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DERIVATION OF U.S. COMMODITY-BY-COMMODITY INPUT-OUTPUT TABLES FROM SNA USE AND MAKE TABLES*

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I. *Introduction*

This paper presents the experimental results of aggregated input-output tables derived by merging the U.S. SNA use and make tables. The experimental results are based on the three alternative technology assumptions proposed by the United Nations and the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce.

Two of the assumptions, namely the commodity technology assumption and the industry technology assumption, are proposed in the SNA, and are well known. The modified industry technology assumption was first made by the BEA in the 1972 commodity-by-commodity Leontief inverse, which they refer to as the commodity-by-commodity total requirements. This modified industry technology assumption is referred to in this paper as the BEA method.

The BEA published, in the 1972 and 1977 input-output accounts, the make and use tables, commodity-by-commodity input coefficient table, commodity-by-industry input coefficient table, commodity-by-commodity inverse table, and industry-by-commodity inverse table. The BEA has not published any commodity-by-commodity input-output table in complete form to-date. This paper, therefore, also presents the U.S. 85-order commodity-by-commodity input-output table in complete form, in order to extend the BEA method.

Further, this paper makes a comparison of the input-output tables and technology coefficients derived from the alternative assumptions.

For the sake of brevity, this paper is primarily confined to the U.S. 1977 input-output accounts, which are now the most up-to-date version available. The method employed in the paper may also be applied for calculations based on the U.S. 1972 input-output accounts, since the BEA has used the same method in compiling the 1972 and 1977 input-output tables.

In section II of this paper the U.S. 1977 aggregated 9-sector make and use tables, which reflect the main characteristics of the U.S. input-output experience, are compiled.

In section III, the three alternative mathematical methods for deriving commodity-by-commodity input-output tables are briefly discussed. In this section it is made clear that the straight-forward extension of the BEA method for merging the use and make table results in an inconsistancy. Namely, the row and column sums are not identical. Theoretically this is an important consideration. On a practical level, however, this may be compensated

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for by assigning a fictitious row to the input-output table.

In section IV, the U.S. 1977 aggregated commodity-by-commodity input-output tables, based on the BEA and the SNA industry technology assumption, are presented and compared to verify the theoretical assertion mentioned above.

In this section, only the aggregated version of the U.S. 1977 input-output table is presented. However, in the appendix, the 85-sector version of the U.S. 1977 commodity-by-commodity input-output table, based on the extended BEA method, is included for reference. As far as the author is aware, this is the first time the U.S. 1977 commodity-by-commodity input-output table has been presented for publication.

In section V, commodity-by-commodity input coefficient tables, based on the SNA technology assumptions, are presented. Comparisons of input-output-related tables are also presented. These comparisons are confined only to the experimental results.

II. *The U.S. 1977 Aggregated SNA Tables*

In the SNA of the United Nations, there are two types of input-output tables which are classified both by commodity (goods and services) and industry (establishment). One type is the use or absorption table, and the other is the make table.

The use table shows commodity inputs by industry, and is variously referred to as the input table, U-table, input matrix, or U-matrix. The make matrix table shows commodity outputs by industry, and is often referred to as the output table, V-table, output matrix, or V-matrix. The output of the primary or characteristic product is shown on the principal diagonal of the make matrix, and the outputs of secondary products of the industry appear on the off-diagonal of the make matrix.

Combined in the U.S. use table are the so-called "use table," which shows only intermediate transactions, the final demand table by commodity, and the value-added table by industry. The U.S. make table is similar to the proto-type make matrix table proposed by the United Nations.

Definitions of notations are as follows:

j, k: = commodity indeces ($j=1, 2, \ldots, n$; $k=1, 2, \ldots, n$);

h, i: = industry indeces ($h=1, 2, \ldots, n$; $i=1, 2, \ldots, n$);

U: = a use matrix, or an n by n commodity-by-industry matrix in which each column for an industry lists commodity inputs to produce that industry's total output and each element u_{ki} denotes the intermediate input of the k-th commodity used by the i-th industry;

V: = a make matrix, or an n by n industry-by-commodity matrix in which each row for an industry lists commodity outputs produced by that industry and each element v_{ik} denotes the value of the k-th commodity produced by the i-th industry.

E: = a final demand (by commodities) matrix;

e: = a total final demand (by commodities) column n-vector.

Y: = a value added (by industries) matrix;

y: = a total value added (by industries) column n-vector.

q: = a commodity output column n-vector;

g: = an industry output column n-vector.

(') indicates the transpose of the corresponding vector.

In the SNA, use and make tables should be integrated into a system of national accounts, as shown in Table 1. In Table 1, there are three blank areas under the commodity column and one blank area under the industry column. The former are compensated for by constructing a commodity-by-commodity input-output table (see Table 2). The latter is compensated for by making an industry-by-industry intermediate transaction matrix. As the latter has only secondary importance in the input-output analysis, it is not treated in this paper.

Table 3 shows the 1977 U.S. aggregated 9-order use table. Table 4 shows the 1977 U.S. 9-order make table. The correlation of 9-order sectoring with 85-order sectoring is also shown in the 1977 U.S. 9-order make table. The correlation of 9-order sectoring with 85-order sectoring is also shown in Table 5. Since the aggregation level is very high, it may first appear that the importance of transferring inputs and outputs of secondary products is not an important consideration. However, as will later be shown, considering the different methods of transferring secondary products is quite necessary to ensure accurate calculation of the input-output tables.

The main characteristics of the U.S. SNA input-output tables are retained in the aggregated version: namely, the non-comparable import sector and the scrap, used and second-hand goods sector. The U.S. use table is primarily based on the competitive import method. However, it can be seen that the U.S. use table also partially employs the non-competitive import treatment. As this feature of the U.S. input-output table is common to all U.S. input-output tables since 1958, it is not necessary to fully discuss this feature in detail. A more important feature that should be addressed is the treatment of the scrap, used and second-hand goods sector.

In the U.S. SNA tables, the output of scrap, used and second-hand goods comforms to the SNA recommendation, even though it is included in the trade sectors. Transactions of scrap, used and second-hand goods are treated explicitly. According to the U.S. treatment, the value of scrap, used and second-hand goods is separated into a trade margin which includes dealers' margins, traditional transaction margins and the producers' values. In the use table, scrap, used and second-hand goods in producers' values are listed as inputs pur-

TABLE 1. THE SNA INPUT-OUTPUT TABLE

	Commodity	Industry	Final demand	Total final demand	Total
Commodity		U	E	e	q
Industry	V				g
Value-added		Y			
Total value-added		y'			
Total	q'	g'			

TABLE 2. COMMODITY-BY-COMMODITY INPUT-OUTPUT TABLE

	Commodity	Final demand	Total final demand	Total
Commodity	X	E	e	q
Value-added	Z			
Total value-added	z'			
Total	q'			

TABLE 3. THE U.S. AGGREGATED 9-SECTOR
(1000 millions of dollars at producers' prices)

Commodity \ Industry		Agriculture, forestry & fishery 1	Mining & manufacturing 2	Construction 3	Transportation & Communication 4	Trade 5	Services 6
1	Agriculture, forestry & fishery	32.	62.	1.	*	1.	5.
2	Mining & manufacturing	28.	685.	101.	19.	22.	97.
3	Construction	1.	15.	*	7.	3.	31.
4	Transportation & Communication	2.	39.	7.	19.	12.	19.
5	Trade	6.	60.	23.	3.	5.	16.
6	Services	12.	82.	20.	17.	67.	149.
7	Noncomparable imports	*	8.	*	4.	*	1.
8	Scrap, used & secondhand goods	0.	5.	*	*	0.	*
9	Others	0.	0.	0.	0.	0.	0.
10	Total intermediate inputs	81.	956.	153.	69.	109.	319.
11	Compensation of employees	12.	343.	90.	71.	162.	278.
12	Indirect business taxes	3.	34.	3.	10.	53.	63.
13	Property-type income	35.	205.	18.	38.	60.	285.
14	Total value added	49.	582.	112.	119.	275.	625.
15	Total industry output	130.	1539.	264.	188.	384.	945.

Source: *Survey of Current Business*, May 1984.
Note: 1 (*) indicates figures less than $ 500 million.
2 The 85-sector use table of the BEA was aggregated by the author.

TABLE 4. THE U.S. AGGREGATED 9-SECTOR MAKE TABLE, 1977
(1000 millions of dollars at producers' prices)

Industry \ Commodity		Agriculture, forestry & fishery 1	Mining & manufacturing 2	Construction 3	Transportation & communication 4	Trade 5	Services 6	Noncomparable imports 7	Scrap, used & secondhand goods 8	Others 9	Total industry output 10
1	Agriculture, forestry & fishery	126.	4.	0.	*	0.	*	0.	0.	0.	130.
2	Mining & manufacturing	*	1518.	0.	0.	0.	19.	0.	2.	0.	1539.
3	Construction	0.	0.	264.	0.	0.	0.	0.	0.	0.	264.
4	Transportation & communication	*	1.	0.	178.	0.	8.	0.	*	0.	188.
5	Trade	0.	0.	0.	0.	384.	0.	0.	0.	0.	384.
6	Services	0.	14.	0.	3.	2.	926.	0.	0.	0.	945.
7	Noncomparable imports	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8	Scrap, used & secondhand goods	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
9	Others	0.	0.	0.	0.	0.	0.	0.	0.	215.	215.
10	Total commodity output	126.	1536.	264.	182.	386.	953.	0.	2.	215.	3664.

Source: *Survey of Current Business*, May 1984.
Note: See the footnotes in Table 3.

USE TABLE, 1977

Noncomparable imports 7	Scrap, used & secondhand goods 8	Others 9	Total intermediate use 10	Personal consumption 11	Public consumption 12	Private fixed investment 13	Changes in business inventrie 14	Exports 15	Imports 16	Total final demand 17	Total commodity output 18
0.	0.	0.	100.	11.	3.	0.	1.	13.	−3.	26.	126.
0.	0.	0.	953.	398.	70.	134.	36.	96.	−150.	583.	1536.
0.	0.	0.	58.	0.	56.	151.	0.	*	0.	207.	264.
0.	0.	0.	99.	56.	10.	5.	1.	11.	*	83.	182.
0.	0.	0.	113.	223.	6.	25.	3.	12.	5.	273.	386.
0.	0.	0.	346.	546.	42.	11.	*	9.	−1.	606.	953.
0.	0.	0.	13.	9.	4.	*	*	0.	−27.	−13.	0.
0.	0.	0.	5.	6.	1.	−10.	*	2.	*	−3.	2.
0.	0.	0.	0.	−1.	204.	0.	−19.	40.	−9.	215.	215.
0.	0.	0.	1688.	1246.	396.	315.	22.	182.	184.	1977.	3664.
0.	0.	210.	1166.								
0.	0.	0.	166.								
0.	0.	5.	645.								
0.	0.	215.	1977.								
0.	0.	215.	3664.								

chased by the intermediate users. However, in the final demand quadrant, in addition to purchases being entered as positive values, sales by final demand sectors are also entered as negative values. The net value of this row is therefore equal to the values of scrap, used and second-hand goods sold, or produced by the intermediate sectors, which are recorded separately in a column of the make table [UNSO (1985)]. For the derivation of the tables by marging the use and make table, sales of scrap, used and second-hand goods are assumed to be proportional to industry outputs. This point is discussed in detail in the following section.

In regard to the make table, it should also be noted that the column for "construction" contains "0" elements for all the sectors other than the construction sector. Before merging the SNA tables, the BEA has redefined construction as a secondary product of all industries when compilling the SNA tables. Namely, construction as a secondary product is redefined; that is the secondary products and associated inputs are excluded from the industry that produced them, and are included in the industry where it was primary. This is based on the assumption that the input coefficients applicable to the redefined product are similar to those of the industry to which the product is primary. This implies that the BEA partially applies the commodity technology assumption to the original data-source when compiling the SNA use and make tables.[1] In other countries, such as the Federal Republic of Germany, this

[1] With regard to the details, see BEA (1984), p. 51.

TABLE 5. CORRELATION OF 9-SECTOR TABLE WITH 85-SECTOR TABLE

	Row and Column Code in 9-Order Tables	Corresponding Code in 85-Order Tables
1	Agriculture, forestry & fishery	1-4
2	Mining & manufacturing	5-10, 13-64, 68
3	Construction	11-12
4	Transportation & communication	65-67
5	Trade	69
6	Services	70-79
7	Noncomparable imports	80
8	Scrap, used & secondhand goods	81
9	Others	82-85
	Row Code in 9-Order Tables	
10	Total intermediate inputs (Total commodity output in make table)	86 (I)
11	Compensation of employees	88
12	Indirect business taxes	89
13	Property-type income	90
14	Total value added	87 (VA)
15	Total industry/commodity output	91 (T)
	Column Code in 9-Order Tables	
10	Total intermediate use (Total industry output in make table)	86
11	Private consumption	91
12	Public consumption	90
13	Private fixed investment	91
14	Changes in business inventries	93
15	Exports	94
16	Imports	95
17	Total final demand	100
18	Total commodity output	101

type of transfer is performed when the SNA tables are merged, rather than when the SNA tables are compiled. Therefore, the ratio of the value of secondary products to the total industry output in the U.S. make table is rather low. For example, in the aggregated 9-sector table, the value is less than 1%.

III. *SNA Technology Assumptions and the BEA Method*

As previously mentioned, the SNA formulated two alternative assumptions to merge the SNA input-output tables:

(a). Commodity technology assumption: a commodity is assumed to have the same input structure, regardless of the industry in which it is produced. Namely, the inputs required to produce or make a given commodity are not affected by the industry in which the commodity is produced.

(b). Industry technology assumption: an industry is assumed to have the same input structure, regardless of its product mix. Namely, the composition of an industry's inputs is not affected by the composition of its output.

Basic input-output relations of the SNA input-output model are expressed by the following six equations (i denotes an aggregation vector $(1 \ldots 1)'$), and $(\hat{\ })$ for a vector denotes a diagonal matrix where the elements of the vector appear on the main diagonal.):

Balance-equations:

$$q=Ui+e, \tag{3.1}$$

$$q=V'i, \tag{3.2}$$

$$g=Vi \tag{3.3}$$

Technology-equations:

$$U=B\hat{g}, \tag{3.4}$$

$$V'=C\hat{g}, \tag{3.5}$$

$$V=D\hat{q}, \tag{3.6}$$

where B: = a commodity-by-industry input coefficient matrix in which an element in each column denotes a commodity input absorbed by an industry to produce a unit of the industry output:

C: = a commodity-by-industry output coefficient matrix in which elements in each column denote for a given industry the proportion of commodity outputs produced by that industry;

D: = an industry-by-commodity output coefficient matrix, or a market share matrix, in which elements in each column denote for a given commodity the shares of that commodity produced by each industry to the total output of that commodity.

Eqs. (3.4) and (3.5) constitute the commodity technology assumption while Eqs. (3.4) and (3.6) constitute the industry technology assumption. Eq. (3.6) implies that the market shares assumption is associated with the industry technology assumption.

If we employ the commodity technology assumption, commodity-by-commodity input coefficient matrix A is derived as follows:

Using Eqs. (3.1), (3.2), (3.4) and (3.5), we have

$$\begin{aligned} q&=Ui+e \\ &=Bg+e \\ &=BC^{-1}q+e. \end{aligned} \tag{3.7}$$

In view of Eqs. (3.4) and (3.5), we can easily get

$$BC=U(V')^{-1}.$$

Hence, the commodity-by-commodity input coefficient matrix A^{COM} is calculated by the following formulas:

$$A^{COM}=BC^{-1}, \text{ or } A^{COM}=U(V')^{-1} \tag{3.8}$$

On the other hand, if we employ the industry technology assumption, matrix A is derived as follows:

$$\begin{aligned} q&=Ui+e \\ &=Bg+e \\ &=BDq+e. \end{aligned} \tag{3.9}$$

Hence, the commodity-by-commodity input-output matrix A^{IND} is calculated by using the following formula:

$$A^{IND}=BD \tag{3.10}$$

Once the A matrix is derived, the first quadrant of the commodity-by-commodity input-output table X can be easily obtained through the following equation using the given total commodity output vector q:

$$X=A\hat{q};\ X=A^{COM}\hat{q},\ \text{or}\ X=A^{IND}\hat{q}. \tag{3.11}$$

It follows from this equation that X can also be calculated as follows:
The commodity technology assumption:

$$\begin{aligned} X&=A^{COM}\hat{q}\\ &=U(V')^{-1}\hat{q}\\ &=U(\hat{q}^{-1}D')^{-1}\hat{q}\\ &=U(D')^{-1}. \end{aligned} \tag{3.12}$$

The industry technology assumption:

$$\begin{aligned} X&=A^{IND}\hat{q}\\ &=BD\hat{q}\\ &=U\hat{g}^{-1}V\hat{q}^{-1}\hat{q}\\ &=UC'. \end{aligned} \tag{3.13}$$

The second quadrant of the commodity-by-commodity input-output table is the same as the second quadrant of the use table (E, e).

