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 A: Time Series on Orders, Shipments, Production, and Inventories

Chapter Author: Victor Zarnowitz

Chapter URL: http://www.nber.org/chapters/c3561

Chapter pages in book: (p. 649 - 668)

PART V

APPENDIXES

APPENDIX A

TIME SERIES ON ORDERS, SHIPMENTS, PRODUCTION, AND INVENTORIES

Coverage in Table A-1

This appendix covers most of the statistical materials employed in this book. In addition to the series catalogued in Table A-1, data on price changes, construction contracts, investment expenditures, and other selected variables have been used.

The distribution of the time series included in Table A-1 by economic variable is as follows:

New orders (N)	108 series
Shipments (S)	95 series
Production (Z)	22 series
Unfilled orders (U)	88 series
Canceled orders (C)	3 series
Inventories (H)	20 series
Total	336 series

The series in constant dollars for N, S, and U are not listed separately. Such deflated series have been constructed for several major-industry groups in the Monthly Industry Survey of the Office of Business Economics (OBE) of the U.S. Department of Commerce for those categories in part I of the table for which the Federal Reserve Board (FRB) production indexes (Z) are also included.[1] Another

[1] See column 3 of Table A-1 for the listing of the principal variables for each group, industry, or product category.

Table A-1
Basic Characteristics and Sources of Data for New and Unfilled Orders, Shipments, Production, and Inventories

Line	Industry, Market Grouping, or Product Category	Comparable SIC Industries[a] (1)	Market Grouping[b] (2)	Comparable Series Used[c] (3)	Period Covered[d] (4)
	I. MONTHLY INDUSTRY SURVEY, OBE-CENSUS, AND INDUSTRIAL PRODUCTION INDEXES, FRB[e]				
1	All manufacturing industries	19–39	All	*N,S,Z,U,H*	1939–66
2	Durable goods	19;24;25; 32–39	All exc. CS	*N,S,Z,U,H*	1939–66
3	Primary metals	33	OM	*N,S,Z,U,H*	1948–66
4	Blast furnaces, steel mills	331	OM	*N,S,U*	1953–66
5	Iron and steel foundries	332	OM	*N,S,U*	1948–62
6	Nonferrous metals	333–6[f]	OM	*N,S,U*	1948–62
7	Other primary metals	339	OM	*N,S,U*	1948–62
8	Fabricated metal products	34	HG,CM,OM	*N,S,Z,U,H*	1948–66
9	Heating and plumbing	343	CM	*N,S,U*	1955–62
10	Structural metal work	344	CM	*N,S,U*	1955–62
11	Tin cans and other	341,2,5,6,7,9	HG,OM	*N,S,U*	1955–62
12	Electrical machinery	36	ND,OM,HG	*N,S,Z,U,H*	1948–66
13	Electrical generator apparatus	361,2	OM	*N,S,U*	1948–62
14	Radio, TV, and communication equip.	365,6	HG,ND	*N,S,U*	1948–62
15	Other electrical equip.	363,4,7,9	OM	*N,S,U*	1948–62
16	Machinery exc. electrical	35	ND,OM	*N,S,Z,U,H*	1948–66
17	Metalworking machinery	354	ND	*N,S,U*	1948–62
18	General industrial machinery	3561,4,7,9	ND	*N,S,U*	1948–62
19	Special-industry machinery	355	ND	*N,S,U*	1948–62
20	Engines and turbines	351	ND,OM	*N,S,U*	1948–62
21	Construction, mining, and material-handling machinery	353	ND	*N,S,U*	1948–62
22	Office and store machines	357	ND	*N,S,U*	1948–62
23	Agricultural implements	352	ND	*N,S,U*	1948–62
24	Household and service appliances	358	ND	*N,S,U*	1948–62
25	Other machinery and parts	3544,5;3599; 3562,5,6	OM	*N,S,U*	1948–62
26	Transport. equip.	37	AE,ND,OM	*N,S,H*	1948–66
27	Motor vehicles and parts	371,5,9	AE	*N,S,Z*	1948–66
28	Motor vehicles	3711	AE	*N,S,U*	1949–62
29	Parts and accessories	3714	AE	*N,S,U*	1948–62
30	Nonautomotive transport. equip.	372,3,4	ND,OM	*N,S,Z,U*	1948–66
31	Aircraft	372	ND,OM	*N,S,U*	1949–62
32	Other nonautomotive transport. equip.	373,4	ND	*N,S,U*	1949–62

(continued)

Table A-1 (continued)

