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APPENDIX A

Coverage and Weighting of Industrial Materials Production Index

According to a study by the Bureau of the Census, the cost of materials to manufacturing industries in 1929 was $15,641 million (Table A-1). Materials costing $11,895 million, or 76% of this total, are represented in our index of industrial materials production. Our index includes all three unmanufactured fuels listed in the Census report (bituminous coal, anthracite, and natural gas); of the other materials 53% (by value) are directly represented, 21% are represented in more highly fabricated forms, and 26% are not represented. For example, among the materials listed in the report are cotton, tobacco, rubber, logs, iron ore, wheat, and coffee. The first three are directly represented by series in our index (cotton and tobacco consumption and rubber imports); the next three by semifabricated materials (lumber, steel ingots, and wheat flour); the last item (coffee) is not included in our index. In general imported materials are less well represented than materials of domestic origin: the index covers 87% of the domestic materials (including fuels) but only 43% of the imported materials. To put it differently, while the value of imported materials is 26% of the total cost of materials to manufacturers, the value of the imported materials included in our index is only 15% of the value of all the materials included.

The industrial breakdown in Table A-1 indicates that certain industries are less well represented by our materials series than others. In five industries—machinery; stone, clay and glass; paper; printing; and chemicals—the coverage of materials (including fuels) is less than two-thirds. If fuels are excluded, one other industry, transportation equipment, must be added to this list. While for most of the other industries the omission of fuels does not greatly affect the percentage coverage, the percentages for these industries (except chemicals) are reduced considerably. In three industries (machinery, transportation equipment, and printing) no raw materials other than fuels are included. But these industries use relatively small quantities of raw materials; the materials they use are largely the semifabricated products of other manufacturing industries (e.g., the iron and steel, nonferrous metal, and paper industries).

The coverage percentages are, of course, dependent on the industrial classification. For example, many finished products, such as

APPENDIX TABLE A-1

Coverage of the Industrial Materials Production Index, in Terms of the Value of Materials used in Manufacturing Industries, 1929

MANUFACTURING INDUSTRY	MATERIALS INCLUDED: DIRECTLY: FUELS Domestic (1)	DIRECTLY: OTHER THAN FUELS Domestic (2)	DIRECTLY: OTHER THAN FUELS Imported (3)	INDIRECTLY[1] Domestic (4)	INDIRECTLY[1] Imported (5)	MATERIALS NOT INCLUDED Domestic (6)	MATERIALS NOT INCLUDED Imported (7)	ALL MATERIALS Domestic (8)	ALL MATERIALS Imported (9)	ALL MATERIALS Total (10)	COVERAGE[2] OF: All materials (11)	Materials other than fuels (12)	Domestic materials (incl. fuels) (13)	Imported materials (14)
	(millions of dollars)										(per cent)			
1 Iron & steel & products	149	32	79	579	40	2	26	762	145	907	97	96	100	82
2 Nonferrous metals & products	36	..	25	477	43	44	235	557	303	860	68	66	92	22
3 Machinery	63	..	..	..	..	47	8	110	8	118	55	0	57	0
4 Transportation equipment	32	..	..	..	..	4	..	36	..	36	89	0	89	..
5 Petroleum & coal products	291	1,673	..	..	..	136	86	2,100	86	2,186	90	88	94	0
6 Stone, clay & glass products	126	78	1	..	..	113	28	317	29	346	59	36	64	3
7 Forest products	26	9	..	206	..	..	81	241	81	322	75	73	100	0
8 Paper & allied products	66	..	..	89	..	100	130	255	130	385	40	28	61	0
9 Printing & publishing	16	..	..	..	..	..	156	16	156	172	9	0	100	0
10 Textiles & products	87	856	620	..	..	22	409	965	1,029	1,994	78	77	98	60
11 Leather & manufactures	10	..	..	146	148	..	50	156	198	354	86	85	100	75
12 Food & kindred products	112	3,344	378	978	37	834	584	5,268	999	6,267	77	77	84	42
13 Miscellaneous industries	16	271	98	..	..	40	153	327	251	578	67	66	88	39
14 Chemicals & allied industries	70	13	..	284	66	96	362	463	428	891	49	44	79	15
15 Rubber products	15	..	209	1	..	..	..	16	209	225	100	100	100	100
All manufacturing industries[3]	1,115	6,276	1,410	2,760	334	1,438	2,308	11,589	4,052	15,641	76	74	88	43

Source: Tracy E. Thompson, *Materials Used in Manufactures: 1929* (Bureau of the Census, 1933). The value figures are the cost to the manufacturer of domestic and imported raw (unmanufactured) materials, imported semimanufactured materials, and unmanufactured fuels. The duplicating item, semimanufactured materials purchased from other manufacturing enterprises, is excluded. Two-thirds of the value of purchased energy was assumed to be derived from fuels (rather than water power) and was included in column (1). Some materials covered by the index but not reported separately by the Census are listed as 'not included'; e.g., materials used in producing cement, newsprint, canned corn, canned peas, and canned tomatoes. The figures in this table differ slightly from those given in the source, because we rounded the entries for individual materials to millions of dollars.

[1] Materials entering into commodities included in the index; e.g., iron ore, entering into steel ingots; logs, entering into lumber.

[2] Direct and indirect.

[3] Excluding Railroad repair shops, which the Census Bureau no longer considers a manufacturing industry.

hardware, are classified as belonging to the iron and steel industry, but machinery is not. Obviously, if the hardware industry were classified separately, the coverage might be very small, since the few *raw* materials used (other than fuels) might not be included in the index. On the other hand, if the machinery industry were classified with iron and steel products, the percentage coverage for this 'iron and steel' industry would be almost as high as it is when machinery is excluded (92 instead of 97%). Taking the classification as it stands, however, our index, including as it does some semimanufactured materials, provides more direct coverage of the industries that use semifabricated materials than it would were it based exclusively on *raw* materials.

The low percentages for the stone, clay and glass; paper; and chemicals industries reflect real lacunae in the coverage of raw materials. As in the case of other industries, materials of domestic origin are more fully covered than imported materials. In part the low percentages are due to our desire to obtain comparable indexes for the two wars. For example, the output of only one kind of paper, newsprint, was recorded during the first war; at present the industry can be much more adequately represented.

Table A-1 relates to 1929. We have no direct evidence on the coverage of materials used in manufactures in 1914 or 1939, the base years of our index, but a comparison of our value weights with Census figures on the value of materials is of some relevance. Our value weights aggregate $4,330 million in 1914, $9,524 million in 1939. According to the 1939 Census of Manufactures, the cost of materials, supplies, fuels and purchased energy was $13,811 million in 1914, $32,160 million in 1939. Hence the indicated 'coverage' in 1914 is 31%, in 1939, 30%. However, there are several things wrong with this comparison. Our index includes some materials, such as coal, that are not consumed wholly by manufacturing industries; some of our series are weighted not by prices but by value added (see Table A-3); and while there is relatively little duplication in our weights there is very considerable duplication in the Census figures since they include all the semimanufactured materials as well as the raw materials purchased by manufacturers. According to the Census study the cost of domestic semimanufactured materials in 1929 was 57% of the total cost of materials. We might estimate the cost of raw materials in 1914 and 1939 by assuming either that it was 43% of the total cost of materials, as in 1929, or that the cost of domestic semimanufactures

was the same percentage of the gross value of products in 1914 and 1939 as in 1929 (31%).[1] By the former method the coverage percentages for 1914 and 1939 are 73 and 69; by the latter, 65 and 66. Either computation is open to the first two objections mentioned above and to a further one—that many of the series weighted by prices in our index represent semimanufactured rather than raw materials. They do suggest, however, that there is no great difference in the materials coverage of our index in the two prewar years.

This conclusion is supported by the apparent absence of any relation between the coverage of materials used in different manufacturing industries and the rate at which the output of those industries grew between the two wars (Table A-2). Comprehensive indexes of

APPENDIX TABLE A-2

Percentage Change in Production and Value Added in Manufacturing Industries, 1914–39, and Coverage of Materials Used, 1929

MANUFACTURING INDUSTRY	PERCENTAGE CHANGE 1914-1939		PERCENTAGE COVERAGE OF MATERIALS USED 1929
	Production (1)	Value added (2)	(3)
Petroleum & coal products	+476	+471	90
Chemical products	+217	+313	49
Metals & products		+230	81
Paper & printing	+126	+214	31
Rubber products		+195	100
Foods & beverages	+93	+166	77
Stone, clay & glass products		+152	59
Textile products	+65	+134	78
Tobacco & miscellaneous products		+108	67
Leather products	+36	+68	86
Forest products	−2	+50	75
Total	+101	+178	76

SOURCES:

(1) Solomon Fabricant, *Employment in Manufacturing, 1899-1939* (National Bureau of Economic Research, 1942). We combined his indexes for Foods and Beverages, and Paper products and Printing & publishing by methods similar to his. Indexes for Nonferrous-metal products; Machinery; Rubber products; Stone, clay & glass products; and Miscellaneous products are not available for 1914. The percentage changes, 1914-39, in the indexes for Iron & steel products, Transportation equipment, and Tobacco products are +71, +270, and +126.

(2) Appendix Table A-5.

