

Quantitative Input and Output Relations in the Economic Systems of the United States

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QUANTITATIVE INPUT AND OUTPUT RELATIONS IN THE ECONOMIC SYSTEM OF THE UNITED STATES

INTRODUCTION

The statistical study presented in the following pages may be best defined as an attempt to construct, on the basis of available statistical materials, a *Tableau Economique* of the United States for the year 1919.¹

One hundred and fifty years ago, when Quesnay first published his famous schema, his contemporaries and disciples acclaimed it as the greatest "invention" since Newton's laws. The idea of general interdependence existing among the various parts of the economic system has become by now the very foundation of economic analysis. And yet, when it comes to the practical application of this theoretical tool, modern economists must rely exactly as Quesnay did upon fictitious numerical examples. What would be the present state of the theory and policy of international trade if, instead of actual balances of foreign trade, the economist had to base his analysis upon assumed numerical set-ups, supplemented by scattered items of actual statistical information? This is the situation in which the student of economics finds himself at present when he faces a problem of national production, consumption, and distribution. Despite the remarkable increase in the volume of primary statistical data, the proverbial boxes of theoretical assumptions are in this respect as empty as ever. Considerable progress has been achieved in the field of national income statistics. The economic balance of some of the most important branches of the national economy, particularly that of agriculture, has been studied with much success. Thus the ground has been prepared, at least in part, for a more complete analysis of the interrelations of the whole economic system. Nevertheless, the difficulty of the task still remaining can hardly be exaggerated.

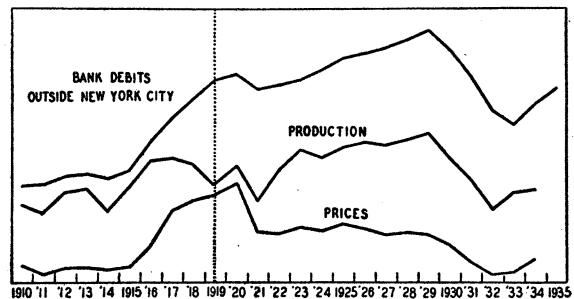
¹ The research project, a summary of the results of which are presented in this paper, has been financed by the Harvard University Committee on Research in the Social Sciences. Mr. Maynard C. Heins worked on it as a full-time assistant for four years. Without his able collaboration, the statistical task could hardly have been accomplished.

The publication of this preliminary survey is prompted by the conviction that the inevitable path of any empirical research is that of trial and error.

Governmental publications constitute the main source of primary statistical information used in this study. Additional data were gathered from trade publications, and in some instances the results of special investigations have been utilized. In many cases, use was made of the work of the National Bureau of Economic Research on national income.

At the time that this study was initiated (1932), the publication of the detailed results of the 1929 Census was still far from complete. As a result, the Census of 1919 had to be used. It is because of this fact that the entire investigation is based on 1919 data.

CHART I.—SERIES INDICATIVE OF BUSINESS CONDITIONS



The general business conditions prevailing during that year are described in W. L. Thorp's *Business Annals* in the following terms:

Revival; prosperity.

Uncertainty gives way to extraordinary activity, late spring; building revival; enormous output of new securities; speculation; steel, coal, and railroad shopmen's strikes, autumn; commodity prices rise; active foreign trade.

Money eases slightly but tightens late in year; stock exchange booms, railroads reaching peak, May, and industrials, November; falling bond prices; embargo on gold export removed, June.

Large wheat, fair cotton and corn crops; prices very high.²

²*Business Annals* (National Bureau of Economic Research, New York, 1926), p. 143.

The position of the year 1919 within the framework of cyclical fluctuations of adjoining decades is fairly well indicated by the three basic economic series presented on Chart I.

THE THEORETICAL SCHEME AND ITS STATISTICAL APPLICATION

FUNDAMENTAL CONCEPTS

I

The theoretical basis of the subsequent statistical analysis is rather simple. The economic activity of the whole country is visualized as if it were covered by one huge accounting system. Not only all branches of industry, agriculture, and transportation, but also the individual budgets of all private persons, are supposed to be included within this system. Each business enterprise as well as each individual household is treated as a separate accounting unit. A complete bookkeeping system consists of a large number of different types of accounts. For our particular purpose, however, only one of them is of importance: the expenditure and revenue account. It registers on its credit side the outflow of goods and services from the enterprise or household (which corresponds to total receipts or sales) and on the debit side the acquisition of goods or services by the particular enterprise or household (i.e., corresponding to total outlays). In other words, such an account gives a description of the flow of commodities and services as it enters the given enterprise (or household) through one end and leaves it by the other. In contrast to a balance sheet, this type of account is related not to a single "instant" but rather to a period of time, say a year, a month, or a week. It differs from the usual profit and loss account in so far as it includes *all* sales and *all* purchases. In the case of purchases, it includes not only those representing expenses in the accounting sense, but also "capital outlays," etc. Our expenditure and revenue account covers in other words the entire "balance of trade" of the individual enterprise (or household).

Profits paid out to the "owners," as well as expenditures connected with additional investment (in plant, etc.), are supposed to be debited, together with payments for all the current operating expenses, purchases, replacements of machinery, etc. Purchases made on credit or paid for with borrowed money are also entered, along with all other expenditures, on the debit

side; while the sales, even if made on credit, are credited in the same way as are the cash sales.

An expenditure and revenue account of this kind may show over a period of time a negative balance (sales smaller than purchases) only to the extent that a given household or enterprise disburses its previously accumulated cash, bank balances, or other negotiable titles, or spends funds obtained by additional borrowings. A positive balance (sales greater than expenditures), on the other hand, can result from an accumulation of cash, repayment of debts, or an increase in bank deposits or security holdings. The structure of the expenditure and revenue account thus described is very similar to that of the "balance of trade" of a country; it covers explicitly all the commodity and service transactions, but not the so-called capital items.

II

It follows from the obvious nature of economic transactions that each revenue item (as defined above) of an enterprise or household must reappear as an outlay item in the account of some other enterprise or household. This consideration makes it possible to present the whole system of interconnected accounts in a single two-way table (Table I).

TABLE I

Distribution of Outlays (Input)	DISTRIBUTION OF OUTPUT (REVENUE)					
	A	B	C	D	E	Total
A		A_b	A_c	A_d	A_e	$\sum A_i$
B	B_a		B_c	B_d	B_e	$\sum B_i$
C	C_a	C_b		C_d	C_e	$\sum C_i$
D	D_a	D_b	D_c		D_e	$\sum D_i$
E	E_a	E_b	E_c	E_d		$\sum E_i$
Total	$\sum i_a$	$\sum i_b$	$\sum i_c$	$\sum i_d$	$\sum i_d$	S

The capital letters, A, B, C, D, and E, indicate business and household units.

Each row contains the revenue (output) items of one separate business (or household), subdivided according to the origin of revenue, or, what amounts to the same thing, the destination of its products. The figures in row A, for example, show that the product of firm A was distributed during some specified period of time in the following way: the amount b was taken by the firm B, the amount c by the firm C, and the amounts d and e were sold to the firms D and E, respectively. The last item $\sum_a A_i$ represents the sum total of these separate entries and shows the total revenue or production of firm A. In a similar manner, the subsequent rows show the production-revenue distribution of firms B, C, D, and E.

If read vertically, column by column, the table shows the expenditure sides of the successive accounts. The last item $\sum_A^E i_a$ of the

first column shows, for example, the total expenditures of firm A; the entries above it in the same column indicate the distribution of these expenditures among all the different sources of supply; B_a was obtained from B, C_a from C, etc. The succeeding columns reveal the cost distribution of the firms B, C, D, and E.

If it contained empirical data, the table would naturally have a number of empty squares. Those lying along the main diagonal are necessarily left open because our accounting principle does not allow for registration of any transaction within the same firm. Actually, no firm or household exists which sells its products or supplies its services to *all* the other households or firms, and which makes its purchases also from every one of them. This means that not only the diagonal but also many other boxes of our revenue-expenditure table will remain blank.

The grand total of all transactions S, placed in the lower right corner, may be obtained by adding up the revenues of all the different firms as shown in the last column or the expenditures as listed in the last row. Although, as was pointed out before, the credit and the debit side of the account for each particular enterprise or household will not necessarily balance, the total expenditures of all the firms and house-

holds must, for obvious reasons, equal the sum total of their revenues.

The simple system of letters and subscripts used in the present description leads to an abridged method of identifying each separate box of the combination table; box AB is situated on the intersection of row A and column B, CD defines the square belonging to row C and column D, etc.

III

Even if the construction of an exhaustive table describing all the transactions taking place between the independent economic units within a national economy were actually possible, the very size of such a table would constitute a serious impediment to any profitable use of the information contained in it. Obviously, considerable simplification of the original scheme is essential. The first step toward such simplification is the grouping of accounts. The majority of theoretical and practical economic problems for the solution of which the *tableau économique* may be used are not formulated in terms of individual business enterprises and households but relate rather to whole classes of such independent units.

The grouping can be based on many different principles. The business enterprises can be classified, for example, according to the type of their products and segregated into separate *industries*, or — if location differences are to be brought out — a regional grouping must be applied.

Whatever the principle of classification, the actual technique of consolidating the accounts is fundamentally always the same. If, for example, the firms B and C of Table 1 had to be combined into one "industry," a new accounting unit, B+C, must be formed (Table 2).

The new B+C row is obtained by adding (vertically) the corresponding items of the rows B and C of the original Table 1. An addition (horizontally) of the corresponding items of the columns B and C produces the new group column B+C.

One difference between the old table and the new is that the latter contains a smaller number of separate accounts. The grand total S remains the same as before. The consolidated account B+C differs, however, from the original "primary" account; the box which lies on the main

diagonal is not necessarily an empty one. If the firms B and C buy commodities or services from each other, as well as from other concerns, the new consolidated account will show purchases or sales from $B+C$ to $B+C$. This kind of registered internal turnover gives rise to a distinction between gross accounts and net accounts. The former registers all the value transfers between the original, simple accounting units, irrespective of any further grouping. The latter suppresses all the transactions between the members of the consolidated accounting group; in other words, it reveals only the external relations and treats the newly formed groups as if they were the original firms and households.

TABLE 2

Distribution of Outlays (Input)	DISTRIBUTION OF OUTPUT (REVENUE)				
	A	B+C	D	E	Total
A		$A_b + A_c$	A_d	A_e	$\sum A_i$
B+C	$B_a + C_a$	$B_c + C_b$	$B_d + C_d$	$B_e + C_e$	$\sum (B_i + C_i)$
D	D_a	$D_b + D_c$		D_e	$\sum D_i$
E	E_a	$E_b + E_c$	E_d		$\sum E_i$
Total	$\sum i_a$	$\sum (i_b + i_c)$	$\sum i_d$	$\sum i_e$	S

Table 2 is constructed on the principle of gross accounting. In order to convert it to a net transaction basis, the content (if any) of the box $[(B+C)(B+C)]$, that is the entry $B_c + C_b$, has to be suppressed. The total revenue sum at the right end of row $(B+C)$ and the total outlays sum at the bottom of column $(B+C)$ must be diminished by the same amount.

The result is shown in Table 3. The notation of Table 2 is now somewhat modified. The consolidated items are defined not as sums of the originally independent accounting elements, but simply as homogeneous transactions between the new composite groups. For example, the content of the box $(B+C)A$, which was described in Table 2 as $B_a + C_a$, is now defined as $(B+C)_a$ ["the product of the firm $(B+C)$ going to the firm A"]; similarly we write $D_{(b+c)}$ instead of $D_b + D_c$.

The grand total S of the consolidated Table 3

TABLE 3

Distribution of Outlays (Input)	DISTRIBUTION OF OUTPUT (REVENUE)				
	A	B+C	D	E	Total
A		$(B+C)_a$	A_d	A_e	$\sum A_i$
B+C			$(B+C)_d$	$(B+C)_e$	$\sum (B+C)_i$
D	D_a	$D_{(b+c)}$		D_e	$\sum D_i$
E	E_a	$E_{(b+c)}$	E_d		$\sum E_i$
Total	$\sum i_a$	$\sum i_{(b+c)}$	$\sum i_d$	$\sum i_e$	S

is smaller than that of Table 2. The difference is due to the exclusion of the internal transactions $(B_c + C_b)$.

The process of consolidation, i.e., the reduction in the number of independent accounts, may proceed up to the point where the whole table is reduced to a single box $[(A+B+C+D+E) - (A+B+C+D+E)]$. The net content of these completely unified accounts equals zero.

It hardly needs to be said that such integration of accounts reduces the volume of information conveyed. The statement that the total amount of transactions between firms B and C equals $(B_c + C_b)$ (Table 2) is considerably less informative than a separate listing of sales from B to C and from C to B.

As has already been mentioned, even the most detailed economic study would hardly require an individual treatment of all the actually independent households and firms. On the other hand, many modern business enterprises combine such a conglomeration of heterogeneous economic activities that a distribution of all their transactions among a number of smaller, more homogeneous, quasi-independent accounting units appears to be highly desirable.

IV

Up to this point the discussion has been based on the assumption that the primary statistical material, consisting of the expenditure and revenue accounts of all the separate firms and households, is absolutely complete. In view of the practical difficulties which make such a thorough coverage of all economic transactions actually impossible, the question arises as to

what effect the inevitable gaps in the primary accounts will have on the form and content of the final table.

The absence of a single individual account would not in any way impair the completeness of the picture. As every transaction is always credited to one firm or household and debited to another, the missing item can always be found in the corresponding "opposite" account. In case of a larger gap, only partial reconstruction is possible. All transactions taking place among the firms whose accounts are missing in our records are definitely irreplaceable. Only those revenue and outlay items which originate in sales to or purchases from the "reporting" firms can be picked out indirectly from the opposite entries. This means that the final result of the completed tabulation will be the same as that which we should get if the accounts of the "unreported" firms were consolidated into a single group and reduced to a net basis. For instance, taking our previous example, if the reports of firms B and C were missing, the revenue and outlay table would be identical with Table 3, which presents the "net" accounts.

V

The meaning and economic nature of a national revenue and outlay table may be further elucidated by relating it to some of the basic concepts of national income statistics such as "value added," "social product," etc.

This relation would be particularly simple in a static economy. By dividing all the accounts into two large groups, one containing the Household accounts, the other, all the rest, which might be called Business, and consolidating each of the two groups into a single item (H and B, respectively, of Table 4), we can reduce the total number of boxes to four.

TABLE 4

Distribution of Outlays (Input)	DISTRIBUTION OF OUTPUT (REVENUE)		
	H (Households)	B (Business)	Total
	H_h	H_b	$H_h + H_b$
H (Households)			
B (Business)	B_h	B_b	$B_h + B_b$
Total	$H_h + B_h$	$H_b + B_b$	S

Since, under static conditions, the corresponding row and column sums are necessarily equal, we find that the sum of the values transferred from Business to Households is equal to the total value movement in the opposite direction. The sum total of the Household expenditures (column H) represents the "National Income"; it is equal to the total value of services credited to Households (row H). The "value added" in Business is equal in its magnitude to H_b (i.e., the services contributed to Business by Households), and this is equal, under static conditions, to the value of goods and services supplied from Business to Households (B_h). The total product of industry $B_h + B_b$ equals $H_h + H_b$.

B_h represents the payments from Business to Business. Its inclusion is often defined as "double counting" and it is very often struck from the final accounts. $B_h (= H_b)$ is defined as the "net product" of industry. The Household accounts can also be reduced to a net basis by disregarding the services furnished and paid for from Household to Household (H_h). On such a net basis the National Income is B_h , which equals the "value added" H_b .

Under dynamic conditions the relations are less symmetric. The value added H_b is not necessarily equal to the Household expenditures B_h . In an expanding economy, the second item will often be somewhat smaller than the first one. The difference, measuring the "active balance of trade" between Household and Business, would indicate the transfer of purchasing power from Household to Business (see p. 115). Such transfer will also be revealed in a corresponding surplus of total industrial expenditures (input), column B, over the aggregate industrial sales (output), row B.