Line	Industry, Market Grouping, or Product Category	Comparable SIC Industries[a] (1)	Market Grouping[b] (2)	Comparable Series Used[c] (3)	Period Covered[d] (4)
33	Other durable goods industries	24;25;32;38; 39;19	HG,ND,CM, OM	*N,S,Z,U* 66]	1948–66
34	Lumber and wood products	24	CM,OM	*N,S,U*	1953–62[g]
35	Furniture	25	HG,ND	*N,S,U*	1953–62[g]
36	Stone, clay, and glass products	32	CM,OM,HG	*N,S,U*	1948–62
37	Prof. and scientific instruments	38	ND,OM,HG	*N,S,U*	1953–62[g]
38	Miscellaneous incl. ordnance	39;19	HG,OM,ND	*N,S,U*	1953–62[g]
39	Nondurable goods industries, total	20–23,26–31	All exc. ND	*N,S,Z,H*	1939–66
40	Reporting unfilled orders	22,26,27,31	HG,CS,CM, OM	*N,S,Z,U*	1939–66
41	Textile-mill products	22	OM,HG	*N,S,Z,U*	1948–62
42	Leather and leather products	31	OM,HG	*N,S,Z,U*	1948–62
43	Paper and allied products	26	OM,CM,CS	*N,S,Z,U,H*	1948–62
44	Printing and publishing	27	CS,OM	*N,S,Z,U*	1948–62
45	Not reporting unfilled orders	20,21,23,28, 29,30	All exc. ND	*S*(= *N*),*Z*	1939–66
MARKET CATEGORIES[h]					
46	Consumer staples	20(excl. 209); 21;2645,6; 271,2,3; 283,4	CS	*N,S,U*	1953–66
47	Home goods and apparel	[i]	HG	*N,S,U*	1953–66
48	Consumer durables (other than automobiles)	251;326; 3421,3,5; 363,5;385, 7;391	CD	*N,S,U*	1960–66
49	Automotive equip.	3011;371,3, 5,9	AE	*N,S,U*	1953–66
50	Nonautomotive equip. and defense	[j]	ND	*N,S,U*	1953–66
51	Defense products	366;3721;19	DP	*N,S,U*	1953–66
52	Other	[j]	OE	*N,S,U*	1953–66
53	Machinery and equip. industries	35(excl. 352, 9);36(excl. 363,5,6); 3731;374	ME	*N,S,U*	1953–66
54	Materials, supplies, and intermediate products	[k]	MS	*N,S,U*	1953–66
55	Construction materials, etc.	[k]	CM	*N,S,U*	1953–66
56	Other materials, etc.	[k]	OM	*N,S,U*	1953–66

(continued)

Table A-1 (continued)

Line	Industry, Market Grouping, or Product Category	Comparable SIC Industries[a] (1)	Market Grouping[b] (2)	Comparable Series Used[c] (3)	Period Covered[d] (4)
	II. MONTHLY INDEXES (1949 = 100), STANDARD AND POOR'S[l]				
57	Composite index	m	m	*N,S,U*	1949–58
58	Steel	33;34	OM,CM	*N,S,U*	1949–58
59	Metal fabricating (nonferrous)	33;34	OM,CM	*N,S,U*	1949–58
60	Machinery, industrial	35	ND	*N,S,U*	1949–58
61	Machine tools	354	ND	*N,S,U*	1949–58
62	Electrical equipment	36	ND,OM	*N,S,U*	1949–58
63	Aircraft	372	ND,OM	*N,S,U*	1949–58
64	Auto parts	371	AE	*N,S,U*	1949–58
65	Lumber	24	CM,OM	*N,S,U*	1949–58
66	Building materials	24;32	CM	*N,S,U*	1949–58
67	Cement	324	CM	*N,S,U*	1949–58
68	Textiles	22	OM,HG	*N,S,U*	1949–58
69	Floor coverings	227	HG	*N,S,U*	1949–58
70	Shoes	314	HG	*N,S,U*	1949–58
71	Paper	26	OM,CM	*N,S,U*	1949–58
	III. COMPOSITE INDEXES				
	NATIONAL INDUSTRIAL CONFERENCE BOARD				
72	All manufacturing	n	All(probably)	*N,S,U*	1929–44 for N and S; 1935–44 for U
73	Durable goods industries	n	All exc. CS	*S,U*	
74	Nondurable goods industries	n	All exc. ND	*S,U*	
	DEPARTMENT OF COMMERCE				
75	Total (composite) index	o	HG,ND,CM, OM	*N,U*	1920–33
76	Iron and steel	331,2;343,4; misc.	CM,OM	*N,U*	1920–33
77	Transportation equipment	3731;3741,2	ND	*N,U*	1920–33
78	Lumber products	241,2;25	HG,ND,CM	*N,U*	1920–33
79	Stone, clay, and glass products	3229;3251,9	CM	*N,U*	1920–33
80	Textile products	2251,4;2261; 2295	HG,OM	*N,U*	1920–33
81	Paper and printing	2621;2631; 2641;2751	OM	*N,U*	1921–33 for N; 1923–33 for U
	MC GRAW-HILL				
82	Nonelectrical machinery, total	351,3,4,5,6, 7[p]	ND	*N*	1949–66
83	Nonelectrical machinery, export	p	ND	*N*	1957–66

(continued)

Table A-1 (concluded)

