

132 PRICES AND WAGES IN MANUFACTURING INDUSTRIES

(9) Services: The output index is based upon deflated net national income originating in services, as published in U.S. Income and Output and Survey of Current Business. The price deflator used was the implicit price deflator for "Other consumer services." The employment index is derived from the number of persons participating in production, as published in U.S. Income and Output. No adjustment was made for changes in average weekly hours.

(10) Trade: The output index was obtained by combining the Schultze output indexes for wholesale and retail trade, using as weights national income originating in each sector in 1947. The man-hours index is based upon the number of persons participating in production, as published in U.S. Income and Output, adjusted for changes in average weekly hours as published by BLS.

Some of these productivity indexes appear to be fairly reliable; others are less so. In particular, the indexes for contract construction, services, and trade should be used with caution—i.e., one should not attribute much to small changes in these indexes.

B. ESTIMATES FOR TWO-DIGIT MINING AND MANUFACTURING INDUSTRIES

Estimates of output, man-hour input, and productivity for all two-digit manufacturing and mining industries are presented in table 2. Each output index is based upon weighted combinations of four-digit output indexes,⁵ the weights used being proportionate to value added in 1954. The man-hours indexes are all based upon BLS data, and are all total man-hours indexes.

Users of these indexes should bear in mind that the output and man-hours series are not strictly comparable, and that, for a particular industry, these productivity indexes may therefore be in considerable error. Another weakness of these productivity indexes is that they are based upon gross output⁶ rather than real-value-added indexes. Insofar as movements of the output indexes used deviate from movements of real value added, the productivity estimates will deviate from true productivity.

These estimates should consequently be interpreted with caution, especially if used to analyze the behavior of productivity within a particular industry.

III. THE RELATIONSHIP BETWEEN PRODUCTIVITY AND OUTPUT WITHIN MANUFACTURING DURING THE POSTWAR PERIOD

The staff report states that output and productivity for the manufacturing industries were positively associated during the postwar period.⁷ This section will present the analysis upon which that conclusion rested.

Tables 3, 4, and 5 summarize the results of various correlations between output and productivity that were computed using the data for manufacturing shown in table 2. The results of these correlations are clear. Changes in productivity are positively associated with changes in output, both for individual industry time series and for cross sections for each year.

A comparison of changes in the rate of growth of output with changes in the rate of growth of productivity for all two-digit manufacturing and mining industries is presented in table 7. The five manufacturing and four mining industries which experienced a greater rate of growth of output after 1953 also experienced a more rapid growth of productivity. Of the 17 manufacturing industries which had slower output growth after 1953, 8 also had slower productivity growth. The lone mining industry with a slower output growth also experienced a slowed growth of productivity.

Evidently an acceleration or deceleration in the growth of output tended to be accompanied by a similar change in the rate of growth of productivity.

Although the conclusion that changes in productivity are positively associated with changes in output is a firm inference from these statistical analyses, one cannot attribute all of the observed relationship between the two variables to a one-way causal relationship. Whereas changes in output may stimulate similar changes in productivity by increasing the rate of utilization of existing capacity or by stimulating innovation within the industry, it is also clear that changes in productivity will tend to result in similar changes in output. Improved productivity, by lowering costs and prices, will lead to higher levels of output.

⁵ These were made available by the Federal Reserve, but are not official Federal Reserve output indexes.

⁶ The four-digit output index (upon which the two-digit indexes are based) are gross output rather than real-value-added indexes.

⁷ P. 91.