
Appendix E
PRODUCTIVITY STATISTICS

Productivity Statistics

The terms "productivity" and "labor productivity" are commonly used to designate measures of output per unit of labor input. Productivity index numbers showing changes in output per employee or per man-hour are used in the discussion and study of various economic topics—e. g., wage-cost-price relationships, the rise of living standards, technological progress, and the outlook for production and employment.

PRODUCTIVITY ESTIMATES FOR THE PRIVATE ECONOMY, 1947-56

Table E-1 shows two sets of productivity index numbers (1947=100) computed by the Bureau of Labor Statistics from available Government data. These productivity measures, relating to the private economy (i. e., excluding Government) and its main components, are based on a common set of output estimates and two different sets of man-hour estimates covering both employers and employees. In one index, the man-hours refer to hours for which pay is received (plus the hours of unpaid family workers). In the other, the man-hours refer to hours worked. In other words, the first man-hour concept includes, and the second excludes, paid holidays, vacations, and sick leave. The output estimates, which are subject to further revision for much of the period, refer to portions of the gross national product adjusted to 1947 prices.

For the decade 1947-56, both productivity measures for the private economy as a whole show average annual rates of increase that exceed the long-term trend rates. According to one mode of computation used throughout this Appendix, the average annual increase in output per man-hour paid was 3.4 percent during the postwar decade, and the average for output per man-hour worked was 3.9 percent. These rates are much larger than the long-term rates of 2 percent or slightly more per year shown by various studies for periods covering several decades. Smaller excesses over long-term rates are indicated if the postwar interval is lengthened to 1945-56 or shortened to 1950-56.

Productivity advanced more rapidly in agriculture than in the rest of the private economy during 1947-56. The two average annual rates for agriculture, derived from an output series fitting into the national product accounts, were about 6 percent. For nonagricultural industries, on the other hand, output per man-hour paid increased at 2.8 percent per year (3.2 percent in the manufacturing sector and 2.6 percent in nonmanufactur-

TABLE E-1.—*Indexes of output per man-hour for the private economy, 1948-57*
 [1947=100]

Year	Based on man-hours paid ¹					Based on man-hours worked ²		
	Total	Agriculture ³	Nonagricultural industries			Total	Agriculture ³	Nonagri- cultural in- dustries
			Total	Manufacturing ⁴	Non- manufac- turing			
1948	104.9	123.4	102.5	102.5	102.8	104.2	123.7	101.7
1949	107.0	114.7	106.0	104.7	107.2	105.4	113.8	104.2
1950	115.6	131.8	112.7	113.1	112.8	114.5	131.4	111.5
1951	118.1	129.8	114.9	114.6	115.1	118.8	129.0	115.7
1952	121.7	138.7	117.5	116.4	118.1	123.2	138.0	119.2
1953	126.2	153.6	120.4	120.3	120.2	127.8	152.7	122.2
1954	129.0	167.1	122.4	123.7	121.9	131.5	166.3	125.1
1955	133.5	169.7	126.8	130.9	124.7	136.3	168.9	129.8
1956	134.6	175.8	127.1	131.4	125.1	137.9	175.0	130.6
1957 ⁵	137.0	183.8	128.6	132.4	127.1	140.9	183.4	132.6

¹ "Man-hours paid" were derived from Bureau of Labor Statistics figures for the nonagricultural component and Bureau of the Census information for the agricultural component. They include the hours of unpaid family workers in addition to wage and salaried workers and the self-employed. They cover paid holidays, vacations, and sick leave.

² "Man-hours worked" were derived from data of the Bureau of the Census, Department of Commerce. Like "man-hours paid," they include the hours of all persons, whether employees or employers. They incorporate adjustments designed to eliminate holidays, vacations, and sick leave.

³ Differs in concept from Department of Agriculture's productivity series based on requirements of equivalent adult man-hours.

⁴ Derived from a Bureau of Labor Statistics index of net output for 1947-53 extended with the aid of Office of Business Economics data.

⁵ Preliminary, subject to revision.