The third quadrant of the commodity-by-commodity input-output table, that is, the *primary inputs* matrix or value-added matrix, is calculated by using the same method as the *intermediate inputs* matrix X:

The cost equation by industry is written as

$$g'=y'+i'B\hat{g}. \tag{3.14}$$

The cost equation by commodity is written as

$$q'=z'+i'A\hat{q}. \tag{3.15}$$

The commodity technology assumption:

Postmultiplying Eq. (3.15) by D' and using Eq. (3.5), we have

$$g'=z'D'+i'B\hat{g}. \tag{3.16}$$

It follows from a comparison of Eqs. (3.14) with (3.15) that

$$y'=z'D';\ z=y'(D')^{-1} \tag{3.17}$$

In a similar manner we have

$$Y=ZD';\ Z=Y(D')^{-1} \tag{3.18}$$

The industry technology assumption:

Postmultiplying Eq. (3.15) by $(C')^{-1}$ and employing the same method as in the above, we have

$$y'=z'(C')^{-1};\ z'=y'C', \tag{3.19}$$

and

$$Y=Z(C')^{-1};\ Z=YC'.$$

The BEA made a slight modification to the industry technology assumption. This modification is relevant only to the scrap, used and second-hand goods sector.

Let us now introduce the following notations:

V^{US} : = a modified make matrix in which the column for scrap, used and second-hand goods has only zero elements;

D^{US} : = a modified market share matrix in which the column for scrap, used and second-hand goods has only zero elements;

s : = a scrap output column vector in which each element denotes each industry's total output of scrap, used and second-hand goods;

r : = a scrap coefficients column vector in which each element denotes the ratio of the value of scrap produced by each industry to that industry's total output.

The relation between V and V^{US} is described as follows:

$$V=\left(\begin{array}{c|c|c} \cdots & \multicolumn{1}{|c|}{\multirow{3}{*}{s}} & \cdots \\ \cdots & & \cdots \\ \cdots & & \cdots \end{array}\right) \quad \text{(scrap, used and second-hand goods)} \quad \Rightarrow \quad V^{US}=V-\left(\begin{array}{c|c|c} \mathrm{O} & s & \mathrm{O} \end{array}\right)$$

The input-output equations of the BEA input-output model are as follows:

Balance-equations:

$$q=Ui+e \tag{3.20}$$

$$g=V^{US}i+s \tag{3.21}$$

Equations for technology assumptions:

$$U=B\hat{g} \tag{3.22}$$

$$V^{US}=D^{US}\hat{q} \tag{3.23}$$

$$s=\hat{r}g \tag{3.24}$$

Eq. (3.23) implies that the industry technology assumption is not applicable to scrap, used and second-hand goods. Eq. (3.24) implies that scrap output in each industry is proportional to that industry's output. The BEA treats scrap in such a way as to prevent its requirement as an input from generating output in the industries in which it originates. The BEA bases its treatment of scrap on the concept that scrap does not constitute an ordinary industry. Namely, in the commodity-by-commodity input-output framework, the scrap sector does not use any commodity as intermediate inputs to "produce" its product.

When we employ the BEA method, or the modified industry technology assumption, matrix A is derived as follows:

Using Eqs. (3.20) and (3.22), we have

$$q=Bg+e. \tag{3.25}$$

Postmultiplying Eq. (3.23) by i and considering Eqs. (3.21) and (3.24), we have

$$\begin{aligned} D^{US}q &= g-s \\ &= g-\hat{r}g, \end{aligned}$$

and thus

$$g=(I-\hat{r})^{-1}D^{US}q. \tag{3.26}$$

Define

$$\tilde{D}:=(I-\hat{r})^{-1}D^{US}. \tag{3.27}$$

Substituting (3.26) into (3.25) and using (3.27), we then have

$$q=B\tilde{D}q+e. \tag{3.28}$$

Hence, the commodity-by-commodity input-output matrix A is calculated by using the following formula:

$$A^{BEA}=B\tilde{D}. \tag{3.29}$$

Given that the A matrix is derived, the first quadrant of the commodity-by-commodity input-output table X can be easily obtained through the following equation, using the given total commodity output vector q:

$$X=A^{BEA}\hat{q}. \tag{3.30}$$

The BEA derived one of the fundamental equations of the conventional input-output model; the production equation. However, the BEA did not refer to the other fundamental equation; namely the cost equation, which is necessary to create a commodity-by-commodity input-output model. The straight-forward extention of the BEA method will provide us with primary input data by commodities.

It follows from Eq. (3.30) that X can also be calculated as follows:

$$\begin{aligned} X &= A^{BEA}\hat{q} \\ &= B\tilde{D}\hat{q} \\ &= U\hat{g}^{-1}(I-\hat{r})^{-1}V^{US} \\ &= U\tilde{C}', \end{aligned} \tag{3.31}$$

where

$$\tilde{C}:=[(I-\hat{r})^{-1}V^{US}]'\hat{g}^{-1}. \tag{3.32}$$

The third quadrant of the commodity-by-commodity input-output table, the *primary inputs* matrix, or value-added matrix, should be calculated by using the same method as the *intermediate inputs* matrix X:

$$\begin{aligned} z' &= y'\tilde{C}'; \\ Z &= Y\tilde{C}'. \end{aligned} \tag{3.33}$$

However, this straight-forward extention results in an asymmetry. Namely, the duality of the production equation and the associated cost equation is lost:

Define

$$\tilde{q}:=[(I-\hat{r})^{-1}V^{US}]'i. \tag{3.34}$$

The cost equation by industry is written as

$$g'=y'+i'B\hat{g}. \tag{3.35}$$

On the other hand, the cost equation by commodity is written as

$$\tilde{q}'=z'+i'A^{BEA}\hat{q}. \tag{3.36}$$

Postmultiplying Eq. (3.36) by $(\tilde{C}')^{-1}$ and considering $g=\tilde{C}^{-1}\tilde{q}$ and $A^{BEA}=B\tilde{D}$, we have

$$\begin{aligned} g' &= z'(\tilde{C}')^{-1}+i'B\tilde{D}\hat{q}(\tilde{C}')^{-1} \\ &= z'(\tilde{C}')^{-1}+i'B(I-\hat{r})^{-1}(V^{US})^{-1}V\,(I-\hat{r})\hat{g} \\ &= z'(\tilde{C}')^{-1}+i'B\hat{g} \end{aligned} \tag{3.37}$$

Comparing Eqs. (3.35) and (3.37), we have

$$y'=z'(\tilde{C}')^{-1}\ ;\ Y=\tilde{C}^{-1}Z.$$

Thus Eq. (3.33) can be derived. However, the cost equation by commodity is now different from Eq. (3.15). q is not identical to q if some element of scrap coefficients vector r is positive. This problem may be eliminated if we assign a row vector to compensate for the difference between q and q in the commodity-by-commodity input-output table.

Let a column vector for the adjustment of computational discrepancy be

$$h:=q-\tilde{q}. \tag{3.38}$$

Then Eq. (3.36) can be rewritten as

$$q'=h'+z'+i'A^{BEA}\hat{q}. \tag{3.39}$$

IV. *The U.S. 1977 Commodity-by-Commodity Input-Output Table*

Employing the extended BEA method, we merged the U.S. 1977 SNA tables. The aggregated 9-sector version of the merged commodity-by-commodity input-output table is shown in Table 6.

It can be seen in Table 6 that:

(1) The BEA method does not include a column for the scrap sector, but does include a row; i.e. 2 billion dollars.

(2) The 16th row (for statistical adjustment) contains negative elements. Column 2, row 16 (mining and manufacturing) contains a negative element; i.e., minus 2.

On the other hand, in a commodity-by-commodity input-output table based on the 'pure' industry technology assumption (Table 7), the scrap sector is treated in a manner similar to other industry/commodity sectors. The adjustment row contains only zero elements, therefore, no further adjustment is required.

These facts verify the theoretical considerations developed in the previous section. It follows then that the scrap sector should not be assigned as an ordinary industry/commodity, since the scrap industry produces a positive output with no inputs; the primary characteristic of the scrap, used and second-hand sector. We can therefore conclude that in the case of

TABLE 6. THE U.S. AGGREGATED COMMODITY-BY-COMMODITY INPUT-OUTPUT TABLE, 1977: THE BEA METHOD

(1,000 millions of dollars at producers' prices)

	Commodity	Agriculture, forestry & fishery	Mining & manufacturing	Construction	Transportation & Communication	Trade	Services	Noncomparable imports	Scrap, used & secondhand goods	Others	Total intermediate use	Total final demand	Gross domestic output
	Commodity	1	2	3	4	5	6	7	8	9	10	17	18
1	Agriculture, forestry & fishery	31.	63.	1.	*.	1.	5.	0.	0.	0.	100.	26.	126.
2	Mining & manufacturing	27.	679.	101.	19.	22.	105.	0.	0.	0.	953.	583.	1536.
3	Construction	1.	16.	*.	6.	3.	31.	0.	0.	0.	58.	207.	264.
4	Transportation & Communication	2.	39.	7.	18.	12.	20.	0.	0.	0.	99.	83.	182.
5	Trade	5.	59.	23.	3.	5.	17.	0.	0.	0.	113.	273.	386.
6	Services	11.	84.	20.	17.	67.	148.	0.	0.	0.	347.	606.	953.
7	Noncomparable imports	*.	8.	*.	4.	*.	1.	0.	0.	0.	13.	−13.	0.
8	Scrap, used & secondhand goods	0.	5.	*.	*.	0.	*.	0.	0.	0.	5.	−3.	2.
9	Others	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	215.	215.
10	Total intermediate inputs	78.	952.	153.	67.	110.	328.	0.	0.	0.	1688.	1977.	3664.
11	Compensation of employees	11.	344.	90.	68.	163.	280.	0.	0.	210.	1166.		
12	Indirect business taxes	3.	35.	3.	10.	53.	62.	0.	0.	0.	166.		
13	Property-type income	34.	207.	18.	37.	60.	283.	0.	0.	5.	645.		
14	Total value added	48.	586.	112.	115.	276.	625.	0.	0.	215.	1977.		
15	Total commodity output	126.	1538.	264.	182.	386.	953.	0.	0.	215.	3666.		
16	Adjustment	0.	−2.	0.	*.	0.	*.	0.	2.	0.	−2.		
17	Total commodity output (15+16)	126.	1536.	264.	182.	386.	953.	0.	2.	215.	3664.		

Note: 1 (*) indicates figures less than $500 million.
2 The final demand quadrant of this input-output table is similar to that of the use table (Table 3), and was therefore omitted.

TABLE 7. THE U.S. AGGREGATED COMMODITY-BY-COMMODITY INPUT-OUTPUT TABLE, 1977: THE INDUSTRY TECHNOLOGY ASSUMPTION

(1,000 millions of dollars at producers' prices)

	Commodity	Agriculture, forestry & fishery	Mining & manufacturing	Construction	Transportation & Communication	Trade	Services	Noncomparable imports	Scrap, used & secondhand goods	Others	Total intermediate use	Total final demand	Gross domestic output
	Commodity	1	2	3	4	5	6	7	8	9	10	17	18
1	Agriculture, forestry & fishery	31.	62.	1.	0.	1.	5.	0.	*.	0.	100.	26.	126.
2	Mining & manufacturing	27.	678.	101.	19.	22.	105.	0.	1.	0.	953.	583.	1536.
3	Construction	1.	16.	*.	6.	3.	31.	0.	*.	0.	58.	207.	264.
4	Transportation & communication	2.	39.	7.	18.	12.	20.	0.	*.	0.	99.	83.	182.
5	Trade	5.	59.	23.	3.	5.	17.	0.	*.	0.	113.	273.	386.
6	Services	11.	84.	20.	17.	67.	148.	0.	*.	0.	347.	606.	953.
7	Noncomparable imports	*.	8.	*.	4.	*.	1.	0.	*.	0.	13.	−13.	0.
8	Scrap, used & secondhand goods	0.	5.	*.	*.	0.	*.	0.	*.	0.	5.	−3.	2.
9	Others	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	215.	215.
10	Total intermediate inputs	78.	951.	153.	67.	110.	328.	0.	1.	0.	1688.	1977.	3664.
11	Compensation of employees	11.	343.	90.	68.	163.	280.	0.	1.	210.	1166.		
12	Indirect business taxes	3.	35.	3.	10.	53.	62.	0.	0.	0.	166.		
13	Property-type income	34.	207.	18.	37.	60.	283.	0.	0.	5.	645.		
14	Total value added	48.	585.	112.	115.	276.	625.	0.	1.	215.	1977.		
15	Total commodity output	126.	1536.	264.	182.	386.	953.	0.	2.	215.	3664.		
16	Adjustment	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.		
17	Total commodity output (15+16)	126.	1536.	264.	182.	386.	953.	0.	2.	215.	3664.		

Note: See the footnote in Table 6.

TABLE 8. RELATIVE DEVIATION OF THE I-O TABLE BASED ON THE EXTENDED BEA METHOD AND THE I-O TABLE BASED ON THE INDUSTRY TECHNOLOGY ASSUMPTION

(%)

	1	2	3	4	5	6	7	8	9
1	0.0	0.14	0.0	0.0	0.0	0.02	0.0	−100.00	0.0
2	0.0	0.14	0.0	0.03	0.0	0.01	0.0	−100.00	0.0
3	0.0	0.13	0.0	0.03	0.0	0.0	0.0	−100.00	0.0
4	0.0	0.14	0.0	0.04	0.0	0.00	0.0	−100.00	0.0
5	0.0	0.14	0.0	0.04	0.0	0.01	0.0	−100.00	0.0
6	0.0	0.14	0.0	0.03	0.0	0.00	0.0	−100.00	0.0
7	0.0	0.14	0.0	0.03	0.0	0.0	0.0	−100.00	0.0
8	0.0	0.13	0.0	0.0	0.0	0.0	0.0	−100.00	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.14	0.0	0.04	0.0	0.01	0.0	−100.00	0.0
11	0.0	0.14	0.0	0.04	0.0	−0.03	0.0	−100.00	0.0
12	0.0	0.13	0.0	0.03	0.0	−0.00	0.0	−100.00	0.0
13	0.0	0.12	0.0	0.04	0.0	0.00	0.0	−100.00	0.0
14	0.0	0.13	0.0	0.04	0.0	−0.01	0.0	−100.00	0.0
15	0.0	0.14	0.0	0.04	0.0	−0.01	0.0	−100.00	0.0
16	0.0	****	0.0	****	0.0	****	0.0	****	0.0

Note: 1. (****) indicates 'overflow'.
2. The sectoring of the Table corresponds to that of Table 6 or 7.

TABLE 9. EXCLUSION OF THE INPUTS OF THE CCC FROM FEDERAL GOVERNMENT ENTERPRISES; COLUMN CODE 78 (1977)

(millions of dollars at producers' prices)

	Industry Commodity	(1) Inputs of the FGE Column 78	(2) Inputs of the CCC	(1)–(2) Revised Inputs of the FGE
2	Other agricultural products	124	108.4	15.6
14	Food & kindred products	490	−29.6	519.6
27	Chemicals & selected chemical products	2166	.1	2165.9
65	Transportation & warehousing	1360	129.0	1231.0
69	Wholesale & retail trade	253	.8	252.2
78	Federal government enterprises	289	81.3	207.7
90	Property-type income	−673	−290.0	−383.0
	Total	—	0.0	—

Source: BEA *IED 84-001*, p. 5
Note: FGE:= Federal Government Enterprises
CCC:= Commodity Credit Corporation

the U.S. SNA accounts, the extended BEA method is more suitable than the 'pure' industry technology assumption from an economic point of view, although the latter appears to be more sophisticated in its approach.