(3) Appendix Table A-1.

production in 1914 and 1939 are not available for all industries, but apparently the differences among the rates of growth of different

[1] According to the first method the cost of raw materials, imported semimanufactured materials, supplies, fuels and purchased energy in 1914 and 1939 would be $5,940 million and $13,830 million; according to the second, $6,670 million and $14,540 million. The estimates for 1914 are not far out of line with those of the Department of Commerce (*Commerce Yearbook, 1932*, I, 94): $5,300-6,500 million.

major industries are so large that the direction of the differences can be determined from figures on value added. That is, although the value added figures overestimate the rate of growth in production between 1914 and 1939, because of the general increase in prices (value added per unit of product), they do this more or less uniformly for each industry—at least, the inter-industrial differences in price movements are not sufficient to disturb greatly the relation between production and value added. Now the coefficient of rank correlation between (1) the percentage change (1914-39) in the value added in eleven manufacturing industries and (2) the percentage coverage of the raw materials used in those industries is very small, −.05. A high negative correlation would, of course, imply that the coverage of our index was weakest in industries whose production (and, presumably, consumption of materials) had grown most rapidly, so that the over-all coverage would rapidly diminish. But this does not appear to be the case.

Table A-1 does not indicate the extent to which our index covers materials produced in the mining industries or used in the construction industry. The total value of minerals produced in 1939 was approximately $3,937 million.[2] Minerals directly represented in our index were valued at $3,185 million, 81% of the total; those indirectly represented (iron ore and bauxite) accounted for $161 million, or another 4%. The coverage of minerals in 1939 is, therefore, about 85%. A similar computation for 1914 indicates a coverage of 84% ($1,271 million direct, $73 million indirect, $1,608 million total).

Since the materials used by the construction industry are, largely, 'finished' products of manufacturing industries,[3] the extent to which our index covers materials used in manufacturing (74%, excluding fuels, in 1929) indicates roughly and indirectly the coverage of manu-

[2] Cf. Table A-5, note. We adjusted the Bureau of Mines total ($4,914 million) to eliminate internal duplication and duplication with manufacturing, and to obtain comparable figures for 1914 and 1939. The adjustment for duplication is rough, going too far in some directions, not far enough in others. Our total is larger than that given by the census of mineral industries, 1939 ($3,222 million); while the latter total is conceptually preferable, it is not distributed by products and there is no comparable figure for 1914.

[3] The only unmanufactured construction materials listed by the census of the construction industry, 1929, were sand, gravel, crushed stone, slag, and cinders, though some other unmanufactured materials may be included in 'all other materials'. The value of the specified items was $164 million, or 10.4% of the total cost of materials; that of 'all other' was $156 million, or 9.9%. Sand and gravel and crushed limestone are included in our index.

factured construction materials. Since manufacturing industries differ both in respect of the coverage provided by our index and in the extent to which they are sources of construction materials, the estimate can be improved by weighting the coverage percentages according to the value of construction materials produced in each industry. A weighted average computed in this way for 1929 is 69%.[4]

Although the foregoing estimates indicate that our index is by no means narrow in its coverage of industrial materials, it may nevertheless not be representative. In the first place the breakdown of materials included may not distinguish significantly different types of materials. Many of the series in our index represent rather broad aggregates, such as steel ingots, lumber, cotton, wool, milk, and tobacco. Had these series been subdivided according to grade or type of material, or by criteria related to the kind of products fabricated from the material (e.g., apparel class and carpet class wool), and weighted separately, our results would have been different. A weighted aggregate index often differs considerably from a simple aggregate.[5] Unfortunately in World War I it was impossible to subdivide many of the series.[6] The effect on the total index in War II does not appear to be large; the current Federal Reserve index excluding manhours series covers the same general area of production as our index but is based on a finer subdivision of commodities (74 series compared with our 47, cf. App. Table 5), yet the two indexes follow one another closely.

[4] The weights (applied to the percentages in column 12 of Table A-1) are the values of construction materials produced in 1929, classified by major manufacturing industries (Simon Kuznets, *Commodity Flow and Capital Formation,* Volume One, National Bureau of Economic Research, 1938, Table I-5). The percentage distribution of the total value ($5,011 million) is: Iron and steel, 35; Forest products, 25; Stone, clay and glass, 19; Chemicals, 8; Nonferrous metals, 5; Machinery, 3; Miscellaneous, 3; Petroleum and coal products, 1; Paper, 1; Rubber, 0.1.

[5] For example, in the Federal Reserve Board index, open hearth and electric steel are weighted separately, with the weight per ton for electric steel approximately four times that for open hearth. Since the output of electric steel increased much more rapidly than the output of other steel from 1939 to 1942 (287 and 58%, respectively), the weighted index rises 75% while our index, based on total tonnage of steel ingot production, rises only 63%.

[6] One possible distinction that was overlooked was to subdivide leaf tobacco consumption according to utilization in cigars, cigarettes, and manufactured tobacco and snuff. An index weighted by value added in these three industries differs from the simple aggregate consumption, as the following tabulation indicates.

Indexes of Leaf Tobacco Consumption

	1914	*1915*	*1916*	*1917*	*1918*	*1919*	*1939*	*1940*	*1941*	*1942*
			(1914:100)					*(1939:100)*		
Simple	100	96	104	112	117	110	100	104	114	128
Weighted	100	92	102	113	118	117	100	104	117	134

In the second place the behavior of the materials not included in our index may differ from that of the materials that are included. The fact that the omitted materials (cf. Table A-1) are not concentrated in any one industry but are rather widely dispersed suggests that their behavior as a whole is not likely to be greatly different from that of the total.[7] On the other hand, Table A-1 also shows that almost two-thirds of the omitted materials (by value) are of foreign origin, and our indexes of products of domestic and foreign origin differ considerably in both wars (see text Table 4).

Another reason for expecting that the omitted materials may behave differently appears when one considers the changing 'population' of materials. Since the same materials are included in our index in both wars, new materials discovered or developed between the wars must be counted as 'omitted' in the second war but not in the first. And since the output and utilization of new materials characteristically proceeds rapidly, the effect of this omission must be to reduce the rate of increase in our index in the second war relative to that in the first. However, while the direction of the effect is obvious, its magnitude is uncertain. Some light is thrown on the matter by the preceding discussion of the coverage of minerals production and of materials used in manufacture, by which it appears that the coverage in 1939 was about the same as in 1914. Another approach is described in the text (Sec. I): a sample of 'new' materials, identified by the rapidity of their growth from 1914 to 1939, is eliminated from the World War I index. This group of commodities rises more than twice as fast from 1914 to 1917 as the total index (71% as compared with 32%). If the new commodities omitted from the World War II index were as important in 1939 as this group was in 1914 (11% by weight) and rose at the same rate from 1939 to 1942 as this group did from 1914 to 1917, their inclusion in our index would make it rise 39% (instead of 35%) from 1939 to 1942.

The bias resulting from the omission of new materials may be 'measured' also by comparing the trend of our index with that of other indexes of broader coverage. For example, between 1914 and 1939 our index (using 1939 weights) rises 59%, or 1.9% per year; the Fabricant-Barger index of mining and manufacturing output (see

[7] The percentage distribution of the total value of the omitted materials ($3,746 million) is: Food, 38; Chemicals, 12; Textiles, 12; Nonferrous metals, 7; Paper, 6; Petroleum and coal products, 6; Miscellaneous, 5; Printing, 4; Stone, clay and glass, 4; Forest products, 2; Machinery, 1; Leather, 1; Iron and steel, 1; Transportation equipment, 0.1.

text Table 9) rises 100%, or 2.8% per year. Hence the downward bias in the materials index averages about 1% per year in this period, and, as one would expect, it seems larger now than in the earlier years—a downward bias of 2% develops in the two year interval 1937-39, whereas it is less than 1% in the five year interval 1914-19. However, the entire downward bias cannot be attributed to inadequate coverage of new materials, for between 1914 and 1939 both the degree of fabrication and the efficiency of utilization of materials undoubtedly increased.

The most direct approach to the question is, of course, to consider what new materials are omitted from the index. It seems clear that the omission of new *raw* materials is a rather unimportant defect.[8] Possibly of greater significance is the omission of new synthetic materials, such as plastics, rayon staple fiber, nylon, and synthetic rubber. A production index for these materials might rise three or four hundred per cent between 1939 and 1942. The value of their output in 1939 might be roughly estimated at $100 million, or slightly more than 1% of the total value weight of the series in our index.[9] Consequently the addition of these items to our list of series might considerably affect certain of our group indexes, such as textiles, but would not add more than 3 or 4 points (percentage of 1939) to the total index in 1942.

* * * *

The values assigned to the materials in Table A-1 represent the cost of materials to manufacturers, materials that are produced on farms, in forests, and in mines. Hence, to use these values as weights in a production index would be to measure the output of agriculture, forestry, and mining rather than that of 'industry' (mining, manufacturing, and construction). Since we are interested in raw materials

[8] Compare, for example, the list of minerals in the Bureau of Mines summary tables for 1914 and 1939 (*Minerals Resources, 1917* and *Minerals Yearbook, 1941*). Twenty-four of the minerals listed in 1939 do not appear in the 1914 table—see Table A-5, note b, '1939' (excluding iron ore for paint, which was included in mineral paints —natural pigments in 1914). Some of these, such as sulfur ore, are obviously not 'new'; on the other hand, some new minerals are probably not listed, although it seems likely that all the important ones would be. In any case, the total value of this group of 24 in 1939 was only $21.5 million, or one-half of one per cent of the total value of mineral products in 1939 (according to our estimate of the total, which does not include the 'new' products).

[9] According to the Census of Manufactures, the value of plastic materials (including synthetic rubber) produced in 1939 was $78 million; the value of rayon staple fiber, $14 million. Commercial production of nylon began in December 1939.

only so far as they reflect the output of 'industry', we endeavored to select weights for our index that would represent values produced *by* 'industry' rather than costs of materials *to* 'industry'.

