.0006)	.92
Other	—.55	.0020 (.0005)	.0085 (.0068)	—.0006 (.0006)	.75
Highways	3.14	.0123 (.0031)	—.0554 (.0402)	—.0070 (.0035)	.54
Schools	5.58	.0240 (.0040)	—.0155 (.0512)	—.0102 (.0045)	.77
Sanitation	—.58	.0008 (.0006)	.0236 (.0078)	.0006 (.0007)	.79
Health, hospitals & public welfare					
Health & hospitals	—.89	.0078 (.0013)	—.0002 (.0167)	.0015 (.0015)	.85
Public welfare	—1.99	.0072 (.0045)	.1835 (.0582)	—.0212 (.0051)	.67
Other	.12	.0110 (.0022)	—.0176 (.0284)	—.0048 (.0025)	.68
Total	3.32	.0822 (.0178)	.1271 (.1516)	—.0396 (.0132)	.85

An equation for all the nonschool functions combined may be derived from the sum of the equations for the separate nonschool functions above:

Expenditure on nonschool operations = —2.26 + .0583 Income + .1427 Urbanization — .0294 Density.

Expenditure is in dollars per capita; income is personal income in dollars per capita; urbanization is percentage of population in cities of 2,500 or more; density is population per square mile.

Figures in parentheses are standard errors of the coefficients.

Table 24

Elasticity of State and Local Government Expenditures per Capita with Respect to Income per Capita, Urbanization and Density

Derived from Data for the 48 States, 1942

	Elasticity with Respect to			
	Income per Capita	*Urbanization*	*Density*	*Three Independent Variables Combined*
General control	1.39	—.43	—.02	.94
Public safety				
Police	1.02	.34	.06	1.42
Fire	.50	.97	.10	1.57
Other	1.21	.42	—.06	1.57
Highways	1.02	—.37	—.10	.55
Schools	.78	—.04	—.06	.68
Health, hospitals, & public welfare				
Health & hospitals	1.20	—.002	.04	1.24
Public welfare	.48	.99	—.24	1.23
Sanitation	.43	1.08	.06	1.57
Other	1.23	—.16	—.09	.98
Total	.90	.11	—.07	.94
Total, excl. school	.96	.19	—.08	1.07

The elasticity measure is the percentage change in per capita expenditures associated with a 1 percent change in the independent variable specified. The change in the independent variable is calculated with its arithmetic mean value as the point of departure, the two other independent variables being held constant at their mean values. Elasticities calculated from change between first and second quartile values of the independent variables, and between their second and third quartile values, are substantially the same as those above, with the following exceptions:

		Elasticity between	
	Independent Variable	*1st & 2nd Quartile*	*2nd & 3rd Quartile*
General control	Urbanization	—.46	—.32
	Three combined	.87	1.14
Highways	Urbanization	—.40	—.28
	Three combined	.56	.72
Public welfare	Density	—.15	—.07
Other	Three combined	.97	1.11

were each variable independently altered from its third to its first quartile value in 1942 (Table 25). The results show how much more influence would be exerted by income than by urbanization or density. Similar proportions appear when we inquire into the

Table 25

CHANGE IN STATE AND LOCAL GOVERNMENT EXPENDITURES PER CAPITA ASSOCIATED WITH CERTAIN CHANGES IN INCOME PER CAPITA URBANIZATION, OR DENSITY

Derived from Data for the 48 States, 1942

Independent Variable	*Change in Independent Variable from 3rd to 1st Quartile Value*	*Associated Change in per Capita Government Expenditure*	*Change in Independent Variable from 1903 to 1942 Mean*	*Associated Change in per Capita Government Expenditure*
Income	276	22.7	246	20.3
Urbanization	22.2	2.8	15	1.9
Density	66.0	−2.6	40	−1.6
Total		22.9		20.6

Units are as defined in Table 23. Dollar figures are in 1942 prices. The calculation for any independent variable holds the other two variables constant at their mean values.

effects of changes from the 1903 to the 1942 mean values of the independent variables.