The foregoing analysis is based on the assumption that the saving and investment accounts are strictly separable. In some instances — as in the case of farming — strict separation of Household and Business units is not only practically but also theoretically impossible. A combined unit of this kind can increase its capital assets by the full amount of its revenue, buying capital goods, for example, yet keeping its expenditure and revenue account as balanced as ever.

The same is true of an industrial enterprise which is incurring "capital losses," or accumulating "undistributed surplus." Its current

expenditures may still be equal to its total revenue (see below, p. 113). In order to discover the deficit or surplus, it is necessary to examine the status of its fixed assets account. But "capital accounting" in this sense leads to an entirely new range of economic problems, such as depreciation, evaluation of assets, etc. The straightforward methods of registering the actual value of all commodities and services as they cross the border lines of separate accounting units cannot contribute anything to the solution of these problems.

VI

In the statistical literature dealing with methods of calculating the National Income, much attention has been given to the concept of "double counting."

It is hardly an exaggeration to say that the principle of double entry constitutes the very foundation of a rational accounting system. Double counting emerges from a process of consolidation of accounts. If two interrelated accounts are added together, the same item may appear simultaneously on the credit and on the debit side of the new account. If the purpose of such an addition happens to be the elimination of all traces of the mutual interrelation of the two accounts, this item can be suppressed on both sides.

Whether or not some particular transaction appears on both sides of the same (consolidated) account depends upon the method of grouping the accounting units for the purpose of consolidation. If, instead of segregating the household accounts in one, and all the others in a second, group, as has been done in Table 4, we should separate all agricultural from all non-agricultural items, an entirely different picture would emerge. A grouping of the latter kind reveals, for example, the "balance of trade" between industry and agriculture. Many value items which according to the first arrangement might have been excluded because of "double counting" would have to be retained in the second, while some of the original income items of the first table would have to be eliminated after the subsequent regrouping.

In its actual application, the elimination of the doubly counted items means the suppression from our record of all those statistical data which describe the mechanism of inter-industrial rela-

tions. But it is exactly this mechanism which to a large degree determines the size of the net income flow and its variations.

For the understanding of the economic structure of a business enterprise and evaluation of the prospects of its future development, even an approximate knowledge of the itemized expenditure and revenue account is more important than the most accurate information concerning the single figure given for its net revenue or deficit. The same is true regarding empirical analysis of the structure of the whole national economy. It is true that, from the point of view of welfare economics, the part of the annual flow of values which is more or less arbitrarily defined as the National Income deserves particular attention. To a more detached observer, however, it may appear to be a mere by-product of the whole highly complex process of production and distribution of economic values.¹

STATISTICAL APPLICATION

I

The classification of accounts used in the following statistical study is a compromise between a theoretical ideal and practical necessity.

According to the abstract theoretical scheme, all production enterprises should be segregated into a number of homogeneous industrial groups, homogeneity being defined in terms of (a) identity of products and (b) qualitative and quantitative similarity of the cost structure of the firms within each group. Further, all the households should be subdivided into separate classes according to the kind of services they supply, i.e., the type of income received. Actually, neither of these desiderata can be achieved.

To begin with, a definite departure from the basic "functional" classification and grouping of industries has been made in dealing with international transactions. The consolidation of all foreign economic units into a single foreign-countries' (imports and exports) account is obviously based upon a geographic, i.e., locational principle.

Even more important is the fact that the very

¹ In this connection it may be interesting to note the extreme variability of the theoretical concept of National Income. Ricardo, for example, definitely treated all wages as a doubly counted item and identified the net income of society with the sum total of rents and profits.

nature of the actual process of production and consumption precludes a clean-cut differentiation of industries. In the case of agriculture, even the fundamental distinction between enterprise and household is impossible. On the other hand, the primary statistical information for industry as a whole is fragmentary and incomplete. Practically none of it could be used directly; a large part of the entries in our final table (Table 5, inserted between pages 124-25) represents more or less indirect estimates. Among the lines of economic activity completely ignored in the present analysis, the most important are the entire fields of (a) distribution, wholesale and retail, (b) banking and finance, and (c) all non-rail transportation. Not less serious is the omission of (d) the income-expenditure accounts of all public bodies, including the budgets of federal, state, and local governments.

It would be erroneous, however, to conclude that these omissions, significant as they are, destroy the fundamental coherence of the final table. The relation of all the "unaccounted" economic units to the rest of the system is implicitly reflected in the anonymous "Undistributed" account (Table 5).

A detailed presentation of methods of computation and a description of all statistical sources will be given in a later part of this paper. The purpose of the present analysis is to show what the meaning of the general table (Table 5) would be if the numerical data contained in it were accepted at their face value.

The major part of the 44 accounts of the main table consists of 41 production accounts: of these, one represents agriculture; 34 represent industrial groups; 4, mining; one, transportation (railroads); and one, electric utilities. Agriculture is represented by a combination of production and household items. The household expenditures and receipts are consolidated in the Total Services row and the Consumption column. Foreign commodity trade is entered in the Export column and the Import row.

A systematic examination of the table can be undertaken from three different angles. If distribution of products of different industries is to be selected as the starting point, the analysis must proceed row by row; on the other hand, if the cost aspect be put in the foreground, the table should be studied column by column. Finally, the question of industrial balance will

lead to a comparison of each column with the corresponding row.

II

A typical industrial distribution is exemplified by row 32, Yarn and Cloth. The gross total of 5,578 million dollars represents the value of the output of this industrial group in 1919, appraised "at factory." Exports amounted to 318 million dollars; 41 millions were used in agricultural production; 8 millions, in automobile manufacturing; 31 millions, in other wood industries (furniture). 911 millions were traded among the different stages of the yarn and cloth manufacturing industry itself, while 1,208 millions were absorbed by the clothing industry, and 290 millions by other textile products. The leather-shoe industry took in 6 millions; the other leather industries, 1 million; and 189 millions went to the rubber industry. One million can be traced to the heterogeneous group of industries under the single heading Industries N.E.S. (not elsewhere specified), and 1,812 millions went to consumption.

Thus 4,816 millions of yarn and cloth products are allocated to definite accounts; subtracting this from the sum total of 5,578 millions, we obtain a residual of 762 millions. This balancing item is entered into the special "Undistributed" column. This column includes both those products the use of which is entirely unknown and those whose classification (as derived from available statistical data) is not determinate enough to assign them to one of the other accounts. This means that the undistributed column, on one hand, contains the net debits of the unreported accounts as defined above (page 1c9), and on the other hand, includes the aggregated errors in allocation of the respective products among the 43 reported accounts. It is quite likely that a certain portion of the undistributed product may actually have been absorbed by industries which, according to the present distribution, are not credited with any takings of yarn and cloth products. The underestimation of some of the distributed amounts represents another source of the undistributed surplus.

The 9,102 millions of its own product absorbed by agriculture include both feed and other intermediate products as well as those consumption goods which were, according to available statis-

tical information, retained on the farm. There is little doubt, however, that a considerable amount of agricultural products consumed by the farmer is obtained through the medium of the usual distributary channels. This means that some part of the 2,209 millions of agricultural products assigned in our table to Consumption was, in fact, used on the farm.

The distribution of transportation (steam railroad) services raises a new problem: Into whose cost schedule should the transportation costs of commodities moved by rail be included? Even if it were practically possible to distinguish between the cases in which the producer sells at factory, and those in which he delivers his goods free at the purchaser's door, such a twofold system of entry would hardly be advisable. One of the principal aims of the present statistical analysis is to reveal the typical productive and distributive interrelations which determine the structure of the national economy. This requires such a classification and grouping of the different elements of the system as will reveal the most stable aspect of these interrelations. Differentiation between "f.o.b." and "c.i.f." transactions, as well as any other classification by mode of payment, scarcely meets this criterion. Thus a systematic presentation of all transactions on a uniform (f.o.b. or c.i.f.) basis appears to be theoretically preferable. In Table 5, the transportation costs of each class of goods are charged to the industry which produces them, i.e., the value of every product includes the sum total of revenue obtained by the railroads for transportation of this particular kind of commodity. In distributing the products of an industry, however, the available statistical information does not enable us to identify the value (quantity times price including transportation costs) of the finished commodity according to location of the buyers. The freight costs allocated to the product of an industry are, therefore, spread in our table in an equal ratio over all units, which would be correct only under the obviously unrealistic assumption that the actual freight charges constitute a fixed proportion of the total price paid by each and every buyer.

Application of our method to imports makes it necessary to augment the import values of foreign commodities by a proportional amount of domestic transportation costs. An equivalent of the sum total of these transportation costs is

charged — in the distribution row of railway services — to exports. This item must not be confused with that part of transportation services which is charged directly to the cost accounts of the particular industries and thereby increases the "at factory" value of American export goods.

It will be seen that 4,161 million dollars of the railroad "product" are allocated to definite accounts. The undistributed 1,464 millions contain less than 1,000 millions of transportation costs still unaccounted for; the rest represents the so-called non-operating revenues.

In allocating imports, we meet in part the same difficulty which was discussed in connection with the distribution of transportation services. One portion of the wares obtained from abroad consists of goods which, like rubber, silk, or diamonds, cannot possibly come from domestic sources. The data revealing the consumption of these particular kinds of commodities by different industries indicate at the same time the distribution of the imports of these goods. This simple solution cannot be applied, however, to imports which are directly competing with domestic products of the same kind. In this case, the consumption data still leave open the question as to what part of the total amount absorbed by any single industry was of foreign origin. In this, as in the instance of freight costs, proportional distribution has been used throughout as the only practicable solution of the problem. The ratio between total domestic production and foreign imports of each particular kind of goods was applied as a fixed distribution key to all the different categories of users of this commodity. Import duties are included in the value of commodities obtained from abroad.

III

The service row (43) is, for the sake of convenience, subdivided into two parts. Distribution of Labor Services (row 43a) is rather simple: each industry is debited with the total amount of wages and salaries disbursed. As the figures in this row include only payments to hired labor, agriculture is credited only with the money wages of hired farm workers.

The definition and evaluation of Capital and Entrepreneurial Services (row 43b) raise an extremely difficult theoretical and statistical

problem. Capital services are clearly discernible only in so far as an enterprise is working with borrowed funds and makes contractual interest payments. But even in this case, ever-changing economic conditions regularly produce a situation in which the contractual rate differs considerably from the current one. The remuneration of that part of the capital investment which belongs to the owners of the enterprise is hardly distinguishable from entrepreneurial returns, monopolistic revenue, windfall profits resulting from appreciation of commodity stocks on hand, etc. So far as monopolistic and speculative profits are concerned, it is highly doubtful whether they could and should be considered as remuneration for some specific kind of service.

The theoretical difficulty and practical impossibility of distinguishing these different kinds of remuneration made it necessary to lump all of them into one single group, loosely defined as "Capital and Entrepreneurial Services." It corresponds rather closely to the bookkeeping concept of net revenue (minus taxes) augmented by the sum total of all interest payments on borrowed capital, and it includes the following three elements of a typical corporate revenue and expenditure account: (a) interest paid, (b) dividends paid, and (c) undistributed profits. According to this set-up, the undistributed surplus plays, so to speak, a double rôle in the cost account of an enterprise. On the one hand, it represents the value of materials, additional pay rolls, and other cost elements on which it usually is spent in the process of new investment; on the other hand, it measures (in addition to the two other items mentioned above) the productive services of capital and entrepreneurship. This twofold function would be more apparent if each enterprise were to pay out the total of its net revenue to the stockholders and other owners and subsequently would obtain from them, in form of a loan or in exchange for a new stock issue, an equal sum of money to be spent on new investment. The formal difference between this and the usual method of retaining undistributed surplus lies only in the fact that the former operation involves two additional monetary transactions; the immediate material consequences are in both cases identical. The identity of the material consequences in this case holds even to the extent that, should the valuation of services obtained be arbitrarily

changed, it would make no difference so long as it were offset by corresponding write-up (or reduction) of the loan value (if profits were distributed and then immediately borrowed). From a certain point of view, therefore, it may be said that the surplus values entered in the table are fictitious. Their meaning is entirely dependent upon the interpretation of the actual valuation and accounting practices of the industry.¹

According to our definition, therefore, the value of capital services will be nil, if no interest or dividend payment is forthcoming during the period under consideration and no additional surplus has been accumulated during that time. Every payment on interest and dividend account is debited as a capital service, even if accompanied by a deficit.

The fundamental set-up of our table necessitates a radical departure from the conventional accounting practices so far as the treatment of deficits is concerned. The existence of a deficit either (a) indicates the fact that the given enterprise purchased more goods and services (including dividend and interest payments) than it sold, or (b) shows that it failed to maintain its fixed investment, inventories, etc.

In the first case, the enterprise must have spent some of its previously accumulated cash balances or, if this proves to be impossible or impracticable, the "loss" is "financed" out of "additional" investment. In either situation, we have a surplus of expenditures over sales which influences the "balance of trade" of this enterprise in exactly the same way as a new additional investment.

In the second case, the deficit is confined to so-called book losses. It is indeed accompanied by revaluation of some assets but does not affect in any direct way the equilibrium of external payments and receipts. The "balance of payments" as well as the "balance of trade" of an enterprise remains entirely unaffected by internal revaluations of this kind.

¹ Without embarking upon a fundamental discussion of the evaluation problem, it is important to indicate that the explanation of actual economic forces should be clearly distinguished from any attempt to improve existing financial practices. Thus it would be as inadmissible to contest the validity of corporate surplus data on the ground of inadequacy of existing accounting systems as it would be wrong, for example, to dismiss our wage statistics with the remark that the existing wage rate cannot provide an adequate standard of living for the working class.

This leads to the conclusion that, unless they are financed by reduction of cash holdings or additional investment, deficits in our set-up should be disregarded; negative surpluses (deficits) can be left entirely out of the picture (see below, page 125).

Official financial statistics for obvious reasons do not follow this line of reasoning. The revenue data computed for any industrial group on the basis of usual accounting practices show only the net difference between the aggregate positive net revenue of all enterprises showing net income and the net losses sustained by the remaining part of the industry. The income statistics published by the Bureau of Internal Revenue, however, give separately figures for incomes of "Corporations Reporting Net Income" as well as for the aggregate deficits of "Corporations Reporting No Net Income." The former figure can be used in the calculation of the services of capital as defined for our special purpose.

In using official net income data, we still introduce a systematic underestimation of the entrepreneurial and capital services. The sum total of dividend payments and other capital services actually exceeds by a certain amount the aggregate net income of industry because a number of business concerns pay dividends in excess of actual earnings. The exact extent of these overpayments for the year 1919 cannot be ascertained readily; for the manufacturing and mining industries alone, they appear not to have exceeded 100 million dollars.¹

The situation of an industry which is suffering losses is, in certain respects, identical with that which arises in the case of additional investment (which might be financed by undistributed profits, security sales, or out of already available cash resources). From the point of view of the present analysis, it is of no import that in one case the surplus of expenses over receipts is accompanied by a decrease in the value of "capital assets," while in the other this value is increasing. The whole approach is based on registration of the current stream of goods and services; the appreciation and depreciation of

capital assets are explicitly not taken into account.

These considerations lead to a corresponding interpretation of the Total Expenditures row (see page 115).

The theoretical and statistical difficulties in dealing with agricultural labor and capital services are essentially the same as in the case of the corresponding industrial cost schedules. In addition, these difficulties are enhanced by the impossibility of falling back on objective accounting figures. Any attempt to split the gross expenditures of agricultural accounting units into the standard components of wages, entrepreneurial and capital income, and other production costs is bound to lead back to arbitrary principles of imputation.

The most radical method of solving the problem would be that of including the farm purchases of consumers' goods among all the other outlays and placing in the service row only the amounts of wages, interest, etc. actually paid out. This type of reasoning has been applied in the general table to the distribution of that part of agricultural production which was consumed directly on the farm (see page 116). Obvious statistical difficulties make the consistent use of this procedure impracticable. Furthermore, there exists a good theoretical reason for keeping, so far as possible, the distribution of marketable consumption goods separate from that of other kinds of commodities.

