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Appendix IV

Net Value of Manufactured Product

The divisions of value added by manufacture according to use of the ultimate product presented in Chapter II measure the productive contribution made by manufacturing industries in the manufacturing process. If these data are combined with other available estimates relating to the contributions of primary producers, measures may be obtained for the net values of manufactured goods (at factory prices) produced in 1929. This is made possible by analysis of data presented in a special Bureau of the Census monograph, published as a part of the 1929 Census of Manufactures.[1] The methods of estimation are rough, but the results are as good as can be obtained under the circumstances and sufficiently accurate to indicate general magnitudes. In Table IVb these estimates of net value of product are contrasted, according to broad groupings, with Dr. Kuznets' estimates of the value of finished products[2] and no wide discrepancies appear. The results provide not only general indications of the output of products that flow through manufacturing industries but also supply information on the part played by primary producers in the creation of different types of economic goods.

Something must be said about the method of securing the estimates in Table IVa. The net value of manufactured products is the value added in the manufacturing process plus the value contributed by producing agents before the commodities reach the manufacturing stage.[3] In other words, to the value added

[1] *Materials Used in Manufactures: 1929*, Tracy E. Thompson (Washington, 1933).
[2] *Commodity Flow and Capital Formation*, Vol. I (National Bureau of Economic Research, 1938). Dr. Kuznets' figures for value of finished goods at the manufacturing stage for major groups were given in Table 1, Ch. II.
[3] The figure is 'net' only in that duplications in the sales of the same commodities are excluded. The cost of durable producers' goods consumed in the productive process is not deducted.

by manufactures must be added the value of raw materials, unmanufactured fuels, and imported semimanufactured goods entering the domestic manufacturing system. The largest of these supplemental items is, of course, the value of raw materials, including the products of farms, mines, and forests. Avoiding duplication of items already covered in the manufactures figure, the value for 1929 is $12,676 million. Semimanufactures imported for further fabrication total $1,855 million and the value of unmanufactured fuels used in manufactures is $1,298 million. These are the figures published in the Bureau of the Census report mentioned. The separation of raw materials according to ultimate product is based on figures presented in Chapter II, Tables 2 and 3. Unfortunately these data are based on all materials, in both raw and semimanufactured form. The influence of semimanufactured materials can be minimized by apportioning separately the three items, raw materials, imported semimanufactures, and manufactured fuels, for in apportioning raw materials a special group of 68 industries into which go the bulk of the raw materials can be separated for special study. The value of raw materials used by these industries, which were divided according to the eleven Census groups in which they occur, was allocated according to the use of the final manufactured product by applying the appropriate ratios of distribution of all materials, both raw and semifinished. For example, for those of the 68 industries which may be included in the food processing group (Census Group I), ratios showing the ultimate use of all materials consumed were derived from an analysis of the individual industries and these ratios used to allocate the five and one-half billion dollars of raw materials consumed. The value of the rest of the raw materials going into the food group, about $155 million, was apportioned in the same fashion, using the data for the other industries of the group. This procedure was followed for each Census group, although in many of them the percentage of semimanufactured materials consumed is higher and the accuracy of our computations correspondingly lower. To a considerable extent the error introduced by this method of estimation is reduced by use of the fairly homogeneous Census groups; moreover, there is no reason to believe that errors are consistently in one direction. Some degree of off-

setting must be present in the fairly large groups for which the figures are presented. These considerations apply equally to the division of imported semimanufactures and unmanufactured fuels which have been similarly allocated.

The estimated values of the contributions prior to the manufacturing stage are presented in Table IVa, together with the values contributed by manufactures.