Line	Industry, Market Grouping, or Product Category	Comparable SIC Industries[a] (1)	Market Grouping[b] (2)	Comparable Series Used[c] (3)	Period Covered[d] (4)
	ASSOCIATED INDUSTRIES OF MASSACHUSETTS				
84	Composite index for Massachusetts	[q]	[q]	*N*	1924–41
	UNITED STATES STEEL CORPORATION				
85	Steel, unfilled orders[r]	33	OM	*U*	1902–33
	IV. SERIES FOR INDIVIDUAL INDUSTRIES OR PRODUCTS[s]				
86	Merchant pig iron[t]	3312	OM	*N,S,Z,H*	1919–26
87	Steel sheets[t]	3312	OM	*N,S,Z,U,H*	1919–36
88	Rails[t]	3312	OM	*N*	1870–1950
89	Fabricated steel plate[t]	3312	OM	*N*	1923–40
90	Fabricated structural steel[t]	3441	CM	*N,S*	1909–56
91	Water-tube boilers[t]	3443	CM	*N*	1927–58
92	Oil burners[t]	3433	CM	*N,S,U,H*	1929–53
93	Bath tubs[t]	3431	CM	*N,S,H*	1917–31
94	Lavatories[t]	3431	CM	*N,S,H*	1917–31
95	Kitchen sinks[t]	3431	CM	*N,S,H*	1917–31
96	Miscellaneous enameled sanitary ware[t]	3431	CM	*N,S,H*	1917–31
97	Machine tools	3541,2	ND	*N,S,U,C*	1919–63
98	Machine tools, export orders	3541,2	ND	*N,S*	1946–63
99	Foundry equipment	3559	ND	*N,S,U*	1921–56
100	Electric overhead cranes	3536	ND	*N,S,U*	1925–46
101	Woodworking machinery	3553	ND	*N,S,U,C*	1921–40
102	Mill and industrial supplies	3291;353,4,5 a.o.[u]	ND,CM,OM	*N*	1948–58
103	Aircraft and parts	3721,2,3,9	ND,OM	*N,S*	1948–63
104	Railroad freight cars[t]	3742	ND	*N,S,U*	1870–1956
105	Railroad passenger cars[t]	3742	ND	*N,S*	1870–1956
106	Railroad locomotives[t]	3741	ND	*N,S*	1870–1955
107	Architectural terra cotta[t]	3259	CM	*N*	1919–40
108	Southern pine lumber[t]	2421	CM	*N,S,Z,H*	1916–56
109	Oak flooring[t]	2426	CM	*N,S,Z,U,H*	1912–56
110	Furniture	2511,2;2521[v]	HG,ND	*N,S,U,C*	1923–46
111	Boxboard and paperboard[t]	2631	OM	*N,Z,U,H*	1923–56
112	Paper, excl. building paper, newsprint, and paperboard[t]	2621	OM	*N,S,Z,H*	1934–55

Notes to Table A-1

[a] In terms of 1957 Standard Industrial Classification (SIC) system. For more detail and descriptions of the industries, see Bureau of the Census, *Manufacturers' Shipments, Inventories, and Orders: 1947–1963 (Revised)*, Washington, D.C., 1963, App. B, pp. 122–25.

[b] According to the source cited in note a. For an explanation of the symbols and industrial content of each grouping, see lines 46–56.

[c] N = new orders; S = shipments; Z = production; U = unfilled orders; C = canceled orders; H = inventories (= inventories of purchased materials plus goods in process plus finished goods). The inventory series have been used in various contexts (in particular, for the stock-backlog ratios), but only a few are presented and analyzed at greater length. The inventory series for individual product categories in part IV of the table are labeled H for uniformity, but they represent finished-goods stocks.

[d] Where new orders (N) are included, the periods are those covered by the analysis of N. The comparisons with shipments generally cover the same periods for the series in parts I–III, but some of them cover shorter periods in part IV. The comparisons with production often cover shorter periods (in part I, mostly 1948–58).

[e] Current values of N, S, and U are reported by the Department of Commerce, Office of Business Economics (OBE) and the Census Bureau in millions of dollars. For the major industries, these series have also been adjusted for price variation; the deflated (constant-dollar) series were used in comparisons with the Federal Reserve Board production indexes (Z). The series on new orders (N) are net of cancellations.

[f] In a sequence of this type, single figures modify the last digit in the number of a group or industry that is listed first. Thus, in the present case, the reference is to the groups 333, 334, 335, and 336; the sequence 3421,3,5 in line 48 stands for industries 3421, 3423, 3425; and analogously elsewhere in this column and in some footnotes below.

[g] For the combined "lumber and furniture" industry group, and for the combined "instruments and miscellaneous including ordnance" industry group, there also exist data for 1948–52.

[h] Census series (1963 revision) beginning in 1953. Earlier estimates from industry data used in Chapter 4 for comparisons with production indexes are not listed.

[i] Includes SIC industries 225,7; 23; 314,5,6,7,9; also, the industries listed on line 48.

[j] The ND group includes industries listed on line 51 and those in the "other" group (line 52), namely, 252,3,4,9; 3511; 3522; 353; 3541,2,8; 355,6,7,8; 361; 3731; 3741,2; 381,2,3,4.

[k] The MS category (line 54) consists of groups CM and OM (lines 55 and 56, respectively). CM includes SIC industries 241,2,3,9; 2661; 2816; 285; 295; 32 (excluding 3221); 3429; 343,4,8. OM includes SIC industries 2211; 2221; 2231; 224,6,8,9; 244; 261,2,3,5; 2641,2,3,4,9; 274,5,6,7,8,9; 2812,3,4,5,8,9; 282,6,7,9; 2911; 2992,9; 302,3,6,7; 311,2,3; 3221; 33; 3411; 3491; 345,6,7,9; 3519; 3544,5; 356,9; 362,4,7,9; 3722,3,9; 3681; 3872; 395,8,9.