A simple non-controversial solution of our difficulty is to relegate all agricultural outlays other than those which are already allocated among other industries to the Undistributed row. This device is essentially that used in our table. The residual amount (with the exception of taxes) is shifted, however, from the undistributed to the service row. This allocation is justified by the fact that most of these monetary expenditures are analogous in their economic nature to the industrial incomes entered in the adjacent boxes of the service row. Strictly speaking, the value of agricultural service-expenses obtained in this indirect way represents an overestimate. They include a certain amount of trade services absorbed in connection with the purchase of agricultural cost-goods; if the exact figure for this item were known, it would go in the Undistributed row. On the other hand, in using this figure, one has to keep in mind that,

¹ The aggregate net income (minus income tax) of "Manufacturing and Mining Corporations Reporting Net Income" in 1919 amounted to 4,217 million dollars, according to *Statistics of Income* (Bureau of Internal Revenue), while total dividend payments and corporate savings as estimated by W. I. King (*National Income and Its Purchasing Power*, New York, 1930) amounted to 4,276 million dollars.

as indicated above, one part (approximately 1,900 or 2,000 million dollars) of the sum total of the commodities charged from Agriculture to Agriculture consists of consumption goods.

The 5,382 millions of capital and entrepreneurial services charged to consumption include rental payments for hired houses and apartments, as well as the contribution of these factors to the so-called service industries, liberal professions, etc.

IV

Each vertical column of Table 5 shows the structure of expenditures of the corresponding industrial (or household) accounts. It gives a list of commodities and services which were absorbed by each particular branch of economic activity during the period under consideration. In an entirely static system, this distribution could be defined as the cost structure. Under the actual dynamic conditions prevailing, however, a large part of the total outlay represents not only current production costs but also additional investment. No attempt is made in the present investigation to split the expenditures of an enterprise into two parts corresponding to these two types of outlay.

The primary statistical data do not contain direct information concerning the total expenditures of the different industries similar to that which the census data on the total "value of product" give for total receipts. The magnitude of the total outlays can be determined, however, in an indirect way, through augmenting the total value of product by the value of additional new capital investment and the reduction of cash holdings. The difficulties involved in the capital accounting problem in so far as they reflect the difficulty of distinguishing current costs from new capital expenditures do not impair the validity of the sum totals thus obtained — so long as we are interested in aggregate expenditures and not in their two separate parts (current and additional expenditures as defined above). The evaluation practices in current use affect, however, the magnitude of the total outlay in so far as they determine that part of the value of capital and entrepreneurial services which is reflected in the surplus accounts.

The general principle for treatment of corporate surpluses as service items has been laid down in the preceding discussion of capital and

entrepreneurial services. The total outlays of an enterprise can be defined accordingly as value of sales (product) plus additional capital investment and borrowing plus increment of positive surplus minus net changes in the cash balance (which might be positive as well as negative). The available statistical information does not give any clue for an evaluation of the last item. There is good reason to believe, however, that the financing of new investment through disbursement of previously accumulated cash balances was in 1919 a relatively minor item. Much more serious is the omission of short-term bank credits obtained by the various industries between the beginning and the end of the year 1919. A very rough estimate shows that approximately one billion dollars was added in this way to total industrial expenditures.¹ The absolute lack of any statistical evidence concerning distribution of the sum total among the separate industries precludes any attempt to use this estimate in our study.

The total outlay items at the bottom of columns 1 to 45 represent the total values of product, including imputed transportation costs (see page 112), augmented by additional positive surpluses and long-term capital investments, of the respective individual industries.

The undistributed-outlays figure (row 44c) is a balancing item which fills the gap between the total outlay for each industry and the sum total of the individual outgo items distributed among the other rows. Taxes are segregated in a special subdivision of the Undistributed account in order to show to what extent the expenditure accounts of industries and households were linked to the revenue accounts of the government. The total of expenditures for consumption (column 43) is taken from the most recent and careful estimate made by Arthur R. Gainsborough.²

The elementary structural characteristics of the economic system represented in Table 5 can be seen more clearly in Table 6 (insert), where all

¹ According to the *Report of the Comptroller of the Currency* for the year 1920 (Vol. 1, page 31), 23 per cent of the total loans and discounts made by national banks during this year were absorbed by industrial enterprises, including railroads and public utilities. Applying this percentage to the average annual increase in total loans and discounts by all reporting banks between June, 1918, and June, 1920, we find that the proportional share of industry for the year 1919 would be approximately one billion dollars.

² As given in W. H. Lough, *High Level Consumption* (New York, 1935).

entries are expressed as percentages of the *net* sum totals of the corresponding rows and columns. Each box contains two figures. The figure that is not in parentheses shows the value of the particular item in its relation to the total *net output* of the industry or service group from which it originates; the other, in parentheses, gives the magnitude of the same item in relation to the total *net outlay* of the industrial or household account by which it was absorbed.

It is interesting to note that the undistributed items in the agricultural and industrial rows and columns (numbered 1 to 41) are relatively much smaller than in the service row and in the consumption column. The explanation seems to lie in the fact that a large part of total household expenditures are directed toward undistributed non-material production branches, which in their turn absorb a great amount of services but a relatively small quantity of material costs.

V

The statistical research — the results of which are presented in this paper — has been under-

taken with the definite aim of supplying an empirical background for the study of the interdependence between the different parts of our national economy on the basis of the theory of general economic equilibrium. These results are incomplete; in many respects they are open to criticism; and certainly, subsequent revisions will modify many important details of the picture. Work on a similar *Tableau Economique* for the year 1929 is already under way. But even the available material, however imperfect it may be, seems to justify a laboratory test of the pertinent theoretical formulations. Such an attempt will be presented in a later article.

The statistical data collected in our main table fill in the "empty boxes" of the theory of general equilibrium. Hypothetical production and consumption equations gain explicit meaning as soon as the symbolic algebraic signs are replaced by observed numerical values. Once an empirical foundation is thus established, the vague generalities of abstract theoretical statements will acquire concrete empirical significance.

STATISTICAL SOURCES AND METHODS OF CALCULATION

The fundamental theoretical framework of our analysis, as well as the main outlines of its statistical application, is developed in the first part of this article. The following pages contain a systematic explanation of the final numerical results which are embodied in the general table (Table 5).

Lack of space precludes the possibility of a complete reproduction of all the preliminary calculations. No attempt is made here to acquaint the reader with the details of individual computations or to present the series of alternative estimates which in many instances were used for checking purposes.

Preliminary Comments

a. The values of the total output of all the separate industries from "Flour and grist mills" (row 2) to "Industries not elsewhere specified" (row 39), with the exception of "Electric utilities" (row 25), are based on the Census of Manufactures and the Census of Mines and Quarries, both for the year 1919.

b. Whenever total production or total consumption data are used as a basis of distribution, adjustments for exports or imports are carried through. These adjustments are not commented upon separately in each particular instance.

c. References to "production" indicate that the particular items are based on production statistics; references to "cost" or "consumption data" show that cost statistics of the industry which uses the particular product have been utilized.

d. Whenever the output of an industry is distributed on the basis of production values, transportation costs (if any) are added separately on the basis of a fixed proportion of the total value of the output. In all of the cases where the distribution is based on cost data of the industries which use the particular product, no such adjustment is necessary.

e. Abbreviations: *Mfr.* and *Min.* indicate, respectively, the

Census of Manufactures and the Census of Mines and Quarries, both for the year 1919 unless stated as being for some other year. The abbreviation "n. e. s." stands for "Not Elsewhere Specified." For brevity, the term Transportation (Steam Railroads) is written Transportation (Railroads).

f. All original calculations are made in thousands of dollars. The rounding off is carried out in such a way as to avoid any discrepancy between the sum totals and their respective parts.

g. The following comments are arranged by distribution rows and within each row according to the order of the items, reading from left to right, in the general table. The italicized main headings refer to the rows of the table, while reference to the items within each row is introduced by the word "*To*."

1. Agriculture

Agriculture is basically defined as farming, and, in accordance with the Census, includes the entire field of crop production, fruits and vegetables, livestock and livestock products, and forest products produced on farms. The value of the total output at farm is taken from the Census of Agriculture, and increased by the amounts of transportation costs of agricultural products. (See row 41 of the general table and the discussion on page 112 above.)

To Agriculture: determined on the basis of the average percentage of products sold from the farm in the years 1924-28 (*Farm Value, Gross Income and Cash Income from Farm Products 1924-1929*, Part V [Bureau of Agricultural Economics United States Department of Agriculture, Washington, Oct. 1930]). *To Flour and Grist Mills:* quantity milled (*Mfr.*, at farm prices). *To Canning and Preserving:* estimated on basis of *Mfr.*, 1929. *To Bread and Bakery Products:* milk, eggs,

nuts, and fruits (estimated). *To Sugar, Glucose and Starch:* production and cost data, Census of Agriculture and *Mfr.* *To Liquors and Beverages:* data taken from Senate Hearings (S. 436 and S. 2473, 72d Congress, 1st session). *To Tobacco Manufacturers:* U. S. production. *To Slaughter and Meat Packing:* data from Census of Agriculture, *Mfr.*, and Department of Agriculture.

To Butter, Cheese, etc.: data from *Mfr.* *To Other Food Products:* dairy products, fruits, and nuts (estimated on the basis of *Mfr.*, 1923-29). *To Chemicals:* cottonseed, flaxseed, etc. (production [Census of Agriculture], sold at farm [See Agriculture to Agriculture, above]). *To Paper and Wood Pulp:* straw (costs, *Mfr.*). *To Yarn and Cloth:* quantities consumed (*Mfr.*) at farm prices. *To Leather, Tanning:* estimated; difference between total consumption of hides and skins and supply from meat packing and imports. *To Consumption:* edible products not distributed to other industries plus part of nursery and greenhouse products. *To Undistributed:* includes increase in cotton, wheat, and corn stocks, undistributed part of forest products.

2. Flour and Grist Mill Products

Includes flour and grist mill products (including output of custom mills), rice cleaning and polishing, prepared feeds for animals.

To Agriculture: animal feeds (*Mfr.*). *To Bread and Bakery Products:* flour consumption (estimated on basis of biennial Censuses of *Mfr.*, 1923-29). *To Consumption:* residual of all edible products. *To Undistributed:* residual inedible products.

3. Canning and Preserving

Includes canning and preserving fish, fruits and vegetables, oysters, and pickles, preserves and sauces.

To Consumption: total output of all specified products (*Mfr.*). *To Undistributed:* "all other products."

4. Bread and Bakery Products

Includes bread and bakery products, breadstuff preparations, and macaroni, vermicelli, etc.

To Consumption: total value of products.

5. Sugar, Glucose and Starch

Includes sugar (cane, beet), sugar refining, glucose and starch, and sweetening sirups.

To Agriculture: stock feed. *To Canning and Preserving:* estimated on basis of *Mfr.*, 1929. *To Bread and Bakery Products:* estimated on basis of biennial Censuses of *Mfr.*, 1923-29. *To Sugar:* raw sugar and cornstarch (*Mfr.*). *To Liquors and Beverages:* quantity of sugar used (Senate Hearings, S. 436 and S. 2473, 72d Congress, 1st session). *To Butter, Cheese, etc.:* cost of materials (*Mfr.*). *To Other Food Products:* report of cost of materials (*Mfr.*). *To Yarn and Cloth:* consumption of starch in cotton manufacture (*Mfr.*). Consumption in other parts of yarn and cloth industry could not be determined. *To Consumption:* residual of edible products. *To Undistributed:* beet pulp, oil cake, and "other products."

6. Liquors and Beverages

Includes liquors (distilled, malt and vinous), malt, and mineral and soda waters.

To Liquors and Beverages: malt (estimate; total output of malt industry is 39 millions). *To Consumption:* remainder of products.

7. Tobacco Manufacturers

Includes tobacco (chewing, smoking, and snuff), cigars, and cigarettes.

To Consumption: total production.

8. Slaughter and Meat Packing

Includes slaughtering and meat packing, poultry killing,

sausage, lard, lard compounds and other substitutes, meat products not elsewhere specified.

To Agriculture: all fertilizers. *To Bread and Bakery Products:* lard and lard substitutes (estimated on basis of biennial Censuses of *Mfr.*, 1923-29). *To Slaughter and Meat Packing:* meat, sausage casings, etc., reported as products and materials (*Mfr.*). *To Butter, Cheese, etc.:* oleo oils and stock. *To Yarn and Cloth:* wool. *To Chemicals:* stearin, soap stock, other oils and greases, and fertilizer materials (last item estimated roughly at 45 millions). *To Leather:* hides and skins, oils and greases (last item estimated roughly at 10 millions). *To Consumption:* meats, oleomargarine, lard, and lard substitutes (consumption of lard is estimated on basis of family budget studies). *To Undistributed:* residual amount.

9. Butter, Cheese, etc.

Includes butter, butter reworking, cheese, condensed milk, oleomargarine.

To Bread and Bakery Products: butter and condensed and evaporated milk (estimated on basis of biennial Censuses of *Mfr.*, 1923-29). *To Other Food Products:* condensed and powdered milk (estimated; one-half the cost of milk and milk products to confectionery and ice cream). *To Consumption:* remaining cream, cheese, butter and substitutes, condensed and evaporated milk, and buttermilk. *To Undistributed:* casein and other products.

10. Other Food Products

Includes baking powder and yeast, chocolate and cocoa products, coffee and spices (roasting and grinding), confectionery and ice cream, cordials and flavoring sirups, flavoring extracts, food preparations not elsewhere specified (peanut butter, all other preparations for human consumption), peanut roasting and grading, vinegar and cider.

To Bread and Bakery Products: baking powder and yeast, chocolate and malt extract (estimated on basis of biennial Censuses of *Mfr.*, 1923-29). *To Other Food Products:* chocolate, cocoa and other materials (cost of materials; *Mfr.*, and estimates). *To Consumption:* remaining products assignable to consumption. *To Undistributed:* undistributed chocolate, cocoa, peanut grading, etc.

11. Iron Mining

Includes mining of iron ore.

To Blast Furnaces: blast furnace consumption, cost data, (*Mfr.*). *To Undistributed:* remainder of products.

12. Blast Furnaces

Includes blast furnaces and ferroalloys.

To Steel Works and Rolling Mills: consumption of domestically produced pig iron, ferroalloys, and blast furnace gases, computed on basis of *Mfr.* *To Automobile Industry:* estimated. *To Other Iron and Steel Industries:* consumption by foundries, etc., less amount taken by the automobile industry, computed on basis of *Mfr.* *To Construction:* slag (sold). *To Undistributed:* residual.

13. Steel Works and Rolling Mills

Includes steel works and rolling mills.

To Agriculture: staples, barbed and woven wire, horseshoes (calculated on basis of *Mfr.*). *To Iron Mining:* This, as well as a number of subsequent items, is calculated on the basis of the statistics of distribution of rolled steel products compiled by the *Iron Age* for 1922 and later years. These distributions show certain relatively constant proportions, on the basis of which a corresponding table for 1919 has been constructed. In the *Iron Age* distribution, all mining industries are treated as a single industry. The final distribution to individual mining industries is made on the basis of the total cost of materials as given in the Census. *To Blast Furnaces:* mill cinder, scale, slag, etc. (cost data, *Mfr.*). *To Steel Works and Rolling Mills:* cost of materials (*Mfr.*). *To Automobiles:*

estimates based on the *Iron Age* distribution (see Steel Works and Rolling Mills to Iron Mining). *To Other Iron and Steel*: This item is the result of a detailed analysis of census data. It is the difference between the total outputs of products of the types and qualities used by "Other Iron and Steel" and the amount of these materials distributed to other industries. *To Non-Ferrous Metal Mining*: estimated (see Steel Works and Rolling Mills to Iron Mining). *To Petroleum and Natural Gas*: estimated (see Steel Works and Rolling Mills to Iron and Steel). *To Coal*: estimated (see Steel Works and Rolling Mills to Iron Mining). *To Rubber*: estimate of wire used in tire production. *To Construction*: estimated on basis of *Mfr.* *To Transportation (Railroads)*: railway track materials and cars. *To Undistributed*: residual item consisting partly of rolled products and partly of advanced products such as nails, bolts, wire manufactures, etc., made in rolling mills.