In general, we have tried to avoid the use of imputed weights; i.e., weights representing values produced at some further stage of production than is actually represented by the commodity series in question. Thus the weight factor for steel ingots is the price of ingots; the value added to steel in the process of further fabrication is not included. Wheat flour is weighted by value added in the flour milling industry; value added in the production of bread or other bakery products is not included. However, the use of imputed weights for certain series is unavoidable if such series are to be included at all. To cotton consumption, for example, we assign the value added in the cotton fabric producing industry. Altogether the imputed weights in our index constitute about 28% of the total in 1914, 30% in 1939 (Table A-3).

The application of imputed weights to series representing the consumption of materials assumes that the physical product of the process of fabrication (i.e., the value added to the material, in con-

APPENDIX TABLE A-3

Use of Imputed Weights in Industrial Materials Production Index

SERIES WEIGHTED BY VALUE, WITH NO IMPUTATION		SERIES WEIGHTED BY VALUE ADDED, WITH NO IMPUTATION		SERIES WEIGHTED BY VALUE ADDED, WITH IMPUTATION	
Commodity	% *Weight, 1939*	*Commodity*	% *Weight, 1939*	*Commodity*	% *Weight, 1939*
1 Steel	16.8	20 Woodpulp	0.9	6 Tin	1.3
2 Aluminum[1]	0.8	21 Newsprint	0.2	22 Cotton	6.0
3 Copper[1]	2.8	26 Cattle hide leather	0.6	23 Wool	3.8
4 Zinc	0.8	27 Calf & kip leather	0.1	24 Rayon yarn	3.0
5 Lead	0.7	28 Goat & kid leather	0.1	25 Silk	0.5
7 Magnesium	*	29 Sheep & lamb leather	0.1	35 Milk	2.9
8 Bituminous coal	7.7	30 Wheat flour	1.5	36 Cattle	2.0
9 Anthracite	2.0	31 Sugar	0.6	37 Calves	0.3
10 Petroleum	13.3	32 Canned corn	0.1	38 Hogs	1.8
11 Natural gas	5.8	33 Canned tomatoes	0.1	39 Sheep & lambs	0.3
12 Portland cement	1.9	34 Canned peas	0.1	45 Leaf tobacco	3.7
13 Sand & gravel	1.1	40 Malt liquors	3.8	47 Rubber	4.3
14 Crushed limestone	0.6	41 Distilled spirits	0.3		
15 Gypsum	*	42 Cottonseed oil	0.3		
16 Sulphur	0.4	44 Linseed oil	0.1		
17 Graphite	*	46 Ethyl alcohol	0.3		
18 Lumber	5.8				
19 Turpentine	0.1				
43 Cotton linters	0.1				
Total	60.7	Total	9.2	Total	29.9

For description of series and their weights see Appendix Tables 2 and 3.

* Less than 0.05%.

[1] Value of imports of ore, crude metal, and scrap is deducted from total value of metal produced.

stant prices) varies proportionately with the amount of material consumed. That is, the physical product per unit of material is assumed to remain constant. This assumption can be objected to even when the kinds of product made from the materials remain the same. Changes in the efficiency with which materials are used are ignored; and when two or more materials are combined to produce a finished product, the total value added cannot be distributed between them except arbitrarily. But when there is a radical change in the kind of product made from the materials, it is hard to justify the method even as a first approximation to an estimate of total output. An assumption, for example, that the value added (in constant prices) per ton of steel consumed in the locomotive industry remains the same when that industry is converted from locomotive to tank production is an assumption that would be extremely difficult to test objectively, if it can be tested at all.

The series that receive imputed weights in our index are textiles, animal slaughter, milk, tobacco, rubber, and tin. Our assumption that the 'physical volume' of value added to these materials per unit remained constant during each war expansion may not be justified. Complete information is of course not available. We think the assumption is sufficiently near the truth in the case of animal slaughter. Apparently the value added per pound of milk used in manufacturing increased substantially in both wars, owing to the greater relative increase in the output of products with high value added relative to quantity of milk consumed (canned milk and ice cream); in tobacco also the value added per unit of material increased in both wars, owing to a greater relative increase in production of cigarettes and cigars than manufactured tobacco and snuff; as for textiles, rubber, and tin there is little information upon which to base a judgment.

One alternative would be to omit the series for which it is necessary to use imputed weights. The effect on the index (Table A-4) is to reduce the rise from 1914 to 1917 to 30%, and to increase the rise from 1939 to 1942 to 39%. Thus the difference between the rates of increase in the two wars is larger than that in the industrial materials production index. The pattern of year to year changes in the first war is not altered appreciably, but in the second war there is a 6% rise from 1941 to 1942, instead of no change. While this is larger than the 2% increase between 1916 and 1917, it is smaller than the 14% rise from 1939 to 1940 and the 15% rise from 1940 to 1941.

Another alternative would be to use imputed weights to the fullest

Appendix Table A-4

Effect of the Use of Imputed Weights on Industrial Materials Production Index

	ORIGINAL INDEX 47 SERIES (1)	INDEX WITH NO IMPUTED WEIGHTS 35 SERIES (2)	INDEX WITH FULL IMPUTED WEIGHTS 47 SERIES (3)
		(1914:100)	
1913	107	108	108
1914	100	100	100
1915	110	109	112
1916	127	127	134
1917	132	130	138
1918	127	124	133
1919	119	113	122
		(1939:100)	
1937	103	104	102
1938	84	84	81
1939	100	100	100
1940	115	114	116
1941	135	131	139
1942	135	139	143

SOURCES:
(1) For a list of series included and their weights see Appendix Tables 1, 2, 3, and 5.
(2) Same as (1), excluding the series with imputed weights listed in Appendix Table A-3.
(3) The groups of series listed in the note to Appendix Table A-5 were first combined into group indexes (1914, 1939:100) with our weights, then weighted by the corresponding figures (1914, 1939) on total value added, mining and manufacturing (Appendix Table A-5).

possible extent. Before examining the effect of such a procedure upon our index, let us consider how much the weights we actually use must be inflated if they are to be raised to the level of total industrial production. According to Table A-5, the weights used in our index would have to be nearly tripled, on the average, if they were to represent the total value of minerals and value added by manufacturing. Only about one-third (42% in 1914, 34% in 1939) of the value of the output of mining and manufacturing is covered.[10] If we include in the industrial total the value added by the construction industry, the coverage is still narrower (about 35% in 1914, 28% in 1939).[11]

[10] The reduction in coverage between 1914 and 1939 corresponds closely with the smaller rate of increase in physical production as shown by our index as compared with the Fabricant-Barger index of mining and manufacturing output. In 1939 the ratio of our index to the Fabricant-Barger index (both on a 1914 base) is 159/200 or .80; the ratio of the 1939 to the 1914 coverage percentages is 34/42 or .81.

[11] According to the census of construction the ratio of cost of materials to value of work performed was .45 in 1939. Applying this ratio to the Department of Commerce estimates of construction work done in 1915 (1914 has not been estimated) and 1939, we obtain estimates of the cost of materials, which, when deducted from the total, yield estimates of value added — 1915: $2.3 billion; 1939: $5.5 billion.

Appendix Table A-5

Coverage of the Industrial Materials Production Index, in Terms of Value Added in Mining and Manufacturing

Group	1914					1939				
	Weights assigned to series in index		Total value added mining & mfg.		Coverage	Weights assigned to series in index		Total value added mining & mfg.		Coverage
	(mil. $)	(%)	(mil. $)	(%)	(%)	(mil. $)	(%)	(mil. $)	(%)	(%)
1 Metals & products	841	19.4	3,069	29.9	27	2,218	23.3	9.345	33.2	24
2 Bituminous coal & products	494	11.4	524	5.1	94	736	7.7	816	2.9	90
3 Anthracite	188	4.3	188	1.8	100	187	2.0	187	0.7	100
4 Petroleum & kindred products	308	7.1	396	3.9	78	1,816	19.1	2,489	8.9	73
5 Stone, clay & kindred products	128	3.0	534	5.2	24	345	3.6	1,336	4.8	26
6 Lumber & products	537	12.4	808	7.9	66	559	5.9	1,214	4.3	46
7 Paper & printing	45	1.0	846	8.3	5	102	1.1	2,658	9.5	4
8 Textiles & products	533	12.3	1,386	13.5	38	984	10.3	3,244	11.5	30
9 Leather & products	117	2.7	353	3.4	33	83	0.9	595	2.1	14
10 Manufactured foods	452	10.4	1,034	10.1	44	932	9.8	3,093	11.0	30
11 Alcoholic beverages	270	6.2	286	2.8	94	391	4.1	424	1.5	92
12 Tobacco products	203	4.7	203	2.0	100	350	3.7	351	1.2	100
13 Chemicals	76	1.8	484	4.7	16	415	4.4	1,948	6.9	21
14 Rubber products	138	3.2	138	1.3	100	406	4.3	407	1.4	100
Total	4,330	100	10,249	100	42	9,524	100	28,107	100	34

The accompanying tabulation indicates the composition of the industry groups. For a description of the series included in our index and their weights see Appendix Tables 2 and 3. The values of mineral products are from *Minerals Resources, 1917* and *Minerals Yearbook, 1941* (preprint), with the following adjustments:

	1914	*1939*
	(million dollars)	
Bureau of Mines Total Value of Mineral Products	2,118	4,914
Add:		
Items not included in Bureau of Mines total[1]	76	159
Deduct:		
Items not given or not given separately in both years[2]	9	53
Items omitted to avoid internal duplication or duplication with manufacturing[3]	577	1,082
Items not fitting our industrial classification[4]	*	*
Difference due to rounding	...	1
Adjusted Total Value of Mineral Products	1,608	3,937

[1] Iron ore (which we substitute for pig iron) and clay, raw (1914 only, since it is included in the Bureau of Mines 1939 total).