[l] Indexes of current-dollar value of manufacturers' orders and shipments (1949 = 100) reported monthly in Standard and Poor's *Industry Surveys*. New orders are gross of cancellations. Only an approximate classification of the series on a two- or three-digit basis and in terms of the market groupings is possible. For more information on these data, see Appendix C.

[m] Includes SIC industries 22; 24; 26; 314; 32–36; and 371–2, as listed before in this column, lines 58–71. Also includes some companies in other industries where the

coverage is considered too narrow to warrant publication of separate industry indexes. The market groupings included, as listed in column 2, lines 58–71, are HG, AE, ND, CM, and OM. The consumer staples group, CS, is probably represented weakly or not at all.

[n] Monthly indexes of current-dollar value (1935–39 average = 100) computed by the chain-index method and seasonally adjusted by the NICB. Chain indexes were derived for each industrial group and combined with weights based on each industry's value of product according to the 1937 Census of Manufactures. The coverage of the composite indexes is as follows. Durable goods: Automobile equipment (for *N*, since January 1935), building equipment, electrical equipment, metal products, iron and steel, machinery, nonferrous metals, office equipment (for *N*, since January 1935), railroad equipment (for *S*, since June 1930), house furnishings (for *N*, since January 1934; for *S* since January 1935), cement (for *S* only), and glass (for *S* only). Nondurable goods: Boots and shoes (for *N*, since January 1934), chemicals and drugs, clothing (for *N*, since January 1935; for *S*, since January 1933), leather (for *N*, since January 1935), paper manufactures, textiles, and rubber goods (for *S* only). Also miscellaneous industries (n.e.c.; for *N*, since January 1935). New orders are gross of cancellations.

[o] Based on the monthly indexes of physical volume of new and unfilled orders (1923–25 average = 100), as listed below on lines 76–81. The commodities included are as follows. For *N*—Iron and steel: steel sheets, malleable castings, steel castings, fabricated structural steel, fabricated steel plate, enameled sanitary ware; Transportation equipment: locomotives, railroad cars; Lumber products: furniture (factories in the Grand Rapids district), lumber (pine, fir, redwood, and walnut), flooring (oak, maple, etc.); Stone, clay, glass: terra cotta, illuminating glassware; Textiles: cotton finishings, hosiery, knit underwear; Paper and printing: boxboard, labels, book paper. For *U*—Iron and steel: pig iron, enameled sanitary ware, orders of the U.S. Steel Corporation and of the independent sheet-steel manufacturers (as compiled by the National Association of Sheet and Tin Plate Manufacturers); Transportation equipment: ships, freight cars, locomotives; Lumber: oak and maple flooring, Grand Rapids district furniture orders; Stone, clay, glass: common brick, face brick, paving brick, illuminating glassware; Textiles: as for *N*, plus pyroxylin-coated textiles; Paper: boxboard.

[p] Indexes of gross current value of new orders; begin in 1949 for total new orders (1950 = 100) and in 1957 for export orders (1957 = 100). Since March 1963, calculated on the base 1957–59 average = 100. Component-industry indexes are available for pumps and compressors, engines and turbines, construction machinery, mining machinery, metalworking machinery, office equipment, other industrial machinery (with one subcomponent, chemical process equipment). Seasonal adjustments are made by McGraw-Hill for total nonelectrical machinery orders and total export orders. The data for the component industries are unadjusted.

[q] Index of gross current value of new orders (1926 = 100). Based on reports from 160–260 concerns in these classifications: textiles, leather and shoes, metal trades, paper, and "all other" industries (mostly consumer goods such as optical, confectionery, jewelry, rubber, plastics, and some electrical appliances). The sample, then, consists mainly of firms in the industry groups 22, 26, 31, 34, 36, and 39 and market groupings HG, CM, and OM.

[r] Total; end of quarter prior to June 1910; thereafter end of month; in thousands of long tons.

Notes to Table A-1 (concluded)

[s] Mostly trade association data. Sources, by line number: 86—American Pig Iron Association; 87—National Association of Flat Rolled Steel Manufacturers; 88, 104–106—Partington (Brookings Institution), Iron Trade Review (*Steel*), *Railway Age*, American Railway Car Institute; 89, 92, 107—Bureau of the Census; 90—Bureau of the Census and American Institute of Steel Construction; 91—Large boiler-producing companies; 93–96—Bureau of the Census and the Enameled Sanitary Ware Manufacturers' Association; 97, 98—National Machine Tool Builders' Association; 99—Foundry Equipment Manufacturers' Association; 100—Electric Overhead Crane Institute; 101—Association of Manufacturers of Woodworking Machinery; 102—American Supply and Machinery Association; 103—Bureau of the Census and Civil Aeronautics Administration; 108—Southern Pine Association; 109—National Oak Flooring Manufacturers' Association; 110—Seidman & Seidman (factories in Grand Rapids, Michigan, district); 111—National Paperboard Association and Bureau of the Census; 112—American Paper and Pulp Association.

