

Table 3. Output per hour for nonfarm business and manufacturing based on hours paid and hours at work, 1983¹

Industry	Percent change from same quarter a year ago								Percent change	
	I		II		III		IV		1982-83	
	Hours paid	Hours at work	Hours paid	Hours at work	Hours paid	Hours at work	Hours paid	Hours at work	Hours paid	Hours at work
Nonfarm business	1.8	1.5	4.3	3.8	3.9	3.2	3.9	3.3	3.5	3.1
Manufacturing	3.4	3.2	4.3	3.6	4.3	3.2	4.9	4.0	4.3	3.8
Durable	4.7	4.4	5.7	4.9	5.5	3.8	6.1	5.1	5.6	4.9
Nondurable	1.4	1.5	2.2	1.8	2.7	2.3	3.3	2.4	2.4	2.1

¹Changes in ratio of hours at work to hours paid are based on survey of production and nonsupervisory employees. Adjustment is applied to all the hours of all persons which includes supervisors, nonproduction workers, and proprietors.

of work to hours paid; 18 had increases between 1982 and 1983 as opposed to 21 decreases and 8 increases from 1981 to 1982. Again these changes mostly reflect the cyclical nature of different industries caused by employers responding to the changing economic conditions.

Productivity measures

As previously noted, the annual change in output per hour (labor productivity) in nonfarm business between 1982 and 1983 was 3.5 percent by using the hours paid method and 3.3 percent based on hours at work. (See table 3.) Similarly, for manufacturing, productivity based on hours paid increased 4.3 percent from 1982 to 1983; after adjusting for the change in hours at work to hours paid, the increase in output per hour at work was 3.8 percent. These comparisons indicate that seemingly small changes in the ratio translate into significant adjustments in productivity growth rates.

As mentioned earlier, it is not possible to adjust quarterly changes in output per hour for the changes in the ratio of hours at work to hours paid because there are no seasonal factors presently available. However, changes from the same quarter a year ago will not be affected by seasonal fluctuations unless there is a change in seasonal patterns. Table 3 shows there are differences between output per hour based on hours paid and hours at work compared with the same quarter a year ago. This is so for nonfarm business, total manufacturing, and durable and nondurable goods manufacturing. The largest percent changes were generally in the third quarter and the smallest were in the first quarter. The largest single quarterly difference was for durable manufacturing in the third quarter of 1983, when the hours at work labor productivity measure was 1.7 percentage points lower than the hours paid measure. The smallest difference was for nondurable manufacturing in the first quarter. □

FOOTNOTES

¹The difference between nonfarm and nonagricultural establishments is that the latter does not include agricultural services.

²The adjustment to the BLS measure of multifactor productivity would be smaller. The annual growth rate in multifactor productivity resulting from the change in the ratio of hours at work to hours paid is equal to the percentage share of labor compensation in output (about 65 percent) times the change in the ratio.

³Similarly, during a recession junior employees are usually the first to be laid off and consequently the ratio of hours at work to hours paid goes up. See Kent Kunze "A new BLS survey measures the ratio of hours worked to hours paid," *Monthly Labor Review*, June 1984, pp. 3-7.

Occupational earnings and benefits in making nonelectrical machinery

Occupational earnings in nonelectrical machinery manufacturing industries varied considerably among 23 metropolitan areas surveyed by the Bureau of Labor Statistics in November 1983.¹ This was due, in part, to the diversity of skills required to manufacture a variety of products, ranging from hedge trimmers and meat grinders to large, complex engines, turbines, construction equipment, and oil drilling rigs. Occupations selected as representative of production jobs in these industries accounted for one-half of the 252,900 production and related workers covered by the study.

Among the jobs surveyed, tool and die makers usually had the highest hourly earnings in an area. Average pay in this occupation ranged from \$10.40 an hour in Atlanta to \$14.38 in Los Angeles-Long Beach, but typically was between \$11 and \$13 an hour. In 6 of the 11 areas that could be compared, workers producing tools and dies for internal use (those employed in other than jobbing shops) averaged more than workers producing tools and dies for sale (those employed in jobbing shops). The differential was usually 5 percent or less.

Machine-tool operators on production work were the largest occupational group studied. They performed their work on conventional equipment or numerically controlled (N/C) machines, which use coded instructions to direct the machine through a sequence of operations. Conventional operators were classified into three groups for wage study purposes. Operators who set up their own machines and perform a variety of operations to close tolerances (class A) averaged from \$8.39 per hour in Atlanta to \$13.24 in San Francisco-Oakland. Average earnings for the intermediate group of operators (class B) ranged from \$7.31 in Atlanta to \$11.37 in Milwaukee; and for operators who do routine and repetitive work but do not set up machines (class C),

the averages ranged from \$5.31 in Newark to \$10.22 in Milwaukee.

Average pay for operators of N/C machines who set up work and operate machines ranged from \$7.13 in Atlanta to \$14.72 in Los Angeles–Long Beach. In 9 of 20 areas for which comparisons could be made, these N/C operators averaged more per hour than class A conventional machine-tool operators, and in eight other areas, their pay levels fell between the averages for class A and class B operators.

