Volume Title: Orders, Production, and Investment: A Cyclical and Structural Analysis

Volume Author/Editor: Victor Zarnowitz

Volume Publisher: NBER

Volume ISBN: 0-870-14215-1

Volume URL: http://www.nber.org/books/zarn73-1

Publication Date: 1973

Chapter Title: Appendix C: Price Deflators for Selected Manufacturing Industries

Chapter Author: Victor Zarnowitz

Chapter URL: http://www.nber.org/chapters/c3563

Chapter pages in book: (p. 683 - 686)

# APPENDIX C

# PRICE DEFLATORS FOR SELECTED MANUFACTURING INDUSTRIES

THE OBE SERIES of new orders and shipments of the major manufacturing industries, in current-dollar values, were adjusted for changes in prices by means of indexes based mainly on selected components of the monthly Wholesale Price Index of the U.S. Department of Labor, Bureau of Labor Statistics (BLS). These deflators are price indexes on the base 1947–49 average = 100.[1] They were applied to the monthly series in the OBE compilation for 1948–58.[2]

To deflate the series for motor vehicles and parts, the WPI component for motor vehicles (code 11-8) was used directly. Similarly, the price index for pulp, paper, and allied products (code 09) was judged to be applicable as reported to the series for paper and allied products. For the other major industries in the OBE compilation, however, price deflators had to be calculated from selected components of the WPI and, in a few cases, from some other price or cost (in particular, average hourly earnings) indexes. Table C-1 identifies these component indexes and the weights used to combine them into the deflators for the major industries or industry groups.

Comprehensive series of deflated values were constructed by adding up the appropriate industry series in constant dollars. These include the aggregates for (1) all durable goods industries (combining seven industries, namely, primary metals, fabricated metal products, electrical machinery, other machinery, motor vehicles, other transportation equipment, and other durable goods); (2) nondurable goods industries reporting unfilled orders (combining four industries, namely, textiles, leather, paper, and printing and publishing); (3) all nondurable goods industries (the preceding aggregate plus that for nondurable goods industries not reporting unfilled orders; see Table D-1, line 60); and (4) all manufacturing industries—the sum of the aggregates for all durables and all nondurables, that is, the series included in (1) and (3) above.

[1] That base replaced the 1926 = 100 base in the extensive revision of the WPI in 1952. The revision doubled the number of commodities and quotations covered. The revised index has been published in complete detail for the period back to January 1947. (More recently, since January 1962, the WPI has been computed on the base 1957–59 = 100.) The index is a chain of relatives each calculated by the Laspeyres formula. For further details on the construction of the index, see references in Table C-1, notes a and b.

[2] See the section, Series in Constant Prices, in Chapter 3.

# Table C-1
## Component Indexes and Weights Used in Calculating the Price Deflators

| Line | Component-Index Series [a] | BLS Code Number (1) | Value of Transactions (millions of dollars) [b] (2) | Relative Importance Within Industry (per cent) [c] (3) |
|---|---|---|---|---|
| | PRIMARY METALS | | | |
| 1 | Iron and steel | 10-1 | 10,420.0 | 68.1 |
| 2 | Nonferrous metals | 10-2 | 4,882.7 | 31.9 |
| 3 | Total | | 15,302.7 | 100.0 |
| | FABRICATED METAL PRODUCTS [d] | | | |
| 4 | Metal containers | 10-3 | 819.2 | 9.2 |
| 5 | Hardware | 10-4 | 1,001.3 | 11.2 |
| 6 | Plumbing equipment | 10-5 | 366.6 | 4.1 |
| 7 | Heating equipment | 10-6 | 1,029.0 | 11.5 |
| 8 | Fabricated structural metal products | 10-7 | 2,123.7 | 23.8 |
| 9 | Fabricated nonstructural metal products | 10-8 | 3,171.9 | 35.6 |
| 10 | Cutlery | 12-6-7 | 144.5 | 1.6 |
| 11 | Metal household containers | 12-6-8 | 253.3 | 2.8 |
| 12 | Total | | 8,909.5 | 100.0 |
| | ELECTRICAL MACHINERY | | | |
| 13 | Electrical machinery and equipment | 11-7 | 2,585.7 | 45.6 |
| 14 | Household appliances | 12-4 | 2,194.2 | 38.7 |
| 15 | Radio, television, and phonographs | 12-5 | 895.7 | 15.8 |
| 16 | Total | | 5,675.6 | 100.0 |
| | MACHINERY EXCEPT ELECTRICAL | | | |
| 17 | Machinery and motive products | 11 | 28,687.3 | 146.6 |
| 18 | *minus* Electrical machinery and equipment | 11-7 | 2,585.7 | 13.2 |
| 19 | *minus* Motor vehicles | 11-8 | 6,535.0 | 33.4 |
| 20 | Total | | 19,566.6 | 100.0 |
| | NONAUTOMOTIVE TRANSPORTATION EQUIPMENT [e] | | | |
| 21 | Railroad equipment index [f] | n.a. | n.a. | 65.7 |
| 22 | Av. hourly earnings index, shipbuilding [g] | n.a. | n.a. | 9.8 |
| 23 | Av. hourly earnings index, aircraft [g] | n.a. | n.a. | 7.6 |
| 24 | Floating equipment, ICC cost index [h] | n.a. | n.a. | 6.1 |
| 25 | Foundry and forge shop products | 10-1-5 | n.a. | 1.5 |
| 26 | Machinery and equipment, special-purpose index | 11 exc. 11-8 | n.a. | 2.2 |

(continued)