The series on orders for rails and aircraft and parts (lines 88 and 103), and those for railroad freight cars before 1913, for railroad passenger cars before 1934, and for railroad locomotives before 1941 (lines 104–106) are quarterly. All the other series are monthly.

New-order series on lines 89, 90, and 92 are reported net of cancellations; those on lines 97, 98, 99, 101, and 110, gross and net; and all others, gross only.

[t] Series in physical units, as follows (by line number): 86, 88—thousands of long tons; 87, 89, 90, 107, 111, 112—thousands of short tons; 91—heating surface and steam capacity indexes, 1947–49 = 100; 92–96—thousands of pieces; 104–106—number; 108, 109—millions of board feet.

The other series in part IV are in current-value units, as follows: 97, 98—average monthly shipments 1926 = 100, 1945–47 = 100 (for 1919–58, gross); thousands of dollars, millions of dollars (1921–40, 1945–66, gross and net); 99—monthly average shipments, 1922–24 = 100, 1937–39 = 100, 1947–49 = 100 (1921–40, gross; 1940–56, net); 100, 101—thousands of dollars; 102—July 1948 = 100; 103—millions of dollars; 110—number of days' production (value).

[u] Index of new orders received by a cross section of members of the American Supply and Machinery Manufacturers' Association, producers of a variety of supplies such as abrasives, beltings, hoists, saws, tools, etc.

[v] Wooden furniture, Grand Rapids district.

source of undercount is in the labeling of the inventory series as *H*, even where more than one such series has been used. For the comprehensive aggregates and several industry groups in the OBE-Census compilation, the analysis involved total inventories and finished-goods inventories, and in some cases purchased materials and goods in process as well. However, these distinctions by stage of fabrication were not considered sufficiently important for the present classification to be shown in the (already rather elaborate) table.

The OBE-Census Series

The main data on manufacturers' orders, shipments, and inventories come from two agencies of the U.S. Department of Commerce. The Office of Business Economics (Monthly Industry Survey, 1939–63) and the Bureau of the Census, which began processing the OBE surveys in the spring of 1957, released revised series (M3-1) in 1963, and has published the data regularly since then. The Commerce series, insofar as they were available to me for use in this book, are listed in Table A-1, lines 1–56, along with some corresponding components of the industrial production index of the Board of Governors of the Federal Reserve System.

The new Census data were used for the most comprehensive aggregates—all manufacturing, durable goods, and nondurable goods industries—in the period since 1947, and for the broad industry groups and market categories in the period since 1953. In the earlier years, only the older OBE series are available for the two-digit industries and their combinations.

Unpublished monthly series covering the period 1948–62 have been received through the courtesy of the OBE and were used to analyze the cyclical timing and some other aspects of new and unfilled orders and shipments of twenty-eight three- or four-digit industries in the durable goods sector. These are pre-1963 revision data, as are also the series for four industry groups in the nondurable goods sector which report unfilled orders. The new Census series produced in the 1963 revision are not published in comparable industrial detail, except as charts.[2] It was therefore not possible to use the revised data for the period since 1953 to replicate the full analysis of the older OBE data for industrial subdivisions. However, limited use could be made of the new series for the three- or four-digit industries through inspection of the charts and presentation of some published descriptive statistics based on these data.[3]

[2] See Bureau of the Census, *Chart Book—Manufacturers' Shipments, Inventories, and Orders: 1953–1963 (Revised)*, Series M3-1 Supplement, Washington, D.C., 1964.

[3] See Table 3-5 and the accompanying text. The statistics on the average percentage changes and related measures are given in Bureau of the Census, *Manufacturers' Shipments, Inventories, and Orders: 1947–1963 (Revised)*, Washington, D.C., 1963, App. F.

Classification by Industries and Market Groupings

Most of the series included in Table A-1 are broadly identified in terms of the products covered. The series in column 1 are classified by the industries into which the products apparently belong. The industry assignment was determined by comparing, in as much detail as possible, the description of the series with the description of the industry as given in the 1957 Standard Industrial Classification (SIC) manual. Some of the assignments, however, are merely approximate or tentative, as information was lacking to make a better determination.

The pre-1963 OBE series were derived from Internal Revenue Service (IRS) classifications, which in turn were based on the 1945 SIC. The new Census series are classified according to the 1957 SIC. In Table A-1, the 1957 SIC is applied throughout for uniformity of treatment.[4]

The new Census series include a classification by market groupings similar to that used in the FRB index of production. These are categories that distinguish between final products and semifabricated goods and materials, and between consumer goods (home goods and apparel and staples) and producer goods (nonautomotive equipment, construction materials, and other materials). There is a separate automotive equipment grouping and a defense products subgroup (which, however, must be combined with nonautomotive equipment as far as the feasible classification of our series is concerned). In short, there are six market categories: home goods and apparel (*MG*); consumer staples (*CS*); automotive equipment (*AE*); nonautomotive equipment and defense (*ND*); construction materials, supplies, and intermediate products (*CM*); and other materials, supplies, etc. (*OM*). In column 2, the series are classified according to these categories, by means of those generalizations and approximations as were considered best for the purpose. The series for these groupings and some additional ones (consumer durables other than automobiles, defense products, other nonautomotive equipment, machinery and equipment industries, and

