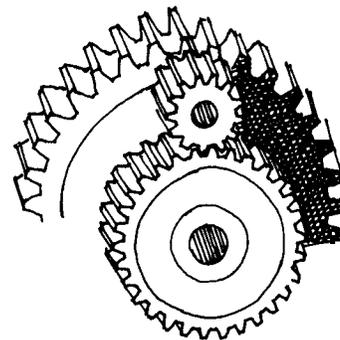


# Productivity Reports



## Productivity drops, output and hours rise during the fourth quarter

LAWRENCE J. FULCO

Productivity decreased at a 1.2 percent annual rate in the private business sector during the fourth quarter of 1980, marking the year's second quarter of decline. Among nonfarm businesses, the drop was less pronounced, agriculture posting a sharper decline.

In manufacturing, productivity advanced briskly in the fourth quarter, registering the largest gain since the third quarter of 1975. Large productivity movements are more common in the manufacturing sector than in the broader-based business measures. Manufacturing currently accounts for about 27 percent of the nonfarm business sector.

A summary of annualized fourth-quarter productivity, output, and hours changes appears in the following tabulation. Further details may be found in tables 31-34 of the Current Labor Statistics section of this *Review*.

<i>Sector</i>	<i>Productivity</i>	<i>Output</i>	<i>Hours</i>
Private business . . .	-1.2	6.9	8.3
Nonfarm business . .	-0.4	7.1	7.5
Manufacturing . . . .	11.4	24.0	11.2
Durable . . . . .	13.6	29.6	14.1
Nondurable . . .	8.6	16.2	7.0
Nonfinancial corporations . . . . .	-0.1	7.9	8.1

### Private business sector

Although productivity declined during both the second and fourth quarters of 1980, the underlying reasons were quite different. During the second quarter, output fell rapidly—the 11.5-percent decline marking the largest drop of its kind since the first quarter of 1975. At the same time, hours fell: employment dropped 5.4 percent and average weekly hours went

down 4.7 percent (to 36.6 hours per week). This was the largest decline in average weekly hours during the postwar period. Thus, hours of all persons engaged in the private business sector decreased 9.9 percent.

On the other hand, fourth-quarter output grew at a 6.9-percent annual rate, and hours of all persons increased 8.3 percent. The productivity drop in this quarter stemmed from an imbalance in the growth rates of output and hours, while the larger decline 6 months earlier occurred during a contraction of both.

Unit labor cost—compensation per unit of output—posted a double-digit increase during the second-quarter productivity decline. In the fourth quarter, the 9.7-percent increase in unit labor cost reflected an 8.4-percent rise in hourly compensation and a 1.2-percent drop in productivity. During the second quarter, unit labor cost increased 14.4 percent, as hourly compensation rose 12.2 percent (the largest advance since 1974), while productivity slipped 1.9 percent. Unit labor cost rose more moderately during the first and third quarters as productivity increased. The interaction of changes in productivity, hourly compensation, and unit labor cost is shown in chart 1.

