

The service-producing sector: some common perceptions reviewed

Many service industries are capital intensive, and the range of expansion in output per hour is not significantly different from that found among goods-producing industries

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Over the past three decades, the rapid growth of the economy's service sector and the increasing interest in the sector on the part of both scholars and policymakers have helped give currency to three perceptions about service industries. The perceptions are that (1) the service sector is composed entirely of industries that have very low rates of productivity growth; (2) service industries are highly labor intensive and low in capital intensity; and (3) shifts in employment to the service-producing sector have been a major reason for the slowdown in productivity growth over the past 10 to 15 years. This article examines these perceptions in the light of available data.

The service sector defined. The broadest definition of the service sector encompasses all industries except those in the goods-producing sector—agriculture, mining, construction, and manufacturing. Under this definition, services include transportation, communication, public utilities, wholesale and retail trade, finance, insurance, real estate, other personal and business services, and government. One variation on this definition of the service sector (or service-producing sector, as it is frequently called) excludes government activities at all levels. A third definition of the service sector is still narrower, including only private personal and business

services and excluding transportation, communication, wholesale and retail trade, finance, insurance, and real estate. All three definitions will be referenced in the following discussion.

Growth rates vary widely by industry. The first apparently generally held perception of the service sector is that it consists entirely of industries with low growth in productivity. Comparison of growth rates for output and employment by industry over the last two decades might seem to lend support for this belief, for the data show that the widely discussed growth in services in the U.S. economy has been more pronounced from an employment perspective than from the output view.

Over the last two decades, there was a very noticeable shift toward service employment. The share accounted for by the service-producing sector, using the broadest definition, increased by 10 percentage points from 1960 to 1981. A shift is also apparent when alternative definitions of the sector are used. When limited to "private" services, the sector share of employment increased by nearly 8 percentage points between 1960 and 1981. Even when limited only to "other services," the sector has increased its employment share by nearly 7 percentage points over the period. Thus, over two-thirds of the total shift toward service employment is accounted for by this one relatively small portion of the service sector. (See table 1.)

There has been a large, steady shift in employment toward the service sector not only in absolute terms but also in relative terms. The goods-producing industries have shown some absolute growth over the period but

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Table 1. Percent distribution of output and employment between the goods- and service-producing sectors, selected years, 1959-81

| Item | 1959 | 1969 | 1973 | 1979 | 1981 |
|-------------------------------|-------|-------|-------|-------|-------|
| Output¹ | | | | | |
| Total private | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Goods-producing | 41.4 | 40.0 | 39.6 | 36.7 | 35.4 |
| Service-producing | 58.6 | 60.0 | 60.4 | 63.3 | 64.6 |
| Employment² | | | | | |
| Total nonagricultural | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Goods-producing sector | 38.3 | 34.6 | 32.4 | 29.5 | 28.0 |
| Service-producing sector | 61.7 | 65.4 | 67.6 | 70.5 | 72.0 |
| Public | 15.2 | 17.3 | 17.9 | 17.8 | 17.6 |
| Private | 46.0 | 48.1 | 49.7 | 52.8 | 54.4 |
| "Other services" | 13.3 | 15.9 | 16.7 | 19.1 | 20.4 |

¹ Data are from the Bureau of Economic Analysis, U.S. Department of Commerce. The specific measure is "gross product originating" in (or net output of) each of the sectors.
² Data relate to numbers of wage and salary workers in the nonagricultural economy, as determined by the Bureau of Labor Statistics Current Employment Statistics survey.

have declined in relative terms. Between 1960 and 1981, goods-producing industries (manufacturing, mining, and construction) gained jobs at an average rate of 1.0 percent a year, while employment in service-producing industries (all other industries and government) grew by 3.2 percent annually. Within the service-producing sector, civilian government employment increased at a pace that was faster than the average for all jobs through the 1960's and early 1970's, but has recorded slower-than-average gains since then. Public job growth has tapered to almost zero since 1979. Job gains in the private portion of the service-producing sector, on the other hand, have consistently led total employment growth.

A component of the private service-producing economy, "other services," includes industries such as business services, medical services, professional services, hotels, personal services, and several others. This component has shown the most rapid job increases of any of the major industry divisions in the economy in the last two decades, averaging growth of 4.4 percent per year between 1960 and 1981. Within this narrowly defined "other service" sector, the fastest job gains have been posted by other medical services (9.2 percent a year) and miscellaneous business services (7.5 percent annually).

On the basis of such evidence, it is tempting to conclude that the service sector comprises only industries in which employment is growing at very rapid rates, rates which may exceed the pace of growth in output. Overall service sector employment, as we have just seen, is growing rapidly. However, within the sector there are a few industries, such as railroad transportation, in which employment is declining, and others, such as public utilities, motion picture production and distribution, and barber and beauty shops, in which employment is growing very slowly.