Table IVa

Net Value of Manufactured Products, 1929

Ultimate Use of Product	Value Added by Domestic Manufacture[1]	Value Contributed by Antecedent Producers	Total Net Value of Product	Percentage of Net Value Contributed by Manufacture
		(millions of dollars)		
Consumption goods	17,871	11,309	29,180	61.2
Capital goods	7,055	1,155	8,210	85.9
Construction materials	3,379	1,042	4,421	76.4
Producers' supplies	3,109	2,323	5,432	57.2
All manufactures[2]	31,414	15,829	47,243	66.5
Consumption goods				
Foods	4,119	6,383	10,502	39.2
Wearing apparel, etc.	4,926	2,306	7,232	68.1
Household goods	2,824	741	3,565	79.2
Transportation	3,171	1,283	4,454	71.2
Domestic fuel and light	326	302	628	51.9
Drugs, medicines, and supplies	322	50	372	86.6
Publications	1,802	220	2,022	89.1
Recreation goods	381	24	405	94.1

[1] Differs slightly from the figure for total value added given in the text and in the 1929 Census because of the exclusion of payments received for contract work. Transportation costs arising from the inter-industry movement of semifinished goods (estimated in Table IVb at $300 million) are not included.
[2] As published in *Materials Used in Manufactures: 1929.*

A net value of manufactured goods of $47,243 million is the estimate reported by the Census of Manufactures (*Materials Used in Manufactures: 1929*, p. 1). Of this amount the present analysis indicates that $10.5 billion, or over 20 per cent, is food-

stuffs; some $7 billion (15 per cent) wearing apparel and personal goods; about $4.5 billion the value (at the producers' stage) of passenger cars and the supplies essential to their operation for general consumer use; some $3.5 billion the value of the aggregate of goods for house-furnishings and maintenance. These are the big items among consumption goods, the group that constitutes over 60 per cent of the total value (at producers' prices) of all goods manufactured in 1929.

The net value of capital goods is some $8 billion; although to this should be added a considerable portion of the value of the construction materials that appear at the manufactures stage. If the $4,421 million of construction materials is divided between consumers' goods and capital goods in the proportions of one-third and two-thirds, then capital value, at the manufacturing stage is some $11 billion.[4]

The item producers' supplies contains materials that are used both by manufacturers and by productive agents at earlier and later stages. It includes, for example, the value of containers, roughly $900 million, which are used chiefly by other manufacturers and should be included in the totals given above. A large part of this item should be allocated to the foods group, but the rest goes to both other manufacturers and nonmanufacturers. Ultimately, producers' supplies are probably used in processes serving consumers and might therefore be classed with the major group consumers' goods but, because some of these fuels, chemicals, and general office and shop supplies are also used in the making of what we have classified as capital goods, the entire group cannot be thus allocated. It is difficult, of course, to divide these items in accordance with our scheme of classification, but a rough division of the part consumed in manufacturing industries (estimated at 40 per cent of the total) would be approximately 90 per cent for consumption goods and 10 per cent for capital goods. Of the 60 per cent not consumed in manufacturing industries almost all goes for ultimate consumption purposes.

There is considerable variation among groups in the propor-

[4] For an analysis of the value of finished goods, at the consumer stage, of the various types recognized in the present analysis, see *Commodity Flow and Capital Formation*, Vol. I, by Simon Kuznets. The present figures and those of Dr. Kuznets are compared in Table IVb.

tion that value added by manufacture is of the total net value at the factory stage, and, of all the groups of products, foods receive least in the fabricating processes. Coming to the manufacturing industries in unprocessed form, with an estimated value of over $6 billion,[5] they receive an additional $4 billion in value before passing into the hands of distributors or consumers. This is slightly less than 40 per cent of the total factory value of foods and compares with 61 per cent for all consumption goods and much higher figures for certain of the groups. Over 85 per cent of the estimated net value of capital goods had its origin in manufacturing industries; over 75 per cent of the value of construction materials is added in manufactures. This rather surprisingly high figure for construction materials results in part from the inclusion in manufacturing of the products of sawmills, cement plants, and similar establishments of a quasi-extractive character, and the exclusion of certain building materials that require little or no processing, such as sand and gravel. The highest ratio for all groups is that for recreation goods, a small group and one for which there may be some question of the adequacy of the estimate. The inclusion of the motion picture industry, with its low cost of raw materials, is a sufficient explanation of this striking ratio.