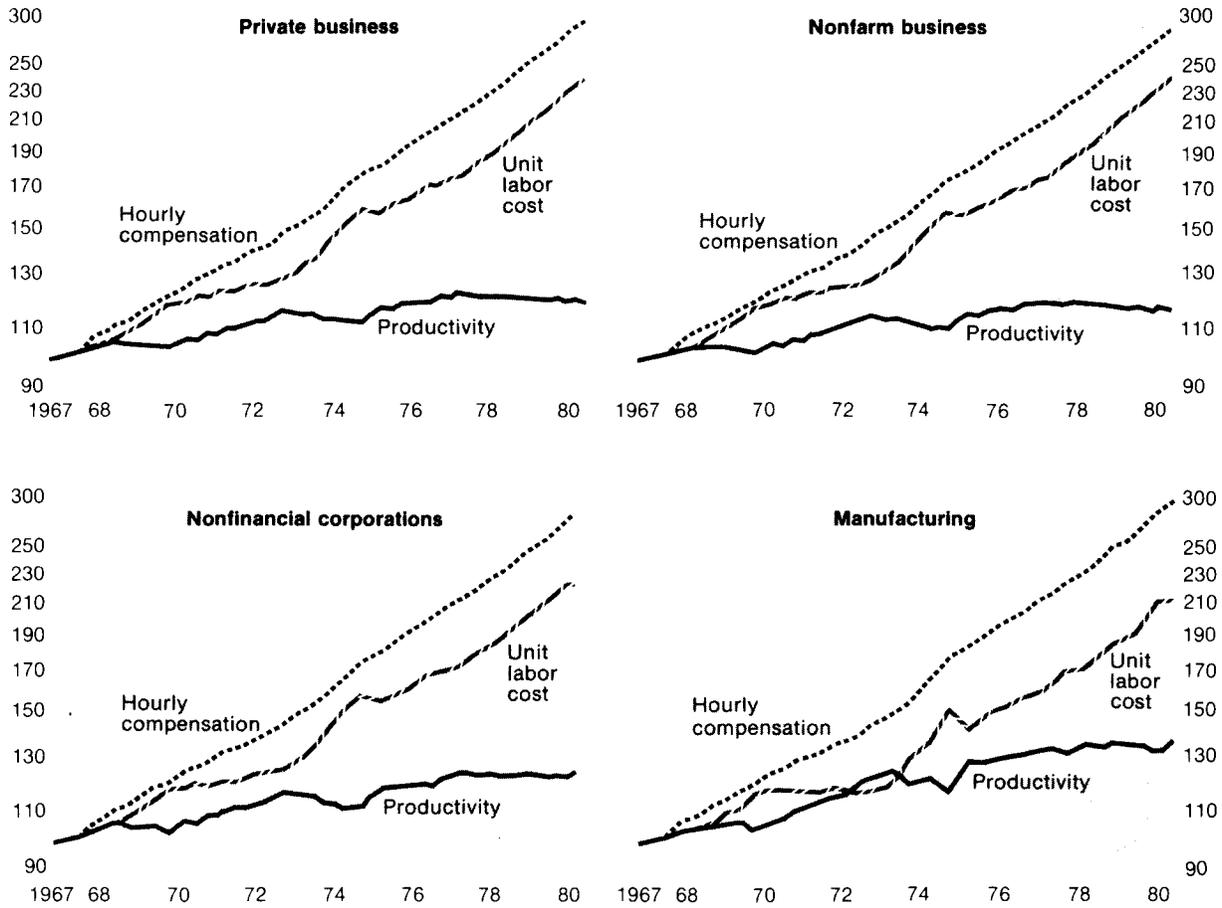
Real hourly compensation adjusts employer outlays for compensation expenses for increases in the Consumer Price Index for All Urban Consumers (CPI-U). During the fourth quarter, real hourly compensation declined 4.0 percent in the private business sector—the third quarterly decrease this year. Since the first quarter of 1978, real hourly compensation has gone up only twice. Hourly compensation includes employer payments for wages and salaries, shift differentials, payments in kind, social security, health and other fringe benefits, and employer taxes.

The implicit price deflator for the private business sector increased 9.9 percent in the fourth quarter. Just as the CPI-U is the deflator for the mix of goods and services which make up consumer spending, the implicit price deflator for the private business sector is a measure of price change for the components of the sector's output. Changes in this deflator reflect movements in unit labor cost and unit nonlabor payments—which include capital consumption allowances, depreciation, indirect business taxes, and profits.

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**Chart 1. Productivity and related measures in four major sectors in the economy, 1967-80**

Ratio scale (1967=100)



### Nonfarm business sector

Productivity also declined during the second and fourth quarters in the nonfarm business sector, which varies from the larger private business sector only by the farm sector, which currently is about 4 percent as large as nonfarm employment. However, because of the volatility of quarterly productivity and cost measures in the farm sector, the rates of change can differ in the private business and nonfarm business sectors. (See table 1.)