Data from the Bureau's expanding effort to measure

productivity in the service sector also argue against labeling all service industries as productivity drains. These data, which at present cover one-third of sector employment, clearly illustrate that not all services have low productivity growth.¹ During the 1965-80 period, productivity growth in the sector ranged from a high of 7.9 percent a year in petroleum pipelines between 1965 and 1973 to a low, reflecting declines of up to 1.0 percent annually, in laundries and cleaning services, eating and drinking places, and retail food stores over the 1973-80 period. In addition to petroleum pipelines, rapid productivity growth has also been found in air transportation, drug and proprietary stores, telephone communication, and gasoline service stations. The range of productivity growth noted in the service sector is not significantly different from the range among goods-producing industries. The perception that service industries all have low productivity growth is not at all consistent with these data.

Capital intensity rather high. To assess a second common perception—that service industries are very low in

Exhibit 1. Service industries ranked in descending order of capital intensity, 1973

| Rank | Capital stock per worker hour |
|--|--|
| First decile (most capital intensive) | Pipeline transportation Railroad transportation Radio and TV broadcasting Electric utilities Gas utilities Water and sanitary service Real estate Advertising |
| Second decile | Water transportation Air transportation Miscellaneous consumer services Automobile repair Amusements |
| Third decile | Truck transportation Transportation services Miscellaneous Professional services Medical, education, and non-profit |
| Fourth decile | Financial institutions Miscellaneous business services |
| Fifth decile | Local transportation and buses |
| Sixth decile | — |
| Seventh decile (least capital intensive) | Wholesale trade Retail trade |

capital intensity—we used 1973 data on capital stock by industry.² (This measure of capital stock covers plant and equipment but excludes land, inventory, and monetary assets.) A measure of capital intensity was calculated for each of 145 industry divisions on the basis of capital stock per worker hour. The industry divisions were then ranked in descending order of capital intensity as indicated by the measure. (See exhibit 1.) The surprising result of this exercise was that service industry divisions made up nearly one-half of the 30 divisions in the first two deciles of the ranking. Transportation industries and utilities were most often found in these “high capital intensity” deciles. The ranking of industry divisions by capital intensity did not contain any service industries in the bottom three deciles. These findings are hardly consistent with the supposition that the service industries are low in capital intensity.

Related to this perception about the service sector is the belief that service industries are highly labor intensive. To assess this perception, we ranked industries according to labor intensity, as indicated by 1981 data on labor hours per unit of output.³ (See exhibit 2.) The ranking indicated that services tend to be dominant among labor-intensive industries; for example, service industries represented 17 of the 30 most labor-intensive industries in the economy. However, service industries were found in nearly every decile of the ranking, and three appeared in the least labor-intensive decile. Thus, while the assumption that service industries are relatively labor intensive has a strong element of truth about it, it is far from being the case for all service-producing industries.

Employment shifts unrelated to productivity growth. A third common perception is that the shift in employment from the goods-producing sector to the service sector has been the major element in the productivity slowdown of the last 10 to 15 years.

To evaluate this assumption, we assembled data which measure 1959–79 employment shifts in a number of different ways:

- Using measures of production
 - Gross product originating
 - Gross duplicated output⁴
- Tracking interindustry employment movements
 - From the farm to the nonfarm sector
 - From goods-producing to service-producing industries
 - Among goods-producing industries
 - Among service-producing industries

Estimates of the effects on productivity growth of the various types of shifts in employment are presented in table 2. (The shifts were measured in terms of labor hours rather than employment to account for differ-

ences in the amount of hours per job and different rates of change in average hours.)

Exhibit 2. Service industries ranked by labor intensity, 1981

| <i>Rank</i> | <i>Labor hours per unit of output</i> |
|---|---|
| First decile (most labor intensive) | Local government passenger transit Transportation services Hotels and lodging places Educational services Medical services, except hospitals Nonprofit organizations Hospitals Post office Agricultural, forestry, and fishery services Barber and beauty shops Retail trade, except eating and drinking places |
| Second decile | Eating and drinking places State and local government enterprises, n.e.c. Other Federal enterprises, n.e.c. Personal and repair services Wholesale trade Business services, n.e.c. |
| Third decile | Banking Local transit and intercity buses Amusement and recreation services Professional services, n.e.c. Radio and television broadcasting |
| Fourth decile | Truck transportation Credit agencies and financial brokers Railroad transportation |
| Fifth decile | Advertising Insurance |
| Sixth decile | Doctors' and dentists' services |
| Seventh decile | Air transportation |
| Eighth decile | — |
| Ninth decile | Automobile repair Electric utilities, public and private |
| Tenth decile (least labor intensive) | Pipeline transportation Gas utilities, excluding public Real estate |

NOTE: The data base for the labor intensity measure does not have the same industry configuration as that for the capital intensity measure. Thus, some slight variation in industries can be noted between exhibit 1 and exhibit 2.
n.e.c. = not elsewhere classified.

According to these estimates, the shift in employment between goods-producing and service-producing industries has had a negligible effect on productivity growth.

This is true regardless of the period chosen or the output measure used. In no instance does the employment shift to services account for as much as .1 per year change in productivity growth. When "gross product originating" weights are used, the shift to service employment actually boosts productivity slightly. In fact, of the movements depicted in the table, the shifts among the goods-producing industries were most important—accounting for as much as .6 per year productivity growth.