14. Other Iron and Steel Industries

Includes aeroplanes, agricultural implements, ammunition, carriage and wagon materials, carriages and sleds, children's carriages and wagons and repairs, cars and general shop construction including railway repair shops, cash registers and calculating machines, copper, tin and sheet iron work, cutlery and edge tools, cream separators, electrical machinery, engines (steam, gas and water), files, firearms, foundry and machine shop products, furniture (metal), galvanizing and other coating processes, gas and electric fixtures, gas machines and gas and water meters, hardware, hardware (saddlery), horseshoes, iron and steel bolts and nuts, cast pipe, doors and shutters, forgings, nails and spikes, tempering and welding, wrought pipe, locomotives, machine tools, motorcycles, bicycles and parts, needles, pins, hooks and eyes, ordnance, steel pens, plumbers' supplies, n. e. s., pumps (not power), pumps (power), safes and vaults, saws, scales and balances, screws (machine), screws (wood), sewing machines and attachments, shipbuilding (steel), soda water apparatus, springs (steel), stamped and enameled ware, steam fittings, etc., steel barrels and drums, stoves and hot air furnaces, stoves (gas and oil), structural ironwork, textile machinery and parts, tin and terne plate, tinware, n. e. s., tools, n. e. s., typewriters and parts, vault lights and ventilators, windmills, window and door screens, wire, wirework, n. e. s.

The highly intricate structure of this important industrial group defies any attempt to introduce a finer distinction among its separate component parts. Even on the basis of the census classification accepted above, it overlaps in many instances the adjoining industries, particularly "Steel Works and Rolling Mills," "Non-Ferrous Metal Smelting and Refining," and "Brass, Bronze, and Copper Products." Such commodities as copper wire, for example, are produced in rolling mills and copper works as well as in special wire works. The distribution of these goods among the different consumers is made in this, as in all other similar cases, on a strictly proportional basis. For each particular kind of use, each source of supply is drawn upon in proportion to its total output.

To Agriculture: agricultural machinery, carriages, traction engines, and other products used by agriculture (production data, *Mfr.*). *To Flour and Grist Mills*: machinery (production data, *Mfr.*). *To Cannings and Preserving*: tin cans (estimated, on basis of Census of *Mfr.*, 1929. Comparing this amount with the total number of containers used by the canning industry in 1929 — 3,936 million cans — we obtain an average price of 2.96 cents per can, which might be somewhat high.) *To Bread and Bakery Products*: machinery (production data, *Mfr.*). *To Sugar, Glucose, and Starch*: sugar machinery (production data, *Mfr.*). *To Liquors and Beverages*: bottling machinery (production data, *Mfr.*). *To Butter, Cheese, etc.*: dairy machinery and tin cans (*Mfr.*). *To Other Food Products*: confectioners' machinery (*Mfr.*). *To Iron Mining*: estimate; mining machinery is distributed among the different branches

of mining in proportion to the horsepower used. *To Steel Works and Rolling Mills*: 30 per cent of metal working machinery (estimated on basis of *Mfr.*, 1925-29). *To Automobiles*: electrical equipment, engines, vehicle hardware, machine tools, stamped ware, etc. (machine tools purchased estimated on basis of statement in *Iron Trade Review*, Jan. 5, 1920, p. 56. Stamped ware estimated on basis of *Mfr.*, 1929. All other items, *Mfr.*). *To Other Iron and Steel*: forgings, engines for shipbuilding, tin and terne plate and other products used in the same industry for further manufacture (*Mfr.*). *To Non-Ferrous Metal Mining*: ore crushers and mining machinery (for explanation of the latter item, see *Other Iron and Steel to Iron Mining*).

To Non-Metal Minerals: clay and glass working machinery (*Mfr.*). *To Petroleum and Natural Gas*: oil well machinery and wrought pipe (estimated on basis of *Mfr.* and *Iron Age* distribution; see Steel Works and Rolling Mills to Iron Mining). *To Coal*: machinery (estimate; see *Other Iron and Steel to Iron Mining*). *To Chemicals*: oil mill machinery (*Mfr.*). *To Electric Utilities*: machinery and apparatus (telephone and telegraph apparatus and supplies and line materials). *To Lumber and Timber*: estimated on basis of *Mfr.* *To Paper and Wood Pulp*: paper and pulp machinery (*Mfr.*). *To Printing and Publishing*: machinery (*Mfr.*). *To Yarn and Cloth*: textile machinery (*Mfr.*). *To Other Textile Products*: industrial sewing machines. *To Leather*: machinery (*Mfr.*). *To Shoes*: machinery (*Mfr.*). *To Other Leather Products*: hardware (*Mfr.*). *To Rubber*: machinery (*Mfr.*). *To Construction*: electric machinery and fixtures, etc., electric wire (estimated on basis of data of American Bureau of Metal Statistics on copper consumption), gas and water meters, etc., building hardware, cast pipe, iron and steel doors and shutters, nails and spikes (estimated), wrought pipe (estimated), plumbing supplies, hot air furnaces, stamped and enameled ware (tubs and sinks), dredging, excavating, and road making machinery, concrete mixers, safes and vaults, steam fittings, structural iron work, vault lights and ventilators. Unless otherwise stated, all data are obtained from *Mfr.* *To Transportation (Railroads)*: products of railway repair shops (*Mfr.*), locomotives, cars and machinery purchased (*Statistics of Railways*, 1919). *To Consumption*: electric wire, machinery and appliances, stoves and ranges, cutlery and edge tools, hardware, enameled ware, sewing machines, etc. (*Mfr.*). *To Undistributed*: This item contains among other products the total output of the steel shipbuilding industry, which in 1919 amounted to 1,456 million dollars.

15. Automobiles

Includes automobile bodies and parts, automobiles, and automobile repairing.

To Automobile Industry: products of bodies and parts industry (*Mfr.*) and 50 per cent (estimated) of the "other products" of the automobile industry (*Mfr.*). *To Consumption*: passenger cars, product of repair shops, and 50 per cent of "other products" of automobile industry (*Mfr.*). *To Undistributed*: trucks and other special types of motor vehicles (*Mfr.*).

16. Non-Ferrous Metal Mining

Includes mining of copper, lead and zinc, gold and silver, and metals, n. e. s.

To Non-Ferrous Metal Mining: purchased ore, etc. (*Min.*). *To Smelting and Refining*: production of copper, lead, and zinc ore (*Min.*). *To Undistributed*: principally products of gold and silver mining.

17. Non-Ferrous Metals: Smelting and Refining

Includes smelting and refining of copper, lead, and zinc, metals n. e. s., and smelting not from ore.

To Steel Works and Rolling Mills: consumption by steel works and rolling mills of copper (*Mfr.*), zinc (quantity as given by the American Bureau of Metal Statistics, 1919); valued at point of production. *To Automobiles:* lead and zinc (American Bureau of Metal Statistics). *To Other Iron and Steel:* lead and zinc (American Bureau of Metal Statistics). *To Smelting and Refining:* rough estimate on basis of *Mfr.* *To Brass, Bronze, etc.:* estimated on basis of metal content of products of the industry. *To Printing and Publishing:* zinc (American Bureau of Metal Statistics). *To Chemicals:* lead and zinc, including pigments from ore. *To Paint Industry:* estimated on the basis of American Bureau of Metal Statistics and *Mineral Industry*. *To Construction:* lead (American Bureau of Metal Statistics). *To Consumption:* lead and zinc (American Bureau of Metal Statistics). *To Undistributed:* includes addition to copper stocks valued at 59 million dollars.

18. Brass, Bronze and Copper Products, etc.

Includes aluminum manufacture, Babbitt metal and solder, bells, brass, bronze, and copper products, gold and silver leaf and foil, gold and silver not from ore, lead (pipe, bar and sheet), silver smithing and silverware, tin and other foils, plated ware.

To Tobacco Manufactures: tin and other foils (rough estimate on basis of production of tin and other foils). *To Other Food Industries:* rough estimate on basis of production of tin and other foils. *To Automobiles:* brass, bronze and copper, and aluminum (calculated on basis of American Bureau of Metal Statistics and *Automobile Facts and Figures*). *To Other Iron and Steel Industries:* calculated on basis of American Bureau of Metal Statistics and *Mfr.* *To Electric Utilities:* copper wire and cable. *To Consumption:* hardware, lamps, etc. (production data, *Mfr.*). *To Undistributed:* residual (includes gold and silver not from ore). *To Construction:* copper wire.

19. Non-Metal Minerals

Includes mining of stone, clay, gypsum, phosphate rock, sulphur, and miscellaneous mineral mining, artificial stone, asbestos (building material and other asbestos products), brick, tile, etc., cement, crucibles, emery and other abrasive wheels, glass, graphite (ground and refined), grindstones, hones and whetstones, marble and stone work, millstones, minerals and earths (ground and prepared), paving materials, pottery, sand, lime, brick, wall plaster and composition flooring.

To Agriculture: limestone, lime, etc. (*Min.*). *To Canning and Preserving:* glass containers (estimated on basis of *Mfr.*). *To Sugar:* lime and limestone (*Mineral Resources of the U. S.*). *To Liquors and Beverages:* glass containers (estimated on basis of *Mfr.*). *To Blast Furnaces:* limestone flux (*Mineral Resources of the U. S.*). *To Steel Works and Rolling Mills:* fluor spar (*Mineral Resources of the U. S.*). *To Automobiles:* plate glass (estimated consumption on basis of *Mfr.*, 1923). *To Other Iron and Steel:* glass and brick. *To Smelting and Refining:* brick, tile, etc.

20. Petroleum and Natural Gas

Includes petroleum and natural gas industry. The distribution of natural gas constitutes a part of the general industrial fuel and power distribution, for the detailed description of which see the distribution of products of the coal industry. The following explanation covers only the crude petroleum and natural gas not included in the general fuel and power distribution.

To Petroleum and Natural Gas: contains 29 million dollars of natural gas purchased for resale (*Min.*). *To Refined Petroleum:* contains 657 million dollars of petroleum and 60 millions of natural gas for refining (*Mfr.*). *To Manufactured Gas:* contains 2 million dollars of natural gas purchased for resale. *To Consumption:* includes 19 million dollars of natural-gas gaso-

line other than that going to refined petroleum. *To Undistributed:* contains 22 million dollars of petroleum.

21. Refined Petroleum

Includes lubricating greases and refined petroleum. The distribution of refined petroleum constitutes a part of the general industrial fuel and power distribution, for the detailed description of which see the distribution of products of the coal industry. The following explanation covers only the distribution of petroleum products not included in the general fuel and power distribution.

To Agriculture: axle grease (*Mfr.*). *To Refined Petroleum:* contains 152 million dollars of distillates purchased and rerun. *To Electric Utilities:* fuel oil (*Statistical Abstract of United States*). *To Construction:* road oils (*Mfr.*). *To Transportation (Railroads):* fuel oil and lubricants (*Statistics of Railways*, 1919). *To Undistributed:* includes fuel oil to shipping and additions to stocks.

22. Coal

Includes coal, anthracite and bituminous. The total value of coal distributed (including transportation costs) exceeds by 3.3 per cent (70 million dollars) the actual output of the coal mines in the year 1919. Due to a prolonged strike, a considerable part of the current consumption was drawn from stocks. According to the fundamental set-up of our general table, all stock accounts belong in the consolidated "Undistributed" account. For want of better knowledge, it is assumed that the distribution from stock is proportional to the distribution from mines. Accordingly, the distribution of the product of the coal industry as described below is subsequently stepped down by 3.3 per cent all along the line.

The main part of the coal distribution is derived from the general fuel and power distribution which is outlined below.

General Fuel and Power Distribution for Manufacture and Mining

The physical quantities of coal (bituminous and anthracite), coke, fuel oil, gasoline, and gas used for fuel by the different industries, as reported in *Mfr.* and *Min.*, were multiplied by the average unit price of the respective products as given at the point of production. The values thus obtained are increased in the case of coal, coke, and oil through addition of average rail transportation costs (see page 112 above). For obvious reasons, no transportation costs have been added to the value of coal used in coal mines and bituminous coal used by cokeries. Fuel oil and gasoline absorbed by the oil refining industry and coke used in cokeries are also valued at average producers' prices without addition of transportation costs.

The subtraction of these hypothetical fuel costs from the total fuel and power costs as given in the Census yields a residual for purchased power which is taken to consist entirely of purchased electric power.

The use of average prices and transportation charges necessarily impairs the reliability of these preliminary estimates. Particular bias is to be expected with respect to those industries in which the fuel costs constitute a large proportion of total expenses or in which the quantity of fuel used is determined by special technical requirements. On the basis of these qualifications, the preliminary estimates were revised for the following twelve industries: Iron Mining, Blast Furnaces, Steel Works and Rolling Mills, Non-Ferrous Metal Mining, Smelting and Refining, Non-Metal Minerals, Petroleum and Natural Gas, Refined Petroleum, Coal, Coke, Manufactured Gas, and Sugar. The revision consists in recalculation of the purchased power costs on the basis of an average outlay of \$17.50 per horsepower of prime movers operated on purchased power in each particular industry. For all branches of the mining industry, the actual cost of purchased power is given in the Census of Mining. Subsequently the costs of other fuels were adjusted

correspondingly. Thus, for example, the price of coal used in coal mining is reduced below the average, while its unit cost to gas manufacturers is considerably increased. Fuel oil costs to the sugar industry are reduced because of special locational advantages.

The final distribution of gas requires additional calculations because this product is supplied from three different sources; one part comes from the petroleum and natural gas industry, another originates in gas manufacture, and the rest is a by-product of the coke industry. The distribution among these three sources is proportional throughout.

The following comments cover only that part of the coal distribution which is not derived from the general fuel and power distribution.

To Electric Utilities: estimate based on quantities consumed (*Statistical Abstract of the United States*). *To Transportation (Railroads):* estimated on the basis of *Statistics of Railways, 1919*. *To Consumption:* estimate of National Coal Commission (*What the Coal Commission Found*). *To Undistributed:* contains 27 million dollars consumed by shipping (*Statistical Abstract of United States*).

23. Coke

Includes coke and manufactured fuel. The main part of the coke distribution is derived from the general fuel and power distribution (see coal distribution). The following remarks cover only that part of the coke and coke gas distribution which is not derived from the general fuel and power distribution.

To Electric Utilities: proportional distribution of gas on the basis of *Statistical Abstract of United States*. *To Consumption:* rough estimate. *To Undistributed:* residual.

24. Manufactured Gas

Includes manufactured gas industry. The main part of the manufactured gas distribution is derived from the general fuel and power distribution (see coal distribution). The following comments cover only that part of manufactured gas which is not included in the general fuel and power distribution.

To Electric Utilities: proportional distribution on the basis of consumption data (*Statistical Abstract of United States*). *To Consumption:* undistributed gas, coke, and appliances (*Mfr.*). *To Undistributed:* undistributed by-products.

25. Electric Utilities

Includes electric railroads, electric light and power, telephone and telegraph. The main part of the electric power distribution is derived from the general fuel and power distribution. (See coal distribution.) The following comments cover only those items which are not derived from the general fuel and power distribution.

To Electric Utilities: power sold by central electric stations to electric railways and to other central electric stations, power sold by electric railroads to central electric stations, etc. *To Consumption:* (a) passenger and baggage revenue of electric railroads (estimated on basis of the Census of Electric Railroads, 1917 and 1922); (b) domestic and farm consumption of electric power (estimated on basis of Census of Electric Industries: Central Electric Stations, 1917, 1922, 1927, and 1932). It is assumed that two-thirds of "small power and light" sales consisted of power and that one-third was used for commercial lighting; (c) thirty per cent of total telegraph and telephone revenue (rough estimate). *To Undistributed:* residual.

26. Chemicals

Includes blackings, stains, and dressings, bluing, candles, chemicals, cleaning and polishing preparations, coal tar products, drug grinding, druggists' preparations, natural dyestuffs and extracts, essential oils, explosives, fireworks, fertilizers, glue, n.e.s., adhesives, cottonseed oil and cake, oil, n.e.s., paints,

patent medicines and compounds, perfumery and cosmetics, salt, soaps, sulphuric, nitric, and mixed acids, turpentine and rosin, varnishes, wood distillation.