In the second quarter, a rapid increase in farm productivity was reflected in the slower rate of productivity decline in the private business sector than in the nonfarm sector. Conversely, in the fourth quarter, a decline in farm productivity was manifested in the bigger drop in the private business sector.

Similar factors were at work during the second and fourth quarter declines in nonfarm productivity as were discussed regarding the private business sector—a sharp contraction during the second quarter and expansion during the fourth quarter.

In the last 13 quarters, productivity has increased only twice in the nonfarm business sector.

### Manufacturing sector

Productivity in the manufacturing sector increased strongly in the fourth quarter, as output gains occurred with less than proportional increases in paid-for hours. Productivity declined during the second and third quarters of 1980 in manufacturing, and output fell 7.9 percent over the period. Hours dropped 6.3 percent at the same time, and employment fell 5.0 percent. In the

**Table 1. Quarterly changes in productivity by sector, 1977-80**

[Seasonally adjusted annual rate]

Sector	1977				1978				1979				1980			
Private business .....	5.8	-0.3	5.1	-1.7	-2.3	0.9	0.5	-0.4	-0.8	-0.2	1.5	-1.1	1.3	1.9	1.5	1.2
Farm .....	5.9	-33.3	88.0	-30.0	3.4	18.3	18.9	3.0	-0.3	59.3	4.7	15.4	40.5	33.8	48.0	19.1
Nonfarm .....	5.7	1.2	2.8	-0.6	-2.4	1.2	0.0	-0.6	0.9	-1.9	1.4	0.3	0.0	3.0	3.8	0.4
Nonmanufacturing .....	7.5	-0.4	3.1	-0.6	-1.6	-0.4	2.1	-1.5	0.3	4.1	1.2	-0.3	0.2	1.4	6.5	5.5
Manufacturing .....	2.0	4.6	2.3	-0.5	-4.2	4.8	4.4	1.2	-2.2	3.3	-1.6	0.1	0.6	5.2	1.5	11.4
Durable .....	0.3	6.7	1.8	0.6	-5.5	7.0	3.0	0.2	4.4	3.2	5.9	0.5	-1.4	3.9	4.1	13.6
Nondurable .....	4.5	1.8	3.1	-2.3	-2.1	1.4	6.5	2.9	1.5	3.3	5.6	-0.6	3.6	7.6	2.3	8.6

fourth quarter, output rose at a 24.0-percent annual rate, its most rapid increase since the third quarter of 1975. Hours advanced 11.2 percent. Despite these rapid advances both output and hours remained below year-earlier levels in the fourth quarter, reflecting the severity of the declines which occurred during the first 3 quarters.

Although compensation grew 10.2 percent during the fourth quarter, unit labor cost declined in manufacturing, reflecting the cost-offsetting effect of productivity gains. This was the first drop in unit labor cost in manufacturing since the third quarter of 1975.

The gain in manufacturing productivity when the nonfarm sector as a whole was experiencing a productivity decline implies that the nonfarm nonmanufacturing sector showed a steep drop in productivity. This "residual" sector includes mining, construction, communications, transportation, public utilities, wholesale and retail trade, services, finance, insurance, and real estate; and State and local government enterprise. This sector employs approximately 57 million persons, whereas manufacturing employment stands at about 20.6 million. Productivity in the nonmanufacturing sector, by this definition, decreased 7.7 percent in the fourth quarter, reversing a 6.3-percent gain during 1980's third quarter.

The output measures compiled by the Bureau of Economic Analysis of the U.S. Department of Commerce as part of the quarterly estimation of the national income and product accounts (which form the basis for the BLS productivity measurement program) do not include quarterly estimates of manufacturing output. To overcome this problem, BLS uses the monthly index of industrial production for durable and nondurable manufacturing industries prepared by the Federal Reserve Board to compute quarterly productivity measurements for this sector. Differences in fluctuations of the manufacturing output and the Gross National Product series tend to be reflected in the implied productivity change in the "residual" sector. It is impossible to directly construct a quarterly productivity series for the "residual" to estimate the impact of these discrepancies.