The relations expressed by the equations in Table 23 may be read also in absolute terms. Thus the relation between expenditures and each independent variable (the other two variables being held constant at their mean levels) may be put as follows. An additional $10 of per capita income, at given levels of urbanization and density, was accompanied in 1942 by about $.82 of additional state and local government expenditure per capita. Every shift of 1 percent of the population from rural areas to cities of 2,500 or more was accompanied by additional per capita government expenditures of $.13. And every addition to population of one person per square mile was accompanied by a fall in per capita govern-

ment expenditure of $.04.[12]

The main conclusion to be drawn from these implications of our statistics is that urbanization is by itself a minor factor, much less important than income and not more important than density. The major factor accounting for interstate differences in government expenditures is income. Urbanization, in the simple correlations that have been made in the past, is apparently a strong influence on expenditures only because it is itself highly associated with income.[13] At a given level of income (and density), even fairly

[12] These results are based on the linear equation in Table 23. We also calculated the relation on the assumption that it was curvilinear:

$$\begin{aligned}\text{Per capita expenditures} = {} & 7.2 + \underset{(0.05)}{0.135}\ \text{Income} - \underset{(0.00004)}{0.00004}\ \text{Income}^2 \\ & - \underset{(0.49)}{0.59}\ \text{Urbanization} + \underset{(0.005)}{0.008}\ \text{Urbanization}^2 \\ & - \underset{(0.03)}{0.165}\ \text{Density} + \underset{(0.00005)}{0.0002}\ \text{Density}^2\end{aligned}$$

The coefficient of multiple correlation is .91.

This equation may be read as follows: As income rises, per capita expenditures rise also, at an almost constant rate. Every $10 of additional income, at given levels of urbanization and density, is accompanied by about $1 of additional government expenditures. Because of the curvature in the relation, the amount added to government expenditures is a little more at low incomes, a little less at high incomes, but the difference is slight and probably not significant.

Curvature is somewhat more pronounced in the case of urbanization. There is a slight tendency for expenditures to fall as urbanization rises from the lowest to the medium levels, then a tendency to rise. But the curve is very flat through most of the relevant range. Only at the highest levels of urbanization, above the upper quartile, is the slope of the curve appreciably different from zero; and we know from the standard error that even this may be insignificant.

Density has a clear negative relation with expenditures through almost the whole range. However, as density rises, a given increase is accompanied by a smaller and smaller decline in expenditures. At the lower quartile point of density, a rise of 1 person per square mile is associated with a fall of about $.15 in expenditures per capita. At the upper quartile point, the corresponding fall in expenditures is only $.10. Only when extremely high levels of density are reached, 413 or more per square mile, is increase in density associated with rise. The rate of rise is low, however.

These results are not much different from those derived from the linear equation. The only interesting and statistically significant difference bears on the curvature of the expenditure-density relation. This is something that we might expect *a priori*. The curvature in the expenditure-urbanization relation also conforms with expectation, but it is not statistically significant.

[13] This association between income and urbanization is well known to students of income statistics; see, e.g., the table in Simon Kuznets' *National Income: A Summary of Findings* (National Bureau of Economic Research, 1946), p. 27.

pronounced differences in degree of urbanization are associated with only slight differences in per capita expenditures.[14]

These relationships make sense. At given levels of urbanization and density, our measure of income indicates differences in real per capita income plus price differences mainly associated with community size (and not held constant by our measure of urbanization). Higher levels in either would tend to make for higher levels in government expenditure: the price factor, for the obvious reason that salary rates, rents, and other "local" commodities — which make up some half of the expenditures — would be high in generally high price areas, low in generally low price areas; the real income factor, because it will increase both the demand for public services and the tax capacity basic to their supply.

At a given level of income and density, urbanization would have little, but positive, effect on expenditures: little, because community-size differentials in expenditures would largely be eliminated

[14] Perhaps we need to emphasize that we are considering only the direct effects of urbanization on government expenditures, apart from its effects via income. If urbanization — because of the production advantages it brings — is a significant factor determining income, through income it may exercise an important influence on government expenditures. Its direct influence, however, appears small.