Table 8 shows the relative deviation of the input-output table, based on the extended BEA method and the table based on the 'pure' industry technology assumption.[2] As can

[2] The relative deviation between the matrices $A^{(1)}=(a_{ij}{}^{(1)})$ and $A^{(2)}=(a_{ij}{}^{(2)})$ is defined as $r_{ij}:=(a_{ij}{}^{(2)}-a_{ij}{}^{(1)})/a_{ij}{}^{(1)}$.
If $a_{ij}{}^{(1)}$ and $a_{ij}{}^{(2)}$ are equal to zero, we define r_{ij} is also zero. If $a_{ij}{}^{(1)}$ is zero but $a_{ij}{}^{(2)}$ not zero, we denote r_{ij} as ****.

TABLE 10. COMMODITY-BY-COMMODITY INPUT COEFFICIENT MATRIX, 1977

Commodity Technology Assumption: A^{COM}

	1	2	3	4	5	6
1	0.2520	0.0410	0.0025	−0.0005	0.0017	0.0044
2	0.2084	0.4503	0.3838	0.1011	0.0570	0.0982
3	0.0107	0.0097	0.0011	0.0353	0.0067	0.0336
4	0.0171	0.0255	0.0262	0.1057	0.0322	0.0201
5	0.0432	0.0392	0.0884	0.0150	0.0129	0.0167
6	0.0909	0.0521	0.0756	0.0892	0.1733	0.1594

Industry Technology Assumption: A^{IND}

	1	2	3	4	5	6
1	0.2457	0.0406	0.0025	0.0002	0.0017	0.0056
2	0.2153	0.4415	0.3838	0.1034	0.0572	0.1100
3	0.0107	0.0102	0.0011	0.0350	0.0068	0.0327
4	0.0174	0.0254	0.0262	0.0999	0.0322	0.0213
5	0.0431	0.0387	0.0884	0.0153	0.0130	0.0175
6	0.0899	0.0544	0.0756	0.0932	0.1732	0.1550

Note: 1. Sectoring corresponds to the 9-order tables.
2. These matrices were derived from Table 3 and 4 by omitting sectors 7, 8 and 9.

TABLE 11. RELATIVE DEVIATION BETWEEN A^{COM} AND A^{IND}

(%)

	1	2	3	4	5	6
1	2.56	.99	.00	−350.00	.00	−21.43
2	−3.20	1.99	.00	−2.22	−.35	−10.73
3	.00	−4.90	.00	.86	−1.47	2.75
4	−1.72	.39	.00	5.81	.00	−5.63
5	.23	1.29	.00	−1.96	−.77	−4.57
6	1.11	−4.23	.00	−4.29	.06	2.84
	1.47	2.30	.00	60.86	.44	7.99

Note: 1. See the footnotes in Table 10.
2. Each Entry of the last row shows an 'average' of each absolute column sum.

easily be seen, the respective intermediate transactions of the 2nd, 4th and 6th sectors in Table 6 are inflated, as compared with Table 7. The primary inputs of the 2nd and 4th sectors are also inflated. These inflation ratios by each column sector are uniform. The 8th sector, (the scrap sector), has a value of -100% to compensate for this inflation.

In this section, only the aggregated commodity-by-commodity input-output table is presented. In the appendix, the 85-sector version of the U.S. 1977 input-output table, based on the extended BEA method, is included. With regard to this table, it should be noted that the inputs of the commodity credit corporation are excluded from the federal government enterprise column. This corresponds to the method used by the BEA in deriving the commodity-by-industry input coefficient matrix B, to eliminate instability. This exclusion is shown in Table 9.

TABLE 12. RELATIVE DEVIATION OF THE COMMODITY-BY-COMMODITY INPUT-OUTPUT TABLES BASED ON THE COMMODITY TECHNOLOGY ASSUMPTION AND THE INDUSTRY TECHNOLOGY ASSUMPTION (%)

	1	2	3	4	5	6
1	2.59	.88	.00	−403.45	−.93	−21.41
2	−3.17	2.00	.00	−2.15	−.37	−10.77
3	.07	−5.01	.00	.85	−1.76	2.56
4	−1.60	.40	.00	5.75	.16	−5.56
5	.33	1.37	.00	−1.80	−.14	−4.20
6	1.18	−4.23	.00	−4.21	.04	2.84
7	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00
10	.08	1.13	.00	−.27	−.08	−2.83
11	−4.69	−.46	.00	1.74	.14	−.42
12	−.26	−4.12	.00	−1.05	.23	2.37
13	1.50	−2.86	.00	−2.91	−.42	2.48
14	−.07	−1.53	.00	.01	.03	1.55
15	.02	.12	.00	−.09	.00	.04
	1.04	1.61	.00	28.29	.29	3.80

Note: 1. Sectoring corresponds to the 9-order tables.
2. Each Entry of the last row shows an 'average' of each absolute column sum.

V. *A Comparison of the SNA Technology Assumptions*

When we compare the input-output-related matrices, based on the "pure" SNA technology assumptions, using the U.S. use and make tables, we must omit "special" industries or commodities, such as non-comparable imports, scrap, used and second-hand goods, and the "others" sector. In performing the calculations for the 9-sector table, it should be noted that the three sectors listed above have been omitted, and not aggregated into 6 sectors. This procedure has been taken since the make matrix, which includes the three omitted sectors, does not have an inverse matrix. It can be seen then, that when the commodity technology assumption is employed, it is assumed that the matrix has an inverse.

Table 10 shows the commodity-by-commodity input coefficient matrices derived from the aggregated U.S. SNA tables, based on the "pure" commodity technology assumption and the "pure" industry technology assumption.

It can be seen that the input coefficient matrix, based on the commodity technology assumption has a well-known defect; the input coefficient matrix has a negative element.

In this aggregated version, only one element has a negative value. However, in the 85-order version, more than 100 elements have a negative value. Therefore, it is not possible to derive meaningful results by mechanical use of the commodity technology assumption.

Table 11 shows the relative deviation between the two input coefficient matrices, based on the commodity technology assumption and the industry technology assumption. It should be noted that the figure in row 1, column 4 of Table 11 contains a significant negative value. This is due to the negative value of the figure contained in row 1, column 4 in Table 10. In addition, the "services" sector also shows significant deviations. Namely, the input structure

of the "services" sector has a significant deviation between the commodity technology assumption and the industry technology assumption. However, the difference is not significant, when compared to the tables of other countries, such as West Germany. This is due to the characteristics of the U.S. use and make tables. In these tables, some subsidiary products, such as construction, have already been transferred.

Table 12 shows the relative deviation between the commodity-by-commodity input-output tables based on the two assumptions. It can be seen from this table that the trends and results obtained by the comparison are similar.

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Appendix

Table The U.S. Commodity-by-Commodity Input-Output Table, 1977

(Millions of dollars at producers' prices)

APPENDIX

TABLE THE U.S. COMMODITY-BY-COMMODITY INPUT-OUTPUT TABLE, 1977

(Millions of dollars at producers' prices)

			1 Livestock and livestock products	2 Other agricultural products	3 Forestry and fishery products	4 Agricultural, forestry, and fishery services	5 Iron and ferroalloy ores mining	6 Nonferrous metal ores mining	7 Coal mining	
1	Livestock and livestock products	1	8277.	1297.	25.	294.	0.	0.	0.	1
2	Other agricultural products	2	12796.	2425.	43.	292.	0.	0.	0.	2
3	Forestry and fishery products	3	0.	0.	32.	16.	0.	0.	0.	3
4	Agricultural, forestry, and fishery services	4	1766.	2446.	484.	100.	0.	0.	4.	4
5	Iron and ferroalloy ores mining	5	0.	0.	0.	0.	173.	1.	0.	5
6	Nonferrous metal ores mining	6	0.	0.	0.	0.	24.	271.	0.	6
7	Coal mining	7	10.	2.	0.	0.	9.	10.	2449.	7
8	Crude petroleum and natural gas	8	0.	0.	0.	0.	0.	0.	0.	8
9	Stone and clay mining and quarrying	9	1.	144.	1.	3.	11.	2.	0.	9
10	Chemical and fertilizer mineral mining	10	0.	0.	0.	0.	0.	0.	0.	10
11	New construction	11	0.	0.	0.	0.	0.	0.	0.	11
12	Maintenance and repair construction	12	303.	655.	306.	94.	23.	12.	113.	12
13	Ordnance and accessories	13	0.	0.	5.	0.	0.	0.	0.	13
14	Food and kindred products	14	10444.	0.	80.	142.	0.	1.	0.	14
15	Tobacco manufactures	15	0.	0.	0.	0.	0.	0.	0.	15
16	Broad and narrow fabrics, yarn and thread mills	16	0.	16.	0.	0.	0.	1.	24.	16
17	Miscellaneous textile goods and floor coverings	17	17.	93.	48.	28.	0.	0.	0.	17
18	Apparel	18	0.	0.	0.	0.	0.	1.	9.	18
19	Miscellaneous fabricated textile products	19	0.	35.	6.	39.	0.	0.	0.	19
20	Lumber and wood products, except containers	20	8.	9.	0.	0.	4.	25.	69.	20
21	Wood containers	21	2.	161.	2.	12.	0.	0.	0.	21
22	Household furniture	22	0.	0.	0.	0.	0.	0.	0.	22
23	Other furniture and fixtures	23	0.	0.	0.	0.	0.	0.	0.	23
24	Paper and allied products, except containers	24	77.	37.	0.	6.	0.	0.	6.	24
25	Paperboard containers and boxes	25	1.	83.	1.	62.	0.	0.	0.	25
26	Printing and publishing	26	9.	13.	0.	4.	0.	1.	4.	26
27	Chemicals and selected chemical products	27	126.	6454.	199.	772.	49.	119.	213.	27
28	Plastics and synthetic materials	28	0.	0.	0.	0.	0.	0.	0.	28
29	Drugs, cleaning and toilet preparations	29	105.	0.	0.	1.	0.	0.	0.	29
30	Paints and allied products	30	0.	0.	2.	0.	0.	0.	0.	30
31	Petroleum refining and related industries	31	469.	2592.	141.	297.	52.	65.	338.	31
32	Rubber and miscellaneous plastics products	32	269.	303.	5.	41.	36.	52.	139.	32
33	Leather tanning and finishing	33	0.	0.	0.	0.	0.	0.	0.	33
34	Footwear and other leather products	34	22.	0.	0.	2.	0.	0.	0.	34
35	Glass and glass products	35	5.	0.	0.	2.	0.	0.	0.	35
36	Stone and clay products	36	0.	59.	1.	9.	3.	20.	75.	36
37	Primary iron and steel manufacturing	37	6.	6.	0.	0.	53.	98.	82.	37
38	Primary nonferrous metals manufacturing	38	0.	0.	0.	0.	4.	11.	43.	38
39	Metal containers	39	0.	0.	4.	0.	0.	0.	0.	39
40	Heating, plumbing, and structural metal product	40	6.	8.	0.	0.	0.	0.	0.	40
41	Screw machine products and stampings	41	19.	0.	0.	0.	9.	19.	146.	41
42	Other fabricated metal products	42	74.	119.	19.	21.	38.	45.	100.	42
43	Engines and turbines	43	0.	0.	8.	27.	23.	28.	109.	43
44	Farm and garden machinery	44	248.	488.	12.	25.	0.	0.	0.	44
45	Construction and mining machinery	45	0.	0.	0.	0.	73.	100.	752.	45
46	Materials handling machinery and equipment	46	0.	0.	0.	0.	12.	11.	51.	46
47	Metalworking machinery and equipment	47	0.	0.	0.	1.	1.	3.	3.	47
48	Special industry machinery and equipment	48	0.	0.	0.	0.	0.	0.	0.	48
49	General industrial machinery and equipment	49	14.	17.	4.	1.	20.	23.	170.	49
50	Miscellaneous machinery, except electrical	50	31.	41.	0.	3.	4.	15.	56.	50
51	Office, computing, and accounting machines	51	0.	0.	0.	0.	0.	0.	0.	51
52	Service industry machines	52	0.	0.	0.	0.	0.	0.	0.	52
53	Electric industrial equipment and apparatus	53	7.	7.	0.	0.	5.	13.	77.	53
54	Household appliances	54	0.	0.	0.	0.	0.	0.	0.	54
55	Electric lighting and wiring equipment	55	4.	2.	0.	2.	0.	1.	12.	55
56	Radio, TV, and communication equipment	56	0.	0.	0.	0.	0.	0.	1.	56
57	Electronic components and accessories	57	0.	0.	0.	0.	0.	0.	0.	57
58	Miscellaneous electrical machinery and supplies	58	67.	284.	3.	25.	0.	5.	6.	58
59	Motor vehicles and equipment	59	41.	42.	3.	31.	38.	5.	4.	59
60	Aircraft and parts	60	0.	0.	0.	4.	0.	0.	0.	60
61	Other transportation equipment	61	0.	0.	158.	5.	1.	3.	0.	61
62	Scientific and controlling instruments	62	0.	0.	1.	0.	0.	2.	6.	62
63	Optical, ophthalmic, and photographic equipment	63	0.	0.	0.	3.	0.	0.	0.	63
64	Miscellaneous manufacturing	64	6.	8.	0.	4.	7.	3.	7.	64
65	Transportation and warehousing	65	856.	754.	52.	207.	45.	49.	128.	65
66	Communications, except radio and TV	66	129.	174.	5.	4.	2.	4.	13.	66
67	Radio and TV broadcasting	67	0.	0.	0.	0.	0.	0.	0.	67
68	Electric, gas, water, and sanitary services	68	381.	1060.	28.	119.	222.	176.	283.	68
69	Wholesale and retail trade	69	1934.	2798.	172.	528.	82.	101.	474.	69
70	Finance and insurance	70	788.	788.	33.	109.	13.	39.	125.	70
71	Real estate and rental	71	1056.	5463.	57.	360.	28.	55.	327.	71
72	Hotels; personal and repair services (exc. auto)	72	62.	63.	7.	17.	2.	5.	17.	72
73	Business services	73	203.	984.	54.	185.	51.	64.	427.	73
74	Eating and drinking places	74	7.	10.	24.	73.	4.	9.	21.	74
75	Automobile repair and services	75	143.	149.	20.	124.	25.	49.	89.	75
76	Amusements	76	0.	0.	0.	182.	0.	0.	1.	76
77	Health, educ., & social serv. and nonprofit org	77	348.	21.	7.	15.	3.	5.	16.	77
78	Federal Government enterprises	78	7.	8.	4.	29.	3.	8.	7.	78
79	State and local government enterprises	79	0.	0.	2.	10.	1.	2.	2.	79
80	Noncomparable imports	80	0.	6.	1.	1.	2.	12.	5.	80
81	Scrap, used, and secondhand goods	81	0.	0.	0.	0.	4.	11.	9.	81
82	Government industry	82	0.	0.	0.	0.	0.	0.	0.	82
83	Rest of the world industry	83	0.	0.	0.	0.	0.	0.	0.	83
84	Household industry	84	0.	0.	0.	0.	0.	0.	0.	84
85	Inventory valuation adjustment	85	0.	0.	0.	0.	0.	0.	0.	85
86	Total intermediate inputs	86	41143.	30123.	2062.	4334.	1163.	1553.	7011.	86
87	Value added	87	7463.	33053.	3097.	4574.	1054.	1596.	9638.	87
88	Compensation of employees	88	2928.	5121.	608.	2728.	659.	1117.	5581.	88
89	Indirect business taxes	89	1044.	1321.	204.	165.	103.	140.	374.	89
90	Property-type income	90	3492.	26612.	2285.	1682.	293.	340.	3683.	90
91	Total commodity output computed	91	48606.	63176.	5160.	8909.	2217.	3150.	16649.	91
92	Statistical adjustment	92	-3.	0.	10.	14.	-4.	-3.	-3.	92
93	Total commodity output	93	48603.	63176.	5170.	8923.	2213.	3147.	16646.	93