[4] A detailed table, "Composition of Monthly Industry Survey Categories in Terms of 1957 Standard Industrial Classification System," is given in the 1953 Census Bureau source cited in note 2; see App. B, pp. 122–25. For another helpful table, "Conversion of 1945 Standard Industrial Classification System to Obtain Comparable Monthly Industry Survey Benchmark Levels," see *ibid.*, App. C, pp. 126–30.

total materials, supplies, and intermediate products) are described in Table A-1, lines 46–56.[5]

Composite Indexes and Series for Individual Industries or Products

Part II of the table includes monthly indexes of new and unfilled orders and shipments compiled for fourteen manufacturing industries by Standard & Poor's. These series, as well as a composite index from the same source, refer to current dollar values of N, U, and S and have been used for 1949–58. Some further detail on them is provided in Appendix C.

Part III is a catalogue of additional monthly indexes and aggregative series for N, S, and U. All but two of the series cover years before or during World War II. The indexes compiled by the National Industrial Conference Board are for 1929–44 and 1935–44 and distinguish between the durable goods sector and the nondurable goods sector of manufacturing. They are based on series in current-dollar values (lines 72–74). The indexes compiled by the Department of Commerce for 1920–33 are based mainly on trade association series for individual-product categories in physical units and are of rather limited coverage. The indexes of new orders and of unfilled orders are not strictly comparable but are similar (lines 75–81). There is also one state index of new orders, for 1924–41, by the Associated Industries of Massachusetts (line 84) and one company series of unfilled orders in physical units, for 1902–33, by the U.S. Steel Corporation (line 85). The postwar indexes in this section of the table are the McGraw-Hill series showing the relative changes in the value of new orders for nonelectrical machinery, total, and for export (lines 82 and 83).

Part IV is a listing of series of narrower coverage, for individual industries or types of product, which can generally be assigned to four-digit industries. Of the 26 different industries or product categories included, 11 represent the metalworking industries; 5, primarily nonelectrical machinery; 4, nonautomotive transportation equipment; and the rest are for paper, furniture, lumber, and clay products. The market

[5] A classification of the Monthly Industry Survey categories in terms of the market groupings is given in Appendix B of Census, *Manufacturers' Shipments* (1963), pp. 122–25.

groupings to which these products belong are essentially industrial equipment and construction and other materials and supplies, i.e., *ND*, *CM*, and *OM*. The series for 19 of the items are in physical units; the others are in current-dollar values. Except for a few quarterly series, the data are monthly as are all the series in the other parts of the table. Most of the series are gross of cancellations but for several items data on canceled and/or net orders are available. Trade associations provide the main source for these series, but some are collected by the Bureau of the Census (see Table A-1, note s).

Some Further Notes on the Composition of the Catalogued Data

The titles of the series included in Table A-1 already indicate that the data give a considerably better representation to durables than to nondurables and to goods used primarily by producers than to goods used primarily by consumers. The classifications in columns 1 and 2 clearly support the inference that our collection of series is heavily weighted with items serving investment in producers' durable equipment and new construction.

To be sure, the distinctions concerned are of necessity to some extent arbitrary and questionable. Producer goods have been defined to include finished goods used by business and all goods that require further fabrication whether destined ultimately for producers or consumers.[6] Because it comprises all commodities that are to undergo further processing, the producer goods category thus defined is certainly much larger than the consumer goods category, which consists only of finished goods of types used primarily by consumers. However, such considerations do not impair the usefulness of the more detailed classifications adopted in Table A-1 or the validity of the derived finding that data relating to manufacturers' orders represent predominantly goods which, in their present form, are demanded mainly by producers (business firms) rather than consumers (households). But it is also necessary to note the importance, among these goods, of materials that may be worked into either consumer goods or finished producer or capital goods. Moreover, government purchases

[6] Cf. Moses Abramovitz, *Inventories and Business Cycles*, New York, NBER, 1950, p. 359, n. 4.

surely account for a substantial proportion of manufacturers' orders, as indicated by the series for the "defense products" (government orders for other goods are not identified). Finally, export orders (i.e., new business received by domestic concerns from foreign buyers) also represent a significant, if smaller, component of the universe of orders held at any time by the U.S. industry.

The industrial composition of data on new orders and, particularly, of data on unfilled orders is associated with differences in the significance of orders for companies in different segments of manufacturing. In some industries new orders are customarily filled from stock. They are therefore practically identical with shipments. Here backlogs of unfilled orders are zero or insignificant, except perhaps at peak levels of demand when firms operate close to capacity, are unable to fill on receipt all new orders they can get, and are willing to accept some new business for future delivery. On the other hand, where production is to specification only, orders cannot be filled immediately and are therefore all of the "advance orders" variety. Today, however, many large manufacturing corporations produce highly diversified outputs that consist partly of goods made to stock and partly of goods made to order.

