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TRENDS IN THE LOCATION OF POPULATION, INDUSTRY, AND EMPLOYMENT

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Something over one hundred years ago, Ezra Champion Seaman, lawyer, administrator in the government of the State of Michigan, and former Treasury official, published a book, *Essays on the Progress of Nations.*[1] Seaman's thesis was a familiar one: Nations progress by industrializing. He used modern methods to establish this thesis. He made national income estimates for several nations and showed that income per head was higher in the industrialized nations. He estimated income by states and showed that income per head in industrial (including commercial) states was higher than in agricultural states. Finally, he estimated income per worker in agriculture and industry (including commerce) by states and showed that income per worker was higher in industry than in agriculture and, also, that income per worker in agriculture was higher in industrialized states than in agricultural states. This indicates that the United States should industrialize!

His policy prescriptions, in general terms, were as modern as his analysis and methods of proof: Markets should be opened for the crops of the agricultural states to improve incomes in these states and to enable industrial states to concentrate even more fully on industrial activities; moreover, industry should be encouraged, not only in the industrial states, but in agricultural states as well. And when Seaman talked about policy he had in mind governmental policy: Government should open agricultural markets by improving internal transport; government should encourage industrialization by tariff policy and other means.

Seaman's proposals were aimed at raising national income per head. But presumably they also were aimed at narrowing the margins among incomes per worker in various sectors and incomes per capita among geographic regions. While Seaman favored social intervention to promote growth, he was well aware of the power of market forces, given economic motivations for owners of resources. That is, he seemed to believe that if major barriers to growth were broken by social action, market forces could achieve the rest. Income differentials would serve as inducements to owners of resources to move

[1] See Robert E. Gallman, "Estimates of American National Product Made Before the Civil War," *Economic Development and Cultural Change,* Vol. IX, No. 3 (April 1961).

these resources from unprofitable industries or regions into profitable ones (the terms "resources" and "profitable" being used here in their broadest senses). This movement would tend to correct imbalances. For example, movement out of agriculture would change relative supplies of agricultural and industrial goods and, *ceteris paribus,* improve the prices of agricultural goods relative to industrial goods. Proper policy might eliminate barriers to resource movement.

To attribute more to Seaman would be unwarranted. Indeed, we may have gone a little too far already. Still, Seaman apparently was not only using modern constructs and measurements, but was beginning to see structural and regional change in terms quite familiar to present-day students of growth.

Structural change is generally treated in terms of the structure of human wants, productivity advance, and economic motives. A poor country, we say, must concentrate its resources in sectors producing food and textile fibers, to keep as many bodies and souls together as possible. But as productivity advances, a smaller share of the work force can manage to feed and clothe the nation. New resources (and perhaps some old ones, too) can be put to work providing other goods. More agricultural goods may be exported in exchange for industrial goods. Or, more likely, the nation may begin to industrialize. The incentive to change is provided by the structure of human wants, which now places a premium on nonagricultural goods.

The process is not simply a once-for-all change; as productivity rises, the nation moves up its priority scale, so to speak. Persistent incentives cause a uni-directional shift in the structure of the economy away from agriculture toward industry and the service sectors. The process of change should narrow income differentials among economic sectors—that is, unless productivity advance is very rapid, compared with resource mobility, or if the structure of wants leads to relatively severe price and income inelasticity of demand for the products of a given sector, or if the system is subject to persistent, severe shocks, etc. Presumably the same analysis might be applied to changes in the regional composition of resources and income.

This broad description of the analysis of structural changes during growth will serve as a framework for the evidence we have concerning the structural and regional changes of the American economy since Seaman's day.

Long-term data on sector resource inputs are very nearly limited to labor force (or gainful worker) data and we will have to rely on labor figures as rough indexes of resource inputs.

Panel A of Table 1 shows the long-term changes in the sector composition of the labor force. The pattern is familiar. Agriculture's share in labor force fell by almost five-sixths between 1840 and 1950 and a further decline of about two-fifths is forecast by 1970. Dividing the period at the turn of the century, we find that the decline since