Crude petroleum and natural gas	Stone and clay mining and quarrying	Chemical and fertilizer mineral mining	New construction	Maintenance and repair construction	Ordnance and accessories	Food and kindred products	Tobacco manufactures	Broad and narrow fabrics, yarn and thread mills	Miscellaneous textile goods and floor coverings	Apparel	Miscellaneous fabricated textile products	Lumber and wood products, except containers
8	9	10	11	12	13	14	15	16	17	18	19	20
0.	0.	0.	0.	0.	0.	36578.	0.	92.	64.	3.	4.	3.
2.	0.	0.	0.	0.	0.	16441.	2442.	1683.	46.	44.	61.	4.
0.	0.	0.	0.	0.	0.	1452.	0.	1.	0.	234.	1.	3707.
0.	0.	2.	225.	433.	0.	135.	0.	1.	0.	0.	0.	54.
0.	0.	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.	1.
0.	1.	1.	0.	0.	0.	3.	0.	0.	0.	0.	0.	0.
5.	11.	2.	0.	0.	5.	78.	7.	29.	5.	5.	3.	8.
2047.	27.	4.	0.	0.	0.	8.	0.	5.	3.	0.	2.	1.
0.	174.	17.	1074.	969.	0.	26.	0.	0.	1.	0.	0.	2.
1.	1.	62.	0.	0.	0.	15.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
2406.	33.	17.	224.	79.	52.	891.	18.	151.	37.	131.	33.	211.
0.	0.	0.	11.	1.	434.	0.	0.	0.	0.	0.	0.	0.
5.	1.	1.	8.	2.	0.	33803.	4.	2.	8.	11.	7.	5.
0.	0.	0.	0.	0.	0.	0.	2623.	0.	0.	0.	0.	0.
0.	1.	2.	0.	0.	2.	2.	0.	8094.	1421.	8593.	2665.	13.
0.	0.	0.	1060.	264.	1.	14.	0.	258.	476.	68.	737.	81.
10.	3.	1.	25.	7.	6.	12.	2.	35.	122.	8556.	126.	13.
0.	0.	0.	44.	36.	1.	48.	0.	6.	13.	528.	272.	1.
0.	1.	1.	16086.	2245.	16.	23.	1.	4.	11.	1.	18.	11824.
0.	0.	0.	0.	0.	10.	57.	5.	0.	0.	0.	0.	3.
0.	0.	0.	89.	29.	3.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	365.	87.	0.	0.	0.	0.	0.	0.	0.	0.
3.	31.	4.	541.	283.	4.	1833.	158.	36.	68.	147.	38.	38.
2.	2.	1.	6.	2.	16.	3828.	78.	185.	50.	164.	77.	77.
10.	5.	1.	4.	1.	19.	920.	125.	12.	8.	43.	17.	18.
365.	73.	77.	399.	261.	31.	1304.	16.	607.	363.	87.	76.	478.
0.	2.	1.	0.	0.	18.	58.	0.	3797.	1837.	1382.	233.	36.
3.	0.	1.	62.	30.	1.	942.	12.	46.	13.	105.	4.	1.
8.	0.	0.	1573.	1251.	3.	11.	0.	2.	4.	0.	1.	168.
237.	156.	36.	4771.	2447.	40.	790.	41.	189.	62.	188.	28.	430.
18.	50.	7.	1678.	1343.	72.	1831.	258.	252.	253.	188.	226.	237.
0.	0.	0.	0.	0.	0.	0.	0.	2.	0.	178.	81.	1.
2.	0.	0.	2.	1.	0.	3.	0.	6.	0.	5.	1.	9.
6.	1.	0.	152.	113.	3.	2976.	0.	75.	24.	1.	4.	44.
10.	29.	1.	12630.	3480.	12.	52.	1.	7.	5.	6.	3.	197.
365.	37.	14.	4569.	1081.	298.	15.	1.	3.	6.	4.	15.	58.
1.	15.	4.	2782.	770.	237.	9.	0.	2.	40.	2.	6.	27.
0.	0.	1.	0.	0.	0.	5831.	1.	0.	1.	0.	1.	0.
33.	16.	4.	13229.	4452.	4.	1.	0.	0.	0.	0.	1.	121.
0.	13.	5.	97.	42.	66.	411.	0.	0.	1.	2.	4.	310.
272.	54.	6.	4117.	2044.	93.	519.	63.	5.	4.	26.	6.	784.
128.	42.	14.	0.	0.	19.	0.	0.	0.	0.	0.	1.	1.
0.	0.	0.	0.	0.	0.	20.	0.	0.	0.	0.	0.	2.
204.	181.	29.	304.	35.	0.	0.	0.	0.	0.	0.	0.	7.
0.	28.	3.	628.	245.	1.	1.	0.	19.	0.	2.	1.	19.
22.	5.	0.	35.	12.	58.	29.	3.	11.	4.	9.	4.	88.
0.	0.	1.	0.	0.	0.	114.	0.	140.	87.	73.	12.	33.
150.	41.	7.	857.	138.	63.	51.	3.	1.	1.	5.	1.	25.
115.	22.	3.	36.	13.	54.	83.	2.	32.	12.	27.	9.	82.
0.	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.	2.	0.
0.	0.	0.	2135.	975.	1.	35.	0.	0.	0.	0.	0.	23.
215.	20.	5.	1199.	442.	54.	1.	0.	0.	1.	0.	1.	25.
1.	0.	0.	581.	300.	0.	0.	0.	0.	0.	31.	0.	0.
12.	2.	1.	2758.	971.	3.	11.	0.	3.	0.	3.	1.	15.
4.	0.	0.	586.	188.	645.	3.	0.	0.	0.	1.	0.	1.
0.	0.	0.	0.	0.	194.	0.	0.	6.	1.	0.	2.	1.
8.	4.	1.	158.	49.	4.	8.	0.	1.	0.	2.	1.	12.
4.	40.	2.	83.	36.	20.	10.	1.	1.	0.	7.	6.	48.
0.	0.	0.	0.	0.	326.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	2.	0.	1.	0.	0.	0.	0.	0.	0.	2.
20.	1.	0.	486.	212.	8.	24.	1.	5.	0.	5.	1.	9.
3.	1.	0.	13.	5.	24.	10.	0.	3.	3.	5.	1.	6.
11.	8.	2.	390.	129.	6.	20.	1.	8.	2.	587.	20.	15.
185.	70.	23.	4377.	1507.	123.	4514.	89.	259.	197.	347.	112.	901.
58.	9.	2.	704.	348.	46.	376.	8.	116.	17.	348.	32.	55.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
684.	251.	168.	603.	230.	116.	2116.	42.	565.	156.	326.	88.	518.
333.	149.	33.	17064.	6290.	181.	10407.	138.	1105.	346.	1587.	438.	1789.
285.	73.	32.	1843.	467.	38.	888.	89.	83.	33.	238.	54.	244.
3989.	110.	21.	451.	176.	54.	642.	30.	67.	29.	293.	82.	120.
39.	29.	5.	253.	66.	23.	383.	7.	34.	14.	123.	43.	53.
632.	179.	50.	14161.	1030.	286.	4832.	633.	712.	173.	822.	192.	477.
247.	21.	9.	150.	49.	82.	430.	17.	100.	26.	176.	40.	106.
121.	29.	13.	983.	185.	11.	346.	23.	41.	14.	79.	17.	140.
4.	1.	1.	1.	0.	0.	3.	1.	0.	0.	2.	0.	1.
25.	5.	2.	4.	2.	5.	76.	5.	26.	2.	23.	27.	43.
12.	6.	4.	84.	26.	9.	220.	30.	36.	17.	165.	21.	28.
5.	5.	1.	44.	13.	3.	124.	3.	12.	5.	8.	1.	5.
99.	2.	2.	3.	1.	2.	4493.	1.	14.	122.	23.	54.	7.
0.	10.	9.	26.	3.	4.	0.	0.	21.	54.	0.	2.	3.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
13425.	2081.	715.	116825.	35896.	3917.	141181.	6985.	19008.	6246.	26024.	6015.	23872.
30101.	2803.	713.	73870.	37745.	4931.	51630.	5864.	7531.	2800.	15447.	3272.	14765.
3174.	1445.	282.	58410.	31962.	3637.	25628.	1121.	5649.	1576.	11953.	2343.	8689.
1922.	182.	34.	1844.	967.	108.	6462.	2419.	220.	96.	167.	41.	340.
25005.	1177.	398.	13617.	4835.	1186.	19541.	2324.	1662.	1131.	3327.	888.	5735.
43526.	4884.	1428.	190695.	73641.	8848.	192811.	12849.	26539.	9046.	41471.	9287.	38637.
-3.	-1.	-2.	-1.	-1.	-7.	44.	-26.	-50.	3.	1.	16.	-21.
43523.	4883.	1426.	190694.	73640.	8841.	192855.	12823.	26489.	9049.	41472.	9303.	38616.

APPENDIX

TABLE THE U. S. COMMODITY-BY-COMMODITY INPUT-OUTPUT TABLE, 1977

(Millions of dollars at producers' prices)

Continued

			Wood containers	Household furniture	Other furniture and fixtures	Paper and allied products, except containers	Paperboard containers and boxes	Printing and publishing	Chemicals and selected chemical products	
			21	22	23	24	25	26	27	
1	Livestock and livestock products	1	0.	0.	0.	7.	2.	1.	47.	1
2	Other agricultural products	2	0.	1.	1.	7.	1.	1.	124.	2
3	Forestry and fishery products	3	4.	2.	2.	25.	1.	0.	32.	3
4	Agricultural, forestry, and fishery services	4	0.	0.	0.	1.	0.	0.	120.	4
5	Iron and ferroalloy ores mining	5	0.	0.	0.	1.	0.	0.	118.	5
6	Nonferrous metal ores mining	6	0.	0.	0.	5.	0.	0.	472.	6
7	Coal mining	7	0.	4.	1.	194.	5.	4.	262.	7
8	Crude petroleum and natural gas	8	0.	0.	0.	10.	2.	1.	5552.	8
9	Stone and clay mining and quarrying	9	0.	0.	0.	109.	0.	1.	250.	9
10	Chemical and fertilizer mineral mining	10	0.	0.	0.	17.	0.	1.	917.	10
11	New construction	11	0.	0.	0.	0.	0.	0.	0.	11
12	Maintenance and repair construction	12	4.	66.	42.	385.	107.	114.	586.	12
13	Ordnance and accessories	13	0.	0.	0.	0.	0.	0.	0.	13
14	Food and kindred products	14	0.	29.	2.	227.	5.	12.	391.	14
15	Tobacco manufactures	15	0.	0.	0.	1.	0.	0.	0.	15
16	Broad and narrow fabrics, yarn and thread mills	16	0.	621.	13.	469.	1.	28.	19.	16
17	Miscellaneous textile goods and floor coverings	17	0.	185.	143.	216.	1.	41.	11.	17
18	Apparel	18	0.	41.	6.	12.	2.	4.	3.	18
19	Miscellaneous fabricated textile products	19	0.	29.	3.	4.	0.	1.	24.	19
20	Lumber and wood products, except containers	20	166.	1231.	421.	2586.	8.	18.	86.	20
21	Wood containers	21	5.	9.	3.	2.	0.	0.	1.	21
22	Household furniture	22	0.	21.	2.	0.	0.	0.	0.	22
23	Other furniture and fixtures	23	0.	0.	48.	1.	0.	0.	0.	23
24	Paper and allied products, except containers	24	0.	22.	12.	6771.	5187.	5079.	622.	24
25	Paperboard containers and boxes	25	29.	115.	76.	533.	546.	88.	285.	25
26	Printing and publishing	26	1.	18.	9.	65.	18.	3025.	89.	26
27	Chemicals and selected chemical products	27	1.	30.	44.	1270.	302.	657.	14191.	27
28	Plastics and synthetic materials	28	3.	52.	10.	914.	137.	22.	580.	28
29	Drugs, cleaning and toilet preparations	29	0.	0.	0.	59.	0.	1.	294.	29
30	Paints and allied products	30	0.	108.	55.	12.	25.	13.	91.	30
31	Petroleum refining and related industries	31	5.	59.	31.	1068.	152.	166.	1897.	31
32	Rubber and miscellaneous plastics products	32	0.	497.	256.	875.	31.	214.	507.	32
33	Leather tanning and finishing	33	0.	36.	2.	1.	0.	3.	0.	33
34	Footwear and other leather products	34	0.	0.	0.	1.	0.	2.	6.	34
35	Glass and glass products	35	0.	53.	11.	4.	1.	2.	47.	35
36	Stone and clay products	36	1.	42.	20.	79.	7.	10.	122.	36
37	Primary iron and steel manufacturing	37	4.	249.	699.	27.	106.	59.	400.	37
38	Primary nonferrous metals manufacturing	38	0.	75.	107.	66.	49.	48.	1063.	38
39	Metal containers	39	0.	0.	0.	2.	3.	6.	528.	39
40	Heating, plumbing, and structural metal product	40	0.	1.	2.	1.	0.	1.	7.	40
41	Screw machine products and stampings	41	0.	63.	104.	7.	2.	3.	26.	41
42	Other fabricated metal products	42	3.	563.	217.	279.	67.	59.	176.	42
43	Engines and turbines	43	0.	0.	2.	0.	1.	0.	13.	43
44	Farm and garden machinery	44	0.	0.	0.	0.	0.	0.	2.	44
45	Construction and mining machinery	45	0.	0.	0.	0.	0.	0.	22.	45
46	Materials handling machinery and equipment	46	0.	0.	0.	0.	0.	0.	2.	46
47	Metalworking machinery and equipment	47	1.	10.	21.	20.	52.	8.	24.	47
48	Special industry machinery and equipment	48	1.	8.	0.	128.	52.	139.	486.	48
49	General industrial machinery and equipment	49	0.	2.	14.	21.	1.	1.	196.	49
50	Miscellaneous machinery, except electrical	50	2.	17.	23.	45.	23.	15.	48.	50
51	Office, computing, and accounting machines	51	0.	0.	3.	5.	0.	7.	6.	51
52	Service industry machines	52	0.	0.	2.	1.	0.	0.	60.	52
53	Electric industrial equipment and apparatus	53	0.	1.	21.	3.	1.	2.	39.	53
54	Household appliances	54	0.	0.	1.	0.	0.	1.	0.	54
55	Electric lighting and wiring equipment	55	0.	1.	3.	4.	1.	3.	5.	55
56	Radio, TV, and communication equipment	56	0.	2.	2.	0.	0.	4.	1.	56
57	Electronic components and accessories	57	0.	3.	3.	6.	0.	7.	14.	57
58	Miscellaneous electrical machinery and supplies	58	0.	0.	1.	3.	1.	4.	3.	58
59	Motor vehicles and equipment	59	0.	1.	20.	13.	2.	6.	12.	59
60	Aircraft and parts	60	0.	0.	2.	0.	0.	2.	0.	60
61	Other transportation equipment	61	0.	0.	1.	0.	0.	0.	0.	61
62	Scientific and controlling instruments	62	0.	6.	3.	15.	3.	3.	57.	62
63	Optical, ophthalmic, and photographic equipment	63	0.	2.	1.	12.	3.	287.	14.	63
64	Miscellaneous manufacturing	64	0.	14.	2.	7.	3.	84.	16.	64
65	Transportation and warehousing	65	14.	225.	133.	1350.	553.	836.	2581.	65
66	Communications, except radio and TV	66	2.	56.	31.	90.	34.	378.	162.	66
67	Radio and TV broadcasting	67	0.	0.	0.	0.	0.	0.	0.	67
68	Electric, gas, water, and sanitary services	68	6.	102.	80.	1523.	155.	261.	3584.	68
69	Wholesale and retail trade	69	31.	566.	282.	2213.	257.	1173.	2383.	69
70	Finance and insurance	70	9.	143.	77.	154.	42.	296.	385.	70
71	Real estate and rental	71	3.	84.	60.	159.	64.	484.	434.	71
72	Hotels; personal and repair services (exc. auto)	72	2.	35.	21.	123.	17.	212.	153.	72
73	Business services	73	14.	384.	274.	835.	172.	1689.	1927.	73
74	Eating and drinking places	74	4.	60.	34.	105.	51.	641.	366.	74
75	Automobile repair and services	75	2.	54.	34.	99.	39.	122.	83.	75
76	Amusements	76	0.	11.	3.	3.	0.	8.	8.	76
77	Health, educ., & social serv. and nonprofit org	77	2.	22.	10.	22.	2.	59.	63.	77
78	Federal Government enterprises	78	1.	26.	22.	46.	17.	531.	65.	78
79	State and local government enterprises	79	0.	2.	1.	33.	4.	7.	25.	79
80	Noncomparable imports	80	0.	17.	2.	29.	7.	17.	270.	80
81	Scrap, used, and secondhand goods	81	0.	0.	0.	487.	1.	3.	63.	81
82	Government industry	82	0.	0.	0.	0.	0.	0.	0.	82
83	Rest of the world industry	83	0.	0.	0.	0.	0.	0.	0.	83
84	Household industry	84	0.	0.	0.	0.	0.	0.	0.	84
85	Inventory valuation adjustment	85	0.	0.	0.	0.	0.	0.	0.	85
86	Total intermediate inputs	86	321.	6079.	3532.	23870.	8332.	16972.	43521.	86
87	Value added	87	190.	4068.	2910.	13897.	4799.	14938.	19631.	87
88	Compensation of employees	88	156.	3144.	2069.	8577.	3104.	10573.	10065.	88
89	Indirect business taxes	89	7.	73.	44.	593.	179.	368.	1183.	89
90	Property-type income	90	26.	851.	798.	4727.	1517.	3998.	8384.	90
91	Total commodity output computed	91	511.	10146.	6442.	37766.	13131.	31911.	63151.	91
92	Statistical adjustment	92	-3.	-9.	-0.	-68.	-98.	-62.	112.	92
93	Total commodity output	93	508.	10137.	6442.	37698.	13033.	31849.	63263.	93