NOTE.—The indexes in this table were computed by Department of Labor, Bureau of Labor Statistics, from estimates of real product and man-hours. The real product estimates, referring to 1947 prices, are based primarily on national product statistics of the Department of Commerce, Office of Business Economics.

Source: Department of Labor (see note above).

ing). In the case of output per man-hour worked, the average nonagricultural productivity rise was 3.3 percent per year.

Both sets of productivity measures show uneven percentage changes from year to year. Although agriculture recorded an exceptionally high rate of gain for the decade as a whole, it experienced setbacks between 1948 and 1949 and between 1950 and 1951. Unusually small rises occurred in the private economy as a whole and in the nonagricultural sector between 1955 and 1956. For the private economy, output per man-hour paid advanced 8 percent between 1949 and 1950 as output increased sharply, and productivity in terms of man-hours worked advanced nearly 9 percent. Between 1955 and 1956, on the other hand, the two productivity indicators for the private sector rose only about 1 percent, and the two measures for the nonagricultural industries changed even less. For the same year, each agricultural measure showed a gain of 3.6 percent.

PRODUCTIVITY CHANGES IN 1957

Preliminary estimates indicate a generally better productivity performance in 1957 than in 1956. According to either man-hour concept, the productivity advance for the private economy apparently matched the long-term trend rate of about 2 percent. The two measures for agriculture approached

5 percent. Some improvement over the preceding year is suggested for the nonagricultural sector and its manufacturing and nonmanufacturing divisions, but the gains were still comparatively small. Thus, the nonagricultural productivity increases for 1957 over 1956 were 1.2 percent for man-hours paid and 1.6 percent for man-hours worked. The advances for the manufacturing and nonmanufacturing divisions, both referring to man-hours paid, were 0.8 percent and 1.6 percent, respectively.

PROBLEMS OF MEASUREMENT AND MEANING

The application and interpretation of available productivity index numbers must take account of many theoretical and practical difficulties of measurement. In principle, various acceptable productivity indicators can be constructed, each of which would be especially appropriate to a particular context or use. But limitations of data and other factors commonly make it impracticable to construct measures consistent with the desired concepts. The details of actual measurement affect the meaning and applicability of the results. Two or more productivity index numbers computed for a given industry occasionally differ significantly—in direction as well as in magnitude. Furthermore, tolerable agreement during a period of observation gives no assurance of similarity thereafter.

The problems of concept, technique, and data that are important for application and interpretation pertain not only to the productivity ratio proper but also to the production numerator and the labor denominator. Production measures often employ gross output concepts rather than preferred net concepts; incorporated weights may refer to a year other than the one desired; basic product data are commonly reported in crude units or broad classes, vary greatly in quality between census and other years, and lack continuity because of technological and other changes. For many industries (e. g., finance) and activities (e. g., research) that do not have uniform or directly measurable products, indirect and rough techniques of estimation have to be used (e. g., the adjustment of dollar values for price changes by means of price measures that may not be altogether pertinent), and these techniques yield results that are conceptually obscure. In labor input measures, employees and hours of different skill are typically treated as equivalent; statistics for hours remunerated often have to be used in lieu of hours actually worked; and the scope of the data frequently fails to coincide exactly with the scope of the production measure. Finally, productivity index numbers for specific industries may be combined in various ways, with results that sometimes differ significantly from ratios of composite production and labor input measures computed for the same group of industries.

Certain common misunderstandings of productivity measures should also be noted. Short-term changes provide no clear guide to the long-term productivity trend or to an alteration of this trend. Furthermore, short-term changes are influenced by, but do not closely reflect, the course of tech-

nological progress. The confinement of the denominator to labor input does not imply that labor is the sole contributor to the value of product or the sole input to be economized in the process of production.

Continual efforts are being made to improve productivity indicators and to extend measurement to additional sectors and industries. These efforts are reflected in the 1959 budget proposals described in Appendix C and in the establishment in January 1957 of an Interagency Committee on Productivity Estimates under the auspices of the Bureau of the Budget. This Committee has been making a systematic review of productivity concepts, methods, and data needs and of opportunities to fill the major statistical gaps.