In examining Table IVa it should be kept in mind that the values are in terms of the prices received by manufacturers and relate to the stream of goods that has just passed the point of manufacturing. But the flow could have been measured at a later point, and for some purposes it is desirable to do so. Costs of getting goods to final consumers vary with the type of product, and the margins between factory values and costs to consumers are certainly not constant. For this reason the figures of Table IVa cannot be compared with estimates of national income, or with the buying power of different groups of consumers, or, as they stand, with estimates of national income originating in manufacturing industries. For purposes of measuring the nation's income, the value of the services rendered manufacturers by outside agencies is distinguished from the

[5] It has been estimated that the value of nonmanufactured foods sold directly to consumers (fruits, vegetables, dairy and poultry products, fresh fish) in 1929 was, at producers' prices, $2,867 million (Simon Kuznets, *op. cit.*, p. 136).

services of the manufacturers themselves. For example, payments made to banks for the use of capital is, from the point of view of national income, payment for a service originating in the finance group and not to be considered a part of the contribution of manufacturing or to be included in the total 'value added by manufacture'.

Payments for professional services such as those rendered manufacturers by independent architects, accountants, lawyers, or other professionals are for some purposes to be distinguished from the contribution of the manufacturing enterprise. Again, payments to government employees, in part traceable to the taxes paid by manufacturing concerns, are considered as national income originating in these public services. So far as these various payments are covered in the value of the goods sold by manufacturing plants, and therefore reported in the item 'value added by manufacture' they have been included in the totals of Table IVa; they are associated with the manufacturing process by reason of the productive stage at which the service is rendered.

Not the origin, in which we are here chiefly interested, but the final destination of manufactured goods may be the focus of attention, and this has been the approach followed by Simon Kuznets in his study of capital formation. His survey is restricted to finished manufactured goods, expanded to cover the distributive activities following that of manufacturing, and results in the estimates of the values of finished goods at producers' prices cited earlier. These estimates of the value of finished goods at the manufacturers' stage should approximate those in Table IVa but cannot be identical, for they differ in timing as well as in scope and methods of classification. Nevertheless, comparison, by groups, of the value of 'finished' manufactured products and the above estimates of the 'net' value of manufactured product is of interest (Table IVb). An attempt is made to reconcile the various classification differences.

Dr. Kuznets' estimate of the value of finished manufactured goods, at producers' prices, for 1929 is $41.5 billion; the net value figure in Table IVa is $47.2 billion. The difference in these totals is due largely to the manner of defining the limits of the tabulation and has been discussed in some detail by Dr.

Kuznets.[6] The comparison of the estimates by detailed groups in Table IVb suggests the source of much of this difference. The closeness of the figures, after adjustment for lack of comparability, confirms to some degree the reasonableness of the estimates, particularly the present ones, for they have been prepared in a more devious fashion. Both estimates are based on Census of Manufactures data, but the material and the methods are so different that their common origin does not lessen the legitimacy of the comparison.

[6] *Op. cit.*, pp. 19–26

Table IVb

Two Estimates of the Value of Manufactured Products, 1929 [1]

Group (1)	Estimates of Net Value (2)	Estimates based on Finished Products (3)	Difference Col. (2)–(3) (4)	Adjustment for Comparability (5)	Net Difference (6)
		(millions of dollars)			
Consumption goods, total	29,180	28,582			
Foods	10,502	11,021	−519	+466	−53
Wearing apparel, etc.	7,232	7,020	+212	−260	+159
House-furnishings	3,008	2,801	+207		
Household supplies	557	1,112	−183	+30	−153
Drugs, etc.	372				
Recreation	405	406	−1	−184	−185
Publications	2,022	1,179	+843	−1,120	−277
Fuel and light	628	1,318	+306	−393	−87
Automotive fuel	996				
Transportation	3,458	3,725	−267		−267
Capital goods	8,210	7,885	+325		+325
Construction materials	4,421	5,075	−654		−654
Producers' supplies	5,432				
Fuel, mfd.	2,686	..	+5,432	−4,022	+1,410
Containers	930	..			
Other	1,816	..			
Grand total	47,243	41,542			
Exported semimanufactured goods [2]					−902
Estimated freight costs, semimanufactured goods [3]					+300
Total net difference after adjustment for comparability					−384

