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Volume Title: The Growing Importance of the Service Industries

Volume Author/Editor: Victor R. Fuchs

Volume Publisher: UMI

Volume ISBN: 0-87014-410-3

Volume URL: <http://www.nber.org/books/fuch65-1>

Publication Date: 1965

Chapter Title: A MORE DETAILED LOOK AT THE GROWTH OF SERVICES

Chapter Author: Victor R. Fuchs

Chapter URL: <http://www.nber.org/chapters/c1692>

Chapter pages in book: (p. 4 - 8)

as a declining fraction of total employment.

In this paper I propose to explore three questions concerning the relative growth of the service sector: (1) Why did the shift occur? (2) What are the implications for the economy? (3) What are the implications for economic analysis? The answers that will be suggested are not based on completed, tested research. They are rather akin to working hypotheses. Some of them are currently being explored in the National Bureau's study of productivity in the service industries.<sup>3</sup>

#### A MORE DETAILED LOOK AT THE GROWTH OF SERVICES

Before considering possible explanations for the increase in the service sector's share of total employment, several aspects of this increase should be explored. First, let us see whether the differential growth has been true for individual industries as well as for the sector aggregate. Table 2 provides an affirmative answer to this question.

Average annual rates of change of employment (1929-63) by industry have been calculated at the sixty-one-industry level of detail provided by the National Income Division of the Office of Business Economics. Thirty-eight of the industries are in the goods sector; twenty-three in the service sector. The fraction of the industries in each sector experiencing different annual rates of growth is also shown.

We see that a large percentage of the service industries had rapid rates of

<sup>3</sup> Some preliminary findings of this study are reported in Victor R. Fuchs, *Productivity Trends in the Goods and Service Sectors, 1929-61: A Preliminary Survey* (Occasional Paper 89). (New York: National Bureau of Economic Research, 1964.) Other work now in progress at the National Bureau includes studies of wholesale and retail trade, state and local government, personal services, health, and changes in the quality of labor.

growth of employment and only a very few had negative or slow rates. For the goods industries, the reverse is true. Almost one-third of the goods industries showed an absolute decline in employment between 1929 and 1963, while fewer than one-sixth of them had rates of growth in excess of 2.5 per cent per annum. Only two of the service industries showed declines in employment and almost half of them grew at rates exceeding 2.5 per cent. The median rates of growth were 2.14 for the service industries, 0.99 for the goods, and 1.43 for all industries.

If the sixty-one industries are grouped by sector, and by whether they grew faster or slower than 1.43 per cent per annum, the difference between sectors is statistically significant at the 95 per cent level of confidence, according to the  $\chi^2$  test. It appears that the generalization about the shift of employment to services has considerable validity at the detailed industry level, as well as for the sector aggregate.

A second question concerns the extent to which a classification of employment by function instead of industry would confirm the existence of a trend toward services. We do not have employment data by function, but we do have information concerning the occupational distribution of the labor force, and the latter more closely approaches function than do the data for industries.

In Table 3, the eleven major occupation groups have been classified as "service type" or "goods type" according to their industrial distribution in 1960. We see that the former group has grown rapidly (2.1 per cent per annum between 1930 and 1960), while the "goods-type" occupations showed no net change over the period. Moderate gains in some goods-producing occupations were offset by absolute declines in others. Thus the

TABLE 2

RATE OF GROWTH OF EMPLOYMENT,<sup>a</sup> GOODS AND SERVICE INDUSTRIES, 1929-63

Average Annual Rate of Change of Employment (Per Cent)	All Industries in Sector (Per Cent)	Goods Industries	All Industries in Sector (Per Cent)	Service Industries
2.5 and over	15.8	Electric machinery <sup>b</sup> Transportation equipment except auto Air transportation (common carrier) Highway freight transportation and warehousing Radio and TV broadcast State and local government enterprise	43.5	Finance, n.e.c. Insurance carriers Commercial and trade schools and employment agencies Business services, n.e.c. Miscellaneous repair services and hand trades Medical and other health services Engineering and other professional services Educational services, n.e.c. Nonprofit membership organizations, n.e.c. Federal general government State and local general government
1.5-2.49	21.0	Crude petroleum natural gas Contract construction Chemical and allied products <sup>b</sup> Rubber products Metal products, etc. <sup>b</sup> Paper and allied products Federal government enterprise Machinery except electric <sup>b</sup>	26.0	Wholesale trade Retail trade Banking Insurance agents and combination offers Real estate Legal services
0-1.49	31.6	Agriculture services, forests and fishing Non-metal mining and quarrying Food and kindred products Apparel and other finished products Printing, publishing, etc. Petroleum and coal products <sup>b</sup> Stone, clay, and glass products Auto and auto equipment Services allied to transportation Telephone, telegraph, etc. Utilities, electricity, and gas Local utilities and public service, n.e.c.	21.7	Hotels and other lodging Personal services Motion pictures Amusement and recreation except motion pictures
Negative	31.6	Farms Metal mining Anthracite mining Bituminous and other soft coal mining Tobacco manufacturing Textile mill products Lumber and furniture <sup>b</sup> Leather products Railroads Local and highway passenger transportation Water transportation Pipeline transportation	8.7	Security and commodity brokers Private households

<sup>a</sup> Employment is measured "by persons engaged," which includes wage and salary workers reduced to full-time equivalents plus self-employed. Unpaid family workers are not included.