Accurate knowledge of the relative volume of the two modes of production within companies is not available. Consequently, it is impossible to differentiate systematically and with some acceptable degree of precision between advance orders and orders for items shipped directly from stock. Compilers of aggregate orders series note as one source of their difficulties that many companies do not maintain records on new orders for shelf goods (goods in stock).[7] In the OBE-Census data, there are figures on new orders, as well as on shipments, for all manufacturing industries, but for a large group of nondurable goods industries unfilled orders are not reported and there shipments and new orders are assumed to be equal. However, it is admitted that "a number of nondurable goods industries which are presently not considered as 'production to order' industries do operate on a backlog basis."[8] On

[7] See Walter W. Jacobs and Genevieve B. Wimsatt, "An Approach to Orders Analysis," *Survey of Current Business*, December 1949, p. 24 (Technical Appendix). Also, "Inventories, Shipments, Orders, 1929–1940," *Supplement to the Conference Board Economic Report*, Vol. II, National Industrial Conference Board, December 26, 1940, p. 8. However, orders supplied directly from stocks of finished goods on hand would then probably be recorded in some other form such as sales in the manufacturers' in-stock departments.

[8] Census, *Manufacturers' Shipments* (1963), p. 12.

the other hand, also according to the Census source, "there are a number of industries in the durable goods area which characteristically produce only for stock."[9] A comprehensive study of industry practices and structure as they relate to production to stock and to order was reported to be under active consideration in 1963 by the Bureau of the Census.[10]

As shown in Chapter 2, a criterion exists for judging approximately the relative importance of production to order in a given industry or for a given type of product. The method requires corresponding data on finished-goods inventories (Q) and unfilled orders (U) and consists in comparisons of the average levels of these variables. Prevalence of manufacture to stock is indicated if typically $Q > U$; prevalence of manufacture to order, if typically $Q < U$. The application of this criterion yields results that are more difficult to interpret for value aggregates that cover heterogeneous industry groups than for series relating to more narrowly defined industries or product categories, particularly those in physical units. But despite some ambiguities, due mainly to aggregation, the classifications based on the average ratios $\bar{Q}/\bar{U}$ are on the whole quite reasonable. This judgment is supported by the consistency of the results obtained not only with general information about the industries involved but also with specific and apparently systematic differences in relative amplitudes and timing between series relating to goods made largely to order and series relating to goods made largely to stock (Chapters 3 and 4).

The evidence of the $\bar{Q}/\bar{U}$ ratios assembled in Table 2-1 suggests that production to order, as defined by this criterion, carries a heavy weight within the aggregate of durable goods industries, and particularly in the metalworking, machinery, and nonautomotive transportation equipment industries. On the other hand, production to stock appears to dominate in the automotive assembly operations, the heterogeneous "other durables" group, and the aggregate of nondurable goods industries. Within the latter, only textiles, leather, paper, and printing and publishing are shown as reporting unfilled orders in the OBE-Census data. Among the individual-industry or product series for which the ratios were examined, there are about as many staples made

[9] *Loc. cit.*
[10] *Ibid.*, p. 20.

ordinarily to stock as items subject to various specifications and made largely to order. However, among the individual series that were subjected to the full analysis of relative amplitudes, timing, etc., the industries or product categories representing production to order exceed those representing production to stock by 11 to 7. Statistics on new orders as distinguished from shipments are simply more likely to be collected and are therefore more readily available in industries where advance orders are of greater relative importance.

While the differences in the relative importance of production to order are important enough in the present context to warrant these references,[11] an attempt to apply the dichotomous classification by type of manufacture to all items in Table A-1 was abandoned after preliminary work revealed the extent of difficulty and potential pitfalls that would inevitably beset such an undertaking. However, the Census-OBE work on the 1963 revision of the shipments and orders series produced some pertinent new information, a summary of which is presented in Table A-2.

This table contains, first, the over-all response rates of companies in the sample reporting shipments and covers forty-eight selected industry groups (column 1). It also provides some information about the sample design for the new series (note a).[12] The coverage was about 70 per cent for both the durable goods and the nondurable goods aggregates, but it was much less, between 40 and 50 per cent, for some industries consisting mainly of small firms, for example, lumber, furniture, and textiles. Against this background, Table A-2 lists, for each of forty-nine industry groups, the percentage of shipments accounted for by the companies that also report unfilled orders (column 2). The over-all figure for the durable goods sector was 65 per cent in August 1962, while that for the nondurable goods sector was only 38 per cent. Aircraft and electrical communication equipment show the highest coverage of unfilled orders, with figures of 96 and 91 per cent, and several industries in machinery, metalworking, and transportation equipment have entries in the 65–89 per cent range. On the other hand,

[11] In addition to Table 2-1 and its accompanying text, relevant information is given in Table 2-4; Chapter 3, passim (particularly in the discussion of Table 3-8); Chapter 4, passim (Tables 4-1, 4-2, 4-4, and their discussion); and Chapter 11 (Table 11-5).

[12] For a more detailed account, see Census, *Manufacturers' Shipments* (1963), Chap. IV and Table D, pp. 9–12.