[2] 1914 and 1939: Antimonial lead, antimony ore and concentrates, bismuth, cadmium compounds, molybdenum, nickel, selenium, titanium ore, diatomite, gems, graphite, lithium minerals, marl, mineral waters, tripoli. 1914: Mineral paints (natural pigments). 1939: Beryllium ore, iron ore for paint, magnesium, tantalum ore, tellurium, andalusite, aplite, calcite, chats, dumortierite, flint lining for tube mills, helium, iodine, kyanite, magnesium salts, natural sulfonated bitumen, olivine, optical fluorspar, pebbles for grinding, potassium salts, silica sand and sandstone, sodium salts, strontium minerals, sulfur ore, vermiculite.

[3] Aluminum, ferro-alloys, pig iron, asphalt-oil (1914 only, since it is not included in the Bureau of Mines 1939 total), cement, clay products, sand-lime brick, sulfuric acid (byproduct).

[4] Peat.

* Less than $0.5 million.

(note to App. Table A-5 concl.)

The value added by manufacturing industries is based on Fabricant's classification of the Census of Manufactures figures for 1914 (*The Output of Manufacturing Industries, 1899–1937*, National Bureau of Economic Research, 1940), and a comparable classification of the Census of Manufactures figures for 1939. The value added for Miscellaneous products is omitted (1914: $287 million; 1939: $661 million). Also, we exclude internal revenue taxes from value added in the Alcoholic beverages and Tobacco products industries.

COMPOSITION OF INDUSTRY GROUPS

INDUSTRY GROUP NO.	SERIES INCLUDED IN INDEX	MINERAL PRODUCTS	MANUFACTURING INDUSTRIES
1	Steel ingots, aluminum, copper, zinc, lead, tin, magnesium	Bauxite, cadmium (metal), chromite, copper, gold, iron ore, lead, manganese ore, manganiferous ore, mercury, platinum metals, silver, tin, tungsten ore, uranium & vanadium ores, zinc, fluorspar	Iron & steel products, nonferrous-metal products, machinery, transportation equipment
2	Bituminous coal	Bituminous coal	Coke oven products, fuel briquets
3	Anthracite	Anthracite	
4	Petroleum, natural gas	Petroleum, natural gas, natural gasoline	Petroleum refining; lubricants, n.e.m.; oils, n.e.c.
5	Portland cement, sand and gravel, crushed limestone, gypsum, graphite	Asbestos, asphalt (native), clay (raw), emery, feldspar, fuller's earth, garnet, grindstones and pulpstones, gypsum, lime, magnesite, mica, millstones, oilstones, pumice, sand & gravel, silica, slate, stone, talc & soapstone	Stone, clay & glass products
6	Lumber, turpentine		Forest products
7	Woodpulp, newsprint		Paper products, printing & publishing
8	Cotton, wool, silk		Textile products
9	Cattle hide leather, calf and kip leather, goat and kid leather, sheep and lamb leather		Leather products
10	Wheat flour, sugar, canned corn, canned tomatoes, canned peas, milk, cattle, calves, hogs, sheep and lambs		Foods, nonalcoholic beverages
11	Malt liquors, distilled spirits		Alcoholic beverages
12	Leaf tobacco		Tobacco products
13	Sulfur, rayon yarn, cottonseed oil, cotton linters, linseed oil, ethyl alcohol	Arsenious oxide, barite, boron minerals, bromine, calcium-magnesium chloride, mineral paints (zinc and lead pigments), phosphate rock, pyrites, salt, sulfur	Chemical products
14	Rubber		Rubber products

The coverage is further reduced if we exclude the imputed weights; i.e., the direct coverage of mining, manufacturing, and construction was about 25% in 1914, 20% in 1939.

The variation in the coverage of different mining and manufacturing industries is wide.[12] The high percentages for tobacco and rubber reflect a liberal use of imputed weights, while the low percentages for textiles and foods indicate a more conservative use of imputed weights. The percentages for the remaining industries reflect the direct coverage of our series. These percentages are influenced by limitations of materials coverage as well as finished products coverage, since our list of series is not complete in either respect. For example, clay, an important material in the Stone, clay and kindred products group, is not included among our series; but its value, and the value added to it in the manufacture of clay products, is included in the total value added by mining and manufacturing. Furthermore, there is only a rough correspondence between the distribution of our series among the industry groups and the actual industrial distribution of materials. The value added in the production of furniture, for example, is included in Lumber and products; although the furniture industry uses textile materials, steel springs, etc., the only series that we include in that group are lumber and turpentine production. Similarly, transportation equipment is assigned to Metals and products, although textiles, leather, wood, glass, etc. are utilized in the production of such equipment.

The result of applying the comprehensive mining and manufacturing weights to group indexes constructed from our series is recorded in Table A-4, col. 3. The new index rises somewhat faster in both wars than does our index of industrial materials production: 38%, 1914-17; 43%, 1939-42. The pattern of year to year changes is not altered greatly, except that the new index rises 3% from 1941 to 1942.

An index based upon an extensive application of imputed weights may be more useful, for some purposes, than our index of industrial materials production. But we believe that during a war expansion it is as misleading to call such an index an index of total production as it is to call our index an index of total production. At most, both

[12] We have not attempted to distribute, among the industry groups in Table A-5, the value added by the construction industry. Though it might be done on the basis of the value of the construction materials produced in the various industries (cf. notes 2 and 4 above), this procedure seems excessively arbitrary.

are indexes of what total production *might have been* had we continued to produce peacetime products by prewar methods; i.e., by methods such that the value added to materials per unit (in constant prices), remained at the prewar level. The difference between them is that in the index with imputed weights, greater allowance is made for prewar differences among materials with respect to the value added to them in the process of fabrication. Since not only the methods of production but also the goods produced are drastically changed during a wartime expansion, neither index measures the 'actual' change in total production.

The difference between these indexes is similar, conceptually, to that between an index of manhours constructed simply by adding the number of manhours worked in different industries, and one constructed by weighting the number of manhours worked in each industry by the value added per manhour in some peacetime base period. Neither would be an index of production, since neither takes account of possible changes in output (value added) per manhour. Both are indexes, on different assumptions, of what production might have been had there been no change in peacetime products or methods of production. The fact that indexes constructed on the basis of manhours and indexes constructed on the basis of materials differ (see text, Sec. IV) is no reflection on either. The difference merely indicates, on the one hand, that the proportions of two factors of production (manhours and materials) have not remained the same, and, on the other hand, that one can arrive at widely different estimates, on the basis of different assumptions, of the nation's peacetime capacity to produce.

Appendix Table 1

Series used in Industrial Materials Production Index, 1913–19, 1932, 1937–42

	STEEL mil. s. t. (1)	ALUMINUM mil. lbs. (2)	COPPER mil. lbs. (3)	ZINC th. s. t. (4)	LEAD th. s. t. (5)	TIN th. l. t. (6)	MAGNESIUM th. lbs. (7)	BITUMINOUS COAL mil. s. t. (8)
1913	35.1	56	1,887	436.2	535.5	45.4	a	478
1914	26.3	67	1,790	437.6	603.1	41.7	a	423
1915	36.0	108	2,026	598.3	629.1	51.1	87.5	443
1916	47.9	154	2,959	797.5	667.1	63.2	75.4	503
1917	50.5	162	3,195	801.6	704.8	69.3	115.8	552
1918	49.8	155	3,138	654.9	737.2	72.5	284.1	579
1919	38.8	165	2,379	596.0	604.2	50.6	127.5	466
1932	15.1	153	1,177	278.2	486.4	35.5	792.0	310
1937	56.6	418	3,198	724.6	742.3	90.1	4,540.0	446
1938	31.8	365	2,305	567.0	608.7	59.8	6,433.4	349
1939	52.8	435	3,019	696.8	726.0	82.4	6,700.1	395
1940	67.0	580	3,691	897.3	793.2	97.2	12,521.7	461
1941	82.8	b	b	b	b	b	b	514
1942	86.1	b	b	b	b	b	b	580

	ANTHRACITE mil. s. t. (9)	PETROLEUM mil. bbls. (10)	NATURAL GAS bil. cu. ft. (11)	PORTLAND CEMENT mil. bbls. (12)	SAND & GRAVEL mil. s. t. (13)	CRUSHED LIMESTONE mil. s. t. (14)	GYPSUM mil. s. t. (15)	SULPHUR th. l. t. (16)
1913	91.5	248	582	92.1	77.8	35.2	2.60	491
1914	90.8	266	592	88.2	77.7	32.7	2.48	418
1915	89.0	281	629	85.9	74.7	31.6	2.45	521
1916	87.6	301	753	91.5	87.1	32.2	2.76	650
1917	99.6	335	795	92.8	74.5	26.6	2.70	1,134
1918	98.8	356	721	71.1	59.7	19.1	2.06	1,354
1919	88.1	378	746	80.8	68.7	21.8	2.42	1,191
1932	49.9	785	1,556	76.7	118.7	35.1	1.42	890
1937	51.9	1,279	2,408	116.2	186.9	56.1	3.06	2,742
1938	46.1	1,214	2,296	105.4	179.2	57.5	2.68	2,393
1939	51.5	1,265	2,477	122.3	223.5	65.7	3.23	2,091
1940	51.5	1,353	2,660	130.2	235.5	66.0	3.70	2,732
1941	55.3	1,404	2,813	164.0	285.2	78.5	4.79	3,139
1942	60.0	1,385	2,982	182.7	307.0	84.6	4.65	3,460

Appendix Table 1 (cont.)