Table C-1 (concluded)

| Line | Component-Index Series[a] | BLS Code Number (1) | Value of Transactions (millions of dollars)[b] (2) | Relative Importance Within Industry (per cent)[c] (3) |
|---|---|---|---|---|
| 27 | Nonferrous metal mill shapes | 10-2-5 | n.a. | 1.1 |
| 28 | Finished steel | 10-1-4 | n.a. | 3.6 |
| 29 | Fabricated structural metal products | 10-7 | n.a. | 2.4 |
| 30 | Total | | | 100.0 |
| | OTHER DURABLE GOODS INDUSTRIES | | | |
| 31 | Lumber and wood products | 08 | 5,363.3 | 35.4 |
| 32 | Household furniture | 12-1 | 1,865.6 | 12.3 |
| 33 | Commercial furniture | 12-2 | 594.1 | 3.9 |
| 34 | Other household durable goods | 12-6 | 1,596.8 | 10.5 |
| 35 | Nonmetallic minerals—structural | 13 | 2,789.8 | 18.4 |
| 36 | Miscellaneous | 15 | 6,095.6 | 40.2 |
| 37 | *minus* Manufactured animal feeds | 15-2 | 3,152.4 | 20.8 |
| 38 | Total | | 14,683.8 | 100.0 |
| | TEXTILE-MILL PRODUCTS | | | |
| 39 | Textiles and apparel | 03 | 19,770.7 | 175.2 |
| 40 | *minus* Apparel | 03-5 | 9,198.6 | 81.5 |
| 41 | Floor covering | 12-3 | 715.6 | 6.2 |
| 42 | Total | | 11,287.7 | 100.0 |
| | LEATHER AND LEATHER PRODUCTS | | | |
| 43 | Leather | 04-2 | 967.0 | 27.2 |
| 44 | Footwear | 04-3 | 1,868.7 | 52.5 |
| 45 | Other leather products | 04-4 | 721.4 | 20.3 |
| 46 | Total | | 3,557.1 | 100.0 |
| | PRINTING AND PUBLISHING | | | |
| 47 | Av. hourly earnings index[g] | n.a. | n.a. | 50.0 |
| 48 | Newsprint | 9-32 | 454.8 | 24.7[i] |
| 49 | Printing paper | 9-31-11 | 95.7 | 5.2[i] |
| 50 | Book paper | 9-31-21 | 371.8 | 20.1[i] |
| 51 | Total | | 922.3 | 100.0 |
| | NONDURABLE GOODS INDUSTRIES NOT REPORTING UNFILLED ORDERS | | | |
| 52 | Processed foods | 02 | 31,807.3 | 46.0 |
| 53 | Apparel | 03-5 | 9,198.6 | 13.3 |
| 54 | Chemicals and allied products | 06 | 10,754.2 | 15.6 |
| 55 | Rubber and rubber products | 07 | 2,051.8 | 3.0 |
| 56 | Tobacco mfrs. and beverages | 14 | 4,776.6 | 6.9 |
| 57 | Manufactured animal feeds | 15-2 | 3,152.4 | 4.6 |
| 58 | Petroleum and products | 05-5 | 8,926.8 | 12.9 |
| 59 | *minus* Crude petroleum | 05-5-6 | 1,590.8 | 2.3 |
| 60 | Total | | 69,076.9 | 100.0 |

*Notes to Table C-1*

n.a. = not applicable.

[a] All series except those identified on lines 21–24 are indexes for groups or subgroups in the BLS Wholesale Price Index, 1947–49 = 100. The BLS code numbers for these indexes are listed in column 1. The price data used in constructing the WPI are those which apply at primary market levels, that is, the first important commercial transaction for each commodity. Most of the quotations are the selling prices of representative manufacturers or producers, or prices quoted on organized exchanges or markets. For a description of the WPI, see U.S. Department of Labor, *Techniques of Preparing Major BLS Statistical Series*, BLS Bulletin 1168, Washington, D.C., 1954, Chap. 10.

[b] Transactions are reported in the Census of Manufactures for 1947 and used as basic weights in the 1952 revision of the WPI. Interplant transfers were excluded insofar as available data permitted. Data for agricultural and extractive industry products were obtained from the *Agriculture* and *Minerals Yearbooks* for 1947; import data cover the year 1947, as reported by the U.S. Department of Commerce.

[c] Refers to each of the ten major industries or group of industries in the OBE *Industry Survey*. These industries are identified below in the body of the table.

[d] Instead of computing the weighted averages of the eight component indexes listed below (lines 4–11), a simpler method of calculation was used. The primary metals index (combining 10-1 and 10-2; see lines 1–3, above) were multiplied by 179.8, and the result was subtracted from the metal and metal products index (code 10) multiplied by 279.8. The weights 179.8 and 279.8 correspond to the 1947 transaction values of $15,302.7 million and $23,814.4 million, respectively. This method is equivalent to computing the weighted averages of the six component indexes listed on lines 4–9 (i.e., omitting cutlery and metal household containers, which have very small weights; see lines 10 and 11).

[e] The weights are based, approximately, on the 1947 values of private purchases of aircraft, ships and boats, and railroad equipment. The criterion assigns much greater weight to the railroad component of nonautomotive transportation equipment than later developments would justify, and much smaller weight to the aircraft component (the former is nearly two-thirds, the latter about one-seventh).

[f] U.S. Department of Commerce price deflator for railroad equipment, with linear extrapolation.

[g] Index numbers, 1947–49 average = 100, based on the monthly BLS series on gross average hourly earnings per worker in the corresponding industries (in dollars). The series used are estimates first published in June 1953.

[h] Interstate Commerce Commission cost index for floating equipment, account 56, with linear extrapolation.

[i] Based on the corresponding values of transactions in column 2, for which the sum ($922.3 million) is treated as representing 50 per cent of the within-industry weights.