To Agriculture: fertilizers (*Mfr.*), cottonseed oil and cake (*Mfr.*), sprays (estimate given in W. I. King, *The National Income and Its Purchasing Power* [National Bureau of Economic Research, New York, 1930]). *To Slaughter and Meat Packing:* cottonseed oil (seventy per cent of the total output as estimated by Philip G. Wright, *The Tariff on Animal and Vegetable Oils* [New York, 1928]). *To Iron Mining:* explosives (estimate based on *Production of Explosives in the United States* [Bureau of Mines, Technical Paper 259, May, 1920]). *To Blast Furnaces:* charcoal from wood distillation (production, *Mfr.*). *To Automobiles:* estimate based on *Automobile Facts and Figures*. *To Non-Ferrous Metal Mining:* explosives (see Chemicals to Iron Mining). *To Non-Metal Minerals:* explosives (see Chemicals to Iron Mining). *To Petroleum Refining:* sulphuric acid, etc. (cost data, *Mfr.*). *To Coal:* explosives (see Chemicals to Iron Mining). *To Chemicals:* chemicals, oils, and tallow (cost data, *Mfr.*). *To Printing and Publishing:* ink (production, *Mfr.*). *To Yarn and Cloth:* dyes and bleaches (estimated on basis of *Mfr.*). *To Paper and Wood Pulp:* bleaching powder (cost data, *Mfr.*). *To Leather, Tanning:* tanning materials (cost and production data, *Mfr.*). *To Rubber:* bone, carbon, and lampblack (estimated on basis of *Mineral Industry, 1920*). *To Construction:* paints (rough estimate on basis of Census of Construction, 1929). *To Consumption:* patent medicines, drugs, soap, cosmetics, paint, etc. (Soap and paint estimated on basis of Census, 1929; other items taken from *Mfr.*). *To Undistributed:* contains chemicals, paints, soap, etc. There is good reason to believe that a considerable part of undistributed chemical products consists of consumption goods.

27. Lumber and Timber Products

Includes lumber and timber products, lumber, planing mill products, boxes (wood), and custom saw mills. This distribution is not intended to include lumber and timber products produced on farms for farmers' own use. Available statistical information does not provide, however, a sufficient basis for a clear-cut distinction among the different sources of the lumber supply.

To Agriculture: fence posts (total output, *Statistical Abstract of United States*). *To Iron Mining:* estimated on basis of 1923 distribution as given by the Department of Agriculture (Statistical Bulletin 21). *To Automobiles:* estimated on basis of *Automobile Facts and Figures* for 1923. *To Other Iron and Steel Industries:* includes wood used in car construction, agricultural implements, and carriages and wagons, estimated on basis of *Wood Using Industries of New York* (Technical Publication No. 14 of New York State College of Forestry, 1921). *To Non-Ferrous Metal Mining:* estimated on basis of 1923 distribution as given by the Department of Agriculture (Stat. Bull. 21). *To Refined Petroleum:* containers (cost data, *Mfr.*). *To Coal Mining:* estimated on basis of 1923 distribution as given by Department of Agriculture (Stat. Bull. 21). *To Lumber and Timber Products:* saw logs consumed by lumber industry, lumber consumed by planing mills and box factories (estimated on basis of *Mfr.*). *To Other Wood Products:* used in wooden shipbuilding, furniture, cooperage, wood (turned and carved), etc. (estimated on basis of Census of Mfr. and *Wood Using Industries of New York*. For reference, see above). *To Chemicals:* material for production of tanning extracts and dyestuffs and wood distillation (*Mfr.*). *To Shoe Industry:* materials for wooden heels (*Mfr.*). *To Construction:* lumber and millwork (estimated on basis of Census of Construction, 1929). *To Transportation (Railroads):* ties (*Statistics of Railways*). *To Industries not elsewhere specified:* estimated on basis of *Wood Using Industries of New York* (for reference, see above).

28. Other Wood Products

Includes baskets, rattan and willow ware, billiard tables and bowling alleys, brooms, brushes, coffins and burial cases, charcoal, cooperage (slack and tight), cork cutting, furniture (wood, rattan, and willow), store and office fixtures, show cases, lasts, looking glass and picture frames, matches, musical instruments, pianos, organs and materials, refrigerators, sewing machine cases, shipbuilding (wooden), wood (turned and carved), wood-ware products not elsewhere specified, wood preserving.

To Tobacco: cigar boxes (*Mfr.*). *To Other Iron and Steel Industries:* sewing machine cases (*Mfr.*). *To Other Wood Products:* musical instruments, parts (*Mfr.*). *To Shoes:* lasts (*Mfr.*). *To Consumption:* wooden furniture, musical instruments, coffins and burial cases, wooden goods n.e.s., etc. (*Mfr.*). *To Undistributed:* includes 165 million dollars of wooden shipbuilding products.

29. Paper and Wood Pulp

Includes paper and wood pulp, pulp from fiber, not wood, and pulp goods.

To Paper and Wood Pulp: pulp (*Mfr.*). *To Other Paper Products:* paper for boxes, bags, etc. (rough estimates on basis of cost of materials, *Mfr.*). *To Printing and Publishing:* printing paper and board (production, *Mfr.*). *To Construction:* building and roofing paper (production, *Mfr.*). *To Consumption:* wallpapers, writing paper, tissue paper, etc. (production, *Mfr.*). *To Undistributed:* wrapping paper, paper board, etc.

30. Other Paper Products

Includes bags (paper), boxes (paper and other n. e. s.), carbon paper, cardboard, cardcutting and designing, envelopes, paper goods, n. e. s., paper novelties, paper patterns, wall paper not made in paper mills.

To Consumption: wall paper not made in paper mills, playing cards, and paper novelties (production, *Mfr.*). *To Undistributed:* bags, boxes, etc.

31. Printing and Publishing

Includes printing and publishing (book and job), music, newspapers and periodicals, book binding and blank book making, engraving (steel and copperplate), lithographing, photo-engraving, engraving materials, printing materials, stereotyping and electrotyping, typefounding, and wood engraving.

To Printing and Publishing: printing for others, photo-engraving, bookbinding, etc. (*Mfr.*). *To Transportation (Railroads):* job printing, blank books, etc. (estimated on basis of cost data, *Statistics of Railways*). *To Consumption:* newspaper and periodical sales and subscriptions, books and pamphlets, sheet music (*Mfr.*). *To Undistributed:* contains job printing, newspaper and periodical advertising, lithographing, etc.

32. Yarn and Cloth

Includes cotton goods, cotton small wares, cotton lace woolen goods, worsted goods, carpets and rugs, wool felt hats, felt goods, knit goods, silk manufactures, cordage and twine, jute, linen, wool shoddy, wool pulling, wool scouring, fur felt hats, dyeing and finishing textiles, flax and hemp (dressed), haircloth, oilcloth and linoleum, straw hats.

To Agriculture: twine (*Mfr.*). *To Automobiles:* upholstery material (estimated on basis of *Automobile Facts and Figures*). *To Other Wood Products:* upholstery goods (production, *Mfr.*). *To Yarn and Cloth:* yarn, etc. (cost data, *Mfr.*). *To Clothing:* distribution based on a special study made by the Bureau of Business Research, Harvard Graduate School of Business Administration (*Distribution of Textiles*, Bulletin No. 56). As this study covers only a part of the industry, the application of its findings to the total output required a series of additional calculations. The estimates were made for each type of fabric

and marketing channel separately. *To Other Textile Products:* bag materials, etc. (estimated on basis of cost of materials and output data, *Mfr.*). *To Shoes:* lining materials (production, *Mfr.*). *To Other Leather Products:* saddle felts (production, *Mfr.*). *To Rubber Industry:* tire duck (production, *Mfr.*) and cloth for rubberizing (estimate on basis of yardage). *To Consumption:* difference between the total product of the industry and the amounts distributed among all other uses, including undistributed (see below). *To Undistributed:* consists of products for further manufacture which could not be assigned to particular industries, products of unknown use, unspecified products and contract work (production, *Mfr.*).

33. Clothing

Includes men's clothing, buttonholes, men's collars and cuffs, men's furnishings, suspenders, garters, etc., shirts, women's clothing, corsets, gloves and mittens, cloth, hats and caps (other than felt, straw, or wool), millinery and lace goods.

To Clothing: sixty per cent (rough estimate) of products of contract clothing manufacture, buttonholes, fur trimmings from fur goods industry (estimated on basis of *Mfr.*, 1929). *To Consumption:* difference between total output of clothing industry and the amounts distributed to other uses. *To Undistributed:* "Other Products" estimated on basis of *Mfr.*, 1929.

34. Other Textile Products

Includes asbestos textile mill products, awnings, tents and sails, bags other than paper, belting and hose (not rubber), carpets (rag), cloth sponging and refinishing, clothing (horse), flags and banners, furs (dressed), hairwork, hammocks, hat and cap materials, house furnishings, n. e. s., mattresses and bed-spreads, nets and seines, oakum, regalia, etc., upholstery materials, n. e. s., waste (cotton and other).

To Agriculture: clothing (horse, *Mfr.*). *To Other Wood Products:* imitation leather and coiled hair (*Mfr.*). *To Yarn and Cloth:* cloth sponging and finishing (production, *Mfr.*). *To Clothing:* hat and cap materials and dressed furs (*Mfr.*). *To Consumption:* house furnishings, mattresses, etc. (*Mfr.*). *To Undistributed:* bags, awnings, tents and sails, asbestos products, etc. (*Mfr.*).

35. Leather, Tanning

Includes leather tanning and finishing. The value of the total product of the industry includes 77 million dollars of hides and skins tanned on contract, which is not included in the value of the product of the industry as given in the Census.

To Automobiles: estimated on basis of *Automobile Facts and Figures*. *To Other Wood Products:* upholstery leather other than that assigned to automobile industry. *To Chemicals:* glue stock and fertilizer materials (*Mfr.*). *To Printing and Publishing:* bookbinders leather (*Mfr.*). *To Yarn and Cloth:* wool and hair (*Mfr.*). *To Clothing:* textile leather and hat sweats (*Mfr.*). *To Leather, Tanning:* rough leather (cost data, *Mfr.*). *To Shoes:* sole, upper, patent, and welting leather, less 55 million dollars assigned to consumption. *To Other Leather Industries:* estimated on basis of cost of materials as given in *Mfr.* *To Consumption:* rough estimate of leather used in shoe repairing. *To Undistributed:* residual.

36. Shoes

Includes boots and shoes, boot and shoe cut stock, boot and shoe findings.

To Boots and Shoes: cut stock and findings (*Mfr.*). *To Consumption:* boots and shoes (*Mfr.*).

37. Leather, Other Products

Includes belting leather, gloves and mittens (leather), saddlery and harness, pocketbook leather, trunks and valises, leather goods, n.e.s.

To Consumption: trunks and valises, gloves and mittens, etc. (production, *Mfr.*). *To Undistributed:* includes 40 million dollars of leather belting.

38. Rubber Manufactures

Includes belting and hose (rubber), boots and shoes (rubber), rubber tires and tubes, and rubber goods, n. e. s.

To Automobiles: tires (estimated; four tires and tubes per automobile produced in 1919) and rubberized cloth (estimated on basis of *Mfr.*). *To Rubber Manufacture:* reclaimed rubber (production, *Mfr.*). *To Consumption:* tires (total production of pneumatic tires less amount assigned to automobile industry), boots and shoes, druggists' and stationers' supplies, etc. (production, *Mfr.*). *To Undistributed:* includes solid tires (less amount assigned to automobile industry), hard rubber products, hose, etc.

39. Industries Not Elsewhere Specified.

Includes buttons, dairymen's and poultrymen's, etc. supplies, electroplating, enameling, engraving and die sinking, feathers and plumes, fire extinguishers (chemical), foundry supplies, glass cutting and staining, hand stamps, instruments (professional and scientific), jpanning, jewelry and instrument cases, labels and tags, lamps and reflectors, models and patterns, musical instruments and materials, n. e. s., photographic apparatus, photographic materials, roofing materials, sand and emery paper and cloth, stencils and brands, surgical appliances, typewriter supplies, upholstery materials, n. e. s., wheelbarrows, artificial flowers, artificial limbs, artists' materials, china decorating, clocks, combs and hairpins not made of rubber, dental goods, fancy goods, n.e.s., ice manufactured, ivory, shell, and bone work, jewelry, lapidary work, mirrors, optical goods, pencils (lead), pens (fountain and stylographic), pens (gold), phonographs, pipes (tobacco), signs and advertising novelties, sporting and athletic goods, stationery, n.e.s., statuary and art goods, theater scenery, toys and games, umbrellas and canes, watch and clock materials, watch cases and watches, whips, window shades and fixtures, washing machines and wringers, all other industries.

To Agriculture: dairymen's, poultrymen's, etc. supplies (production, *Mfr.*). *To Other Iron and Steel:* foundry supplies (production, *Mfr.*). *To Other Wood Products:* upholstery materials, n. e. s. (production, *Mfr.*). *To Yarn and Cloth:* buttons for knit goods (cost data, *Mfr.*). *To Clothing:* buttons (rough estimate). *To Construction:* roofing materials (production, *Mfr.*). *To Consumption:* includes products of all industries from artificial limbs to all other industries as listed above. *To Undistributed:* residual.

40. Construction

Includes construction of multiple dwellings, public works and public utilities, business buildings, industrial buildings, residential projects by operators, individual-built homes, etc., educational buildings, social and recreational buildings, religious and memorial buildings, hospitals and institutions, public and government buildings, military and naval structures.

The total value of products, as given in the table, is an authoritative estimate made on the basis of contracts awarded in 25 states as reported by the F. W. Dodge Corporation ("Who Builds the Homes in Which You Live," *Literary Digest*, 1926, p. 6).

To Consumption: multiple dwellings, residential projects and individual-built homes, stables, etc. (estimate; Dodge data for 25 states are increased by 21.7 per cent, which is the ratio between the total construction in the United States as given above and the Dodge figures of construction in 25 states). *To Undistributed:* residual. No attempt has been made to dis-

tribute the 625 million dollars of industrial construction (estimate) among the various industries.

41. Transportation (Steam Railroads)

Includes Class I, II, and III railroads, switching and terminal companies.

The total value of product is equal to the total operating and non-operating revenue of all railways, diminished by 809 million dollars, a sum which represents the total of financial transactions between separate railroads and consists of rent payments to other roads, interest and dividend payments to other roads, and the net income of "federal" roads.

The interpretation of railroad finances for the year 1919 is considerably complicated by the repercussions of governmental control. The non-operating revenue of "corporate" railroads includes approximately 900 million dollars paid by the Federal Treasury in compensation for "leased lines." On the other hand, in operating these "federal" roads, the government earned some net income. In the official accounting sheets, this amount appears twice, once in the income schedule of the "corporate" roads as a part of payment received for "leased lines," and again in the revenue account of the "federal" roads. In order to avoid this double counting, the latter item had to be subtracted from the aggregate railroad revenue.

The general scheme of distribution of transportation services is described in the first part of this article (see page 112).

To all branches of industry and agriculture: distribution of freight services is based on the "Revenue Freight Tonnage by Classes of Commodities" as published in *Statistics of Railways* for 1919. The freight revenue on each of the different types of commodities "per ton" is estimated on the basis of the "Estimate of the Freight Revenue of Class I Roads by Classes of Commodities on Basis of 1922 Tonnage and 1923 Rates," Interstate Commerce Commission, Bureau of Statistics, 1923. The average per ton revenue on each particular type of commodity as given in this study is corrected for the main freight rate changes which took place between 1919 and 1922.

To Consumption: total revenue earned in connection with passenger traffic, which includes, in addition to the revenue on passenger account, receipts from transportation of excess baggage, the revenue from hotel accommodations owned by the railroads, etc. *To Exports:* estimated costs of domestic transportation of imported commodities (see page 112). *To Undistributed:* this residual item includes the net governmental payment for lease of lines to the amount of approximately 400 million dollars.