	Graphite th. s. t. (17)	Lumber bil. bd. ft. (18)	Turpentine th. bbls. (19)	Woodpulp mil. s. t. (20)	Newsprint th. s. t. (21)	Cotton mil. running bales (22)	Wool mil. lbs. (23)	Rayon yarn mil. lbs. (24)
1913	26.2	38.4	694	2.89	1,305	5.58	353	1.82
1914	20.0	37.3	566	2.89	1,313	5.45	357	2.42
1915	22.5	37.0	537	2.89	1,239	6.01	371	3.88
1916	42.1	39.8	625	3.44	1,315	6.62	420	5.78
1917	40.0	35.8	502	3.51	1,359	6.82	416	6.54
1918	18.5	31.9	359	3.31	1,260	6.18	399	5.85
1919	26.0	34.6	387	3.52	1,375	5.92	329	8.28
1932	5.6	10.2	573	3.76	1,009	5.02	230	135
1937	27.3	26.0	699	6.57	946	7.42	381	322
1938	15.5	21.6	709	5.93	820	5.90	285	258
1939	20.6	25.0	605	6.99	939	7.37	396	329
1940	29.4	28.9	556	8.85	1,013	8.06	408	390
1941	b	33.5	549	9.98	1,015	10.59	648	451
1942	b	31.8	592	10.14	953	11.44	604	479

	Silk mil. lbs. (25)	Cattle hide leather mil. hides (26)	Calf & kip leather mil. skins (27)	Goat & kid leather mil. skins (28)	Sheep & lamb leather mil. skins (29)	Wheat flour mil. bbls. (30)	Sugar mil. l. t. (31)	Canned corn mil. cases (32)
1913	34.0	16.9	22.2	39.7	33.3	114	2.28	7.28
1914	30.6	18.1	16.6	34.6	29.7	116	2.49	9.79
1915	37.0	23.1	11.2	43.9	46.5	115	2.62	10.12
1916	40.4	26.5	14.6	60.7	56.5	120	2.73	9.13
1917	43.0	24.5	11.6	51.2	45.7	118	2.40	10.80
1918	48.2	25.0	11.5	37.3	25.4	112	2.16	11.72
1919	55.0	24.4	12.0	52.7	19.4	133	2.87	13.55
1932	74.8	14.6	11.6	37.0	28.8	108	3.75	9.36
1937	61.5	22.4	12.0	46.6	34.2	106	4.24	23.54
1938	54.3	19.0	13.0	31.9	28.9	109	3.99	20.47
1939	51.8	22.1	14.0	40.4	39.4	112	3.83	14.57
1940	41.9	21.1	11.4	37.7	37.9	109	3.97	15.52
1941	b	28.1	13.1	45.4	51.9	112	4.71	26.11
1942	b	30.8	12.3	41.1	53.6	115	2.93	32.00

APPENDIX TABLE 1 (concl.)

	CANNED TOMATOES mil. cases (33)	CANNED PEAS mil. cases (34)	MILK bil. lbs. (35)	CATTLE mil. lbs. (36)	CALVES mil. lbs. (37)	HOGS mil. lbs. (38)	SHEEP & LAMBS mil. lbs. (39)	MALT LIQUORS mil. bbls. (40)
1913	24.25	8.77	22.3	6,999	325	7,319	1,138	65.8
1914	25.98	8.85	23.1	6,743	288	6,994	1,124	63.0
1915	14.46	9.27	24.2	7,032	316	8,060	977	59.2
1916	22.43	6.69	25.5	8,044	421	8,832	955	59.7
1917	25.73	9.83	26.9	9,750	582	7,053	748	55.6
1918	27.11	11.06	26.8	10,894	639	9,150	826	39.0
1919	18.45	8.68	30.5	9,284	691	9,324	990	18.4
1932	20.37	10.37	46.3	7,189	784	10,397	1,445	0
1937	26.23	23.47	48.3	9,051	1,190	7,139	1,462	58.3
1938	23.13	25.46	53.2	9,004	1,036	8,439	1,534	53.6
1939	24.47	16.07	53.1	8,906	1,006	9,735	1,483	55.2
1940	29.53	25.20	55.9	9,175	1,024	11,716	1,495	53.9
1941	31.76	28.72	60.5	10,518	1,070	11,214	1,600	60.6
1942	40.00	35.50	61.3	11,779	1,198	13,205	1,925	67.9

	DISTILLED SPIRITS mil. tax gal. (41)	COTTONSEED OIL mil. lbs. (42)	COTTON LINTERS th. running bales (43)	LINSEED OIL mil. lbs. (44)	LEAF TOBACCO mil. lbs. (45)	ETHYL ALCOHOL mil. proof gal. (46)	RUBBER mil. lbs. (47)
1913	108.9	1,422	312	451	593	156	196
1914	81.4	1,584	312	436	589	134	187
1915	65.1	1,486	636	539	565	160	265
1916	72.6	1,492	852	498	612	225	319
1917	51.6	1,344	960	429	660	181	462
1918	15.6	1,284	1,068	376	692	160	349
1919	2.7	1,430	216	453	648	112	577
1932	5.6	1,571	636	327	690	129	947
1937	201.6	1,626	804	665	873	215	1,378
1938	146.3	1,678	744	441	865	193	953
1939	132.2	1,390	953	565	885	222	1,151
1940	163.7	1,274	1,116	606	923	263	1,865
1941	199.2	1,392	1,473	868	1,009	b	b
1942	96.8	1,386	1,443	982	1,100	b	b

For source and description of series see Appendix Table 2.
[a] No production. [b] Not available for publication.

APPENDIX TABLE 2

Source and Description of Series used in Industrial Materials Production Index, 1913–19, 1932, 1937–42

SERIES	SOURCE 1913–19	SOURCE 1932, 1937–42	DESCRIPTION
1 Steel	1	1, 2	Production, ingots & castings.
2 Aluminum	3, 4	4, 5, 6, 7, 8	Production. Sec. aluminum incl.
3 Copper	3	4, 7, 8	Production, ref., from dom. & for. ores. Sec. copper incl.
4 Zinc	3	4, 7, 8	Production, smelter, from dom. & for. ores. Sec. zinc recovered from metal, alloys, & chemical products incl.
5 Lead	3	4, 7, 8	Production, ref., from dom. & for. ores & base bullion. Sec. lead recovered from metal, alloys, & chemical products incl.
6 Tin	9, 3	4, 7, 8	Imports, consumption. 1913-15: net imports of metallic tin (gen. imports minus for. exports). 1916-19: gen. imports of metallic tin, plus dom. smelter output of tin, minus for. & dom. exports of metallic tin. 1932, 1937-42: consumption of prim. & sec. tin (stocks taken into account).
7 Magnesium	4	4, 8	Production, primary. No production before 1915.
8 Bituminous coal	3	4, 2	Production.
9 Anthracite	3	4, 2	Production.
10 Petroleum	3	4, 2	Production, crude.
11 Natural gas	3	4, 7	Production. 1942: estimated by assuming a 6% increase, 1941-42, the same as 1940-41.
12 Portland cement	3	4, 2	Production.
13 Sand & gravel	3	4, 7, 8	Production. Glass sand excl.
14 Crushed limestone	3	4, 7, 8	Production.
15 Gypsum	3	4, 7, 8	Production, crude.
16 Sulphur	3	4, 7	Production, crude.
17 Graphite	3	4, 8	Net imports, unmfd.
18 Lumber	10	10, 2	Production.
19 Turpentine	11	11, 12, 8	Production, gum, wood, & steam solvent. Figures for year beginning April 1.
20 Woodpulp	2	2	Production. 1913, 1915: assumed to be same as 1914.
21 Newsprint	2	2	Production.
22 Cotton	2	2	Consumption. Linters excl.
23 Wool	13, 2	2	Consumption, unmfd., scoured basis. 1913-18: computed by multiplying the 1918 mill consumption by an index (1918:100) of % of active spindles, avg. of woolen & worsted spindles.
24 Rayon yarn	14	14	Production.
25 Silk	9	9, 8	Net imports, unmfd. Raw silk, cocoons & waste incl.
26 Cattle hide leather	15	15	Production. 1913: computed by multiplying 1913 cattle slaughter (no.) by 1914 ratio of total hides minus imports to cattle slaughter, then adding 1913 imports.
27 Calf & kip leather	15	15	Production. 1913: computed by method used for cattle hide leather.
28 Goat & kid leather	15	15	Production. 1913: computed by multiplying 1914 production by ratio of 1913 to 1914 imports of goat skins.
29 Sheep & lamb leather	15	15	Production. 1913: computed by method used for cattle hide leather.
30 Wheat flour	16, 2	16	Production. 1913: 2-year avg. of published fiscal year data.
31 Sugar	17	17	Meltings, raw. Figures through 1919 for four ports; thereafter for all ports.
32 Canned corn	18	11, 19, 20	Packed.
33 Canned tomatoes	21	21, 20	Packed.
34 Canned peas	18	11, 19, 20	Packed.

APPENDIX TABLE 2 (cont.)