## Real compensation and productivity

There has been a close relationship between real hourly compensation and productivity throughout the postwar period. Because both variables are expressed in terms of the same hours, their relationship hinges on the ratio of real compensation (deflated by the CPI-U) and real output (deflated by the implicit price deflator). Because the portion of current-dollar output remitted to labor in the form of compensation payments—known as labor share—has varied in an exceedingly narrow range over the postwar period, and because there is little difference between the CPI-U and the implicit price deflator for private business output, the close correlation between productivity and real hourly compensation is assured.

**Table 2. Trends in hours in the private business sector, fourth quarter-1980**

Worker category	Percent change in hours <sup>1</sup>	Category share of hours	Contribution to trend
Total .....	8.20	1.000	8.20
Manufacturing .....	10.77	0.271	2.91
Durable .....	13.58	0.163	2.22
Nondurable .....	6.59	0.107	0.71
Transportation, communication, and public utilities .....	2.23	0.070	0.16
Transportation .....	2.30	0.039	0.09
Communications .....	3.88	0.019	0.07
Public utilities .....	-0.51	0.012	-0.01
Finance, insurance, and real estate .....	5.69	0.064	0.37
Services .....	4.26	0.129	0.55
Mining .....	35.11	0.015	0.52
Construction .....	13.34	0.055	0.74
Wholesale trade .....	6.98	0.069	0.48
Retail trade .....	3.79	0.158	0.60
Farm employees .....	23.51	0.014	0.32
Farm unpaid family workers .....	131.49	0.004	0.53
Farm proprietors .....	14.05	0.025	0.35
Nonfarm proprietors .....	10.64	0.100	1.06
Nonfarm unpaid family workers .....	-7.27	0.005	-0.04
Government enterprises .....	-4.78	0.022	0.11
Sum of interaction terms <sup>2</sup> .....	...	...	-0.25

<sup>1</sup> Percent changes in hours refer to preliminary fourth-quarter measures.

<sup>2</sup> A measure of how much of the total private business change results from the joint effect of individual worker category movements.

Compensation outlays account for about two-thirds of output; since 1947 the ratio in the nonfarm business sector has never been lower than 63.7 percent nor higher than 69.6 percent. Within this narrow range, some cyclical deviations in labor share have been observed. The downward rigidity of compensation payments is reflected during contractions by a rise in the portion of output devoted to compensation, and a reciprocal drop in the fraction available for all other payments—nonlabor payments—which include depreciation, capital consumption allowance, indirect business taxes, and profits. In each postwar business cycle, labor share has been higher at the trough than the corresponding peak. There has also been a fairly steady rise in the ratio over the period.

Labor share peaked in the second quarter of 1980—at 69.6 percent of output—and in the fourth quarter

stood at 69.1 percent. The ratio has increased each year since 1977.

### **Employment and hours**

Employment grew 5.0 percent in the private business sector, as gains occurred in nearly every subsector. The largest contribution to the rise in employment was in the manufacturing sector, where a 6.9-percent increase occurred. Manufacturing constitutes 27.1 percent of employment, so the effect of the increase in employment was to add 1.8 percentage points to the employment gain. The rise in employment and hours for the sectors which make up the private business sector are shown in table 2, together with their associated weights and contributions to the advances in employment and hours in the fourth quarter. □

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### **The naked table**

No one can use a statistical report honestly who does not take pains to read the text accompanying the tables. It is in many cases a mathematical and physical impossibility to put into a table just all that the table means, and the statistician who does not accompany his table with a sufficient explanation in the text of its defects and of the whole method of its construction and the manner in which it is to be used, has failed in performing his duty.

CARROLL D. WRIGHT  
"The Limitations and Difficulties  
of Statistics," *The Yale Review*,  
August 1894, p. 142.

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