

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Employment in Manufacturing, 1899-1939: An Analysis of Its Relation to the Volume of Production

Volume Author/Editor: Solomon Fabricant

Volume Publisher: NBER

Volume ISBN: 0-87014-040-X

Volume URL: <http://www.nber.org/books/fabr42-1>

Publication Date: 1942

Chapter Title: Appendix D: Note on Factory Output

Chapter Author: Solomon Fabricant

Chapter URL: <http://www.nber.org/chapters/c4882>

Chapter pages in book: (p. 245 - 250)

Appendix D

Note on Factory Output



Appendix D

Note on Factory Output

THE data on factory output utilized in this study are described in detail in Chapter 2 and Appendix A of *The Output of Manufacturing Industries, 1899-1937*. This discussion is summarized here very briefly.¹

The indexes of output for individual industries presented in this report are indexes of physical, rather than pecuniary, output. They measure those changes in the aggregate value of each industry's production which are attributable exclusively to the actual changes in physical quantities. Prices have been kept constant in the computation of the indexes. Further, the indexes apply to gross physical output rather than to net physical output. They show the changes in the aggregate value of gross output which are attributable to changes in the physical quantities of final products. They do not measure the changes in the value added by the industry in the process of manufacture with prices of final products and of materials and other commodities consumed in the fabrication of the final products kept constant. The indexes for major groups and for total manufacturing also are indexes of physical output. However, because "value added" rather than "value of products" has been used as the weight in combining the indexes of the component individual industries, the group and total indexes do purport to measure net output, at least to a first approximation.

Output may be classified in terms of products as well as in terms of industries. But since employment is given only by industries, we have prepared our indexes of output to correspond with

¹ The indexes of output for 1899-1937 are all taken from the volume cited, except for a few revisions and additions, which are noted below in Appendix F. The indexes for 1869-99 and 1937-39 were constructed in a manner consistent with that followed for the 1899-1937 indexes, and, like the 1899-1937 indexes, are based largely on data collected in the Census of Manufactures.

the employment series. For this reason the measures in this volume relate to the industry which *specializes* in the products that give the industry its name. For example, we present indexes for "oleomargarine, not elsewhere made." The establishments in this industry devote themselves primarily to the production of oleomargarine. Yet a large amount of oleomargarine is made also as a secondary product in the meat-packing industry. Therefore, the number of persons employed in the "oleomargarine, not elsewhere made" industry is considerably fewer than the total number actually engaged in the manufacture of oleomargarine; and the changes in the former do not necessarily correspond to the movements of the total. A somewhat similar difficulty occurs in the case of "butter," the indexes for which relate only to factory production, though a considerable (and changing) fraction of butter production takes place on farms.

Because our interest is concentrated on the relation between output and employment, it is necessary to pay particular attention to the degree to which the two are comparable. So far as output is concerned, a difficulty arises because the Census does not always collect data on the physical quantity of all the products of an industry. We have used a "coverage adjustment," following Frederick C. Mills, by which we may pass from the sample of quantity data for an industry to the total output of the industry. This adjustment has both *a priori* and empirical justification and, it is safe to say, usually surmounts the difficulties raised by incomplete coverage. We have already noted certain of the disturbing characteristics of the employment figures, but since the Census has on the whole defined factory employment in such a way as to make the resulting figures consistent with output, serious problems on this account rarely arise. There is, however, one incomparability which should not be minimized. This occurs in the measure of output, or, according to the point of view, in that of employment. There are changes from time to time in the degree to which manufacturers of complex products make their own parts. Correspondingly, there are changes in the number employed. When parts are made outside the industry, the number of workers employed per unit of final product as recorded is smaller than when parts are made within the industry. More con-

cretely, less men are needed merely to assemble a motor car than to produce the component parts from steel and rubber, and then to assemble them. On this sort of change there is little readily available information. Fortunately, this kind of incomparability arises only in a relatively few industries.

In general the indexes of output are essentially estimates. Lack of detail in the Census data, and incomplete and changing coverage of each industry's output by the Census data on physical quantities, make this statement necessary. We have, however, used every available detail and made elaborate adjustments for coverage in order to render these estimates as reliable as possible.