Table A-2
Response Rate in Reporting Shipments and Percentage of Reported Shipments (S) Accounted for by Companies Also Reporting Unfilled Orders, August and October 1962

Line	Industry Group	Response Rate[a] in Reporting S (1)	Share of S Accounted for by Cos. Reporting Unfilled Orders[b] (2)
1	All manufacturing industries	70%	n.a.
2	Durable goods industries	72	65%
3	Primary metals	87	68
4	Blast furnaces and steel mills	97	74
5	Iron and steel foundries	74	82
6	Nonferrous metals	71	52
7	Other primary metals	80	76
8	Fabricated metal products	57	54
9	Metal cans, barrels, and drums	95	2
10	Hardware and structural steel	56	72
11	Other fabricated metal products	52	58
12	Machinery except electrical	67	69
13	Engines and turbines	94	86
14	Farm machinery	83	22
15	Construction, mining, and materials handling	72	59
16	Metalworking machinery	67	89
17	Miscellaneous equipment	49	70
18	Special-industry machinery	51	72
19	General industrial machinery	69	73
20	Office and store machines	84	88
21	Service industry machinery	56	86
22	Electrical machinery	78	73
23	Transmission and distribution equipment	81	82
24	Electric industrial equipment apparatus	79	80
25	Household appliances, including radio and TV	78	51
26	Communication equipment	91	91
27	Electronic components	66	66
28	Other electrical machinery	67	64
29	Transportation equipment	86	74
30	Motor vehicles, trucks, and bodies	91	54
31	Aircraft and parts	87	96
32	Other transportation equipment	78	78
33	Lumber products	43	30

(continued)

Table A-2 (concluded)

Line	Industry Group	Response Rate[a] in Reporting *S* (1)	Share of *S* Accounted for by Cos. Reporting Unfilled Orders[b] (2)
34	Furniture	48%	72%
35	Stone, clay, and glass products	65	28
36	Scientific and other instruments	76	47
37	Other durable goods	66	65
38	Nondurable goods industries	69	38
39	Textile mill products	50	45
40	Leather and leather products	62	38
41	Industrial products and cut stock	57	16
42	Other leather products	63	43
43	Paper and allied products	74	42
44	Pulp and paper	87	57
45	Paperboard containers	66	26
46	Printing and publishing	49	28
47	Newspaper, books, and periodicals	57	9
48	Other publishing and printing	40	48
49	Industries with unfilled orders, total[c]	n.a.	60
50	Nondurable goods industries with unfilled orders[d]	n.a.	38

n.a. = not available.

Source: Bureau of the Census, *Manufacturers' Shipments, Inventories, and Orders: 1947–1963 (Revised)*, Washington, D.C., 1963, Table D (for column 1) and Table E (for column 2), pp. 10–11.

[a] As of October 1962. Based on the sample for the new Census series, a probability sample selected as a subsample of the 1959 Annual Survey of Manufacturers. All companies with 1,000 or more manufacturing employees were included with certainty (with a sampling weight of 1.00). Smaller companies were sampled with probabilities proportional to their employment size within each industry category stratum. Approximately 7,500 companies were thus drawn for the panel, according to the Census source (p. 9). The over-all response rates, from which a selection is given below in this table, are in *ibid.*, Table D, together with response rates for the "certainty class" and three other sample weight ranges.

[b] As of August 1962. Measures the percentage of total shipments of each industry group that is accounted for by those companies in the group that also report unfilled orders.

[c] Includes all durable goods industries, textiles, paper, printing and publishing, and leather, except for the following: wooden containers; glass containers; metal cans, barrels, and drums; building paper; and automotive assembly operations.

[d] Includes textiles, paper (excluding building paper), printing and publishing, and leather.

even in these areas, the coverage of unfilled orders is much lower in some industries, although not below 50 per cent, except in two cases.[13] Elsewhere among the durables, it is weak (about 28–47 per cent) for lumber, stone, clay, and glass products, and instruments. Among the nondurable goods industries, the highest coverage is 57 per cent (pulp and paper); the lowest is 9 per cent (newspapers, books, and periodicals).

This evidence is, of course, not conclusive, because a company that does not report unfilled orders may nevertheless hold such orders. However, it is certainly suggestive and it is, on the whole, consistent with some other information I was able to assemble. It is to be hoped that more documentation on the importance of new advance orders and unfilled orders will be provided in the future work by the Bureau of the Census.[14]

[13] The two are farm machinery and equipment (22 per cent) and metal cans, barrels, and drums (2 per cent). The latter industry has been excluded from the group of industries with unfilled orders in the new Census data (see Table A-2, note c). (However, for "heavy type" steel barrels and drums alone, the $\bar{Q}/\bar{U}$ ratios in Table 2-1 indicate relatively very large backlogs in the period 1933–54.)

[14] This is particularly needed, since the proper benchmark levels for the order series are not known. The initial level of unfilled orders was established by applying the ratio of December 1947 unfilled orders to 1948 sales (shipments) for the reporting companies to the total 1948 sales estimates. Figures for earlier and subsequent months were computed from that point. New levels were established similarly by using the August 1962 U/S ratios. See Jacobs and Wimsatt, "Approach to Orders Analysis," p. 24; and Census, *Manufacturers' Shipments* (1963), p. 12.