Assemblers, the second largest employee group, usually accounted for between one-tenth and one-fourth of the production work force in an area. Average earnings for work requiring fitting of parts and decisions regarding proper performance of parts or units (class A) typically ranged between \$9 and \$11 an hour. Workers assembling in accordance with standard and prescribed procedures (class B) typically averaged between \$7 and \$9, while those performing short-cycle, repetitive assembling operations (class C) generally averaged between \$6 and \$8.

Janitors, among the lowest paid occupations in the survey, averaged between \$5.57 in New York and \$10.08 in Detroit. They averaged less than \$8 in 15 of the 22 areas for which data could be presented.

Except in Milwaukee, nearly nine-tenths or more of the production workers were paid on a time-rated basis, usually under formal plans that provided a range of rates for specific occupations. In most areas, progression within individual ranges usually was based on length of service or a combination of length of service and merit review. Incentive plans applied to two-fifths of the workers in Milwaukee, and to approximately one-tenth in Baltimore, Boston, Chicago, and Hartford.

Pay levels rose 14.8 percent, or 5.0 percent a year, between January 1981 and November 1983, according to an index developed for this survey series.² This contrasted sharply to the 10.2-percent annual rate recorded for the preceding 3 years. The wage and salary component of the Bureau's Employment Cost Index for durable goods manufacturing also showed a similar pattern—6.2 percent annually between December 1980 and December 1983 and 9.1 percent between December 1977 and December 1980.

As pay levels in nonelectrical machinery manufacturing increased at a slower pace, surveywide employment dropped 36 percent—from 393,000 production workers in January 1981 to 252,900 in November 1983. Proportionally, the declines were largest (50 to 59 percent) in Cleveland, Houston, Milwaukee, Pittsburgh, and Portland, and ranged from 20 to 40 percent in 15 other areas. The only area reporting increased employment was Atlanta—up 19 percent to 2,827 workers.

Virtually all production workers covered by the survey were provided paid holidays, vacations, and several types of insurance plans. Most workers had provisions for 9 to 12 holidays annually, and 1 or 2 weeks of vacation pay after 1 year of service, 2 or 3 weeks after 5 years, 3 weeks after 10 years, and 4 weeks or more after 20 years. In most of the areas, life, hospitalization, surgical, and basic medical insurance applied to nearly all production workers; while major medical, accidental death and dismemberment, and sickness and accident insurance covered at least a large majority. Retirement pension plans were available to four-fifths or more of the production workers in 16 areas, and to between one-half and three-fourths in the remaining seven areas. Employers typically paid the entire cost of the health, insurance, and pension plans.

One-half of the production workers were in establishments with collective bargaining agreements covering a majority of such workers. Most of the contracts were with the International Association of Machinists, the United Auto Workers, or the United Steelworkers of America. At least two-thirds of the production workers in Buffalo, Cleveland, Milwaukee, New York, San Francisco–Oakland, and St. Louis were covered by union contracts, compared with less than one-fifth of the workers in Denver–Boulder and Worcester.

A comprehensive report on the survey—*Industry Wage Survey: Nonelectrical Machinery, November 1983* (BLS Bulletin 2229)—may be purchased from any of the Bureau's regional sales offices or the Superintendent of Documents, U.S. Government Printing Office, Washington 20402. □

————FOOTNOTES————

¹The 23 areas for which data have been developed are Standard Metropolitan Statistical Areas as defined by the U.S. Office of Management and Budget through October 1979. They are: *Northeast*—Boston, Buffalo, Hartford–New Britain–Bristol, Newark, New York, Philadelphia, Pittsburgh, and Worcester; *South*—Atlanta, Baltimore, Dallas–Fort Worth, Houston, and Tulsa; *North Central*—Chicago, Cleveland, Detroit, Milwaukee, Minneapolis–St. Paul, and St. Louis; and *West*—Denver–Boulder, Los Angeles–Long Beach, Portland, and San Francisco–Oakland. Earnings data exclude premium pay for overtime and for work on weekends, holidays, and late shifts.

²Earnings trend data are limited to the 21 machinery centers surveyed since 1955. Tulsa was first studied in the winter 1970–71 and Atlanta in the 1973 study. The index is based on the straight-time hourly earnings of production workers in the following occupations: Assemblers (classes A, B, and C); maintenance electricians; inspectors (classes A, B, and C); janitors, porters, and cleaners; material handling laborers; production machine-tool operators (classes A, B, and C); production machinists; tool and die makers (other than jobbing); and class A hand welders. For accounts of the two previous studies, see *Industry Wage Survey: Machinery Manufacturing, January 1981*, and *January 1978*, Bulletins 2124 and 2027, respectively (Bureau of Labor Statistics, 1982 and 1979). See also, "Area pay levels vary widely in machinery manufacturing," *Monthly Labor Review*, November 1979, pp. 51–52.