Plastics and synthetic materials	Drugs, cleaning and toilet preparations	Paints and allied products	Petroleum refining and related industries	Rubber and miscellaneous plastics products	Leather tanning and finishing	Footwear and other leather products	Glass and glass products	Stone and clay products	Primary iron and steel manufacturing	Primary nonferrous metals manufacturing	Metal containers	Heating, plumbing, and structural metal product
28	29	30	31	32	33	34	35	36	37	38	39	40
5.	60.	0.	0.	12.	0.	0.	0.	0.	0.	0.	3.	1.
86.	71.	2.	3.	9.	0.	0.	0.	5.	0.	0.	5.	1.
2.	14.	17.	1.	4.	0.	0.	0.	1.	0.	0.	0.	5.
7.	2.	0.	3.	0.	0.	0.	0.	1.	1.	0.	0.	0.
6.	2.	6.	2.	0.	0.	0.	0.	7.	3081.	15.	0.	8.
28.	9.	10.	10.	5.	0.	0.	4.	10.	63.	2245.	1.	32.
104.	17.	1.	19.	29.	1.	1.	1.	276.	3026.	35.	0.	9.
409.	75.	53.	55753.	69.	0.	1.	2.	69.	26.	1.	24.	0.
17.	20.	34.	204.	20.	0.	0.	166.	1401.	208.	9.	0.	5.
52.	17.	3.	25.	7.	2.	0.	3.	89.	51.	2.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
197.	119.	45.	951.	241.	7.	21.	85.	416.	1260.	233.	62.	353.
0.	0.	0.	0.	0.	0.	0.	0.	20.	12.	0.	0.	3.
64.	618.	156.	41.	25.	503.	23.	1.	21.	8.	4.	3.	5.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.	0.
468.	6.	1.	2.	613.	1.	225.	11.	133.	2.	23.	0.	3.
18.	12.	0.	19.	887.	0.	245.	3.	3.	2.	4.	0.	4.
5.	1.	0.	2.	14.	0.	22.	5.	6.	16.	3.	1.	3.
2.	3.	1.	1.	6.	0.	0.	2.	1.	10.	4.	0.	3.
14.	13.	1.	24.	138.	0.	37.	89.	150.	91.	79.	12.	78.
0.	0.	0.	0.	5.	0.	1.	56.	0.	11.	17.	0.	23.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
0.	0.	0.	0.	0.	0.	0.	0.	0.	3.	0.	0.	1.
314.	235.	14.	196.	530.	0.	47.	16.	330.	15.	22.	13.	30.
192.	616.	49.	277.	486.	11.	76.	418.	114.	59.	62.	31.	103.
15.	99.	32.	14.	36.	1.	13.	20.	22.	28.	23.	120.	26.
7217.	2805.	1576.	3063.	2138.	117.	50.	411.	620.	1636.	812.	9.	60.
1004.	113.	411.	35.	7183.	0.	92.	3.	233.	13.	460.	23.	12.
103.	1996.	18.	362.	18.	40.	15.	0.	19.	2.	0.	7.	14.
43.	43.	75.	6.	26.	0.	0.	16.	47.	21.	32.	187.	89.
461.	310.	124.	7226.	509.	17.	10.	145.	495.	779.	456.	29.	133.
412.	957.	24.	149.	1833.	0.	363.	53.	152.	116.	247.	18.	206.
0.	0.	0.	0.	4.	82.	1092.	0.	0.	0.	0.	0.	0.
1.	1.	0.	4.	6.	0.	237.	3.	0.	4.	0.	0.	0.
15.	406.	6.	26.	203.	0.	0.	704.	24.	9.	15.	0.	206.
28.	17.	66.	168.	148.	4.	3.	113.	3173.	488.	125.	5.	62.
24.	16.	29.	77.	502.	0.	4.	13.	202.	12654.	403.	2484.	5560.
63.	34.	49.	22.	115.	0.	2.	36.	208.	1391.	15430.	1168.	2497.
95.	570.	326.	330.	5.	0.	0.	0.	5.	4.	2.	343.	1.
0.	7.	0.	3.	33.	0.	0.	1.	9.	6.	3.	0.	525.
2.	125.	11.	1.	132.	0.	18.	22.	20.	253.	112.	8.	750.
36.	203.	26.	217.	235.	0.	55.	12.	305.	534.	284.	88.	833.
0.	0.	0.	10.	11.	0.	0.	0.	5.	37.	2.	0.	21.
0.	0.	0.	0.	0.	0.	0.	0.	0.	9.	0.	0.	4.
0.	0.	0.	17.	2.	0.	0.	0.	152.	8.	0.	0.	7.
1.	0.	0.	0.	2.	0.	0.	0.	3.	19.	14.	0.	1.
8.	11.	1.	8.	100.	1.	7.	46.	25.	407.	375.	37.	151.
42.	10.	1.	11.	74.	0.	4.	55.	5.	57.	12.	0.	2.
41.	55.	1.	149.	19.	0.	0.	4.	19.	626.	260.	1.	173.
21.	15.	5.	26.	123.	2.	12.	39.	54.	346.	148.	25.	142.
0.	0.	0.	0.	6.	0.	0.	0.	0.	11.	0.	0.	4.
3.	2.	0.	1.	1.	0.	0.	0.	1.	7.	4.	1.	61.
2.	4.	0.	17.	14.	0.	0.	14.	11.	430.	139.	2.	255.
0.	0.	0.	0.	0.	0.	0.	6.	0.	0.	0.	0.	2.
1.	3.	0.	8.	32.	0.	1.	7.	22.	12.	11.	0.	8.
0.	1.	0.	1.	5.	0.	0.	1.	1.	7.	6.	0.	9.
2.	4.	0.	0.	30.	0.	0.	1.	5.	9.	27.	0.	12.
0.	3.	0.	2.	8.	0.	0.	1.	2.	13.	11.	0.	5.
1.	4.	8.	97.	29.	0.	0.	1.	74.	127.	36.	2.	50.
0.	0.	0.	1.	10.	0.	0.	0.	2.	11.	1.	0.	11.
0.	0.	0.	0.	0.	0.	0.	0.	0.	4.	0.	0.	3.
12.	27.	1.	21.	30.	0.	2.	16.	7.	75.	21.	1.	50.
3.	7.	0.	5.	11.	0.	0.	4.	11.	12.	4.	2.	7.
3.	20.	7.	4.	27.	0.	71.	1.	33.	14.	10.	1.	18.
640.	626.	225.	3116.	1077.	31.	77.	289.	1802.	2606.	1304.	211.	475.
42.	107.	16.	168.	113.	2.	31.	29.	89.	72.	67.	9.	115.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	7.
776.	323.	53.	2333.	827.	23.	40.	591.	1167.	2929.	1598.	115.	270.
818.	1153.	268.	1520.	1292.	85.	195.	330.	793.	3275.	2058.	322.	1197.
85.	226.	41.	560.	239.	5.	64.	55.	199.	318.	236.	52.	170.
158.	447.	35.	541.	320.	3.	42.	103.	191.	193.	137.	48.	168.
50.	93.	24.	46.	78.	13.	29.	21.	53.	113.	66.	23.	130.
641.	3932.	204.	1623.	976.	20.	217.	218.	643.	940.	586.	110.	585.
107.	340.	48.	241.	214.	4.	42.	43.	168.	137.	105.	39.	149.
62.	48.	16.	83.	78.	2.	14.	38.	105.	48.	76.	15.	64.
1.	5.	1.	1.	3.	0.	0.	1.	0.	1.	2.	1.	7.
21.	98.	7.	57.	60.	1.	2.	6.	19.	10.	19.	6.	18.
16.	67.	16.	68.	47.	3.	46.	17.	36.	65.	31.	3.	38.
5.	12.	0.	27.	8.	4.	0.	3.	7.	16.	8.	2.	5.
40.	230.	45.	185.	528.	1.	1.	42.	68.	150.	123.	3.	11.
4.	1.	0.	1.	10.	0.	0.	45.	3.	1845.	1503.	1.	49.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15124.	17488.	4189.	80182.	22633.	987.	3551.	4446.	14344.	40841.	30164.	5683.	16101.
7221.	11267.	2023.	15701.	17177.	558.	2545.	4814.	11240.	23155.	10681.	2991.	10990.
4868.	5612.	1099.	5274.	10809.	345.	2000.	3546.	6965.	18679.	6930.	1766.	7524.
391.	383.	73.	5035.	1205.	6.	26.	141.	470.	1012.	684.	53.	292.
1983.	5272.	850.	5392.	5163.	207.	519.	1127.	3806.	3466.	3267.	1172.	3175.
22345.	28755.	6212.	95883.	39811.	1545.	6096.	9260.	25584.	63996.	40846.	8674.	27091.
-32.	-30.	-18.	231.	-20.	-4.	1.	-24.	5.	-373.	-144.	-123.	-77.
22313.	28725.	6194.	96114.	39791.	1541.	6097.	9236.	25589.	63623.	40702.	8551.	27014.

APPENDIX

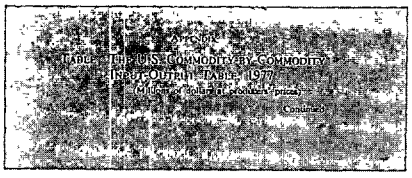
TABLE. THE U.S. COMMODITY-BY-COMMODITY INPUT-OUTPUT TABLE, 1977

(Millions of dollars at producers' prices)

Continued

		Screw machine products and stampings	Other fabricated metal products	Engines and turbines	Farm and garden machinery	Construction and mining machinery	Materials handling machinery and equipment	Metalworking machinery and equipment	
		41	42	43	44	45	46	47	
1	Livestock and livestock products	7.	0.	0.	0.	0.	0.	0.	1
2	Other agricultural products	3.	1.	0.	0.	0.	0.	0.	2
3	Forestry and fishery products	0.	5.	0.	0.	0.	0.	0.	3
4	Agricultural, forestry, and fishery services	0.	1.	0.	0.	0.	0.	0.	4
5	Iron and ferroalloy ores mining	7.	83.	0.	2.	1.	0.	4.	5
6	Nonferrous metal ores mining	1.	21.	0.	0.	0.	0.	5.	6
7	Coal mining	11.	88.	1.	6.	8.	1.	6.	7
8	Crude petroleum and natural gas	0.	3.	0.	0.	1.	0.	3.	8
9	Stone and clay mining and quarrying	1.	14.	0.	0.	0.	0.	2.	9
10	Chemical and fertilizer mineral mining	0.	3.	0.	0.	0.	0.	0.	10
11	New construction	0.	0.	0.	0.	0.	0.	0.	11
12	Maintenance and repair construction	191.	235.	76.	44.	94.	29.	58.	12
13	Ordnance and accessories	1.	1.	2.	0.	0.	0.	1.	13
14	Food and kindred products	8.	7.	1.	1.	2.	1.	2.	14
15	Tobacco manufactures	0.	0.	0.	0.	0.	0.	0.	15
16	Broad and narrow fabrics, yarn and thread mills	2.	12.	1.	1.	0.	0.	3.	16
17	Miscellaneous textile goods and floor coverings	2.	10.	2.	2.	1.	1.	4.	17
18	Apparel	3.	11.	4.	1.	1.	1.	3.	18
19	Miscellaneous fabricated textile products	38.	4.	4.	2.	2.	1.	3.	19
20	Lumber and wood products, except containers	50.	156.	4.	36.	17.	8.	15.	20
21	Wood containers	19.	3.	0.	1.	3.	2.	7.	21
22	Household furniture	0.	1.	0.	0.	0.	0.	0.	22
23	Other furniture and fixtures	1.	1.	1.	1.	0.	2.	0.	23
24	Paper and allied products, except containers	71.	57.	19.	4.	4.	5.	9.	24
25	Paperboard containers and boxes	119.	248.	33.	26.	6.	4.	57.	25
26	Printing and publishing	20.	38.	9.	9.	14.	6.	18.	26
27	Chemicals and selected chemical products	108.	552.	5.	11.	16.	5.	89.	27
28	Plastics and synthetic materials	52.	118.	2.	6.	2.	3.	22.	28
29	Drugs, cleaning and toilet preparations	11.	13.	0.	0.	0.	0.	0.	29
30	Paints and allied products	72.	155.	7.	32.	23.	7.	21.	30
31	Petroleum refining and related industries	52.	163.	61.	26.	41.	27.	84.	31
32	Rubber and miscellaneous plastics products	152.	656.	58.	325.	309.	85.	86.	32
33	Leather tanning and finishing	0.	1.	0.	0.	0.	0.	0.	33
34	Footwear and other leather products	0.	1.	0.	0.	0.	0.	0.	34
35	Glass and glass products	24.	39.	3.	2.	1.	1.	4.	35
36	Stone and clay products	28.	110.	73.	27.	103.	16.	128.	36
37	Primary iron and steel manufacturing	5123.	4029.	1390.	1412.	2725.	652.	1295.	37
38	Primary nonferrous metals manufacturing	815.	1808.	444.	114.	123.	102.	365.	38
39	Metal containers	15.	11.	0.	0.	0.	0.	1.	39
40	Heating, plumbing, and structural metal product	3.	18.	149.	8.	305.	70.	87.	40
41	Screw machine products and stampings	681.	457.	282.	205.	118.	62.	106.	41
42	Other fabricated metal products	351.	1085.	153.	119.	186.	78.	133.	42
43	Engines and turbines	8.	51.	1168.	728.	569.	77.	10.	43
44	Farm and garden machinery	1.	2.	4.	780.	20.	1.	1.	44
45	Construction and mining machinery	1.	13.	24.	8.	1262.	20.	2.	45
46	Materials handling machinery and equipment	0.	1.	0.	1.	2.	208.	1.	46
47	Metalworking machinery and equipment	243.	223.	160.	78.	122.	44.	677.	47
48	Special industry machinery and equipment	2.	12.	0.	1.	1.	1.	3.	48
49	General industrial machinery and equipment	26.	81.	255.	472.	1042.	306.	271.	49
50	Miscellaneous machinery, except electrical	603.	193.	315.	212.	111.	86.	309.	50
51	Office, computing, and accounting machines	4.	14.	0.	0.	0.	3.	3.	51
52	Service industry machines	8.	5.	2.	2.	1.	1.	2.	52
53	Electric industrial equipment and apparatus	49.	147.	125.	71.	230.	178.	350.	53
54	Household appliances	3.	0.	1.	1.	0.	0.	0.	54
55	Electric lighting and wiring equipment	18.	6.	3.	12.	2.	1.	16.	55
56	Radio, TV, and communication equipment	7.	10.	21.	2.	3.	2.	4.	56
57	Electronic components and accessories	11.	34.	12.	1.	3.	4.	14.	57
58	Miscellaneous electrical machinery and supplies	10.	8.	134.	74.	5.	8.	5.	58
59	Motor vehicles and equipment	195.	44.	113.	252.	246.	19.	41.	59
60	Aircraft and parts	8.	12.	68.	4.	8.	3.	6.	60
61	Other transportation equipment	0.	1.	3.	3.	2.	0.	1.	61
62	Scientific and controlling instruments	10.	16.	5.	2.	3.	2.	23.	62
63	Optical, ophthalmic, and photographic equipment	6.	11.	7.	3.	5.	2.	7.	63
64	Miscellaneous manufacturing	6.	16.	2.	3.	9.	4.	6.	64
65	Transportation and warehousing	346.	501.	137.	157.	211.	54.	156.	65
66	Communications, except radio and TV	113.	130.	31.	23.	77.	19.	47.	66
67	Radio and TV broadcasting	0.	0.	0.	0.	0.	0.	0.	67
68	Electric, gas, water, and sanitary services	267.	523.	96.	109.	156.	40.	165.	68
69	Wholesale and retail trade	727.	1171.	433.	783.	1002.	279.	452.	69
70	Finance and insurance	102.	230.	47.	37.	73.	23.	79.	70
71	Real estate and rental	93.	165.	34.	50.	52.	29.	81.	71
72	Hotels; personal and repair services (exc. auto)	42.	74.	19.	12.	22.	9.	26.	72
73	Business services	443.	739.	193.	139.	320.	102.	292.	73
74	Eating and drinking places	67.	141.	40.	34.	63.	25.	85.	74
75	Automobile repair and services	60.	67.	29.	10.	15.	12.	39.	75
76	Amusements	1.	1.	1.	0.	1.	1.	1.	76
77	Health, educ., & social serv. and nonprofit org	31.	21.	4.	3.	3.	2.	13.	77
78	Federal Government enterprises	20.	42.	12.	18.	19.	9.	17.	78
79	State and local government enterprises	5.	11.	2.	2.	3.	1.	4.	79
80	Noncomparable imports	9.	28.	7.	14.	29.	5.	21.	80
81	Scrap, used, and secondhand goods	6.	91.	25.	14.	8.	1.	24.	81
82	Government industry	0.	0.	0.	0.	0.	0.	0.	82
83	Rest of the world industry	0.	0.	0.	0.	0.	0.	0.	83
84	Household industry	0.	0.	0.	0.	0.	0.	0.	84
85	Inventory valuation adjustment	0.	0.	0.	0.	0.	0.	0.	85
86	Total intermediate inputs	11597.	15055.	6313.	6541.	9807.	2749.	5876.	86
87	Value added	8597.	13292.	4569.	4892.	7201.	2236.	7990.	87
88	Compensation of employees	6446.	8541.	3047.	3051.	4914.	1499.	5510.	88
89	Indirect business taxes	183.	271.	113.	86.	210.	48.	127.	89
90	Property-type income	1968.	4481.	1408.	1755.	2077.	688.	2352.	90
91	Total commodity output computed	20194.	28347.	10882.	11433.	17008.	4985.	13866.	91
92	Statistical adjustment	-202.	-74.	-17.	-17.	-26.	-9.	-20.	92
93	Total commodity output	19992.	28273.	10865.	11416.	16982.	4976.	13846.	93