SERIES	SOURCE 1913–19	SOURCE 1932. 1937–42	DESCRIPTION
35 Milk	22	2	Production of dairy products, factory, milk equivalent basis. 1913-19: incl. consumption of fluid milk in butter, cheese (except cottage, pot, & bakers'), condensed & evaporated milk, ice cream, malted milk, & dried or powdered whole milk & cream. 1932, 1937-42: incl. consumption in butter, cheese from whole milk, & condensed & evaporated milk, case goods, unskimmed; totals are raised to represent the total milk equivalent of all mfd. dairy products produced.
36 Cattle	23	24, 25	Slaughter, fed. insp., live wt. 1942: estimated from no. slaughtered & avg. live wt.
37 Calves	23	24, 25	Slaughter, fed. insp., live wt.; 1942: see 'cattle slaughter'.
38 Hogs	23	24, 25	Slaughter, fed. insp., live wt.: 1942: see 'cattle slaughter'.
39 Sheep & lambs	23	24, 25	Slaughter, fed. insp., live wt.: 1942: see 'cattle slaughter'.
40 Malt liquors	26	2	Production. 1913-19: 2-year avg. of published fiscal year data. No figure for 1932, prohibition year.
41 Distilled spirits	27	2	Production. Alcohol excl. 1913-19, 1932: 2-year avg. of published fiscal year data. Figure for 1942 excludes unfinished & high-proof spirits.
42 Cottonseed oil	28, 29, 2	30, 2	Production, crude. 1913-15: 2-year avg. of published fiscal year data.
43 Cotton linters	2	2	Consumption.
44 Linseed oil	31, 2	30, 2, 8	Production. 1913-19: converted from published data in gallons, 1 gal. = 7.5 lbs.
45 Leaf tobacco	32	27, 33, 8	Consumption.
46 Ethyl alcohol	34	2, 8	Production. 1919: estimated by multiplying the 1918 figure by the 1918-19 % change in the 2-year avg. of published fiscal year data for production of denatured alcohol.
47 Rubber	9	9, 8	Imports, unmfd.

The sources as indicated by numbers are:

1 Amer. Iron & Steel Institute, *Annual Statistical Report.*
2 Bur. of For. & Dom. Commerce, *Survey of Current Business.*
3 Bur. of Mines. *Mineral Resources.*
4 Bur. of Mines, *Minerals Yearbook.*
5 Amer. Metal Market, *Metal Statistics.*
6 Amer. Metal Market.
7 Bur. of Mines, *Mineral Market Report.*
8 War Production Board.
9 Bur. of For. & Dom. Commerce, *Monthly Summary of Foreign Commerce.*
10 Bur. of the Census, *Census of Manufactures.*
11 Dept. of Agr., *Agricultural Statistics.*
12 Bur. of Agr. Chemistry & Engineering, *Naval Stores Report.*
13 Dept. of Agr., *Trends in the Consumption of Fibers in the United States, 1892-1939,* April 1941.
14 Textile Economics Bur., *Rayon Organon, Special Supplement.*
15 Tanners' Council of America.
16 Food Research Inst., *Wheat Studies.*
17 *Weekly Statistical Sugar Trade Journal.*
18 Dept. of Agr., 'Vegetable Statistics' (*Statistical Bulletin 22*).
19 Amer. Inst. of Food Distribution, *Weekly Digest. Food Markets.*
20 Amer. Inst. of Food Distribution.
21 *The Canning Trade: Almanac.*

APPENDIX TABLE 2 (concl.)

22 Dept. of Agr., 'Production and Consumption of Manufactured Dairy Products' *(Technical Bulletin 722)*.
23 Estimate by C. A. Burmeister, Bur. of Agr. Econ.
24 Agr. Marketing Admin., *Livestock, Meats, and Wool: Market Statistics and Related Data.*
25 Bur. of Agr. Econ., *The Livestock Situation.*
26 Bur. of Prohibition, *Statistics Concerning Intoxicating Liquors.*
27 Bur. of Internal Revenue, *Annual Report of the Commissioner of Internal Revenue.*
28 Bur. of the Census, 'Cotton Production and Distribution' *(Bulletin 167)*.
29 Dept. of Agr., 'The Production and Conservation of Fats and Oils in the United States' *(Supplement to Bulletin 769)*.
30 Bur. of the Census, *Animal and Vegetable Fats and Oils.*
31 War Industries Board, 'Prices of Paints and Varnishes' *(Price Bulletin 44)*.
32 A. F. Burns, *Production Trends in the United States since 1870* (National Bureau of Economic Research, 1934).
33 Bur. of Agr. Econ., *The Tobacco Situation.*
34 War Industries Board, 'Prices of Miscellaneous Organic Chemicals' *(Price Bulletin 57)*.

APPENDIX TABLE 3

Value Weights used in Industrial Materials Production Index, 1914 and 1939

SERIES AND QUANTITY UNIT	VALUE PER UNIT (*dollars*) 1914	1939	DERIVATION OF VALUE PER UNIT, 1914 AND 1939*
1 Steel, s.t.	19.49	30.36	(1) Value of ingots produced for sale & interplant transfer. (2).
2 Aluminum, lb.	.1403	.1809	(3, 5) Value of imports of bauxite, crude metal, & scrap deducted from total value of metal produced to obtain value produced by dom. industry. (4, 6).
3 Copper, lb.	.1108	.0894	(3, 5) Value of imports of ore, crude metal, & scrap deducted from total value of metal produced to obtain value produced by dom. industry. (4, 6).
4 Zinc, s.t.	102	104	(3) Value of ref. zinc from dom. ores, at St. Louis. (4) Sales value of ref. zinc from dom. ores.
5 Lead, s.t.	78	94	(3) Value of ref. lead from dom. ores & base bullion, at N. Y. (4) Sales value of ref. lead from dom. ores & base bullion.
6 Tin, l.t.	674	1500	(1, 15) Value added, Tin Cans & other Tinware, n.e.c. industry. (2, 15).
7 Magnesium, lb.	5.00	.27	(7) Value & production figures for 1915 used since there was no production before 1915. (4) Lowest nominal price at N. Y. for prim. metal ingot, 99.8% pure, carload lots.
8 Bituminous coal, s.t.	1.167	1.864	(3) Value of production, incl. brown coal, lignite, & anthracite mined elsewhere than Penn. (4).
9 Anthracite, s.t.	2.071	3.635	(3) Value of Penn. anthracite production. (4).
10 Petroleum, bbl.	.806	1.001	(3) Value of crude petroleum production, at wells. (4).
11 Natural gas, M cu.ft.	.159	.222	(3) Avg. value of natural gas consumed per th. cu. ft. (4) Value of natural gas production.
12 Portland cement, bbl.	.927	1.47	(8) Price of Portland cement at factory. (4).
13 Sand & gravel, s.t.	.287	.455	(3) Value of sand & gravel production excl. glass sand. (4).
14 Crushed limestone, s.t.	.550	.880	(3) Value of crushed limestone production. (4).
15 Gypsum, s.t.	1.41	1.37	(3) Price of crude gypsum. (4) Value of crude gypsum mined.
16 Sulphur, l.t.	22	16	(8) Price of crude sulphur, f.o.b. mines. (4).
17 Graphite, s.t.	110	51.60	(7) Price of dom. crystalline graphite per lb. (4, 15) Value of imports of graphite.
18 Lumber, M bd.ft.	14.04	21.97	(9) Avg. price of lumber, all kinds, at the mill. 1915; no price for 1914 available. (2) Value of lumber production.
19 Turpentine, bbl. (50 gal.)	23.65	15.70	(8) Price of southern turpentine at N. Y., per gal. (10).
20 Woodpulp, s.t.	6.99	11.75	(1, 2, 15) Value added, Pulp Mills & Paper & Paperboard Mills industry, multiplied by the 1939 ratio (.170) of value added in Pulp Mills industry to value added in Pulp Mills & Paper & Paperboard Mills industry. (2, 15) Value added, Pulp Mills industry.
21 Newsprint, s.t.	18.96	21.51	(8, 2) Price of newsprint, contract, rolls, at mills, multiplied by the 1939 ratio (.430) of value added to value of products, Paper & Paperboard Mills industry. (10, 2) Price, contracts, rolls, at N. Y.; ratio, .430.
22 Cotton, bale	45.91	77.72	(1, 15) Value added, Cotton Goods & Cotton Small Wares industries. (2, 15) Value added, Cotton Mfrs. industry.
23 Wool, lb.	.486	.913	(1, 15) Value added, Wool Pulling, Wool Scouring, Woolen Goods, Worsted Goods, & Carpets & Rugs industries. (2, 15) Value added, Woolen & Worsted Mfrs. (excl. Dyeing & Finishing), Carpets & Rugs—Wool, & Carpet Yarn—Woolen & Worsted industries.
24 Rayon yarn, lb.	2.60	.883	(8, 11, 2) Computed composite price ($1.819) multiplied by the 1939 ratio (1.43) of value added in Rayon & Allied Products & Rayon Mfrs. industries to value of rayon yarn produced. (2, 15) Value added, Rayon & Allied Products & Rayon Mfrs. industries.
25 Silk, lb.	3.58	.961	(1, 15) Value added, Silk industry. (2, 15) Value added, Silk Mfrs. industry.

APPENDIX TABLE 3 (cont.)