<sup>b</sup> Industry definition not strictly comparable throughout period.

Source: 1929, *National Income, 1954 Edition*, Table 28, pp. 202-3; 1963, *Survey of Current Business*, July, 1964, Table 55, p. 30.

occupational data suggest that the industry shift in employment, far from exaggerating the shift in function, may actually understate it.

We are primarily concerned with comparing goods-producing and service-producing industries, but it should be noted that in the national income accounts a distinction between goods and services is made on the basis of final expenditure.

fication also shows a more rapid rate of growth for services in current and constant dollars.

The final point to be made in this section is that the shift of employment to services does not represent a sudden departure from previous long-term trends. For as long as we have records on the industrial distribution of the labor force, we find a secular tendency for the per-

TABLE 3  
OCCUPATIONAL DISTRIBUTION OF LABOR FORCE, 1930 AND 1960

	PER CENT OF OCCUPATION EMPLOYED IN SERVICE SECTOR, 1960	LABOR FORCE (MILLIONS)		AVERAGE ANNUAL RATE OF CHANGE 1930-60 (PER CENT)
		1930	1960	
<b>"Service-Type" Occupations:</b>				
Professional, technical, and kindred workers...	74.5	3.3	7.3	2.7
Managers, officials, and proprietors excluding farm.....	69.0	3.6	5.9	1.4
Clerical and kindred workers.....	63.2	4.3	9.6	2.7
Sales workers.....	84.3	3.1	4.8	1.5
Private household workers.....	100.0	2.0	1.8	-0.3
Service workers excluding private household..	91.8	2.8	5.8	2.5
<b>Total.....</b>	<b>76.0</b>	<b>19.1</b>	<b>35.2</b>	<b>2.1</b>
<b>"Goods-Type" Occupations:</b>				
Craftsmen, foremen, and kindred workers....	24.3	6.2	9.2	1.3
Operatives and kindred workers.....	19.9	7.7	12.8	1.7
Laborers excluding farm and mine.....	27.4	5.3	3.5	-1.4
Farmers and farm managers.....	0.0	6.0	2.5	-2.9
Farm laborers and foremen.....	0.0	4.3	1.6	-3.5
<b>Total.....</b>	<b>19.2</b>	<b>29.5</b>	<b>29.6</b>	<b>0.0</b>
<b>Total, all occupations.....</b>	<b>50.4</b>	<b>48.6</b>	<b>64.8</b>	<b>1.0</b>

SOURCE: 1930, U.S. Bureau of the Census, *Occupational Trends in the United States, 1900 to 1950*, Working Paper No. 5, 1958, Table 1; 1960, U.S. Bureau of the Census, 1960 Census of Population; Vol. I, *Characteristics of the Population*, Part 1, "U.S. Summary," Table 201, and "Occupation by Industry," Table 1.

Employment data are not available in this form, but gross product data in current and constant dollars are available and are reproduced in Table 4. There are important differences between services defined as expenditures and our definition of the service industries;<sup>4</sup> nevertheless, we find that the expenditure classi-

centage accounted for by the service sector to rise.

Table 5 shows sector levels and shares for census years from 1870 to 1930. Services grew more rapidly than goods throughout the period; the average *differential* in rates of growth of employment was approximately 1.4 per cent per annum. Since 1929, the differential be-

<sup>4</sup> The expenditures method of classification treats government as a consumer rather than as a producer. Also, the value of the services of wholesale and retail

trade and of many business service industries is assigned to goods rather than services.

**TABLE 4**  
**GROSS PRODUCT BY TYPE OF FINAL OUTPUT IN CURRENT**  
**AND CONSTANT DOLLARS, 1929 AND 1963**

	1929 (Billions)	1963 (Billions)	Average Annual Rate of Change 1929-63 (Per Cent)
<b>Current Dollar Output:</b>			
Durable goods.....	\$ 18.1	\$110.4	5.5
Non-durable goods.....	38.1	179.8	4.7
Construction.....	11.2	65.2	5.3
"Goods" (including construc- tion).....	67.5	355.4	5.0
Services.....	37.0	228.4	5.5
<b>Constant (1954) Dollar Output:</b>			
Durable goods.....	30.8	96.3	3.4
Non-durable goods.....	64.7	161.8	2.7
Construction.....	26.1	53.0	2.1
"Goods" (including construc- tion).....	121.5	311.1	2.8
Services.....	\$ 60.3	\$181.4	3.3

Source: 1929, Office of Business Economics, *U.S. Income and Output*, 1958, Tables 1-6 and 1-7; 1963, *Survey of Current Business*, July, 1964, Table 65.