Special industry machinery and equipment	General industrial machinery and equipment	Miscellaneous machinery, except electrical	Office, computing, and accounting machines	Service industry machines	Electric industrial equipment and apparatus	Household appliances	Electric lighting and wiring equipment	Radio, TV, and communication equipment	Electronic components and accessories	Miscellaneous electrical machinery and supplies	Motor vehicles and equipment	Aircraft and parts
48	49	50	1	52	53	54	55	56	57	58	59	60
3.	0.	0.	0.	2.	0.	1.	0.	0.	0.	0.	0.	0.
3.	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
0.	0.	0.	0.	0.	1.	0.	0.	1.	0.	0.	1.	0.
0.	4.	1.	0.	0.	1.	0.	3.	0.	0.	5.	8.	0.
2.	3.	0.	0.	0.	2.	0.	1.	1.	1.	7.	10.	0.
1.	7.	2.	1.	3.	4.	5.	5.	2.	2.	3.	50.	3.
2.	3.	2.	0.	0.	0.	0.	0.	0.	2.	1.	0.	0.
1.	2.	0.	1.	0.	1.	0.	1.	1.	1.	0.	3.	0.
2.	0.	0.	0.	9.	0.	0.	0.	0.	1.	1.	1.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
43.	84.	36.	47.	44.	115.	61.	40.	81.	87.	35.	279.	112.
1.	0.	0.	0.	0.	1.	0.	0.	14.	0.	0.	2.	19.
5.	3.	2.	4.	2.	3.	2.	1.	3.	3.	2.	4.	3.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	2.	1.	4.	1.	2.	36.	13.	2.	4.	1.	31.	43.
2.	73.	17.	2.	1.	6.	2.	1.	1.	2.	4.	243.	1.
1.	5.	1.	2.	2.	3.	1.	1.	13.	11.	1.	15.	5.
1.	3.	2.	1.	3.	4.	2.	2.	0.	0.	4.	2237.	47.
25.	36.	5.	13.	36.	28.	60.	19.	21.	12.	2.	145.	14.
2.	7.	1.	0.	18.	10.	15.	0.	13.	0.	0.	7.	4.
0.	0.	0.	3.	0.	2.	0.	1.	306.	23.	0.	1.	8.
0.	0.	0.	0.	0.	1.	6.	0.	0.	0.	0.	225.	8.
10.	60.	4.	100.	13.	111.	35.	6.	46.	67.	6.	108.	8.
13.	61.	51.	63.	84.	84.	167.	138.	74.	66.	55.	110.	5.
14.	19.	12.	35.	12.	29.	12.	10.	157.	24.	8.	44.	39.
141.	32.	10.	24.	57.	123.	53.	78.	55.	237.	262.	237.	23.
13.	22.	6.	55.	62.	65.	189.	115.	162.	79.	65.	206.	21.
1.	2.	1.	0.	0.	0.	0.	0.	0.	1.	2.	7.	0.
1.	9.	4.	31.	34.	47.	85.	23.	21.	3.	12.	407.	33.
52.	131.	34.	65.	61.	116.	23.	33.	58.	69.	36.	265.	133.
139.	187.	24.	578.	237.	283.	510.	222.	959.	594.	215.	4947.	139.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.	5.	1.
14.	5.	2.	14.	12.	17.	61.	266.	32.	239.	9.	1023.	6.
37.	106.	107.	30.	61.	147.	67.	36.	31.	129.	20.	415.	42.
758.	2029.	638.	148.	910.	1224.	898.	507.	187.	154.	246.	9448.	709.
258.	567.	278.	271.	802.	1203.	470.	532.	748.	699.	962.	2216.	975.
1.	1.	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
104.	129.	3.	128.	91.	60.	3.	2.	154.	30.	12.	25.	42.
70.	217.	59.	272.	297.	298.	243.	232.	264.	249.	131.	7951.	264.
158.	201.	126.	203.	241.	204.	264.	169.	359.	345.	208.	2706.	213.
88.	109.	27.	2.	39.	114.	3.	2.	3.	1.	2.	995.	6.
2.	3.	0.	0.	0.	0.	1.	0.	0.	0.	0.	2.	1.
1.	13.	2.	0.	1.	3.	0.	0.	2.	0.	0.	25.	0.
5.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	19.	0.
112.	226.	132.	58.	101.	129.	41.	62.	82.	67.	61.	332.	260.
244.	4.	0.	2.	1.	0.	0.	0.	0.	1.	1.	1.	0.
290.	921.	106.	22.	224.	89.	60.	7.	20.	6.	58.	708.	170.
227.	291.	637.	58.	156.	94.	39.	28.	102.	51.	34.	993.	284.
2.	13.	1.	2338.	0.	40.	2.	2.	45.	71.	5.	0.	13.
6.	8.	1.	1.	546.	3.	189.	1.	6.	1.	4.	1160.	1.
321.	582.	49.	443.	814.	1298.	535.	145.	198.	79.	91.	274.	53.
0.	1.	0.	0.	3.	1.	122.	0.	0.	0.	0.	2.	0.
2.	4.	2.	43.	57.	89.	102.	148.	171.	35.	38.	465.	3.
5.	9.	2.	13.	2.	14.	1.	4.	1585.	27.	2.	723.	1137.
31.	54.	9.	1444.	3.	378.	5.	130.	4521.	2018.	276.	229.	470.
1.	4.	51.	21.	3.	15.	2.	148.	17.	6.	342.	1753.	61.
12.	25.	26.	9.	36.	50.	22.	20.	27.	2.	61.	30930.	16.
9.	24.	22.	9.	4.	31.	0.	5.	34.	6.	0.	26.	4216.
0.	2.	0.	0.	0.	3.	0.	0.	0.	0.	0.	23.	1.
3.	30.	3.	13.	157.	25.	262.	5.	37.	8.	5.	201.	199.
6.	9.	6.	13.	5.	15.	2.	8.	66.	16.	5.	17.	123.
3.	5.	4.	12.	23.	13.	48.	3.	14.	7.	2.	32.	9.
113.	211.	132.	210.	169.	270.	140.	139.	305.	244.	189.	1173.	418.
53.	104.	40.	86.	44.	74.	26.	25.	144.	73.	21.	73.	135.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91.	193.	112.	118.	111.	216.	134.	98.	203.	212.	110.	795.	255.
447.	736.	198.	778.	694.	955.	549.	479.	1269.	766.	397.	4837.	539.
69.	101.	61.	160.	45.	176.	62.	87.	122.	138.	93.	388.	305.
52.	99.	88.	146.	47.	150.	34.	47.	848.	115.	69.	168.	129.
20.	39.	28.	166.	32.	77.	30.	44.	226.	106.	47.	81.	293.
200.	415.	445.	535.	255.	388.	413.	217.	960.	446.	187.	1801.	852.
54.	140.	63.	160.	56.	118.	46.	56.	224.	154.	50.	155.	473.
14.	40.	42.	26.	10.	29.	13.	13.	32.	45.	20.	719.	47.
0.	5.	1.	1.	0.	1.	0.	1.	5.	7.	12.	15.	10.
4.	16.	14.	10.	10.	8.	9.	5.	31.	19.	3.	90.	33.
22.	32.	13.	25.	7.	29.	32.	14.	100.	28.	6.	132.	78.
1.	4.	2.	5.	3.	4.	2.	2.	5.	5.	3.	22.	5.
12.	15.	2.	116.	2.	45.	12.	6.	103.	27.	12.	304.	29.
20.	13.	12.	2.	1.	4.	1.	16.	1.	3.	38.	222.	1.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
4433.	8692.	3762.	9139.	6761.	9143.	6215.	4430.	15275.	7931.	4561.	83273.	13546.
4398.	8098.	4747.	6674.	4671.	9233.	4176.	3788.	13136.	6903.	4072.	33902.	11662.
3140.	5531.	3808.	4995.	2997.	6646.	2443.	2322.	11440.	5547.	2857.	23259.	10074.
96.	142.	118.	116.	91.	147.	68.	53.	253.	156.	88.	1632.	187.
1162.	2425.	821.	1563.	1582.	2438.	1665.	1416.	1444.	1201.	1127.	9011.	1402.
8831.	16590.	8509.	15814.	11432.	18375.	10391.	8219.	28411.	14834.	8633.	117174.	25207.
-13.	-34.	-17.	-16.	-46.	-54.	-20.	-20.	-78.	-44.	-21.	-268.	-18.
8818.	16556.	8492.	15798.	11386.	18321.	10371.	8199.	28333.	14790.	8612.	116906.	25189.