SERIES AND QUANTITY UNIT	VALUE PER UNIT (*dollars*) 1914	1939	DERIVATION OF VALUE PER UNIT, 1914 AND 1939*
26 Cattle hide leather, hide	4.25	2.43	(8, 11, 1) Composite price ($7.36), computed from Bureau of Labor Statistics data & conversion factor (1 hide=40 lbs.), multiplied by the ratio (.577) of value added, Leather, Tanned, Curried & Finished industry, to computed value of all leather (cattle, calf & kip, goat & kid, sheep & lamb). (10, 11, 2) Composite price, $4.88; ratio, .498.
27 Calf & kip leather, skin	1.41	.95	(5, 1) Unit value ($2.45), computed from import value & quantity data & conversion factor (1 skin=10 lbs.), multiplied by ratio used for 'cattle hide leather.' (6, 2) Unit value, $1.90.
28 Goat & kid leather, skin	.226	.174	(5, 1) Same as for 'calf & kip leather.' Unit value, $.392; conversion factor, 1 skin=1.5 lbs. (6, 2) Unit value, $.349.
29 Sheep & lamb leather, skin	.310	.229	(5, 1) Same as for 'calf & kip leather.' Unit value $.537; conversion factor, 1 skin=3 lbs. (6, 2) Unit value, $.459.
30 Wheat flour, bbl.	1.08	1.28	(1, 15) Value added, Flour-mill & Gristmill Products industry. (2, 15) Value added, Flour & other Grain-mill Products industry.
31 Sugar, l.t.	10.16	14.62	(1, 15) Value added, Cane Sugar Refining industry. (2, 15).
32 Canned corn, case	.490	.618	(1, 15) Census value multiplied by the 1914 ratio (.343) of value added to value of products, Canned Vegetables industry. (1, 2, 15) 1914 ratio used.
33 Canned tomatoes, case	.335	.478	(1, 15) Same as for 'canned corn.' (1, 2, 15) 1914 ratio used.
34 Canned peas, case	.588	.734	(1, 15) Same as for 'canned corn.' (1, 2, 15) 1914 ratio used.
35 Milk, lb.	.0031	.0052	(1, 15) Value added, Butter, Cheese, Condensed Milk, & Ice Cream industries. (2, 15).
36 Cattle, lb.	.0131	.0216	(8, 11, 1) Computed composite price ($.0749) multiplied by the ratio (.175) of value added, Slaughtering & Meat Packing industry, to computed value of all slaughter (cattle, calves, hogs, sheep & lambs). (10, 11, 2) Composite price, $.0838; ratio, .258.
37 Calves, lb.	.0170	.0260	(8, 1) Price per lb., good to choice, vealers, at Chicago, multiplied by ratio used for 'cattle.' (10, 2).
38 Hogs, lb.	.0147	.0180	(8, 11, 1) Same as for 'cattle.' Composite price $.0838. (10, 11, 2) Composite price, $.0698.
39 Sheep & lambs, lb.	.0127	.0193	(8, 11, 1) Same as for 'cattle.' Composite price, $.0727. (10, 11, 2) Composite price, $.0749.
40 Malt liquors, bbl.	3.97	6.58	(1, 15) Value added, Liquors, Malt industry, excl. int. rev. taxes. (2, 15).
41 Distilled spirits, gal.	.237	.210	(1, 15) Value added, Liquors, Distilled industry, excl. int. rev. taxes. (2, 15).
42 Cottonseed oil, lb.	.0197	.0235	(1, 15) Value added, Cottonseed Oil, Cake, Meal, & Linters industry. (2, 15).
43 Cotton linters, bale	9.74	14.38	(12) Value of cotton linters production; avg. of growth years taken for calendar year. (13).
44 Linseed oil, lb.	.0122	.0205	(1, 15) Value added, Linseed Oil, Cake, and Meal industry. (2, 15).
45 Leaf tobacco, lb.	.345	.396	(1, 15) Value added, Tobacco Mfrs. industry, excl. int. rev. taxes. (2, 15).
46 Ethyl alcohol, gal.	.159	.148	(8, 1) Price per gal., denatured, 188° proof, at N. Y. multiplied by ratio (.471) of value added to value of products, Liquors, Distilled industry, excl. int. rev. taxes. (14, 2) Price, at works; ratio, .494.
47 Rubber, lb.	.738	.353	(1, 15) Value added, Rubber Products industry. (2, 15).

* The entries indicate, first, the source (by number) of the 1914 figure; second, the method of deriving the 1914 figure; third, the source (by number) of the 1939 figure; and fourth, the method of deriving the 1939 figure, except that so far as the methods are the same, the 1914 statement is not repeated. Unless otherwise stated, the value per unit was computed by dividing the designated total value by the quantity figure appearing in the same source or in App. Table 1, as indicated. In some cases the values per unit differ, because of rounding, from those actually used in constructing the index.

APPENDIX TABLE 3 (concl.)

SOURCES:

1 Bur. of the Census, *Census of Manufactures, 1914.*
2 Bur. of the Census, *Census of Manufactures, 1939.*
3 Bur. of Mines, *Mineral Resources, 1914.*
4 Bur. of Mines, *Minerals Yearbook, 1940.*
5 Bur. of For. and Dom. Commerce, *Monthly Summary of Foreign Commerce, Dec. 1915.*
6 Bur. of For. and Dom. Commerce, *Monthly Summary of Foreign Commerce, Dec. 1939.*
7 Bur. of Mines, *Mineral Resources, 1917.*
8 Bur. of Labor Statistics, *Bulletin 493.*
9 Bur. of the Census, *Census of Manufactures, 1919.*
10 Bur. of Labor Statistics, *Wholesale Prices, June 1940.*
11 Bur. of Labor Statistics, *Wholesale Prices: Quantity Weighting Factors used in Calculating Index Numbers, 1890-1934* (mimeo. release, March 1935).
12 Bur. of the Census, 'Cotton Production and Distribution' *(Bulletin 164).*
13 Bur. of the Census, 'Cotton Production and Distribution' *(Bulletin 177).*
14 Bur. of Labor Statistics, *Wholesale Prices, Dec. 1939.*
15 App. Table 1.

APPENDIX TABLE 4

Classification of Series used in Industrial Materials Production Index

	DURABLE			NONDURABLE		
	Mineral	*Agricultural*	*Forest*	*Mineral*	*Agricultural*	*Forest*
Ferrous metals	Steel					
Nonferrous metals	Aluminum Copper Zinc Lead Tin* Magnesium					
Construction materials (nonmetal)	Portland cement Sand & gravel Crushed limestone Gypsum	Linseed oil	Lumber Turpentine			
Fuels				Bituminous coal Anthracite Petroleum Natural gas		
Textiles					Cotton Wool Rayon yarn Silk*	
Mfd. foods					Wheat flour Sugar* Canned corn Canned tomatoes Canned peas Milk Cattle Calves Hogs Sheep & lambs Cottonseed oil	
Misc.	Sulphur Graphite*				Cattle hide leather Calf & kip leather Goat & kid leather* Sheep & lamb leather Malt liquors Distilled spirits Cotton linters Tobacco Ethyl alcohol Rubber*	Woodpulp Newsprint

* Product of foreign origin; products not so designated are classified as of domestic origin.

APPENDIX TABLE 5

Composition of Five Indexes of Industrial Production[1]

	A	B	C	D		E	
	STEWART'S INDEX (1914 weights)	EARLY FRB INDEX (1919 weights)	PRE-1940 FRB INDEX (1923-25 weights)	CURRENT FRB INDEX[2] Total (1935-39 weights)	Excl. Manhours Series	INDUSTRIAL MATERIALS PRODUCTION INDEX (1914 weights)	(1939 weights)
				(*percentage*)			
Products of Mines	**46.8**	**44.0**	**44.0**	**34.2**	**50.6**	**45.4**	**56.0**
Ferrous Metals	*a*	*24.0*	*19.6*	*11.6*	*17.2*	*11.9*	*16.8*
Iron ore[3]	a		0.8	0.6	0.9		
Pig iron	a	18.0	1.7	1.7	2.5		
Steel ingots & castings[4]	a	6.0	17.1	9.3	13.8	11.9	16.8
Fabricated steel products[5]	a						
Nonferrous Metals	*a*	*5.0*	*5.5*	*4.4*[b]	*6.6*[b]	*7.6*	*6.5*
Copper ore[6]	a	3.0	1.0	0.4	0.7		
Copper, refined[7]	a		2.0	0.6	0.9	4.6	2.8
Lead ore[8]	a		1.0	0.1	0.2		
Lead, refined[9]	a			0.3	0.3	1.1	0.7
Zinc ore	a			0.1	0.2		
Zinc, refined[10]	a	2.0	0.9	0.3	0.5	1.0	0.8
Tin[11]	a		0.4	0.2	0.3	0.6	1.3
Gold[12]	a			0.7	1.1		
Silver[12]	a		0.2	0.2	0.3		
Mercury	a						
Aluminum[13]						0.2	0.8
Magnesium						c	c
Fuels	*a*	*12.0*	*15.2*	*15.2*	*22.4*	*22.9*	*28.8*
Bituminous coal	a	7.0	5.2	3.4	5.1	11.4	7.7
Anthracite	a	2.0	1.9	0.9	1.3	4.3	2.0
Petroleum, crude	a	3.0	4.7	8.7	12.9	5.0	13.3
Natural gas						2.2	5.8
Coke[14]	a		1.5	0.3	0.4		
Gasoline			1.1	1.2	1.7		
Kerosene			0.2	0.1	0.1		
Fuel oil			0.4	0.4	0.6		
Lubricating oil			0.2	0.2	0.3		
Other Nonmetals	*a*	*3.0*	*3.7*	*3.0*[d]	*4.4*[d]	*3.2*	*4.0*
Cement	a	3.0	1.2	0.4	0.6	1.9	1.9
Brick[15]	a		1.2	0.1	0.2		
Plate glass			1.3	0.1	0.2		
Glass containers				0.4	0.5		
Sand & gravel						0.5	1.1
Crushed limestone						0.4	0.6
Gypsum						0.1	c
Graphite[16]						0.1	c
Pyrites	a						
Sulphur	a					0.2	0.4
Salt	a						
Lime	a						

APPENDIX TABLE 5 (cont.)