The following example may assist some readers to follow the discussion in the text. Suppose I (income) is a simple linear function — the sum — of U (urbanization) and X, X being independent of U; and that E (expenditures) equals 10 percent of I. Let us assume, further, that there are three states with zero U, three with U of 1, three with U of 2, and so on; and that one of each group of three is characterized by a value of X equal to 1, another by a value equal to 2, and the third by a value equal to 3. The following distribution would result:

E at Specified State Levels of U and I

		I							
		0	1	2	3	4	5	6	. . .
	0	—	.1	.2	.3	—	—	—	
	1	—	—	.2	.3	.4	—	—	
	2	—	—	—	.3	.4	.5	—	
U	3	—	—	—	—	.4	.5	.6	
	.								
	.								
	.								

It is quite clear that when I is held constant, as in each column, the correlation between U and E is zero. When U is held constant, as in each row, the correlation between I and E is perfect. That is, U has no effect whatever on E apart from its effect through I.

through the income factor; positive, because not all would be.[15] What was left would mean more expenditures, again partly because of the rural-urban price differential, partly because of the rural-urban service differential.[16]

Finally, increased density, at given levels of income and urbanization, acts to reduce expenditures — presumably because when public facilities can be used more intensively the cost of meeting specified levels of public service per head is lessened.

What would the combined effect of these factors be if all three changed? Since the relation we have derived is, by assumption, a simple additive one, the answer also is simple: it is the sum of the separate effects.[17] In terms of the elasticities mentioned earlier, a 1 percent increase in each of the three independent variables would be associated with an increase of a little less than 1 percent in expenditures per capita. This is, in fact, close to the amount associated with a 1 percent increase in income alone. The effects of urbanization and density work in opposite directions and almost offset one another. When changes of a relative order of magnitude proportional to the coefficients of variation of the three variables are assumed (Table 25), the influence of density becomes slightly more important, but not enough to modify seriously the preceding results.

We have been asking how expenditures compare with the average when all three independent variables are above or below average. The Mountain States are above average in income, but below

[15] The larger a city (measured by population) the larger its government expenditure per capita tends to be. But so also does its per capita income.

[16] It is money income, not real income, that is being held constant. At a given level of *money* income, a high level of urbanization might really mean a low level of *real* income, and a low level of urbanization, a high level of *real* income. The real income factor thus associated with urbanization might help — because of its negative effect — to offset, in part, some of the other factors — with positive effects — associated with urbanization. This may help to explain the slight importance ascribed to urbanization at given levels of income and density.

[17] We could, of course, have tested the existence of two- (or three-) factor product terms in the regression equation. If such terms had significant (and substantial) coefficients, the answer to the above (and to our earlier) questions would not be as simple. But the strength of the correlation could not have been raised much above the present level by adding such terms.

average in density. In these states, therefore, income and density work in the same direction: per capita expenditures are exceptionally high.[18]

The elasticities that express the relation between total expenditures and each independent variable are weighted averages of the elasticities for the several functional groups making up the total. The latter are interesting in their own right, and the average elasticities in fact summarize figures for them that are rather widely different (Table 24).

Income is still the most important influence on all functions except fire, sanitation, and welfare. For these three, urbanization is outstanding. This is reasonable; what is surprising is that police is not also an exception. Density is of tertiary importance, measured by its elasticity, in all functions except schools and health and hospitals. In these two, it is secondary. It is curious that density is not more important in the case of highways and less important in the case of welfare. Urbanization appears to be a negligible influence only in the case of schools and health and hospitals, though statistically insignificant also in the case of "other". The school figure suggests that educational standards were so widely diffused as to eliminate urban-rural differences (at given income and density levels). Income is never negligible, but it is statistically insignificant in the case of sanitation and public welfare.