		Other transportation equipment	Scientific and controlling instruments	Optical, ophthalmic, and photographic equipment	Miscellaneous manufacturing	Transportation and warehousing	Communications, except radio and TV	Radio and TV broadcasting	
		61	62	63	64	65	66	67	
1	Livestock and livestock products	0.	0.	0.	4.	1.	0.	0.	1
2	Other agricultural products	0.	2.	0.	20.	5.	0.	0.	2
3	Forestry and fishery products	1.	1.	0.	7.	0.	0.	0.	3
4	Agricultural, forestry, and fishery services	0.	0.	1.	0.	5.	1.	0.	4
5	Iron and ferroalloy ores mining	0.	0.	1.	0.	0.	0.	0.	5
6	Nonferrous metal ores mining	0.	2.	2.	1.	0.	0.	0.	6
7	Coal mining	3.	2.	7.	3.	96.	0.	0.	7
8	Crude petroleum and natural gas	0.	2.	6.	2.	78.	0.	0.	8
9	Stone and clay mining and quarrying	0.	2.	2.	25.	0.	0.	0.	9
10	Chemical and fertilizer mineral mining	0.	2.	4.	1.	1.	0.	0.	10
11	New construction	0.	0.	0.	0.	0.	0.	0.	11
12	Maintenance and repair construction	60.	51.	46.	103.	5260.	1927.	2.	12
13	Ordnance and accessories	3.	0.	0.	1.	1.	0.	0.	13
14	Food and kindred products	3.	40.	3.	32.	75.	0.	0.	14
15	Tobacco manufactures	0.	0.	0.	0.	0.	0.	0.	15
16	Broad and narrow fabrics, yarn and thread mills	10.	134.	2.	322.	2.	0.	0.	16
17	Miscellaneous textile goods and floor coverings	248.	92.	8.	56.	62.	0.	0.	17
18	Apparel	16.	21.	1.	21.	94.	36.	0.	18
19	Miscellaneous fabricated textile products	86.	2.	1.	59.	74.	0.	0.	19
20	Lumber and wood products, except containers	815.	34.	7.	415.	17.	0.	0.	20
21	Wood containers	0.	0.	0.	7.	0.	0.	0.	21
22	Household furniture	67.	6.	1.	0.	0.	0.	0.	22
23	Other furniture and fixtures	74.	0.	0.	0.	0.	0.	0.	23
24	Paper and allied products, except containers	25.	121.	277.	342.	78.	35.	0.	24
25	Paperboard containers and boxes	14.	106.	74.	337.	37.	9.	0.	25
26	Printing and publishing	22.	46.	15.	50.	269.	140.	1.	26
27	Chemicals and selected chemical products	58.	140.	788.	346.	151.	8.	0.	27
28	Plastics and synthetic materials	99.	123.	96.	506.	0.	0.	0.	28
29	Drugs, cleaning and toilet preparations	1.	9.	1.	4.	6.	38.	0.	29
30	Paints and allied products	133.	15.	2.	103.	23.	29.	0.	30
31	Petroleum refining and related industries	126.	87.	62.	144.	8830.	119.	0.	31
32	Rubber and miscellaneous plastics products	296.	458.	362.	556.	965.	67.	0.	32
33	Leather tanning and finishing	0.	1.	0.	37.	0.	0.	0.	33
34	Footwear and other leather products	0.	8.	0.	51.	4.	1.	0.	34
35	Glass and glass products	101.	61.	94.	15.	21.	2.	0.	35
36	Stone and clay products	207.	42.	27.	68.	61.	12.	0.	36
37	Primary iron and steel manufacturing	1967.	292.	49.	460.	287.	0.	0.	37
38	Primary nonferrous metals manufacturing	477.	494.	298.	931.	95.	62.	0.	38
39	Metal containers	0.	7.	2.	2.	0.	0.	0.	39
40	Heating, plumbing, and structural metal product	858.	32.	6.	5.	0.	0.	0.	40
41	Screw machine products and stampings	208.	300.	84.	109.	65.	72.	0.	41
42	Other fabricated metal products	330.	241.	110.	246.	418.	24.	0.	42
43	Engines and turbines	636.	5.	0.	5.	186.	98.	0.	43
44	Farm and garden machinery	2.	0.	0.	0.	9.	0.	0.	44
45	Construction and mining machinery	62.	3.	0.	1.	0.	0.	0.	45
46	Materials handling machinery and equipment	3.	0.	0.	0.	5.	0.	0.	46
47	Metalworking machinery and equipment	99.	71.	14.	30.	61.	0.	0.	47
48	Special industry machinery and equipment	4.	2.	3.	10.	0.	0.	0.	48
49	General industrial machinery and equipment	482.	26.	24.	10.	265.	60.	0.	49
50	Miscellaneous machinery, except electrical	245.	76.	23.	50.	140.	11.	0.	50
51	Office, computing, and accounting machines	3.	65.	10.	7.	4.	0.	0.	51
52	Service industry machines	94.	2.	0.	23.	13.	0.	0.	52
53	Electric industrial equipment and apparatus	220.	225.	38.	68.	202.	0.	0.	53
54	Household appliances	198.	0.	0.	0.	19.	0.	0.	54
55	Electric lighting and wiring equipment	129.	29.	16.	20.	45.	9.	0.	55
56	Radio, TV, and communication equipment	151.	14.	3.	12.	46.	1252.	1.	56
57	Electronic components and accessories	11.	442.	531.	125.	30.	266.	11.	57
58	Miscellaneous electrical machinery and supplies	47.	25.	10.	9.	61.	9.	0.	58
59	Motor vehicles and equipment	586.	15.	2.	9.	336.	146.	0.	59
60	Aircraft and parts	50.	18.	0.	6.	650.	0.	0.	60
61	Other transportation equipment	814.	0.	0.	8.	1081.	4.	0.	61
62	Scientific and controlling instruments	50.	471.	22.	7.	43.	7.	0.	62
63	Optical, ophthalmic, and photographic equipment	10.	15.	451.	13.	26.	11.	7.	63
64	Miscellaneous manufacturing	27.	48.	3.	1016.	118.	69.	0.	64
65	Transportation and warehousing	300.	181.	206.	454.	16518.	254.	5.	65
66	Communications, except radio and TV	75.	83.	69.	152.	995.	946.	4.	66
67	Radio and TV broadcasting	0.	0.	0.	0.	0.	0.	4.	67
68	Electric, gas, water, and sanitary services	174.	137.	103.	191.	1513.	451.	4.	68
69	Wholesale and retail trade	1084.	612.	412.	1149.	2611.	233.	3.	69
70	Finance and insurance	97.	77.	74.	170.	1763.	456.	4.	70
71	Real estate and rental	257.	113.	78.	270.	1363.	853.	22.	71
72	Hotels; personal and repair services (exc. auto)	33.	36.	45.	65.	286.	112.	4.	72
73	Business services	364.	449.	484.	862.	3956.	1338.	18.	73
74	Eating and drinking places	70.	119.	117.	135.	1031.	169.	8.	74
75	Automobile repair and services	36.	111.	30.	51.	2327.	105.	0.	75
76	Amusements	18.	17.	9.	9.	32.	2.	113.	76
77	Health, educ., & social serv. and nonprofit org	7.	29.	43.	51.	194.	54.	1.	77
78	Federal Government enterprises	23.	34.	17.	71.	155.	170.	0.	78
79	State and local government enterprises	2.	4.	3.	6.	108.	37.	1.	79
80	Noncomparable imports	4.	57.	16.	486.	2850.	900.	2.	80
81	Scrap, used, and secondhand goods	1.	1.	1.	3.	48.	0.	0.	81
82	Government industry	0.	0.	0.	0.	0.	0.	0.	82
83	Rest of the world industry	0.	0.	0.	0.	0.	0.	0.	83
84	Household industry	0.	0.	0.	0.	0.	0.	0.	84
85	Inventory valuation adjustment	0.	0.	0.	0.	0.	0.	0.	85
86	Total intermediate inputs	12778.	6591.	5294.	10949.	56167.	10564.	217.	86
87	Value added	8633.	7069.	6431.	8087.	72169.	42309.	309.	87
88	Compensation of employees	7317.	4941.	3437.	5222.	50246.	18365.	170.	88
89	Indirect business taxes	143.	110.	122.	205.	4294.	5571.	11.	89
90	Property-type income	1174.	2018.	2873.	2660.	17631.	18373.	128.	90
91	Total commodity output computed	21411.	13661.	11725.	19036.	128336.	52873.	526.	91
92	Statistical adjustment	-29.	-30.	-25.	2.	-72.	-5.	-0.	92
93	Total commodity output	21382.	13631.	11700.	19038.	128264.	52868.	526.	93

Electric, gas, water, and sanitary services	Wholesale and retail trade	Finance and insurance	Real estate and rental	Hotels; personal and repair services (exc. auto)	Business services	Eating and drinking places	Automobile repair and services	Amusements	Health, educ., and social serv. and nonprofit org.	Federal Government enterprises	State and local government enterprises	Noncomparable imports
68	69	70	71	72	73	74	75	76	77	78	79	80
1.	0.	0.	0.	3.	9.	445.	0.	43.	85.	5.	0.	0.
3.	21.	0.	15.	23.	19.	693.	0.	667.	87.	12.	0.	0.
2.	3.	0.	0.	0.	0.	743.	0.	0.	13.	12.	0.	0.
14.	613.	3.	1464.	39.	6.	1.	0.	67.	81.	1.	3.	0.
2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6420.	49.	2.	66.	0.	1.	53.	7.	7.	16.	420.	135.	0.
13218.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	7.	0.
0.	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.	0.	0.
3.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6242.	2730.	361.	20336.	595.	571.	553.	404.	702.	3535.	153.	1019.	0.
0.	4.	1.	0.	0.	78.	0.	0.	0.	2.	0.	0.	0.
66.	353.	8.	5.	96.	83.	24842.	2.	302.	2215.	377.	0.	0.
6.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	0.	1.	147.	24.	0.	0.	31.	25.	4.	0.	0.
2.	58.	0.	0.	20.	26.	16.	11.	19.	13.	1.	1.	0.
11.	77.	0.	5.	379.	33.	0.	36.	78.	335.	1.	2.	0.
8.	35.	80.	4.	388.	12.	53.	0.	31.	324.	38.	1.	0.
59.	414.	0.	3.	68.	20.	14.	0.	63.	28.	0.	0.	0.
0.	19.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	2.	0.	0.	0.	2.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
60.	2233.	385.	59.	146.	3348.	344.	21.	17.	905.	33.	5.	0.
6.	691.	1.	1.	46.	91.	611.	1.	0.	60.	11.	0.	0.
113.	1557.	1633.	318.	223.	3331.	108.	13.	62.	3262.	122.	12.	0.
454.	34.	7.	202.	133.	614.	48.	7.	38.	2163.	4.	50.	0.
0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	0.	0.	0.
11.	137.	6.	9.	528.	168.	115.	0.	4.	3179.	12.	3.	0.
1.	0.	0.	0.	1.	51.	0.	310.	1.	10.	1.	0.	0.
8624.	5094.	431.	422.	444.	1032.	243.	708.	169.	1480.	144.	189.	0.
95.	1061.	54.	240.	330.	439.	677.	98.	64.	1367.	15.	10.	0.
0.	0.	0.	0.	0.	3.	0.	0.	0.	0.	0.	0.	0.
3.	87.	8.	2.	31.	7.	2.	0.	17.	20.	7.	0.	0.
2.	104.	7.	2.	93.	21.	136.	181.	0.	152.	1.	0.	0.
39.	68.	2.	18.	148.	23.	101.	382.	3.	32.	1.	13.	0.
31.	9.	1.	0.	2.	29.	0.	0.	0.	7.	1.	0.	0.
22.	0.	0.	0.	5.	53.	11.	0.	3.	0.	4.	0.	0.
4.	115.	0.	0.	0.	30.	0.	0.	0.	0.	0.	0.	0.
2.	19.	0.	94.	0.	0.	0.	0.	0.	4.	1.	0.	0.
53.	2.	0.	1.	21.	58.	286.	1479.	8.	92.	26.	1.	0.
110.	277.	11.	6.	97.	192.	54.	1184.	13.	103.	6.	1.	0.
635.	1.	0.	2.	0.	68.	0.	33.	0.	0.	3.	5.	0.
30.	11.	0.	46.	0.	214.	0.	1.	1.	0.	0.	13.	0.
11.	0.	0.	1.	0.	243.	0.	0.	0.	0.	1.	0.	0.
5.	104.	0.	1.	0.	121.	0.	0.	0.	0.	1.	0.	0.
20.	41.	0.	1.	0.	109.	0.	6.	0.	0.	1.	2.	0.
0.	15.	0.	0.	0.	151.	67.	0.	0.	0.	0.	0.	0.
55.	3.	4.	5.	0.	229.	1.	3.	0.	0.	6.	1.	0.
89.	208.	0.	14.	18.	65.	151.	314.	4.	9.	6.	25.	0.
3.	29.	70.	9.	591.	459.	0.	0.	0.	13.	3.	0.	0.
4.	290.	0.	1.	34.	26.	150.	335.	13.	11.	6.	1.	0.
201.	9.	0.	16.	14.	100.	0.	107.	2.	0.	0.	36.	0.
13.	36.	40.	30.	306.	42.	1.	0.	0.	20.	4.	5.	0.
106.	46.	14.	35.	17.	74.	37.	100.	15.	115.	8.	9.	0.
7.	77.	19.	1.	33.	55.	2.	53.	5.	56.	4.	1.	0.
8.	10.	49.	7.	522.	634.	0.	0.	0.	99.	1.	2.	0.
15.	102.	12.	37.	8.	61.	8.	236.	1.	322.	4.	4.	0.
57.	340.	21.	19.	11.	82.	14.	5045.	20.	44.	18.	12.	0.
7.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
44.	2.	18.	6.	2.	156.	1.	5.	77.	5.	10.	11.	0.
76.	60.	8.	3.	21.	26.	0.	7.	0.	1453.	1.	1.	0.
40.	173.	99.	43.	260.	1041.	4.	1.	102.	584.	9.	3.	0.
46.	576.	239.	57.	685.	338.	178.	16.	89.	475.	28.	5.	0.
2532.	6878.	947.	259.	250.	2399.	1441.	1014.	381.	2095.	894.	73.	0.
387.	5592.	2511.	537.	628.	2907.	460.	456.	241.	1865.	86.	15.	0.
0.	0.	0.	1.	0.	171.	0.	0.	0.	0.	0.	0.	0.
23074.	7575.	1274.	2363.	1721.	1135.	1813.	513.	528.	3386.	158.	723.	0.
1349.	4997.	420.	718.	928.	2007.	5029.	4520.	270.	2444.	183.	73.	0.
859.	5609.	25128.	6991.	700.	1647.	987.	283.	372.	1465.	37.	22.	0.
831.	14941.	2922.	17867.	1770.	4392.	2595.	747.	1118.	9430.	255.	38.	0.
189.	1561.	640.	86.	670.	1353.	469.	96.	239.	1051.	43.	10.	0.
1312.	29449.	8659.	5355.	2192.	10823.	3296.	1183.	1898.	7748.	381.	93.	0.
219.	6557.	1213.	760.	315.	2338.	166.	102.	278.	1788.	62.	34.	0.
210.	5515.	381.	165.	336.	1217.	136.	174.	313.	1006.	88.	11.	0.
10.	780.	3.	1.	18.	1890.	809.	0.	3284.	331.	20.	0.	0.
118.	380.	502.	94.	283.	583.	157.	24.	138.	2928.	7.	5.	0.
369.	1736.	2188.	567.	142.	1336.	136.	24.	48.	902.	151.	13.	0.
23.	208.	27.	39.	49.	44.	62.	29.	10.	100.	8.	1.	0.
96.	396.	254.	7.	11.	332.	90.	0.	56.	30.	369.	0.	0.
2.	0.	0.	0.	19.	0.	0.	206.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
68734.	110176.	50662.	59422.	16561.	49268.	48413.	20480.	11918.	59367.	4266.	2701.	0.
53518.	275985.	77916.	219822.	29576.	105252.	39399.	22904.	12665.	102653.	9768.	2265.	0.
17973.	162953.	52414.	7876.	16604.	57629.	27373.	10909.	7168.	82765.	10257.	1623.	0.
4995.	53161.	5474.	47723.	1706.	1496.	3349.	1126.	1354.	550.	0.	3.	0.
30584.	59885.	20027.	164224.	11266.	46127.	8704.	10869.	4144.	19338.	-278.	639.	0.
122252.	386161.	128578.	279244.	46137.	154519.	87812.	43384.	24583.	162020.	14034.	4966.	0.
204.	10.	0.	-1.	-8.	7450.	27.	-4.	-0.	-4.	206.	-5.	0.
122456.	386171.	128578.	279243.	46129.	161969.	87839.	43380.	24583.	162016.	14240.	4961.	0.

APPENDIX

TABLE. THE U.S. COMMODITY-BY-COMMODITY INPUT-OUTPUT TABLE, 1972

(Millions of dollars at producers' prices)