TABLE 1. SHARES OF ECONOMIC SECTORS IN LABOR FORCE AND NATIONAL INCOME, 1840-1970

Economic Sector	1840	1860	1900	1910	1920	1930	1940	1950	1970
Panel A: Shares in Labor Force (Percent)									
Agriculture	69	60	37	31	27	22	17	12	7
Industry	15	20	30	31	34	31	31	35	35
Services	17	20	33	38	39	47	52	53	58
Total	101	100	100	100	100	100	100	100	100
Panel B: Shares in National Income (Percent)[1]									
Agriculture	44	36	17	17	15	9	9	7	5
Industry	14	19	26	27	29	26	29	38	39
Services	41	45	57	57	56	66	62	55	56
Total	99	100	100	101	100	101	100	100	100
Panel C: Sector Incomes per Worker as Relatives of National Income per Worker (Percent)									
Agriculture	65	60	46	55	57	40	53	59	73
Industry	97	94	86	84	83	83	92	109	112
Services	250	225	173	149	144	138	121	104	96
Range	100–386	100–389	100–376	100–271	100–252	100–345	100–228	100–183	100–153

[1] 1840 and 1860, census years; 1900-1950, weighted decade averages, centered on the beginnings of the years preceding those indicated (e.g., 1899); 1970, trend values, in prices of 1950.

SOURCES: 1840, 1860—*Panel A,* derived from data in *Historical Statistics of the United States,* Bureau of the Census, 1960, p. 74. *Panel B,* agriculture and industry, extrapolated from 1900 on value added series contained in Robert E. Gallman, "Commodity Output in the United States, 1839-1899," *op. cit.,* p. 43 (variant B); services, extrapolated from 1900 on value added by distribution and the value of services flowing to consumers, unpublished series drawn up by the author and resting, in part, for the post Civil War period on Harold Barger, *Distribution's Place in the American Economy Since 1869,* Princeton University Press, Princeton, New Jersey, 1955, and Simon Kuznets, *Capital in the American Economy,* forthcoming. *Panel C,* Panel B divided by Panel A.

1900-1950—Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations," Part II, *Economic Development and Cultural Change,* supplement to Vol. V, No. 4, July 1957, pp. 73, 93, 103.

1970—*Panels A and B,* derived from data in Bonnar Brown and W. Janet Hansen, *Production Trends in the United States Through 1975,* Stanford Research Institute, Menlo Park, California, 1957, pp. 25-50, and Gerhard Colm, *National Economic Projections,* National Planning Association, Washington, D. C., 1959, pp. 140-41. *Panel C,* Panel B divided by Panel A.

1900 has been more precipitous than in the preceding sixty years. Agriculture's share fell by about two-fifths between 1840 and 1900, and by over two-thirds between 1900 and 1950. The shares of the other two sectors (industry and services) increased, and at about the same pace, to 1900. Both began with shares of about 15 percent and by 1900 had doubled them. Thereafter, the service sector increased the more rapidly. By 1950 over half the labor force was committed to the service sectors, an increase of about two-thirds. The part of the labor force committed to industry increased very much more slowly, rising from about 30 percent in 1900 to about 35 percent in 1950. This part of the labor force is not likely to increase substantially by 1970. The decline of the share of the labor force attached to agriculture will be offset by a rise of about 10 percent in the share attached to the service sector. By 1970 almost 60 percent of the labor force will be in the service industries, if our projections are accurate.

Panel B shows distribution of income among the three sectors for the same period. The pattern shown by Panel B is, in some respects, the same as the pattern shown by A. Agriculture's share of income falls over the full period, while the shares of the other sectors rise. But in Panel B agriculture's share declines at about the same pace before 1900 as afterward. Furthermore, the rise in industry's share of income after 1900 is much more pronounced than the rise in the share of labor force. Finally, the service sector begins with a much larger share of income than labor, and the share increases pronouncedly to 1900 but not thereafter.

These contrasts are reflected in the data in Panel C. The ratios in Panel C are derived by dividing the figures of Panel B by those of Panel A. That is, each expresses the ratio of a sector's share of labor to that sector's share of income. A ratio greater than one means that income originating per worker in that sector was larger than the average, and so forth. For example, in 1840 income originating per worker in agriculture was about 65 percent of income originating per worker in the entire economy; income originating per worker in industry was just slightly below average; while income originating per worker in the service sector was about two and a half times the average. Now by 1900 *all* of these ratios had fallen. How could this happen? The explanation is that the sector composition of income and labor force had shifted in such a way that it raised the general average (of course, other factors were at work to raise it as well). For example, the high income sector, services, had only about 17 percent of the labor force in 1840, while by 1900 it had over 30 percent. The mere change in composition raised the average, bringing it closer to income per worker in the service sectors.