All functional expenditures are positively correlated with income. In the case of urbanization and density, however, there are some interesting differences in sign. Urbanization, which has positive influence on total expenditures and half the individual functional groups, works in the opposite direction in the case of general control, highways, health and hospitals, schools and "other". However, the results for general control and "other" may merely reflect the tendency toward more specialization of function and better

[18] In technical language, we have been moving along only one direction on the surface that describes the relation between expenditures and the three independent variables under consideration: the direction in which all the independent variables rise. If we move from the mean of the surface in a direction in which income increases substantially and density decreases substantially, we get other results. The movement, in this case, would be toward the portion of the surface where the Mountain States are congregated: these had high levels of expenditure per capita.

records in the more urbanized states. The result for highways and schools must surely mean intensive use of facilities. Density's influence is negative in the case of total expenditures and most of the individual functions; the exceptions are police, fire, sanitation, and health and hospitals.

The aggregate effect of a 1 percent change in each variable is substantially more on the three public safety functions, health and hospitals, public welfare, and sanitation than on total expenditures. It is about the same on general control and "other" expenditures. It is less in the case of schools and highways. If instead of a uniform 1 percent change in each independent variable we take the change from the 1903 mean levels of income, urbanization, and density to their 1942 mean levels, we get somewhat different results. Now, only highways and schools would increase less than total expenditures, but these make up a good part of the total. All the other functions would increase more than total expenditures.

Factors Affecting Interstate Differences in Government Employment in 1942

We have suggested that the strong association between expenditures and income, urbanization and density reflects interstate price differentials in some degree. But how important are these price differences? In particular, does income have an outstanding influence because both it and expenditures are influenced by the common factor, interstate price differences?

In our review of interstate differences in expenditures we concluded that price differences could not account for the entire differences in expenditures. The range of variation in expenditures is very wide compared with that in prices, and any deflation would cut it only a fraction. The same, of course, goes for income. Nevertheless, the price factor affects our results.

Perhaps the simplest way to get rid of a good deal of its influence is to substitute government employment, in terms of number of workers, for government expenditures and see how the relationship turns out (Table 26).[19] The coefficient of correlation is sub-

[19] The substitution is somewhat deficient, however, because of the differences between expenditures and employment mentioned in footnote 3, above.

Table 26

STATISTICAL RELATIONS BETWEEN GOVERNMENT EMPLOYMENT PER CAPITA IN THE 48 STATES IN 1942 AND THEIR RESPECTIVE LEVELS OF INCOME PER CAPITA, URBANIZATION, AND DENSITY

DEPENDENT VARIABLE		REGRESSION COEFFICIENT OF INDEPENDENT VARIABLE			COEFFICIENT OF MULTIPLE CORRELATION
Employment per Capita (1942)	CONSTANT TERM	*Per Capita Income (1938-42)*	*Urbanization (1940)*	*Density (1940)*	
Schools	125.6	.0540	—.8543	—.0486	.58
		(.0270)	(.3473)	(.0303)	
Other	41.4	.1710	.4123	—.1190	.62
		(.0493)	(.6348)	(.0554)	
Total	166.9	.2250	—.4420	—.1677	.54
		(.0638)	(.8218)	(.0718)	

The employment data, in terms of government workers per 10,000 population, include part-time and temporary workers. For nonschool functions a rough calculation of the full-time equivalent number yields an alternative equation (see below; column headings have been omitted). This is combined with the above equation for schools to yield another equation for total employment.

Other than school	20.3	.1448	.4568	—.0782	.83
		(.0255)	(.3282)	(.0287)	
Total	145.8	.1988	—.3975	—.1268	.66
		(.0413)	(.5322)	(.0465)	

Figures in parentheses are standard errors of the coefficients.

stantially reduced: the three independent variables account for a much smaller percentage of the variance in employment than they did of the variance in expenditures. Nevertheless, the general outlines of the relations remain substantially the same. Income, though less important, still exerts the major influence, as indicated by the elasticity coefficient (Table 27). Urbanization now exerts a negative influence but is still statistically insignificant. Density continues to exercise a negative influence and is now more important.