Continued

		Scrap, used, and secondhand goods	Government industry	Rest of the world industry	Household industry	Inventory valuation adjustment	Total intermediate use	Personal consumption expenditures	
		81	82	83	84	85	86	87	
1	Livestock and livestock products	0.	0.	0.	0.	0.	47385.	2511.	1
2	Other agricultural products	0.	0.	0.	0.	0.	38173.	7726.	2
3	Forestry and fishery products	0.	0.	0.	0.	0.	6346.	788.	3
4	Agricultural, forestry, and fishery services	0.	0.	0.	0.	0.	8091.	353.	4
5	Iron and ferroalloy ores mining	0.	0.	0.	0.	0.	3548.	0.	5
6	Nonferrous metal ores mining	0.	0.	0.	0.	0.	3256.	0.	6
7	Coal mining	0.	0.	0.	0.	0.	14125.	215.	7
8	Crude petroleum and natural gas	0.	0.	0.	0.	0.	77477.	0.	8
9	Stone and clay mining and quarrying	0.	0.	0.	0.	0.	4932.	20.	9
10	Chemical and fertilizer mineral mining	0.	0.	0.	0.	0.	1299.	2.	10
11	New construction	0.	0.	0.	0.	0.	0.	0.	11
12	Maintenance and repair construction	0.	0.	0.	0.	0.	57527.	0.	12
13	Ordnance and accessories	0.	0.	0.	0.	0.	620.	630.	13
14	Food and kindred products	0.	0.	0.	0.	0.	75228.	113507.	14
15	Tobacco manufactures	0.	0.	0.	0.	0.	2628.	8437.	15
16	Broad and narrow fabrics, yarn and thread mills	0.	0.	0.	0.	0.	24347.	882.	16
17	Miscellaneous textile goods and floor coverings	0.	0.	0.	0.	0.	5953.	2045.	17
18	Apparel	0.	0.	0.	0.	0.	10306.	33194.	18
19	Miscellaneous fabricated textile products	0.	0.	0.	0.	0.	4677.	4068.	19
20	Lumber and wood products, except containers	0.	0.	0.	0.	0.	38247.	548.	20
21	Wood containers	0.	0.	0.	0.	0.	526.	0.	21
22	Household furniture	0.	0.	0.	0.	0.	572.	8642.	22
23	Other furniture and fixtures	0.	0.	0.	0.	0.	830.	566.	23
24	Paper and allied products, except containers	0.	0.	0.	0.	0.	319225.	5307.	24
25	Paperboard containers and boxes	0.	0.	0.	0.	0.	12361.	192.	25
26	Printing and publishing	0.	0.	0.	0.	0.	16716.	10237.	26
27	Chemicals and selected chemical products	0.	0.	0.	0.	0.	56418.	1149.	27
28	Plastics and synthetic materials	0.	0.	0.	0.	0.	20779.	0.	28
29	Drugs, cleaning and toilet preparations	0.	0.	0.	0.	0.	8544.	16921.	29
30	Paints and allied products	0.	0.	0.	0.	0.	5608.	168.	30
31	Petroleum refining and related industries	0.	0.	0.	0.	0.	57321.	38595.	31
32	Rubber and miscellaneous plastics products	0.	0.	0.	0.	0.	32027.	6444.	32
33	Leather tanning and finishing	0.	0.	0.	0.	0.	1530.	0.	33
34	Footwear and other leather products	0.	0.	0.	0.	0.	575.	7610.	34
35	Glass and glass products	0.	0.	0.	0.	0.	7908.	829.	35
36	Stone and clay products	0.	0.	0.	0.	0.	24244.	1123.	36
37	Primary iron and steel manufacturing	0.	0.	0.	0.	0.	67841.	11.	37
38	Primary nonferrous metals manufacturing	0.	0.	0.	0.	0.	42583.	48.	38
39	Metal containers	0.	0.	0.	0.	0.	8256.	0.	39
40	Heating, plumbing, and structural metal product	0.	0.	0.	0.	0.	20918.	374.	40
41	Screw machine products and stampings	0.	0.	0.	0.	0.	18128.	798.	41
42	Other fabricated metal products	0.	0.	0.	0.	0.	23526.	2038.	42
43	Engines and turbines	0.	0.	0.	0.	0.	6186.	207.	43
44	Farm and garden machinery	0.	0.	0.	0.	0.	1955.	105.	44
45	Construction and mining machinery	0.	0.	0.	0.	0.	3594.	0.	45
46	Materials handling machinery and equipment	0.	0.	0.	0.	0.	1545.	0.	46
47	Metalworking machinery and equipment	0.	0.	0.	0.	0.	5268.	281.	47
48	Special industry machinery and equipment	0.	0.	0.	0.	0.	2076.	92.	48
49	General industrial machinery and equipment	0.	0.	0.	0.	0.	9460.	0.	49
50	Miscellaneous machinery, except electrical	0.	0.	0.	0.	0.	8041.	40.	50
51	Office, computing, and accounting machines	0.	0.	0.	0.	0.	3872.	420.	51
52	Service industry machines	0.	0.	0.	0.	0.	6266.	432.	52
53	Electric industrial equipment and apparatus	0.	0.	0.	0.	0.	10299.	91.	53
54	Household appliances	0.	0.	0.	0.	0.	1776.	7014.	54
55	Electric lighting and wiring equipment	0.	0.	0.	0.	0.	5966.	1318.	55
56	Radio, TV, and communication equipment	0.	0.	0.	0.	0.	6835.	8328.	56
57	Electronic components and accessories	0.	0.	0.	0.	0.	12724.	529.	57
58	Miscellaneous electrical machinery and supplies	0.	0.	0.	0.	0.	4333.	2003.	58
59	Motor vehicles and equipment	0.	0.	0.	0.	0.	39830.	46124.	59
60	Aircraft and parts	0.	0.	0.	0.	0.	5597.	427.	60
61	Other transportation equipment	0.	0.	0.	0.	0.	2469.	7063.	61
62	Scientific and controlling instruments	0.	0.	0.	0.	0.	4399.	1927.	62
63	Optical, ophthalmic, and photographic equipment	0.	0.	0.	0.	0.	3687.	2379.	63
64	Miscellaneous manufacturing	0.	0.	0.	0.	0.	5778.	12684.	64
65	Transportation and warehousing	0.	0.	0.	0.	0.	75320.	33210.	65
66	Communications, except radio and TV	0.	0.	0.	0.	0.	23408.	22394.	66
67	Radio and TV broadcasting	0.	0.	0.	0.	0.	182.	344.	67
68	Electric, gas, water, and sanitary services	0.	0.	0.	0.	0.	75728.	41824.	68
69	Wholesale and retail trade	0.	0.	0.	0.	0.	112690.	222550.	69
70	Finance and insurance	0.	0.	0.	0.	0.	58754.	65533.	70
71	Real estate and rental	0.	0.	0.	0.	0.	79443.	181316.	71
72	Hotels; personal and repair services (exc. auto)	0.	0.	0.	0.	0.	10928.	33938.	72
73	Business services	0.	0.	0.	0.	0.	131337.	13863.	73
74	Eating and drinking places	0.	0.	0.	0.	0.	22162.	67477.	74
75	Automobile repair and services	0.	0.	0.	0.	0.	17175.	25437.	75
76	Amusements	0.	0.	0.	0.	0.	7666.	16018.	76
77	Health, educ., & social serv. and nonprofit org	0.	0.	0.	0.	0.	7094.	135932.	77
78	Federal Government enterprises	0.	0.	0.	0.	0.	10626.	2692.	78
79	State and local government enterprises	0.	0.	0.	0.	0.	1266.	3576.	79
80	Noncomparable imports	0.	0.	0.	0.	0.	13373.	8727.	80
81	Scrap, used, and secondhand goods	0.	0.	0.	0.	0.	4952.	5502.	81
82	Government industry	0.	0.	0.	0.	0.	0.	0.	82
83	Rest of the world industry	0.	0.	0.	0.	0.	0.	-7221.	83
84	Household industry	0.	0.	0.	0.	0.	0.	5930.	84
85	Inventory valuation adjustment	0.	0.	0.	0.	0.	0.	0.	85
86	Total intermediate inputs	0.	0.	0.	0.	0.	1687366.	1246482.	86
87	Value added	0.	203934.	23464.	5930.	-18582.	0.	0.	87
88	Compensation of employees	0.	203934.	-40.	5930.	0.	0.	0.	88
89	Indirect business taxes	0.	0.	0.	0.	0.	0.	0.	89
90	Property-type income	0.	0.	23504.	0.	-18582.	0.	0.	90
91	Total commodity output computed	0.	203934.	23464.	5930.	-18582.	0.	1246481.	91
92	Statistical adjustment	2250.	0.	0.	0.	0.	0.	0.	92
93	Total commodity output	2250.	203934.	23464.	5930.	-18582.	0.	0.	93

				Government Expenditure									
Gross private fixed investment	Change in business inventories	Exports	Imports	National defense	Nondefense	Education	Other	Total final demand	Total commodity output computed	Inputs of CCC or adjustment	Total commodity output		
88	89	90	91	92	93	94	95	96	97	98	99		
0.	-1183.	199.	-360.	1.	5.	24.	24.	1219.	48604.	-1.	48603.	1	
0.	1832.	12523.	-1047.	0.	3496.	191.	177.	24897.	63070.	106.	63176.	2	
0.	34.	214.	-1302.	0.	-828.	4.	-85.	-1175.	5171.	-1.	5170.	3	
0.	0.	24.	-3.	4.	57.	165.	227.	828.	8919.	4.	8923.	4	
0.	-437.	326.	-1173.	-49.	0.	0.	0.	-1335.	2213.	-0.	2213.	5	
374.	57.	203.	-728.	-16.	0.	0.	0.	-110.	3146.	1.	3147.	6	
0.	161.	2096.	-86.	22.	9.	49.	60.	2525.	16650.	-4.	16646.	7	
116.	690.	202.	-35062.	1.	99.	0.	0.	-33955.	43522.	1.	43523.	8	
0.	79.	181.	-286.	-2.	0.	0.	-39.	-47.	4885.	-2.	4883.	9	
0.	39.	228.	-231.	0.	3.	0.	87.	128.	1427.	-1.	1426.	10	
150890.	0.	1.	0.	2361.	5089.	5585.	26769.	190694.	190694.	0.	190694.	11	
0.	0.	26.	0.	2265.	1086.	4351.	8388.	16115.	73642.	-2.	73640.	12	
22.	115.	1530.	-99.	5157.	821.	0.	45.	8220.	8860.	1.	8861.	13	
0.	1617.	7308.	-8358.	161.	443.	2045.	938.	117660.	192888.	-33.	192855.	14	
0.	365.	1664.	-272.	0.	0.	0.	0.	10195.	12823.	0.	12823.	15	
0.	1082.	1148.	-1075.	50.	5.	27.	32.	2152.	26499.	-10.	26489.	16	
892.	187.	342.	-402.	2.	14.	4.	17.	3101.	9054.	-5.	9049.	17	
0.	2472.	733.	-5865.	344.	0.	7.	281.	31167.	41473.	-1.	41472.	18	
0.	222.	332.	-255.	54.	20.	35.	152.	4627.	9304.	-1.	9303.	19	
11.	1329.	1928.	-3537.	18.	5.	49.	23.	373.	38620.	-4.	38616.	20	
0.	8.	10.	-40.	3.	2.	0.	0.	-17.	509.	-1.	508.	21	
725.	360.	203.	-475.	9.	45.	40.	16.	9566.	10138.	-1.	10137.	22	
4325.	131.	91.	-269.	23.	82.	411.	253.	5612.	6442.	-0.	6442.	23	
0.	739.	2150.	-3725.	32.	96.	525.	654.	5779.	37704.	-6.	37698.	24	
0.	181.	178.	-13.	26.	17.	40.	52.	673.	13034.	-1.	13033.	25	
0.	596.	702.	-360.	138.	195.	2117.	1507.	15131.	31847.	2.	31849.	26	
541.	1083.	6273.	-4370.	1071.	204.	330.	576.	6857.	63275.	-12.	63263.	27	
0.	259.	1734.	-495.	34.	3.	2.	0.	1538.	22317.	-4.	22313.	28	
0.	600.	1703.	-1338.	198.	132.	239.	1731.	20184.	28728.	-3.	28725.	29	
0.	148.	162.	-8.	0.	3.	102.	17.	594.	6202.	-8.	6194.	30	
0.	3046.	2693.	-11366.	2043.	-169.	1795.	2160.	38799.	96120.	-6.	96114.	31	
58.	1366.	1532.	-2527.	213.	96.	137.	453.	7772.	39799.	-8.	39791.	32	
0.	18.	166.	-175.	0.	1.	0.	0.	10.	1560.	1.	1541.	33	
0.	209.	144.	-2493.	17.	7.	0.	28.	5522.	6097.	0.	6097.	34	
0.	163.	503.	-466.	7.	9.	87.	195.	1327.	9235.	1.	9236.	35	
0.	717.	604.	-1247.	22.	44.	36.	51.	1349.	25593.	-4.	25589.	36	
5.	1274.	1580.	-7256.	119.	38.	4.	16.	-4209.	63632.	-9.	63623.	37	
106.	1007.	1512.	-4747.	88.	90.	1.	17.	-1878.	40705.	-3.	40702.	38	
29.	164.	79.	-55.	54.	0.	24.	1.	295.	8551.	-0.	8551.	39	
3055.	902.	1126.	-251.	634.	256.	0.	0.	6096.	27014.	-0.	27014.	40	
0.	368.	1059.	-618.	72.	32.	124.	38.	1871.	19999.	-7.	19992.	41	
1591.	830.	1466.	-1757.	288.	120.	95.	78.	4751.	28277.	-4.	28273.	42	
1663.	423.	1993.	-468.	725.	25.	0.	112.	4681.	10867.	-2.	10865.	43	
8410.	661.	1240.	-1057.	17.	4.	20.	60.	9460.	11415.	1.	11416.	44	
8692.	603.	4421.	-814.	127.	29.	0.	329.	13386.	16980.	2.	16982.	45	
2984.	104.	427.	-201.	76.	36.	1.	1.	3430.	4975.	1.	4976.	46	
7507.	400.	1087.	-953.	116.	82.	39.	20.	8580.	13848.	-2.	13846.	47	
5209.	227.	2354.	-1248.	64.	20.	26.	1.	6745.	8821.	-3.	8818.	48	
5080.	474.	2214.	-994.	193.	90.	0.	48.	7105.	16565.	-9.	16556.	49	
29.	184.	157.	-92.	36.	66.	17.	17.	454.	8495.	-3.	8492.	50	
7432.	558.	3476.	-1550.	867.	351.	235.	138.	11926.	15798.	0.	15798.	51	
2986.	317.	1155.	-133.	54.	36.	217.	59.	5122.	11388.	-2.	11386.	52	
5854.	586.	2072.	-1488.	552.	242.	68.	67.	8024.	18323.	-2.	18321.	53	
1607.	174.	657.	-965.	28.	5.	32.	46.	8597.	10373.	-2.	10371.	54	
97.	361.	460.	-240.	47.	21.	128.	43.	2234.	8200.	-1.	8199.	55	
10620.	703.	2498.	-5716.	4395.	400.	183.	86.	21497.	28332.	1.	28333.	56	
35.	490.	2468.	-2226.	454.	261.	20.	40.	2069.	14793.	-3.	14790.	57	
1491.	383.	859.	-763.	83.	81.	19.	122.	4277.	8610.	2.	8612.	58	
30854.	4368.	10963.	-18253.	685.	291.	651.	1399.	77084.	116914.	-8.	116906.	59	
2777.	186.	7159.	-760.	9166.	629.	0.	8.	19592.	25189.	-0.	25189.	60	
8323.	597.	975.	-1284.	2846.	151.	29.	218.	18917.	21386.	-4.	21382.	61	
4570.	484.	1976.	-1395.	708.	398.	60.	508.	9236.	13635.	-4.	13631.	62	
4188.	177.	1510.	-1713.	276.	404.	380.	412.	8013.	11700.	-0.	11700.	63	
1283.	913.	1295.	-3833.	58.	25.	518.	318.	13263.	19041.	-3.	19038.	64	
1976.	1020.	9756.	-332.	2728.	587.	2373.	1506.	52823.	128143.	121.	128264.	65	
3385.	0.	985.	0.	502.	562.	851.	785.	29464.	52872.	-4.	52868.	66	
0.	0.	0.	0.	0.	0.	0.	0.	344.	526.	-0.	526.	67	
0.	0.	276.	-2200.	862.	662.	2466.	2845.	46734.	122462.	-6.	122456.	68	
24668.	2980.	12416.	5376.	1584.	542.	1254.	2121.	273489.	386179.	-8.	386171.	69	
0.	0.	630.	-524.	7.	606.	184.	3390.	69826.	128580.	-2.	128578.	70	
10747.	0.	3705.	0.	236.	464.	446.	2892.	199805.	279248.	-5.	279243.	71	
0.	0.	29.	0.	380.	177.	-294.	975.	35205.	46133.	-4.	46129.	72	
0.	0.	3481.	-100.	2666.	4387.	2324.	4019.	30640.	161977.	-8.	161969.	73	
0.	0.	81.	0.	129.	66.	-2762.	695.	65685.	87847.	-8.	87839.	74	
0.	7.	2.	-11.	48.	33.	153.	541.	26210.	43385.	-5.	43380.	75	
0.	145.	444.	-37.	132.	57.	134.	25.	16917.	24583.	-0.	24583.	76	
0.	0.	.75.	0.	764.	3074.	-757.	15835.	154923.	162017.	-1.	162016.	77	
0.	0.	193.	0.	140.	35.	48.	431.	3538.	14164.	76.	14240.	78	
0.	0.	1.	0.	33.	10.	44.	39.	3702.	4968.	-7.	4961.	79	
17.	35.	0.	-26610.	3406.	1030.	15.	2.	-13377.	-4.	4.	0.	80	
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0.	0.	0.	0.	42213.	23309.	77533.	60878.	203934.	203934.	0.	203934.	82	
0.	0.	40119.	-9117.	-14.	-303.	0.	0.	23464.	23464.	0.	23464.	83	
0.	0.	0.	0.	0.	0.	0.	0.	5930.	5930.	0.	5930.	84	
0.	-18582.	0.	0.	0.	0.	0.	0.	-18582.	-18582.	0.	-18582.	85	
314927.	21706.	182045.	-184157.	92829.	50541.	105492.	146717.	1976568.	3663934.	69.	3664003.	86	
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1976563.	87	
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1165555.	88	
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	165958.	89	
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314926.	21700.	182043.	-184154.	92825.	50538.	105492.	146712.	1976563.	1976563.	0.	0.	91	
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	92	
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	93	