[1] Coverage of the two estimates is not the same, and certain undistributed items of our estimates must be considered. The entries of col. (2) appear in Table IVa. The entries

in col. (3) are the following combinations of minor groups given in Table I–4 of *Commodity Flow and Capital Formation*, Vol. I, by Simon Kuznets. Foods: groups 1, 2; Wearing apparel, etc: groups 6–11, 23, 25, 30, consumers' goods servicing; House furnishings: groups 12, 15–21; Household supplies and drugs, etc.: group 3; Recreation goods: groups 13, 22; Publications: groups 4, 24; Fuel and light, including automotive fuel: group 5; Transportation: groups 14, 26–29; Capital goods: groups 32–44 and producers' goods servicing; Construction materials: group 31 and special group of same name (p. 99).

The entries in col. (5), making for greater comparability of the estimates, are explained as follows:

Foods: $596 million (+) estimated as value of containers used for foods, classified under producers' supplies in col. (2); $130 million (—) for poultry packing excluded under col. (3).

Wearing apparel, etc., house-furnishings: another $260 million (—) reported as receipts for contract work in textile industries included in col. (2) but excluded from col. (3). $302 million paid by manufacturers for contract work is not included in the entries of col. (2). A portion of this sum represents work done for nonmanufacturers, and is therefore not a duplicating item from the viewpoint of the present study. Examination of the 1925 Census of Manufactures (the latest complete report on amounts paid by manufacturers for contract work) indicates that the $302 million paid for contract work used in the estimate is an understatement by about $50 million. The net value estimate of the Bureau of the Census, however, has not been changed.

Drugs: $30 million (+) of containers traceable to drug industry classified under producers' supplies in col. (2).

Recreation: $184 million (—) motion picture industry excluded from col. (3).

Publications: $1,120 million (—) receipts for advertising are included under col. (2), but excluded under col. (3).

Fuel and light: $393 million (—) manufactured gas, excluded under col. (3).

Producers' supplies: $596 million (—) from containers transferred to the food group, $30 million (—) to the drug group, $161 million (—) used outside manufacturing, $1,843 million (—) from producers' fuels estimated as consumed outside the manufacturing industries, $1,286 million (—) other producers' supplies consumed outside manufacturing industries, $106 million of gas used for industrial purposes, not included under col. (3).

[2] Manufactured goods exported before reaching the final manufacturing process are not included in Dr. Kuznets' totals used in this table. The Department of Commerce reports total exports in 1929 of wholly and partly manufactured goods to be $3,745 million; Dr. Kuznets estimates exports of goods considered finished at $2,720 million. The difference, $1,025 million, is the value of partly manufactured goods exported before completion. This figure is reduced 12 per cent to approximate the lower valuation at the manufacturers' stage (cf. Kuznets, *op. cit.*, p. 123).

[3] The estimates of net value in col. (2) are understatements by reason of the omission of freight and other charges incurred in the movement of semimanufactured goods between manufacturing industries. The values of semimanufactured goods if reported by manufacturers would be less for this reason than the amounts that would be reported for the cost of these same products by the manufacturers next in line. (See the discussion, Defects in the Method of Finding Net Value of Products, 12th Census of the United States, Vol. 7, p. cxli.) The estimate of $300 million is based on an analysis of freight revenues of Class I railroads for the shipment of semifinished manufactured goods. No allowance for middlemen's profits has been made.