For individual functions the question about the influence of interstate price differentials is less easily answered. We have information on only two separate categories of government employment by states: school and nonschool. When we relate interstate differences in nonschool employment to corresponding differences in

Table 27

ELASTICITY OF STATE AND LOCAL GOVERNMENT EMPLOYMENT PER CAPITA WITH RESPECT TO INCOME PER CAPITA, URBANIZATION AND DENSITY

Derived from Data for the 48 States, 1942

	Elasticity with Respect to			
	Income per Capita	*Urbanization*	*Density*	*Three Independent Variables Combined*
Schools	.28	—.36	—.04	—.12
Other				
Full & part-time	.67	.13	—.08	.72
Full-time equivalent	.72	.18	—.07	.83
Total				
Full & part-time	.50	—.08	—.06	.36
Full-time equivalent	.50	—.08	—.05	.37

The elasticity measure is the percentage change in per capita employment associated with a 1 percent change in the independent variable specified. The change in the independent variable is calculated with its arithmetic mean as the point of departure, the two other independent variables being held constant at their mean values. Elasticities calculated from change between the quartile values of the independent variables are substantially the same as those above.

income, urbanization, and density, we again have confirmation of the results for expenditures, as we would expect from the comparison of the totals.

In the case of the school functions, however, the change is considerable. School expenditures are correlated positively with income, negatively with density and urbanization. This is also true of school employment. But the three independent variables differ greatly in relative importance. The major factor is now urbanization. In schools, then, the price factor is of outstanding importance. School salary levels are highly correlated with income; the regression coefficient has a very substantial value; and salaries constitute the preponderant part of school expenditures (Table 11). It appears that school expenditures are high in high income states mainly, but not entirely, because salaries are high. As income, urbanization, and density increase, school employment per capita tends to fall. The decline in school employment per capita resulting from greater urbanization and density (because of fewer public

school children per capita and more pupils per teacher) is more than enough to offset the increase due to higher income. But since salaries rise with higher income and urbanization, school expenditures per capita tend to rise. The price differential probably reflects some quality difference,[20] but it is hardly possible to argue that quality accounts for the entire price differential. Among states, the levels of school service rendered per capita of the total population, taking into account both quantity and quality, seem surprisingly similar.

It is doubtful if the price factor is as important in any of the individual nonschool functions. The range of school salaries seems to be exceptionally wide.

Bearing of the 1942 Analysis on Changes between 1903 and 1942

May we use our results for 1942 in interpreting *change* in government expenditure between 1903 and 1942? The declining interstate differences in urbanization already noted, and other data, suggest that at the opening of the century interstate differences in income were greater than before World War II. But as we do not have any data on income by states before World War I, we cannot determine either the "cross-sectional" relationship for 1903, for which data on state and local government expenditures as well as measures of urbanization and density by states are available, or the relationship between changes since then in income, urbanization, and density, and changes in government expenditures.[21] The question initially posed is therefore important; and experience with the application of cross-sectional savings functions to changes in time suggests that the answer is not obvious.

Statistically, about all we can do is to return with another question: how well does our 1942 relationship conform to the 1903 relationship? While we lack the latter, we do know one thing about

[20] Cf., George Stigler, "Employment and Compensation in Education", *Occasional Paper 33* (National Bureau of Economic Research, 1950), p. 17.

[21] Wealth, available for both the early and recent periods, would seem to be a likely substitute for income, but it could not be used because seriously affected by the high values which the wealth estimates include for public lands in the West and by other deficiencies.

it: it must exactly fit the means of expenditures, income, etc., for 1903; that is, the surface describing it must pass through the point defined by the mean of the system. (We do not have state data on incomes in 1898-1902, it is true, but Simon Kuznets has provided a rough national estimate and therefore the basis for a first approximation to the mean state income per capita. Both income and expenditures in the earlier period need, of course, to be put into the prices of the later period.) If the 1942 relationship conforms to the 1903 relationship, it too will pass through the mean of the 1903 system, although this is not a guarantee that it conforms in all respects to the latter.