The data in the last row of the table show the range of income per worker in each year. These data show that differences among sector levels of income per worker had not narrowed significantly over the sixty-year period ending in 1900. That is, the forces which we described as working toward the narrowing of income differentials and which, we saw, led to substantial structural changes in the economy, had not been strong enough to narrow income differentials. But after 1900 the story is quite different. The range falls from about 100-376 to about 100-183 by 1950, and a further decline to about 100-153 is forecast by 1970. The decline does not proceed without interruption —the range rises between 1920 and 1930—but is nonetheless clear.

The ratios of Panel C suggest a substantial degree of success, since the turn of the century, in the long-term ability of the economy to adjust to the forces of growth. But this picture must be qualified somewhat before it is allowed to stand.

We have treated labor force figures as measures of sector resource inputs. But, of course, labor force figures do not even measure labor inputs properly. Some account should be taken of the length of the work week and levels of employment. At a guess, the work week in nonagriculture has probably fallen faster than the work week in agriculture.[2] On the other hand, open unemployment has always been a larger problem in nonagriculture than in agriculture, and the average share of the nonagricultural labor force unemployed has probably diminished, over the long period.[3] The biases introduced into the rates of change of our input series by failure to consider these factors are probably opposite in direction and may offset each other.

More important is the fact that we have ignored other resource inputs. We have a few fragments of information about these inputs. For example, we know that the capital-output ratio for manufacturing and for mining rose from the latter part of the nineteenth century to about the end of the second decade of the twentieth and fell thereafter, whereas the capital-output ratio for agriculture (including land in capital) fell continuously.[4] The movements of the ratios for the industrial sectors were the more pronounced. Consequently, the widening and then the narrowing of the margins between the sector ratios of

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[2] See Robert E. Gallman, "Commodity Output in the United States, 1839-1899," *Studies in Income and Wealth,* Vol. 24, Princeton University Press, Princeton, New Jersey, 1960, p. 17, and sources cited therein.

[3] Stanley Lebergott, "Long-Term Factors in Labor Mobility and Unemployment," *Employment, Growth, and Price Levels,* Part 3, Hearings before the Joint Economic Committee, Congress of the United States, Govt. Printing Office, 1959, pp. 582-83.

[4] Daniel Creamer, Sergei P. Dobrovolsky, and Israel Borenstein, *Capital in Manufacturing and Mining,* Princeton University Press for the National Bureau of Economic Research, Princeton, New Jersey, 1960, and Alvin S. Tostlebe, *Capital in Agriculture,* same publisher, 1957.

Panel C may be due, in some measure, to changes in the relative importance of nonlabor inputs.

So far as the service sectors are concerned, it seems reasonable to suppose that the capital-output ratio declined, especially since, say, 1920. We know that the capital-output ratio for transportation, communications, and public utilities declined, and we also know that the other important capital-using service, shelter, probably declined in relative importance with respect to the other services after 1920.[5] How pronounced the decline in the capital-output ratio has been, we do not know.

Let us now turn to the regional data. Panel A of Table 2 shows the regional distribution of population in various years. Changing shares in population reflect, of course, differential rates of population growth. An increase in the share of a sector indicates that population is growing more rapidly in that sector than on the average, and so forth. The table tells a familiar story. The share of population contained in the oldest areas, the Northeast and the South, fell sharply between 1840 and 1900, and thereafter remained roughly constant. A further slight decline is predicted by 1970 in the share of the Northeast. The North Central and West South Central regions experienced increases which ended around the turn of the century. The share of the former region then declined slightly; the share of the latter remained roughly constant. The combined Pacific Coast and Mountain regions alone experienced a persistent, strong increase, an increase which will probably continue to at least 1970.

Panel A gains significance if read with Panel B. Panel B shows income per head in each region expressed as a percentage of average income per head for the nation. For example, the figure 135 for the Northeast, in 1840, means that in 1840 income per head in that region was 35 percent greater than the national average.

Two features of Panel B are of some interest. First, taken with Panel A, it shows that the region which persistently experienced the largest rate of population growth, the Pacific Coast and Mountain, also had the highest levels of income per capita. The rate of population growth of the West South Central region was very large between 1840 and 1880, and in 1840 income per head in that region was exceptionally high. These findings seem to fit the model set out early in this paper. But two important bits of information do not, at first blush, seem to fit at all well. Population growth in the North Central region was relatively rapid between 1840 and 1880, yet income

[5] Melville J. Ulmer, *Capital in Transportation, Communications, and Public Utilities*, same publisher, 1960, and Simon Kuznets, *National Product Since 1869*, National Bureau of Economic Research, New York, p. 144.