IT IS NOT our purpose here to offer alternative explanations of the significant slowdown in productivity growth that has taken place since the late 1960's. However, we believe we have clearly shown that the productivity slowdown is not primarily (or even importantly) the result of shifts in employment to the service-producing industries.⁵ □

— FOOTNOTES —

¹ For a discussion of the Bureau's program, see Jerome A. Mark, "Measuring productivity in the service industries," *Monthly Labor Review*, June 1982, pp. 3-8.

² For a description of this data base, see *Capital Stock Estimates for Input-Output Industries: Methods and Data*, Bulletin 2034 (Bureau of Labor Statistics, 1979).

In addition to the measure described below, an industry ranking in terms of capital stock per dollar of output was also developed. Results of this ranking were quite similar to those presented in exhibit 1.

³ For a description of methods used in developing this data base, see *Time Series Data for Input-Output Industries*, Bulletin 2018 (Bureau of Labor Statistics, 1979).

⁴ "Gross product originating" is a measure of net output—the final value of goods and services produced in a sector less the cost of materials and purchased services. "Gross duplicated output" is a measure of gross output that includes not only the gross product originating in a sector, but also the cost of materials and purchased services.

⁵ For detailed analyses of the slowdown in productivity, see J.R. Norsworthy, Michael Harper, and Kent Kunze, "Slowdown in Productivity Growth: Analysis of Some Contributing Factors," *Brookings Papers on Economic Activity*, Fall 1979, pp. 387-427; Barbara M. Fraumeni and Dale W. Jorgenson, "The role of capital in U.S. economic growth, 1943-76," in George M. Von Furstenburg, ed., *Capital Efficiency in Growth* (Cambridge, Mass., Ballinger Publishing Co., 1980), pp. 9-250; Edward F. Denison, *Accounting for Slower Economic Growth in the United States* (Washington, The Brookings Institution, 1979); and John Kendrick, *Understanding Productivity: An Introduction to the Dynamics of Productivity Change* (Baltimore, Md., The Johns Hopkins Press, 1977).

Table 2. Impact of employment shifts on labor productivity change, selected measures, 1959-79

| Measure and type of shift | Rate of productivity change | | |
|---|-----------------------------|---|---|
| | Actual | Productivity within sector ¹ | Portion of change accounted for by employment shifts ¹ |
| Gross product originating | | | |
| Farm to nonfarm shift: | | | |
| 1959-79 (Total private business) | 2.29 | 2.11 | .18 |
| 1959-66 | 3.36 | 3.01 | .34 |
| 1966-73 | 2.41 | 2.27 | .14 |
| 1973-79 | 0.92 | 0.84 | .08 |
| Goods- to service-producing industries shift: | | | |
| 1959-79 (Total private business) | 2.29 | 2.25 | .04 |
| 1959-66 | 3.36 | 3.34 | .03 |
| 1966-73 | 2.41 | 2.38 | .02 |
| 1973-79 | 0.92 | 0.90 | .02 |
| Shift among goods-producing industries: | | | |
| 1959-79 (Goods-producing industries) | 2.58 | 2.23 | .34 |
| 1959-66 | 3.94 | 3.31 | .63 |
| 1966-73 | 2.73 | 2.50 | .23 |
| 1973-79 | 0.85 | 0.72 | .13 |
| Shifts among service-producing industries: | | | |
| 1959-79 (Service-producing industries) | 2.00 | 1.88 | .12 |
| 1959-66 | 2.84 | 2.77 | .08 |
| 1966-73 | 2.09 | 1.92 | .17 |
| 1973-79 | 0.93 | 0.88 | .04 |
| Gross duplicated output | | | |
| Farm to nonfarm shift: | | | |
| 1959-79 (Total private) | 2.15 | 2.04 | .12 |
| 1959-66 | 3.19 | 2.93 | .27 |
| 1966-73 | 2.31 | 2.22 | .09 |
| 1973-79 | 0.77 | 0.74 | .03 |
| Goods- to service-producing industries shift: | | | |
| 1959-79 (Total private) | 2.15 | 2.32 | -0.16 |
| 1959-66 | 3.19 | 3.27 | -0.08 |
| 1966-73 | 2.31 | 2.53 | -0.22 |
| 1973-79 | 0.77 | 0.99 | -0.21 |
| Shift among goods-producing industries: | | | |
| 1959-79 (Goods-producing) | 2.81 | 2.49 | 0.31 |
| 1959-66 | 3.73 | 3.12 | 0.61 |
| 1966-73 | 3.00 | 2.76 | 0.24 |
| 1973-79 | 1.52 | 1.45 | 0.07 |
| Shift among service-producing industries: | | | |
| 1959-79 (Service-producing) | 1.44 | 1.28 | .17 |
| 1959-66 | 2.70 | 2.75 | -.04 |
| 1966-73 | 1.58 | 1.29 | .29 |
| 1973-79 | -0.17 | -0.39 | .22 |

¹ The actual productivity change has been partitioned into two broad contributing factors, and the interaction effect between them. The interaction effect (not shown) has been allocated equally between these two columns.