Table 28

STATE AND LOCAL GOVERNMENT EXPENDITURES PER CAPITA, ACTUAL 1942 AND 1903 LEVELS AND ESTIMATED 1903 LEVELS, IN 1942 PRICES

	Actual 1942 (1)	*Actual 1903* (2)	*Estimated 1903* (3)	*Difference 1903 (2)-(3)* (4)
Total expenditures	$53.51	$27.93	$32.87	—$4.94
General control	5.01	5.10	2.81	2.29
Public safety	4.76	1.90	2.01	—.11
Highways	7.04	2.97	5.12	—2.15
Schools	17.86	13.65	12.59	1.06
Health, hospitals, & public welfare	12.58	2.27	6.89	—4.62
Sanitation	1.04	.47	.47	.00
Other	5.23	1.57	2.98	—1.41

Column 3 is estimated from the 1903 average levels of income, urbanization, and density, and the equations derived from the 1942 data (Table 23). The per capita expenditures shown are the unweighted averages of the 48 individual state per capita expenditures.

Substitution of the 1942 mean income (584), urbanization (47.3), and density (97.7), in our 1942 equation (Table 23) of course yields the 1942 mean total expenditure per capita, $53.51. Substitution of the corresponding 1903 values (338, 32.1 and 58.2) in the 1942 equation yields an estimate of mean expenditures in 1903 of $32.87 (in 1942 prices). The actual 1903 mean expenditure was $27.93, about $5 less (Table 28).

To answer the question, then, it seems that the two relation-

ships differ by a modest amount, and this difference (if significant) is reasonable because it shows a secular rise in expenditures (at given levels of income, urbanization, and density) during the four decades.[22] In other words, the data are not inconsistent with the hypothesis that the 1942 relationship is applicable to the 1903 data and to the 1903-42 changes, subject only to the addition of a time or trend factor.[23] The trend factor is positive, taking 1903 as the point of reference. This means that the chief cause of rising per capita expenditures would be rising income. Greater urbanization and the "passage of time" would add a little. Increased density would subtract a little.

The results of parallel explorations of the data for the separate functions may be noted briefly (Table 28). On the assumptions listed, the effect of the passage of time would be to increase the expenditures on highways, health, hospitals, and public welfare, and "other" functions, and to reduce the expenditures on general control. Its effects on the expenditures on schools, public safety, and sanitation would seem negligible, well within the margins of error.

These implications also seem reasonable, on the whole, for the period and environment to which they relate. For example, we expect expenditures on general control to decline (relative to total government expenditures) as government activity, and with it specialization, increases: incidental functions performed by the general control group of offices or bureaus would be split off when

[22] In technical language, the one point that we know lies on the earlier surface does not lie also on the recent surface; but the difference between the two surfaces, in the vicinity of that point, is of reasonable sign and magnitude. There is some question whether the difference is large enough to be significant. In this connection we may note that the more elaborate equation given in footnote 12, above, yields an estimate for 1903 that is only about a dollar above the actual 1903 figure — i.e., differs from it by only three percent. On the other hand, the equation in footnote 11, which excludes the urbanization variable, gives about the same result as the equation in Table 23; and the employment equation in Table 26 also yields an estimate for 1903 higher than the actual 1903 (the "actual" in this case is itself a rather rough estimate derived by interpolating between the 1900 and 1910 figures in Table B13).

[23] More exactly, the constant term in the original 1942 equation, 3.32, is now assumed to consist of two components: a different constant term, −1.64, and a trend term, $+.127t$, where t is the number of years since 1903.

they grew large enough to be administered by special bureaus or offices devoted entirely to them, and these would usually be classified outside the general control function. To explain a positive trend factor for highways we may appeal to the advent of the motor car, among other things. And in connection with health, hospitals, and public welfare, and "other functions", a trend toward higher standards of service might be mentioned. (In the case of schools, raised standards could have been offset by reduction in the relative importance of school children in the population.)

While there seems to be some merit in the assumptions from which these implications are drawn, it is necessary to note that other and quite different assumptions are also consistent with the existing statistical data; and these also can be made to appear reasonable. Thus the differences we have accounted for by a time trend could be accounted for instead by changes in the regression coefficients. There is, indeed, some indication that this is so for one functional category. To judge from hints supplied by equations for 1903 and 1942 in which the independent variables are urbanization and density, increase between 1903 and 1942 in the income regression coefficient did play the significant role in raising expenditures on health, hospitals, and public welfare.[24] Such a change could reflect, for example, the assumption after 1903 of welfare activities on which the "marginal propensity to spend", as urbanization rises, is above the corresponding propensity to spend on the 1903 type of welfare and health activities.[25] For all other functions, and for the total as well, however, the same evidence seems to support the (competing) hypothesis first considered, namely, that

[24] The equations appear in the appendix, Table E3.