TABLE 2. POPULATION, INCOMES PER CAPITA, LABOR FORCE INDUSTRIALIZATION, BY GEOGRAPHIC REGIONS, 1840-1970

Geographic Region	1840	1880	1900	1920	1950	1970
Panel A: Regional Shares in Population (Percent)						
Northeast	43	31	29	30	28	24
North Central	19	34	35	33	29	30
South Atlantic and East South Central	35	24	22	19	20	20
West South Central	3	7	9	10	10	9
Pacific Coast and Mountain	—	3	5	8	13	17
Total	100	100	100	100	100	100
Panel B: Relative Incomes per Capita (National Average = 100)						
Northeast	135	141	134	124	109	
North Central	68	98	103	100	106	
South Atlantic and East South Central	71	48	47	56	69	
West South Central	144	60	61	72	80	
Pacific Coast and Mountain	—	192	153	123	115	
Range	100–312	100–400	100–326	100–222	100–169	
Panel C: Relative Labor Force Industrialization (National Average = 100)						
		(a)	(b)			
Northeast	164	188	152	140	125	110
North Central	85	84	91	97	101	98
South Atlantic and East South Central	45	31	48	58	69	89
West South Central	67	29	49	52	70	92
Pacific Coast and Mountain	—	169	140	115	103	103
Range	100–364	100–644	100–317	100–269	100–181	100–124

(a) Comparable to 1840; (b) comparable to 1900.

SOURCE: 1840-1950, derived from data in Richard A. Easterlin, *op. cit.*, pp. 136-38; 1970, derived from data in U. S. Bureau of the Census, Current Population Reports, Series P-25, Nos. 160 and 187.

per head in that region in 1840 was lower than in any other region. On the other hand, the Northeast, with high income per capita in 1840, increased its population at a less than average pace between 1840 and 1880. But, of course, the North Central region had other

attractions during this period—initially cheap, then free, land and glowing long-term prospects, to some extent fulfilled, as the data for 1880 and subsequent years suggest. Seen in this context, the decline in the share of population in the Northeast also becomes more reasonable.

The second interesting feature of Panel B is that over the full period income differentials among regions seem to have narrowed somewhat. As we found in the case of the industrial sectors, the narrowing has taken place largely in this century. Between 1840 and 1900 average incomes per head actually drifted apart.

In Panel C we have brought together data bearing on one important factor explaining differences among regional incomes per capita and the tendency for these differences to be eliminated over time—the degrees of industrialization of the various regions. Again the figures in the table represent percentages of national averages. For example, the figure 164 next to the Northeast in 1840 means that in that year the share of the nonagricultural labor force in the total labor force of the Northeast was 164 percent of the share of the nonagricultural labor in the total U. S. labor force. The data show very clearly the spread of industrialization and the tendency for the various regions to move toward the same degree of industrialization.

One criticism of the table is that incomes are expressed in current prices. No doubt the differences among regional incomes per head are in some measure explicable in terms of different regional price levels; that is, the differences we have measured may overstate real differences.[6]

The findings with respect to both sector and regional trends can be summarized quite briefly. The United States has done what Seaman originally suggested and has achieved results which he predicted. That is, this nation has changed from an agricultural to an industrial nation, industrialization has gone on apace in every geographic region, income per head has risen rapidly, and incomes per head in the various economic sectors and regions have tended to draw closer together. More of the same seems to be in prospect for the future. The Pacific Coast will gain in share of total population at the expense of the Northeast. Agriculture will continue to decline in relative importance, incomes per head will rise, and we may find a further narrowing of differences in regional and sector incomes per head.

Seaman asked for a certain amount of social action with respect to growth and his request was answered. Federal and state intervention

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[6] See Richard A. Easterlin, "Interregional Differences in per Capita Income, Population, and Total Income, 1840-1950," *Studies in Income and Wealth*, Vol. 24, Princeton University Press, Princeton, New Jersey, 1960, pp. 93-95.

speeded and shaped the character of western movement. Some social action was clearly of a provincial, beggar-thy-neighbor character. Washington, Baltimore, Philadelphia, New York, and Boston raced to tap the markets of the West, with mixed results, so far as national development is concerned. Still, some barriers to growth would fall swiftly only under social action on a grand scale and the costs of this action were surely recompensed.

Today we find similar developments. Chronically depressed or underdeveloped regions call for the movement of resources, the retraining of labor force, the formation of integrated plans through social action at the local, state, or federal level. The responses to these needs seem to imply both concern for broad social goals and a narrow provincialism. Future growth depends in no small measure on the extent to which the latter concerns are subordinated to the former.