**TABLE 5**  
**GAINFUL WORKERS, GOODS AND SERVICE SECTORS, 1870-1930<sup>a</sup>**

	1870	1880	1890	1900	1910	1920	1930
Thousands of Workers							
Goods.....	10,330	13,875	18,370	21,780	26,360	29,870	30,770
Service.....	2,450	3,320	5,200	6,920	9,770	11,360	16,730
Goods excluding agri- culture.....	3,840	5,170	8,200	10,860	14,770	18,470	20,020
Service excluding gov- ernment and domes- tic service.....	1,410	2,100	3,490	4,880	7,080	8,740	13,350
Per Cent of Total							
Goods.....	80.8	80.7	77.9	75.9	73.0	72.4	64.8
Service.....	19.2	19.3	22.1	24.1	27.0	27.6	35.2
Goods excluding agri- culture.....	30.0	30.1	34.8	37.8	40.9	44.8	42.1
Service excluding gov- ernment and domes- tic service.....	11.0	12.2	14.8	17.0	19.6	21.2	28.1

<sup>a</sup> Sector totals exclude a small number of workers in each year for whom no industry was reported. "Gainful workers" includes unpaid family workers and unemployed.

Source: U.S. Bureau of the Census, Sixteenth Census of the United States: 1940, *Comparative Occupation Statistics for the United States, 1870 to 1940* (Washington, D.C., 1943).

tween the two sectors has been slightly larger, 1.7 per cent per annum.

Until 1920, the shift to services could be explained entirely by the movement from agricultural to non-agricultural pursuits; employment in the goods sector, excluding agriculture, rose as rapidly as in services. After 1920, however, the rates of growth diverged; and, as we saw in the first section of this paper, in recent years employment in the non-agricultural goods sector has begun to decline absolutely as well as relatively.

#### REASONS FOR THE RELATIVE GROWTH OF SERVICE EMPLOYMENT

Allan G. B. Fisher was one of the first economists in this century to emphasize the strength of the trends we are examining in this paper. His book, *The Clash of Progress and Security*, published in 1935, is perceptive and contains much that is relevant to the problems of 1965.<sup>5</sup>

Colin Clark's writings on this point are better known, particularly his often-quoted conclusion, "We may well now turn to examine what much careful generalization of available fact shows to be the most important concomitant of economic progress, namely, the movement of working population from agriculture to manufacture, and from manufacture to commerce and services."<sup>6</sup>

Neither Fisher nor Clark offered a systematic analysis of the factors respon-

<sup>5</sup> London: Macmillan & Co., 1935. E.g., "When we reach a level of wealth where the provision of personal services becomes economically important, the importance of the limitations of physical natural resources in the narrow sense steadily diminishes. We are then much more concerned with the exploitation of human capacity (which is also perfectly 'natural') and the maintenance of a moving equilibrium in a progressive economy comes to depend more and more upon the effective organization and education of human capacity" (p. 38).

<sup>6</sup> *The Conditions of Economic Progress* (1st ed., London: Macmillan & Co., 1940), p. 176.

sible for the growth of services; both tended to stress sector differences in income elasticity and changes in productivity. Professors Kuznets and Stigler have questioned the existence of significant differences in income elasticity,<sup>7</sup> and a recent econometric analysis questions the alleged difference in productivity.<sup>8</sup> This section considers some evidence concerning both matters.

#### INCOME ELASTICITY OF DEMAND

When the income of a family or a nation rises, so does its demand for most goods and services.<sup>9</sup> The ratio of the percentage increase in demand to the percentage increase in income is referred to as the "income elasticity." When the percentage increase in demand is equal to the percentage increase in income, the income elasticity is unity. Individual items of consumption that have elasticities greater than unity are said to have elastic demand, while those with elasticities below unity are characterized as inelastic. The question at issue here is whether services, in the aggregate and at the individual industry level, face demands that are more elastic than the demand for goods.

A clear-cut answer to this question is difficult to obtain for a number of reasons. Some of the most important are:

1. To calculate elasticities, we need

<sup>7</sup> Cf. Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations, II, Industrial Distribution of National Product and Labor Force," *Economic Development and Cultural Change*, Supplement, July, 1957; and George J. Stigler, *Trends in Employment in the Service Industries* (Princeton, N.J.: Princeton University Press [for the National Bureau of Economic Research], 1956), p. 161.

<sup>8</sup> Phoebus Dhrymes, "A Comparison of Productivity Behavior in Manufacturing and Service Industries," *Review of Economics and Statistics*, XLV (February, 1963), 64-69.

<sup>9</sup> The exceptions are often referred to as "inferior" goods, e.g., potatoes.