[25] This possibility may be illustrated with the figures in Table E3. Suppose that the "health, hospitals, and public welfare" group in 1903 consisted entirely of health and hospital activities, and was therefore related to urbanization and density in 1942 in accord with the 1942 equation for "health and hospitals" alone. Then, as we can see in the table, the urbanization coefficient in 1903 would not be much different from the 1942 urbanization coefficient. The addition of welfare activities, related to urbanization and density in accord with the 1942 equation for "public welfare", would cause the urbanization coefficient of the two subgroups combined to rise between 1903 and 1942 to the extent indicated in the table.

the 1942 relationships are reasonably applicable to 1903 and to the changes between 1903 and 1942 (with the addition of a time factor in the cases noted above).[26]

[26] Note, first, that the regression coefficients of the urbanization variable in 1903 are not significantly different from those in 1942, with the one exception of expenditures on health, hospitals, and public welfare. Now, urbanization and income are strongly correlated. If in both 1903 and 1942 they are related in a simple linear fashion,

$$\text{Urbanization} = a + b\ (\text{Income}) + c\ (\text{Years since } 1903),$$

which is probably not too far fetched an assumption, then the urbanization coefficients in the equations in Table E3 will be proportionate to the income coefficients in which we are interested. Therefore, the ratio of the 1942 to the 1903 regression coefficients of urbanization will be identical with the corresponding ratio for income. That is, change in the urbanization coefficient will indicate change in the income coefficient: when the former is negligible, so is the latter.

Second, according to Table E3, the constant term is substantially altered between 1903 and 1942 in the directions and cases postulated earlier in the text. However, on the assumption made in the preceding paragraph, change in the constant terms in the Table E3 equations overstates degree of change in the constant terms in the equations in which income rather than urbanization is the independent variable.

While it is the urbanization, rather than the density, variable which is more important in all cases, we may note the substantial declines (ignoring signs) that occurred in the density regression coefficients for schools and general control. These may reflect the influence of improved transportation and some of the other developments we have noticed.

All this is merely suggestive, for it is difficult to connect the equations in Table E3 with those in Table 23, and the correlation coefficients of the former are usually rather low. It would seem worthwhile, however, to study further the equations in Table E3, adding corresponding equations for 1890, 1913 (though some difficulties would be encountered), 1932, and — when the data become available — 1952. (The 1952 Census of Governments will make it possible also to determine equations for 1952 corresponding to those in Table 23 and thus check, to some extent, the validity of the hypotheses discussed above.)

When interest lies in change in the average level of per capita state and local government expenditures for the United States as a whole, another factor enters the scene, to join those discussed above. This is the correlation between expenditures and population size. For the level of per capita state and local government expenditures in the United States as a whole is the mean of the individual state levels, each state level being weighted by the population of the state. Change in the correlation between expenditure and population may therefore help to explain changes in the United States level.

Shifts in this correlation, in fact, had an appreciable effect on the United States level of per capita expenditures devoted to some of the individual functions for which we have separate data. This may be seen if we compare changes in the weighted averages, which reflect shifts in population, with changes in the unweighted averages, which do not (Table E4). The United States weighted mean level of per capita state and local government expenditures on

general control rose from $2.15 in 1903 to $5.07 in 1942, or 136 percent. The unweighted mean of the 48 state levels rose from $2.47 to $5.01, or 103 percent. (Both percentages relate to expenditures in current, not constant, prices.) The difference is in the opposite direction and largest in the case of highways, the weighted mean having risen 299 percent, the unweighted mean, 389 percent. For the other functions the differences are smaller, and indeed negligible in the case of the composite "health, hospitals, and public welfare", and perhaps also schools and sanitation.

For expenditures as a whole the differences cancel out almost completely.