42. Imports

Includes commodity imports into the United States entered for domestic consumption (as listed in *Foreign Commerce and Navigation of the United States*, 1919). Imports of gold and silver are excluded. The general principles of the import distribution are presented in the first part of this article (see page 112).

The declared values of each particular kind of imports are augmented by the amount of duty collected and by the proportional amount of domestic rail-transportation costs paid within the country (see *Transportation to Exports*). The statistical scheme used in distribution of imports is analogous to the set-up of the general table: it may best be represented by a two-way tabulation, in which the rows show the distribution of all the individual kinds of imports while the columns indicate the quantities of the different foreign goods absorbed by the respective industries. The detailed figures are given below in non-tabular form. Main headings refer to type of imports; subheadings indicate the industries in which the imports were absorbed.

IMPORTS (Unit: thousand dollars)		
<i>Agricultural</i>		
To: Agriculture.....	38,700	
Flour and grist mills.....	17,156	
Bread and bakery products.....	8,865	
Liquors and beverages.....	238	
Tobacco.....	75,146	
Slaughter and meat packing.....	56,772	
Other food products.....	335,677	
Yarn and cloth.....	714,502	
Chemicals.....	64,868	
Consumption.....	138,161	
Undistributed.....	8,363	
<i>Flour and grist mill products</i>	1,458,448	
To: Bread and bakery products.....	738	
Consumption.....	9,905	
<i>Canning and preserving</i>	10,643	
To: Consumption.....	27,509	
<i>Bread and bakery products</i>		
To: Consumption.....	6,842	
<i>Sugar, etc.</i>		
To: Sugar, etc. (refining).....	393,171	
Undistributed.....	4,420	
<i>Liquors and beverages</i>	397,591	
To: Consumption.....	798	
<i>Tobacco mfrs.</i>		
To: Consumption.....	11,339	
<i>Slaughtering and meat packing</i>		
To: Slaughtering and meat packing.....	5,629	
Chemicals.....	1,820	
Leather, tanning.....	306,509	
Consumption.....	16,020	
Undistributed.....	8,050	
<i>Butter, cheese, etc.</i>	338,028	
To: Consumption.....	11,013	
Undistributed.....	2,010	
<i>Other food products</i>	13,023	
To: Consumption.....	2,807	
<i>Iron mining</i>		
To: Blast furnaces.....	2,386	
<i>Blast furnaces</i>		
To: Steel works and rolling mills.....	5,443	
Other iron and steel industries.....	1,652	
<i>Steel works and rolling mills</i>	7,905	
To: Steel works and rolling mills.....	3,849	
Other iron and steel industries.....	808	
Transportation.....	652	
<i>Automobiles</i>	5,309	
To: Consumption	123	
<i>Other iron and steel industries</i>		
To: Agriculture.....	4,083	
Other iron and steel industries.....	589	
Textiles, yarn and cloth.....	1,136	
Construction.....	134	
Consumption.....	773	
Undistributed.....	9,314	
<i>Non-ferrous metal mining</i>	16,029	
To: Blast furnaces.....	19,200	
Smelting and refining.....	21,868	
<i>Smelting and refining</i>	41,068	
To: Blast furnaces.....	144	
Steel works and rolling mills.....	22,188	
Other iron and steel industries.....	28,702	
Smelting and refining.....	29,331	
Brass, bronze, etc.....	9,277	
Undistributed.....	12	
		139,654
<i>Brass, bronze, etc.</i>		
To: Other iron and steel industries.....	3,923	
Brass, bronze, etc.....	5,811	
Clothing.....	1,283	
Other textile products.....	1,283	
Chemicals.....	471	
Other industries n. e. s.....	3,770	
Consumption	1,669	
Undistributed.....	4,613	
		22,823
<i>Non-metal minerals</i>		
To: Brass, bronze, etc.....	37	
Non-metal minerals.....	9,674	
Chemicals.....	983	
Construction.....	1,800	
Consumption.....	83,218	
Other industries n. e. s.....	28,526	
Undistributed.....	13,881	
		138,119
<i>Petroleum and natural gas</i>		
To: Petroleum refining.....	26,443	
<i>Petroleum refining</i>		
To: Consumption.....	4,997	
Undistributed.....	974	
		5,971
<i>Coal</i>		
To: Consumption.....	5,473	
<i>Coke</i>		
To: Consumption.....	141	
<i>Lumber and timber</i>		
To: Agriculture.....	137	
Lumber and timber.....	32,768	
Other wood products.....	5,772	
Paper and pulp.....	10,459	
Construction.....	11,883	
Transportation.....	355	
Electric utilities.....	182	
Consumption	536	
Undistributed.....	13,222	
		75,314
<i>Other wood products</i>		
To: Other wood products.....	236	
Consumption	5,819	
Undistributed.....	4,401	
		10,456
<i>Paper and wood pulp</i>		
To: Tobacco mfr.....	6,124	
Paper and wood pulp.....	37,049	
Printing and publishing.....	43,732	
Consumption	143	
Undistributed.....	2,677	
		89,725
<i>Other paper products</i>		
To: Consumption	104	
Undistributed.....	1,814	
		1,918
<i>Printing and publishing</i>		
To: Consumption	4,894	
Undistributed.....	237	
		5,131
<i>Yarn and cloth</i>		
To: Agriculture.....	2,696	
Flour and grist mills.....	590	
Other wood products.....	427	
Yarn and cloth.....	28,130	
Clothing	32,457	

Other textile products	50,000	Consumption	12,919
Consumption	25,102	Undistributed	
Undistributed	53,393	Special imports	32,377
		Other	16,002
Clothing	192,795	Household effects	8,449
To: Consumption	21,020	U. S. mfrs. returned	44,777
Other textile products			
To: Yarn and cloth	497	Total Imports	255,010
Clothing	12,452		3,904,368
Consumption	2,843		
Undistributed	26,680		
Chemicals	42,472		
To: Agriculture	33,345	43a. Wages and Salaries	
Textiles	5,466	To Agriculture: total of money wages paid to farm laborers (Census of Agriculture). To Manufacturing and Mining Industries (all industries from Flour and Grist Mills to Industries Not Elsewhere Specified, with the exception of Electric Utilities): calculated on the basis of <i>Mfr.</i> and <i>Min.</i> To Electric Utilities: calculated on the basis of the Census of Electric Utilities. To Construction: rough estimate. The percentage relation of wages and salaries and cost of materials to the value of product of the industry in the year 1929 was calculated on the basis of the Census of Construction. These ratios were corrected for the change in wage level and variation in the cost of materials between 1919 and 1929 and then applied to the total value of output in 1919. To Transportation (Railroads): total wages and salaries (<i>Statistics of Railways</i> , 1919) diminished by the amount of wages and salaries paid out by steam railroad repair shops. (The latter are included in the Other Iron and Steel Industries.) To Consumption: estimate; the total of direct services (intangibles) absorbed by households amounted, according to W. H. Lough (<i>High Level Consumption</i> [New York, 1935]), to 6,546 million dollars. It is assumed that the material costs connected with the direct services are negligible and that consequently the total amount is distributed among wages, salaries, and capital and entrepreneurial services. The ratio between the two shares is obtained on basis of the income distribution within the "Unclassified Industries" as given by W. I. King (<i>The National Income and Its Purchasing Power</i> , 1930). To Undistributed: includes wages and salaries paid out in banking, mercantile industry, Pullman and express industry, shipping, undistributed unclassified (W. I. King: <i>The National Income . . .</i>). The last amount represents the difference between the total wages and salaries paid out in unclassified industries and the amount of wages and salaries assigned to Consumption (see Wages and Salaries to Consumption).	
Chemicals	41,700		
Construction	1,236		
Consumption	9,330		
Undistributed	14,254		
Vegetable oils	105,331		
To: Canning and preserving	8,000		
Slaughtering and meat packing	41,181		
Other food products	1		
Steel works and rolling mills	98		
Other iron and steel	127		
Yarn and cloth	10,606		
Chemicals	42,107		
Consumption	10,014		
Undistributed	15,700		
Chemicals including vegetable oils	127,834		
	233,165		
Leather, tanning			
To: Other wood products	1	43b. Capital and Entrepreneurial Services (for definition and general discussion, see page 113.)	
Tanning	5,751		
Shoes	3,966	To Agriculture: see page 114. To Manufacturing Industries and Mining: calculated on the basis of the corporate income tax data in <i>Statistics of Income</i> , 1919 (published by the Bureau of Internal Revenue). For each industry, the amount of the net corporate income, earned by "corporations reporting net income" less tax, is augmented by the estimated amount of interest paid. In the official income statistics for 1919 the industrial classification used in the distribution of interest charges is somewhat less detailed than that which is given in our table. The necessary subdivision is obtained through a very rough estimate: the interest charges within each industrial group are distributed in proportion to the value of product.	
Other leather products	11,376		
Undistributed	123		
Shoes	21,217		
To: Consumption	226		
Other leather products			
To: Agriculture	230		
Consumption	6,261		
Undistributed	287		
Rubber	6,778		
To: Consumption	368		
Undistributed	636		
Rubber, crude	1,004		
To: Rubber industries	221,626		
Industries n. e. s.			
To: Industries n. e. s.	70		
Consumption	40,368		
Undistributed	8,411		
Miscellaneous	48,849		
To: Tobacco mfrs.	3,865		
Other food products	6,217		
Steel works and rolling mills	3,341		
Brass, bronze, etc.	3,267		
Other wood products	6,036		
Paper and pulp	7,185		
Other textiles	74,235		
Chemicals	22,688		
Leather, tanning	10,225		
Industries n. e. s.	3,337		

Table 5. - Quantitative Input and Output Relations in the Economic System of the United States
 (Unit: million dollars)

Statistical Input and Output Relations in the Economic System of the United States, 1919

(Unit: million dollars)

DISTRIBUTION OF OUTPUT OF CLASSES LISTED AT LEFT OF TABLE																																																											
Iron mining	Blast furnaces	Steel works and rolling mills	Other iron and steel and electric mfrs.	Automobiles	Non-ferrous metal mining	Smelting and refining	Brass, bronze, copper, etc., mfrs.	Non-metal minerals	Petroleum and natural gas	Refined petroleum	Coal	Coke	Manufactured gas	Electric utilities	Chemicals	Lumber and timber products	Other wood products	Paper and wood pulp	Other paper products	Printing and publishing	Clothing	Other textile products	Leather tanning	Leather shoes	Other leather products	Rubber manufactures	Industries n.e.s.	Construction	Transportation (steam railroads)	Exports	Consumption	Undistributed	Gross total output	Net total output																									
0 11 12 13 14 15 16																																																											
53																308		4	1117		30								2100	2209	972	22147	13045	1																									
16																													318	968	136	2462	2442	2																									
36																													151	462	15	628	628	3																									
67																													23	1325	1348	1348	4*																										
269 5																													159	749	23	1201	1190	5																									
669 161 5																													28	552	615	580	6																										
12 6 482 1154 86 31																													47	966	1013	1013	7																										
10 4 17 503 381 11																													1035	2626	87	4576	4222	8																									
997																													146	874	65	1148	1148	9																									
7 267																													56	1189	66	1400	1333	10																									
24 36 1 406 216																41													4	21	299	299	11																										
13 251 46																2													1	13	8	857	857	12																									
22 4 22 14 3 20 3 13 54																9													622	15	66	189	336	1441																									
10 4 3 7 41 722																6													1	2	15	90	29	932																									
1 22 32 5 5 7 3 17 10 177 1 50 21 6 3 1 5 1 5																													1	5	5	73	363	649																									
7 9 10 95 85 7 10 16 5 76 20 36 189 49 121 45 8 7 34 2 3 39 2 1 6 2 8 20 441 120 595 96 2223 2187 22																													1	5	5	61	369	366																									
230 7 20 1 7 1 4 2 3 13 4 17 4 11 1 1 1 1 101 8 2 5 15 2 10 38 6 2 4 5 1 5 14 2 227 12 330 313 24																													1	74	349	342	16																										
1 18 8 1 5 12 3 7 17 4 11 1 1 13 1 1 101 8 2 5 15 2 10 38 6 2 4 5 1 5 14 979 778 2133 2032 25																													251	46	2	130	5	173																									
5 2 1 12 44 11 10 2 7 14 1 1 13 1 1 101 8 2 5 15 2 10 38 6 2 4 5 1 5 14 622 15 66 189 336 1441 1421 19																													1	52	113	300	783	783																									
4 3 10 9 1 13 23 194 6 25 58 47 2 30 388 725 1249 3302 3108 26																													22	4 22	14	3 7 41	722	19																									
3 96 44 12 35 36 9 48 485 453 14 37 77 210 233 184 31 91 1208 290 6 1 189 1 318 1812 762 5578 4667 32																													42	3109	75	3371	3226	33																									
1 18 8 1 5 12 3 7 17 4 11 1 1 13 1 1 101 8 2 5 15 2 10 38 6 2 4 5 1 5 14 14 252 95 86 469 2408 1923 27																													61	757	391	1285	1248	28																									
8 31 91 1208 290 6 1 189 1 19 58 47 184 30 4 47 19 53 651 261 1138 1119 38 1034 2108 3142 3142 40																													10	130	88	303	303	37																									
19 8 17 3 6 4 14 482 106 233 82 1064 1379 1146 36 19 53 651 261 1138 1119 38 1034 2108 3142 3142 40 5 141 1246 1464 5625 5620 41																													19	53	651	261	1138	1119																									
10 14 3 20 86 97 1134 391 1776 39 1034 2108 3142 3142 40 5 141 1246 1464 5625 5620 41 10																													10	130	88	303	303	37																									
80 24 97 165 19 17 187 131 713 50 9 337 181 33 12 56 44 792 129 55 371 4 11 222 43 18 1 572 257 4205 4205 42																													23	35 36 115 18 11 26 1 1 1 1 101 8 2 5 15 2 10 38 6 2 4 5 1 5 14 231	171	488	405	268	63	102	716	1547	663	220	341	93	545	792	1027	68	101	235	73	396	856	252	450	50 1980	32083	4440			
353 23 35 36 115 18 11 26 1 1 1 1 101 8 2 5 15 2 10 38 6 2 4 5 1 5 14 190 83 92 736 4096 677 148 72 171 488 169 118 975 50 78 782 497 713 402 171 106 589 1095 731 86 108 292 68 279 514 762 2228 3464 10137 33356 19																																																											
141 8 36 383 866 207 67 42 34 158 179 140 126 22 18 281 243 184 103 74 45 133 585 271 47 85 100 37 107 407 95 815 5382 9151 30937 43(b) 331 91 128 1121 4962 884 215 114 205 646 348 258 1101 72 96 1063 740 897 505 245 151 722 1680 1002 133 193 392 105 386 921 857 3043 8846 19286 64293 55447 19																																																											
49 31 21 88 427 148 19 7 20 32 39 78 49 9 19 143 104 50 32 35 15 32 249 34 15 26 25 6 38 55 78 244 1355 4174 49 136 173 402 4445 673 156 126 351 546 903 405 268 63 102 716 1547 663 220 341 93 545 792 1027 68 101 235 73 396 856 252 450 50 1980 32083 4440 468 167 194 490 4872 821 175 133 371 578 942 483 317 72 121 859 1651 713 252 376 108 577 1041 1061 83 127 260 79 434 911 330 694 50 13335 36257 36257 1461 372 910 3108 2482 3488 504 1095 826 1593 1467 1908 2358 388 349 2534 3404 2540 1352 852 473 1850 5825 3586 613 1045 1423 317 1285 1933 3167 5928 7890 52362 38536 205576 45 1394 372 910 2626 1979 2491 497 689 826 1573 1426 1731 2322 385 332 2433 3210 2055 1315 175 473 1666 4914 3443 566 1031 190 317 1266 1933 3167 5923 7890 43516 38636 182020 46 10 11 12 13 14 15 16 17 18 19 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146																																																											

Table 6.- Quantitative Input and Output Relations in the Economic System of the United States, 1919: Percentages
 (Unit: one per cent)