	A	B	C	D		E	
			(*percentage*)				
Products of Farms	**44.7**	**40.5**	**31.6**	**28.9**	**31.1**	**41.1**	**37.0**
Textiles	*a*	*22.0*	*16.8*	*11.2*	*16.6*	*12.5*	*13.4*
Cotton[17]	a	15.0	8.3	4.8	7.1	5.8	6.0
Silk[18]	a		3.4	1.0	1.5	2.5	0.5
Wool[19]	a	7.0	5.1	3.4	5.0	4.0	3.8
Rayon yarn[20]				2.1	3.0	0.1	3.0
Hemp[12]	a						
Jute[12]	a						
Sisal grass[12]	a						
Leather	*a*	*5.0*	*3.3*	*2.3*	*3.4*	*2.7*	*0.9*
Cattle hide leather[21]	a	5.0	0.7	0.5	0.8	1.8	0.6
Sheep & lamb leather[22]	a					0.2	0.1
Calf & kip leather			0.3	0.2	0.2	0.5	0.1
Goat & kid leather			0.3	0.2	0.3	0.2	0.1
Boots & shoes			2.0	1.4	2.0		
Manufactured Foods	*a*	*11.5*	*8.7*	*10.9*	*4.4*	*11.2*	*10.1*
Wheat flour	a	5.8	2.1	0.5	0.8	2.9	1.5
Cattle[23]	a	1.7	1.8	0.4	0.6	2.0	2.0
Calves[23]		0.1	0.2	0.1	0.1	0.1	0.3
Sheep & lambs[23]	a	0.3	0.2	0.1	0.1	0.3	0.3
Hogs[23]	a	2.4	3.0	0.6	0.9	2.4	1.8
Sugar[24]		1.2	1.4	0.2	0.3	0.6	0.6
Dairy products[25]				1.1	1.6	1.7	2.9
Other mfd. foods[26]				7.9		1.1	0.6
Other Products of Farms	*a*	*2.0*	*2.8*	*4.5*	*6.7*	*14.8*	*12.7*
Tobacco[27]	a	2.0	1.0	1.2	1.9	4.7	3.7
Rubber[28]	a		1.8	1.4	2.0	3.2	4.3
Alcoholic beverages[29]				1.8	2.8	6.2	4.1
Ethyl alcohol						0.5	0.3
Cottonseed products, excl. oil[30]	a					0.1	0.1
Linseed oil						0.1	0.1
Products of Forests	**8.5**	**15.5**	**18.8**	**12.5**	**18.5**	**13.4**	**6.9**
Lumber[31]	a	11.0	8.6	2.9	4.3	12.1	5.8
Turpentine	a					0.3	0.1
Woodpulp[32]			0.9	0.3	0.5	0.5	0.9
Paper[33]		4.5	9.3	9.2	13.7	0.6	0.2
Unclassified			**5.5**	**24.5**			
Fish[34]	a						
Machinery[35]				10.8			
Automobiles[36]			5.1	4.8			
Aircraft[35]				0.2			
Railroad cars[35]				0.3			
Locomotives[35]			0.2	0.1			
Shipbuilding[35]			0.2	0.5			
Furniture[35]				1.5			
Chemicals[35]				6.3			
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

APPENDIX TABLE 5 (cont.)

[a] Weights for individual series not given in source.
[b] Incl. 'other nonferrous metals', a special series derived by adjusting the total of the individual series in this group to the general level shown by Census of Manufactures data for the group as a whole.
[c] .05 or less.
[d] Incl. 'other stone, clay, and glass products'; see note (b).
[1] The entries in the table and footnotes pertain to series entering into the indexes in their respective base periods, and do not cover additions, substitutions, or omissions in other years. Unless otherwise specified the series relate to production. So far as possible, differences among the series whose weights are on a given line are indicated in the notes, but the descriptions in the sources are not always complete, and no attempt was made to go beyond them to determine precisely what series was used. The percentage weight for a commodity is its unit weight (e.g., price) multiplied by the quantity in the base year, divided by the sum of such products for all commodities in the index.
[2] The weights given in the footnotes are for the total index; the weights for the index excluding manhours series may be obtained by multiplying by 1.48.
[3] A, C, D: Shipments.
[4] D: Open hearth and Bessemer steel (8.7), electric steel (0.6).
[5] A: Merchant bars, plates and sheets, rails, structural shapes, skelp, wire rods, tin plate, and nails.
[6] D: Smelting.
[7] A: Consumption. C: Blister copper. D: Smelting (0.2), deliveries (0.4). E: Sec. copper incl.
[8] C, D: Smelter receipts.
[9] A: Consumption. D: Smelter receipts (0.1), shipments (0.2). E: Sec. lead incl.
[10] A: Consumption. D: Smelting (0.1), shipments (0.2). E: Smelting. Sec. zinc incl.
[11] A, D: Consumption. C: Deliveries. E: 1914—imports. 1939—consumption; sec. tin incl.
[12] A: Consumption.
[13] E: Sec. aluminum incl.
[14] C: Byproduct (1.4), beehive (0.1). D: Byproduct (0.3), beehive (0.01).
[15] A: Common, front, and vitrified. C: Face (0.8), paving (0.4).
[16] E: Imports.
[17] A, B, C, D, E: Consumption.
[18] A: Consumption. C: Deliveries (2.2), loom activity (1.2). D: Deliveries. E: Imports.
[19] A, E: Consumption. B: Wool machinery activity. C: Consumption (2.7), loom and spindle activity (1.5), carpet and rug loom activity (0.9). D: Carpet wool consumption (0.3), apparel wool consumption (0.2), woolen spindle activity (0.4), worsted spindle activity (0.3), woolen and worsted broad loom activity (2.2).
[20] D: Deliveries.
[21] A: Cattle hides. B: Sole leather.
[22] A: Sheep skins.
[23] B, C: Animals slaughtered under Federal inspection. D: Same series, dressed weight. E: Same series, live weight.
[24] B, C, D, E: Meltings.
[25] D: Butter (0.3), cheese (0.1), canned and dried milk (0.2), ice cream (0.5). E: Milk used in mfd. dairy products.
[26] D: Based on manhours data adjusted for changes in output per manhour. E: 1914—canned corn (0.1), canned tomatoes (0.2), canned peas (0.1), cottonseed oil (0.7). 1939—same series, respectively, (0.1), (0.1), (0.1), (0.3).
[27] A: Tax-paid production; cigarettes, cigars, and mfd. tobacco and snuff. B: Same series, respectively, (0.7), (1.0), (0.3). C: Same series, respectively, (0.6), (0.3), (0.1). D: Same series, respectively, (0.7), (0.3), (0.2). E: Leaf tobacco consumption.
[28] A: Consumption. C: Pneumatic tires (1.6), inner tubes (0.2). D: Consumption (1.2), pneumatic tires (0.1), inner tubes (0.02). E: Imports.

APPENDIX TABLE 5 (concl.)

29 D: Malt liquors (1.2), whiskey (0.2), other distilled spirits (0.1), rectified spirits (0.2). E: 1914—fermented malt liquors (5.8), distilled spirits excl. alcohol (0.4). 1939—same series, respectively, (3.8), (0.3).
30 A: Cottonseed, cottonseed cake and meal, cotton hulls, and cotton linters. E: Cotton linters consumption.
31 C: Lumber cut (7.8), flooring (0.8).
32 C: Mechanical (0.2), chemical (0.7). D: Groundwood (0.05), sulphate (0.1), sulphite (0.2), soda (0.03).
33 B, E: Newsprint. C: Newsprint (1.0), book paper (1.9), wrapping paper (1.1), fine paper (0.9), boxboard (1.6), paperboard shipping boxes (0.6), newsprint consumption (2.2). D: Newsprint (0.1), printing paper (3.6), wrapping paper (0.5), fine paper (0.2), tissue and absorbent paper (0.2), paperboard (0.7), paperboard containers (0.6), newsprint consumption (3.2).
34 A: Cod, haddock, mackerel, and canned salmon.
35 D: Based on manhours data adjusted for changes in output per manhour.
36 C: Factory sales. D: Factory sales (0.5); bodies, parts, and assembly based on manhours data adjusted for changes in output per manhour (4.3).

SOURCES:
A W. W. Stewart, 'An Index Number of Production, 1890-1919', *American Economic Review*, March 1921, pp. 57-70. The index we use is a combination of Stewart's indexes of total materials and of total manufactures, from which we eliminated his index of farm materials. Hence the percentage weights given here are derived by dividing his percentage weights for the respective groups by their total (47%).
B *Federal Reserve Bulletin*, Dec. 1922, p. 1415.
C Board of Governors of the Federal Reserve System, *Federal Reserve Index of Industrial Production* (mimeo. release, Oct. 1939).
D Board of Governors of the Federal Reserve System, *New Federal Reserve Index of Industrial Production* (1942). The weights for the total index are given in the source. The weights for the index excluding manhours series were computed by dividing the weights for the total index by 67.57, the difference between 100 and the sum of the weights of the manhours series (32.43). The sum of the weights of series designated as manhours series in this table (cf. notes 26, 35, and 36) is 31.9, which is correct for the base period 1935-39. In computing the index excluding manhours series, we eliminated the entire Transportation Equipment group, which included automobile factory sales (0.5%) until November 1941, after which time the series was dropped and its weight transferred to automobile bodies, parts, and assembly, a manhours series.
E For a description of the series included and the derivation of their weights see Appendix Tables 1, 2, and 3.

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