DISTRIBUTION OF OUTLAYS (INPUT) OF CLASSES LISTED AT TOP OF TABLE																			DISTRIBUTION OF OUTPUT OF CLASSES LISTED AT LEFT OF TABLE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Agriculture		Flour and grist mill products		Canning and preserving		Bread and bakery products		Sugar, glucose, and starch		Liquors and beverages		Tobacco manufactures		Slaughtering and meat packing		Butter, cheese, etc.		Other food industries		Iron mining		Blast furnaces		Steel works and rolling mills		Other iron and steel and electric mfrs.		Automobiles		Non-ferrous metal mining		Smelting and refining		Brass, bronze, copper, etc., mfrs.		Non metal minerals		Petroleum and natural gas		Refined petroleum		Manufactured gas		Electric utilities		Chemicals		Lumber and timber products		Other wood products		Paper and wood pulp		Printing and publishing		Yarn and cloth																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
1 Agriculture		13.6 (70.7)	1.6 (31.7)	.2 (1.5)	1.2 (13.3)	4 (9.7)	1.5 (16.8)	23.3 (70.6)	6.1 (68.4)	4 (3.8)	8 (2.6)	9 (1.0)	11 (2.5)	10 (9.7)	11 (6.3)	12 (1.7)	13 (2.2)	14 (1.3)	15 (1.2)	16 (1.3)	17 (1.2)	18 (1.2)	19 (1.2)	20 (1.2)	21 (1.2)	22 (1.2)	23 (1.2)	24 (1.2)	25 (1.2)	26 (2.4) (9.0)	27 (2.4)	28 (.9)	29 (22.7)	30 (.9)	31 (.9)	32 (.6)	33 (.6)	34 (.6)	35 (.5)	36 (.5)	37 (.5)	38 (.5)	39 (.5)	40 (.5)	41 (.5)	42 (.5)	43 (.5)	44 (.5)	45 (.5)	46 (.5)	47 (.5)	48 (.5)	49 (.5)	50 (.5)	51 (.5)	52 (.5)	53 (.5)	54 (.5)	55 (.5)	56 (.5)	57 (.5)	58 (.5)	59 (.5)	60 (.5)	61 (.5)	62 (.5)	63 (.5)	64 (.5)	65 (.5)	66 (.5)	67 (.5)	68 (.5)	69 (.5)	70 (.5)	71 (.5)	72 (.5)	73 (.5)	74 (.5)	75 (.5)	76 (.5)	77 (.5)	78 (.5)	79 (.5)	80 (.5)	81 (.5)	82 (.5)	83 (.5)	84 (.5)	85 (.5)	86 (.5)	87 (.5)	88 (.5)	89 (.5)	90 (.5)	91 (.5)	92 (.5)	93 (.5)	94 (.5)	95 (.5)	96 (.5)	97 (.5)	98 (.5)	99 (.5)	100 (.5)	101 (.5)	102 (.5)	103 (.5)	104 (.5)	105 (.5)	106 (.5)	107 (.5)	108 (.5)	109 (.5)	110 (.5)	111 (.5)	112 (.5)	113 (.5)	114 (.5)	115 (.5)	116 (.5)	117 (.5)	118 (.5)	119 (.5)	120 (.5)	121 (.5)	122 (.5)	123 (.5)	124 (.5)	125 (.5)	126 (.5)	127 (.5)	128 (.5)	129 (.5)	130 (.5)	131 (.5)	132 (.5)	133 (.5)	134 (.5)	135 (.5)	136 (.5)	137 (.5)	138 (.5)	139 (.5)	140 (.5)	141 (.5)	142 (.5)	143 (.5)	144 (.5)	145 (.5)	146 (.5)	147 (.5)	148 (.5)	149 (.5)	150 (.5)	151 (.5)	152 (.5)	153 (.5)	154 (.5)	155 (.5)	156 (.5)	157 (.5)	158 (.5)	159 (.5)	160 (.5)	161 (.5)	162 (.5)	163 (.5)	164 (.5)	165 (.5)	166 (.5)	167 (.5)	168 (.5)	169 (.5)	170 (.5)	171 (.5)	172 (.5)	173 (.5)	174 (.5)	175 (.5)	176 (.5)	177 (.5)	178 (.5)	179 (.5)	180 (.5)	181 (.5)	182 (.5)	183 (.5)	184 (.5)	185 (.5)	186 (.5)	187 (.5)	188 (.5)	189 (.5)	190 (.5)	191 (.5)	192 (.5)	193 (.5)	194 (.5)	195 (.5)	196 (.5)	197 (.5)	198 (.5)	199 (.5)	200 (.5)	201 (.5)	202 (.5)	203 (.5)	204 (.5)	205 (.5)	206 (.5)	207 (.5)	208 (.5)	209 (.5)	210 (.5)	211 (.5)	212 (.5)	213 (.5)	214 (.5)	215 (.5)	216 (.5)	217 (.5)	218 (.5)	219 (.5)	220 (.5)	221 (.5)	222 (.5)	223 (.5)	224 (.5)	225 (.5)	226 (.5)	227 (.5)	228 (.5)	229 (.5)	230 (.5)	231 (.5)	232 (.5)	233 (.5)	234 (.5)	235 (.5)	236 (.5)	237 (.5)	238 (.5)	239 (.5)	240 (.5)	241 (.5)	242 (.5)	243 (.5)	244 (.5)	245 (.5)	246 (.5)	247 (.5)	248 (.5)	249 (.5)	250 (.5)	251 (.5)	252 (.5)	253 (.5)	254 (.5)	255 (.5)	256 (.5)	257 (.5)	258 (.5)	259 (.5)	260 (.5)	261 (.5)	262 (.5)	263 (.5)	264 (.5)	265 (.5)	266 (.5)	267 (.5)	268 (.5)	269 (.5)	270 (.5)	271 (.5)	272 (.5)	273 (.5)	274 (.5)	275 (.5)	276 (.5)	277 (.5)	278 (.5)	279 (.5)	280 (.5)	281 (.5)	282 (.5)	283 (.5)	284 (.5)	285 (.5)	286 (.5)	287 (.5)	288 (.5)	289 (.5)	290 (.5)	291 (.5)	292 (.5)	293 (.5)	294 (.5)	295 (.5)	296 (.5)	297 (.5)	298 (.5)	299 (.5)	300 (.5)	301 (.5)	302 (.5)	303 (.5)	304 (.5)	305 (.5)	306 (.5)	307 (.5)	308 (.5)	309 (.5)	310 (.5)	311 (.5)	312 (.5)	313 (.5)	314 (.5)	315 (.5)	316 (.5)	317 (.5)	318 (.5)	319 (.5)	320 (.5)	321 (.5)	322 (.5)	323 (.5)	324 (.5)	325 (.5)	326 (.5)	327 (.5)	328 (.5)	329 (.5)	330 (.5)	331 (.5)	332 (.5)	333 (.5)	334 (.5)	335 (.5)	336 (.5)	337 (.5)	338 (.5)	339 (.5)	340 (.5)	341 (.5)	342 (.5)	343 (.5)	344 (.5)	345 (.5)	346 (.5)	347 (.5)	348 (.5)	349 (.5)	350 (.5)	351 (.5)	352 (.5)	353 (.5)	354 (.5)	355 (.5)	356 (.5)	357 (.5)	358 (.5)	359 (.5)	360 (.5)	361 (.5)	362 (.5)	363 (.5)	364 (.5)	365 (.5)	366 (.5)	367 (.5)	368 (.5)	369 (.5)	370 (.5)	371 (.5)	372 (.5)	373 (.5)	374 (.5)	375 (.5)	376 (.5)	377 (.5)	378 (.5)	379 (.5)	380 (.5)	381 (.5)	382 (.5)	383 (.5)	384 (.5)	385 (.5)	386 (.5)	387 (.5)	388 (.5)	389 (.5)	390 (.5)	391 (.5)	392 (.5)	393 (.5)	394 (.5)	395 (.5)	396 (.5)	397 (.5)	398 (.5)	399 (.5)	400 (.5)	401 (.5)	402 (.5)	403 (.5)	404 (.5)	405 (.5)	406 (.5)	407 (.5)	408 (.5)	409 (.5)	410 (.5)	411 (.5)	412 (.5)	413 (.5)	414 (.5)	415 (.5)	416 (.5)	417 (.5)	418 (.5)	419 (.5)	420 (.5)	421 (.5)	422 (.5)	423 (.5)	424 (.5)	425 (.5)	426 (.5)	427 (.5)	428 (.5)	429 (.5)	430 (.5)	431 (.5)	432 (.5)	433 (.5)	434 (.5)	435 (.5)	436 (.5)	437 (.5)	438 (.5)	439 (.5)	440 (.5)	441 (.5)	442 (.5)	443 (.5)	444 (.5)	445 (.5)	446 (.5)	447 (.5)	448 (.5)	449 (.5)	450 (.5)	451 (.5)	452 (.5)	453 (.5)	454 (.5)	455 (.5)	456 (.5)	457 (.5)	458 (.5)	459 (.5)	460 (.5)	461 (.5)	462 (.5)	463 (.5)	464 (.5)	465 (.5)	466 (.5)	467 (.5)	468 (.5)	469 (.5)	470 (.5)	471 (.5)	472 (.5)	473 (.5)	474 (.5)	475 (.5)	476 (.5)	477 (.5)	478 (.5)	479 (.5)	480 (.5)	481 (.5)	482 (.5)	483 (.5)	484 (.5)	485 (.5)	486 (.5)	487 (.5)	488 (.5)	489 (.5)	490 (.5)	491 (.5)	492 (.5)	493 (.5)	494 (.5)	495 (.5)	496 (.5)	497 (.5)	498 (.5)	499 (.5)	500 (.5)	501 (.5)	502 (.5)	503 (.5)	504 (.5)	505 (.5)	506 (.5)	507 (.5)	508 (.5)	509 (.5)	510 (.5)	511 (.5)	512 (.5)	513 (.5)	514 (.5)	515 (.5)	516 (.5)	517 (.5)	518 (.5)	519 (.5)	520 (.5)	521 (.5)	522 (.5)	523 (.5)	524 (.5)	525 (.5)	526 (.5)	527 (.5)	528 (.5)	529 (.5)	530 (.5)	531 (.5)	532 (.5)	533 (.5)	534 (.5)	535 (.5)	536 (.5)	537 (.5)	538 (.5)	539 (.5)	540 (.5)	541 (.5)	542 (.5)	543 (.5)	544 (.5)	545 (.5)	546 (.5)	547 (.5)	548 (.5)	549 (.5)	550 (.5)	551 (.5)	552 (.5)	553 (.5)	554 (.5)	555 (.5)	556 (.5)	557 (.5)	558 (.5)	559 (.5)	560 (.5)	561 (.5)	562 (.5)	563 (.5)	564 (.5)	565 (.5)	566 (.5)	567 (.5)	568 (.5)	569 (.5)	570 (.5)	571 (.5)	572 (.5)	573 (.5)	574 (.5)	575 (.5)	576 (.5)	577 (.5)	578 (.5)	579 (.5)	580 (.5)	581 (.5)	582 (.5)	583 (.5)	584 (.5)	585 (.5)	586 (.5)	587 (.5)	588 (.5)	589 (.5)	590 (.5)	591 (.5)	592 (.5)	593 (.5)	594 (.5)	595 (.5)	596 (.5)	597 (.5)	598 (.5)	599 (.5)	600 (.5)	601 (.5)	602 (.5)	603 (.5)	604 (.5)	605 (.5)	606 (.5)	607 (.5)	608 (.5)	609 (.5)	610 (.5)	611 (.5)	612 (.5)	613 (.5)	614 (.5)	615 (.5)	616 (.5)	617 (.5)	618 (.5)	619 (.5)	620 (.5)	621 (.5)	622 (.5)	623 (.5)	624 (.5)	625 (.5)	626 (.5)	627 (.5)	628 (.5)	629 (.5)	630 (.5)	631 (.5)	632 (.5)	633 (.5)	634 (.5)	635 (.5)	636 (.5)	637 (.5)	638 (.5)	639 (.5)	640 (.5)	641 (.5)	642 (.5)	643 (.5)	644 (.5)	645 (.5)	646 (.5)	647 (.5)	648 (.5)	649 (.5)	650 (.5)	651 (.5)	652 (.5)	653 (.5)	654 (.5)	655 (.5)	656 (.5)	657 (.5)	658 (.5)	659 (.5)	660 (.5)	661 (.5)	662 (.5)	663 (.5)	664 (.5)	665 (.5)	666 (.5)	667 (.5)	668 (.5)	669 (.5)	670 (.5)	671 (.5)	672 (.5)	673 (.5)	674 (.5)	675 (.5)	676 (.5)	677 (.5)	678 (.5)	679 (.5)	680 (.5)	681 (.5)	682 (.5)	683 (.5)	684 (.5)	685 (.5)	686 (.5)	687 (.5)	688 (.5)	689 (.5)	690 (.5)	691 (.5)	692 (.5)	693 (.5)	694 (.5)	695 (.5)	696 (.5)	697 (.5)	698 (.5)	699 (.5)	700 (.5)	701 (.5)	702 (.5)	703 (.5)	704 (.5)	705 (.5)	706 (.5)	707 (.5)	708 (.5)	709 (.5)	710 (.5)	711 (.5)	712 (.5)	713 (.5)	714 (.5)	715 (.5)	716 (.5)	717 (.5)	718 (.5)	719 (.5)	720 (.5)	721 (.5)	722 (.5)	723 (.5)	724 (.5)	725 (.5)	726 (.5)	727 (.5)	728 (.5)	729 (.5)	730 (.5)	731 (.5)	732 (.5)	733 (.5)	734 (.5)	735 (.5)	736 (.5)	737 (.5)	738 (.5)	739 (.5)	740 (.5)	741 (.5)	742 (.5)	743 (.5)	744 (.5)	745 (.5)	746 (.5)	747 (.5)	748 (.5)	749 (.5)	750 (.5)	751 (.5)	752 (.5)	753 (.5)	754 (.5)	755 (.5)	756 (.5)	757 (.5)	758 (.5)	759 (.5)	760 (.5)	761 (.5)	762 (.5)	763 (.5)	764 (.5)	765 (.5)	766 (.5)	767 (.5)	768 (.5)	769 (.5)	770 (.5)	771 (.5)	772 (.5)	773 (.5)	774 (.5)	775 (.5)	776 (.5)	777 (.5)	778 (.5)	779 (.5)	780 (.5)	781 (.5)	782 (.5)	783 (.5)	784 (.5)	785 (.5)	786 (.5)	787 (.5)	788 (.5)	789 (.5)	790 (.5)	791 (.5)	792 (.5)	793 (.5)	794 (.5)	795 (.5)	796 (.5)	797 (.5)	798 (.5)	799 (.5)	800 (.5)	801 (.5)	802 (.5)	803 (.5)	804 (.5)	805 (.5)	806 (.5)	807 (.5)	808 (.5)	809 (.5)	810 (.5)	811 (.5)	812 (.5)	813 (.5)	814 (.5)	815 (.5)	816 (.5)	817 (.5)	81

[†]The figures in this table are based upon 1950 census data and gross product at factor cost.

DISTRIBUTION OF OUTPUT OF CLASSES LISTED AT LEFT OF TABLE			
Butter, cheese, etc.	Other food industries	Iron mining	Blast furnaces
10	11	12	13
10	11	12	13
10	11	12	13
6.1 (6.4)	.4 (3.8)	14	15
2.5 (2.6)	9.7 (8.3)	16	17
3.1 (2.6)	1.4 (1.1)	18	19
90.0 (29.6)	1.7 (.2)	20	21
78.1 (23.5)	18.8 (1.3)	22	23
.5 (.3)	47.2 (9.6)	24	25
.5 (.4)	3.5 (3.6)	26	27
.5 (.4)	1.3 (6.2)	28	29
3.8 (.9)	5.7 (.3)	30	31
3.8 (.9)	2 (*)	32	33
3.8 (.9)	34.1 (26.2)	34	35
1.7 (.9)	32.1 (2.1)	36	37
1.5 (2.4)	1.5 (.2)	38	39
1.1 (.4)	.4 (.2)	40	41
1.4 (.8)	.3 (.2)	42	43
2.2 (.4)	.5 (.3)	44	45
62.8 (25.3)	5.5 (.2)	46	47
.3 (.1)	5.8 (.7)	48	49
.2 (.4)	2.0 (.5)	50	51
.1 (.1)	1.1 (1.8)	52	53
.2 (.8)	5.0 (1.8)	54	55
1.2 (.1)	1.2 (.1)	56	57
1.2 (.3)	2.2 (2.4)	58	59
1.9 (.8)	1.9 (1.8)	60	61
1.9 (.8)	1.9 (1.8)	62	63
1.9 (.8)	1.9 (1.8)	64	65
1.9 (.8)	1.9 (1.8)	66	67
1.9 (.8)	1.9 (1.8)	68	69
1.9 (.8)	1.9 (1.8)	70	71
1.9 (.8)	1.9 (1.8)	72	73
1.9 (.8)	1.9 (1.8)	74	75
1.9 (.8)	1.9 (1.8)	76	77
1.9 (.8)	1.9 (1.8)	78	79
1.9 (.8)	1.9 (1.8)	80	81
1.9 (.8)	1.9 (1.8)	82	83
1.9 (.8)	1.9 (1.8)	84	85
1.9 (.8)	1.9 (1.8)	86	87
1.9 (.8)	1.9 (1.8)	88	89
1.9 (.8)	1.9 (1.8)	90	91
1.9 (.8)	1.9 (1.8)	92	93
1.9 (.8)	1.9 (1.8)	94	95
1.9 (.8)	1.9 (1.8)	96	97
1.9 (.8)	1.9 (1.8)	98	99
1.9 (.8)	1.9 (1.8)	100	101
1.9 (.8)	1.9 (1.8)	102	103
1.9 (.8)	1.9 (1.8)	104	105
1.9 (.8)	1.9 (1.8)	106	107
1.9 (.8)	1.9 (1.8)	108	109
1.9 (.8)	1.9 (1.8)	110	111
1.9 (.8)	1.9 (1.8)	112	113
1.9 (.8)	1.9 (1.8)	114	115
1.9 (.8)	1.9 (1.8)	116	117
1.9 (.8)	1.9 (1.8)	118	119
1.9 (.8)	1.9 (1.8)	120	121
1.9 (.8)	1.9 (1.8)	122	123
1.9 (.8)	1.9 (1.8)	124	125
1.9 (.8)	1.9 (1.8)	126	127
1.9 (.8)	1.9 (1.8)	128	129
1.9 (.8)	1.9 (1.8)	130	131
1.9 (.8)	1.9 (1.8)	132	133
1.9 (.8)	1.9 (1.8)	134	135
1.9 (.8)	1.9 (1.8)	136	137
1.9 (.8)	1.9 (1.8)	138	139
1.9 (.8)	1.9 (1.8)	140	141
1.9 (.8)	1.9 (1.8)	142	143
1.9 (.8)	1.9 (1.8)	144	145
1.9 (.8)	1.9 (1.8)	146	147
1.9 (.8)	1.9 (1.8)	148	149
1.9 (.8)	1.9 (1.8)	150	151
1.9 (.8)	1.9 (1.8)	152	153
1.9 (.8)	1.9 (1.8)	154	155
1.9 (.8)	1.9 (1.8)	156	157
1.9 (.8)	1.9 (1.8)	158	159
1.9 (.8)	1.9 (1.8)	160	161
1.9 (.8)	1.9 (1.8)	162	163
1.9 (.8)	1.9 (1.8)	164	165
1.9 (.8)	1.9 (1.8)	166	167
1.9 (.8)	1.9 (1.8)	168	169
1.9 (.8)	1.9 (1.8)	170	171
1.9 (.8)	1.9 (1.8)	172	173
1.9 (.8)	1.9 (1.8)	174	175
1.9 (.8)	1.9 (1.8)	176	177
1.9 (.8)	1.9 (1.8)	178	179
1.9 (.8)	1.9 (1.8)	180	181
1.9 (.8)	1.9 (1.8)	182	183
1.9 (.8)	1.9 (1.8)	184	185
1.9 (.8)	1.9 (1.8)	186	187
1.9 (.8)	1.9 (1.8)	188	189
1.9 (.8)	1.9 (1.8)	190	191
1.9 (.8)	1.9 (1.8)	192	193
1.9 (.8)	1.9 (1.8)	194	195
1.9 (.8)	1.9 (1.8)	196	197
1.9 (.8)	1.9 (1.8)	198	199
1.9 (.8)	1.9 (1.8)	200	201
1.9 (.8)	1.9 (1.8)	202	203
1.9 (.8)	1.9 (1.8)	204	205
1.9 (.8)	1.9 (1.8)	206	207
1.9 (.8)	1.9 (1.8)	208	209
1.9 (.8)	1.9 (1.8)	210	211
1.9 (.8)	1.9 (1.8)	212	213
1.9 (.8)	1.9 (1.8)	214	215
1.9 (.8)	1.9 (1.8)	216	217
1.9 (.8)	1.9 (1.8)	218	219
1.9 (.8)	1.9 (1.8)	220	221
1.9 (.8)	1.9 (1.8)	222	223
1.9 (.8)	1.9 (1.8)	224	225
1.9 (.8)	1.9 (1.8)	226	227
1.9 (.8)	1.9 (1.8)	228	229
1.9 (.8)	1.9 (1.8)	230	231
1.9 (.8)	1.9 (1.8)	232	233
1.9 (.8)	1.9 (1.8)	234	235
1.9 (.8)	1.9 (1.8)	236	237
1.9 (.8)	1.9 (1.8)	238	239
1.9 (.8)	1.9 (1.8)	240	241
1.9 (.8)	1.9 (1.8)	242	243
1.9 (.8)	1.9 (1.8)	244	245
1.9 (.8)	1.9 (1.8)	246	247
1.9 (.8)	1.9 (1.8)	248	249
1.9 (.8)	1.9 (1.8)	250	251
1.9 (.8)	1.9 (1.8)	252	253
1.9 (.8)	1.9 (1.8)	254	255
1.9 (.8)	1.9 (1.8)	256	257
1.9 (.8)	1.9 (1.8)	258	259
1.9 (.8)	1.9 (1.8)	260	261
1.9 (.8)	1.9 (1.8)	262	263
1.9 (.8)	1.9 (1.8)	264	265
1.9 (.8)	1.9 (1.8)	266	267
1.9 (.8)	1.9 (1.8)	268	269
1.9 (.8)	1.9 (1.8)	270	271
1.9 (.8)	1.9 (1.8)	272	273
1.9 (.8)	1.9 (1.8)	274	275
1.9 (.8)	1.9 (1.8)	276	277
1.9 (.8)	1.9 (1.8)	278	279
1.9 (.8)	1.9 (1.8)	280	281
1.9 (.8)	1.9 (1.8)	282	283
1.9 (.8)	1.9 (1.8)	284	285
1.9 (.8)	1.9 (1.8)	286	287
1.9 (.8)	1.9 (1.8)	288	289
1.9 (.8)	1.9 (1.8)	290	291
1.9 (.8)	1.9 (1.8)	292	293
1.9 (.8)	1.9 (1.8)	294	295
1.9 (.8)	1.9 (1.8)	296	297
1.9 (.8)	1.9 (1.8)	298	299
1.9 (.8)	1.9 (1.8)	300	301
1.9 (.8)	1.9 (1.8)	302	303
1.9 (.8)	1.9 (1.8)	304	305
1.9 (.8)	1.9 (1.8)	306	307
1.9 (.8)	1.9 (1.8)	308	309
1.9 (.8)	1.9 (1.8)	310	311
1.9 (.8)	1.9 (1.8)	312	313
1.9 (.8)	1.9 (1.8)	314	315
1.9 (.8)	1.9 (1.8)	316	317
1.9 (.8)	1.9 (1.8)	318	319
1.9 (.8)	1.9 (1.8)	320	321
1.9 (.8)	1.9 (1.8)	322	323
1.9 (.8)	1.9 (1.8)	324	325
1.9 (.8)	1.9 (1.8)	326	327
1.9 (.8)	1.9 (1.8)	328	329
1.9 (.8)	1.9 (1.8)	330	331
1.9 (.8)	1.9 (1.8)	332	333
1.9 (.8)	1.9 (1.8)	334	335
1.9 (.8)	1.9 (1.8)	336	337
1.9 (.8)	1.9 (1.8)	338	339
1.9 (.8)	1.9 (1.8)	340	341
1.9 (.8)	1.9 (1.8)	342	343
1.9 (.8)	1.9 (1.8)	344	345
1.9 (.8)	1.9 (1.8)	346	347
1.9 (.8)	1.9 (1.8)	348	349
1.9 (.8)	1.9 (1.8)	350	351
1.9 (.8)	1.9 (1.8)	352	353
1.9 (.8)	1.9 (1.8)	354	355
1.9 (.8)	1.9 (1.8)	356	357
1.9 (.8)	1.9 (1.8)	358	359
1.9 (.8)	1.9 (1.8)	360	361
1.9 (.8)	1.9 (1.8)	362	363
1.9 (.8)	1.9 (1.8)	364	365
1.9 (.8)	1.9 (1.8)	366	367
1.9 (.8)	1.9 (1.8)	368	369
1.9 (.8)	1.9 (1.8)	370	371
1.9 (.8)	1.9 (1.8)	372	373
1.9 (.8)	1.9 (1.8)	374	375
1.9 (.8)	1.9 (1.8)	376	377
1.9 (.8)	1.9 (1.8)	378	379
1.9 (.8)	1.9 (1.8)	380	381
1.9 (.8)	1.9 (1.8)	382	383
1.9 (.8)	1.9 (1.8)	384	385
1.9 (.8)	1.9 (1.8)	386	387
1.9 (.8)	1.9 (1.8)	388	389
1.9 (.8)	1.9 (1.8)	390	391
1.9 (.8)	1.9 (1.8)	392	393
1.9 (.8)	1.9 (1.8)	394	395
1.9 (.8)	1.9 (1.8)	396	397
1.9 (.8)	1.9 (1.8)	398	399
1.9 (.8)	1.9 (1.8)	400	401

Percentages not in parentheses are percentages of the total output of each industry. Percentages in parentheses are percentages of the net totals of the columns (net of 1/500 of one per cent).

entrepreneurial income derived from personal services (see Wages and Salaries to Consumption). *To Undistributed*: calculated on basis of the estimates given in W. I. King's *The National Income . . .*. Includes (a) profit, dividends, and interest derived from banking, mercantile industry, Pullman and express services, transportation by water, and income derived from governmental properties; (b) total annual addition to the undistributed surplus in all industries, less that part of it which is attributed by W. I. King to factories, mines, quarries and oil wells, railroads, and electric utilities; (c) profit, dividends, and interest derived from "Unclassified Industries," as defined by W. I. King in *The National Income . . .*, less capital and entrepreneurial services (excluding rents) charged to consumption (see above); (d) aggregate corporate deficit in all industries, minus deficits of industries covered in the distribution columns 1 to 41.

44a. Taxes

Taxes Paid by Agriculture: estimate made by W. I. King (*The National Income . . .*). Taxes paid by manufacturing industries and mining (from Flour and Grist Mills to Industries Not Elsewhere Specified, excluding Electric Utilities); federal, state, county, and local, including excises, as reported in *Mfr. and Min.* Taxes paid by the Electric Utilities: comprise corporate income, war profit, excess profit, and other domestic taxes as listed in *Statistics of Income* (Bureau of Internal Revenue). Taxes paid by Construction: include the same items as taxes paid by Electric Utilities. Taxes paid by consumers: comprise income taxes, direct personal property taxes, poll taxes, licenses, and fees for personal activities. Estimate taken from W. H. Lough, *High Level Consumption*.

44b. Other Undistributed

Each item represents the difference between the Total Expenditures and the total of all other items included in each column.

45. Gross Total Outlays

The definition of the concept of Gross Total Outlays, as well as the general outlines of its statistical derivation, is given on page 115 above. The following comments are limited to description of actual statistical calculations.

To Agriculture: this item is obtained by adding the value of the total product (22,147 million dollars) as given in row 1 to the estimated net increase in agricultural indebtedness between the beginning and the end of the year 1919.

According to data presented in the *Federal Reserve Bulletin* (April, 1936) the increase in agricultural mortgage indebtedness amounted in 1919 to four or five hundred million dollars. Agricultural loans by commercial banks expanded between July 31, 1918, and December 31, 1920, from 3,517 million dollars to 5,317 million dollars, which gives an average annual increase of 720 million dollars. Augmenting this sum by the 400 million dollars of new mortgage credits we have 1,120 million dollars as the total of additional agricultural credits. To obtain a net figure, it will be necessary to subtract from this amount that part of the mortgage credit which originated in financing sales of agricultural land by non-farmers. Furthermore, the increase in bank savings and other non-agricultural financial investments by the farm population has also to be taken into consideration. Neither of these items can be determined with any degree of accuracy. Thus the gross total of 1,120 million dollars is simply reduced to 900 million dollars, 220 million dollars being allowed for the two items mentioned above.

To Manufacturing Industries and Mining (from Flour and Grist Mills to Industries Not Elsewhere Specified with exception of Electric Utilities): the aggregate additional corporate investment is obtained by combining the data on corporate savings as estimated by W. I. King (*The National Income . . .*) with the statistics of new capital issues (stock and bond, excluding refunding) compiled by the *Commercial and Financial Chronicle*. The distribution of this total among the separate industries is based upon the analysis of the financial statistics of approximately 2,000 corporations covered in the *Source Book for the Study of Industrial Profits*, compiled by Ralph C. Epstein and published by the Department of Commerce.

The increment in the total capital investment between 1919 and 1920 has been calculated for each particular industrial group as represented among these 2,000 corporations. In order to make the industrial groups of the sample representative, the relative size of each of them was brought into accord with the relative size of the respective total industries. This was accomplished in two steps: first, the capital increase within each sample industrial group was related to the value of product (sales) as given for the identical sample; i.e., the capital increase per dollar of output (sales) was calculated. Next, the ratios thus obtained were weighted by the total corporate product of each particular industry as given in the Census, and each of these weighted ratios was expressed as a proportion of the sum of such weighted ratios. Finally, after these two steps were taken, the estimate of the relative corporate capital increase within the different industrial groups was applied to the sum total of new investment.

The capital increase as calculated for each industry must be further augmented by the total of the deficits for the corresponding industry (as given in *Statistics of Income*, published by the Bureau of Internal Revenue). According to conventional accounting principles, these are charged against the net income of profitable corporations but in our set-up (see page 114) the offsetting influence of deficits has to be eliminated, which means that they have to be "added back."

The last stage in these calculations consists in stepping up the results which apply only to the corporate part of the industry so as to include all producers covered in the Census. The ratio between the total output of each separate industry and that part of it which was produced by corporations is used as a multiplier in each case.

The "Gross Total Outlays" were obtained by adding the new capital investment in each industry as derived above to the value of its total product.

To Electric Utilities: the total is obtained by adding to the total value of product new stock and bond issues (estimate taken from W. I. King, *The National Income . . .*) and additional corporate surplus, roughly estimated at 15 million dollars. *To Construction*: no attempt is made to estimate additional stock and bond issues or additions to undistributed surplus. Thus this item represents the total output of the industry increased by the total deficits of corporate construction enterprises (*Statistics of Income*, Bureau of Internal Revenue). *To Railroads*: total of new issues, additions to undistributed surplus (W. I. King, *The National Income . . .*), augmented by total corporate deficit (*Statistics of Income*, Bureau of Internal Revenue), added to the total value of product. *To Exports*: total exports of domestic products augmented by domestic transportation costs charged to imported goods (see Transportation to Exports). *To Consumption*: total consumption expenditures, i.e., total consumers' spendings and withholdings (received income), less savings as estimated in *High Level Consumption* by Lough. *To Undistributed*: total of undistributed products and services listed in column 44.