From Make-Use to Symmetric I-O Tables:
An Assessment of Alternative Technology Assumptions

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Abstract

Since the United Nations introduced the nonsymmetrical make-use input-output (I-O) tables in 1968, there have been on-going discussions about ways to translate them into symmetric I-O tables. The discussions have focused on secondary products that cause the asymmetry between industries and commodities and two alternative assumptions, the industry-technology assumption (ITA) and the commodity-technology assumption (CTA), which have been used for their transfer between industries. Despite much debate and discussion over the years, no definitive consensus has emerged as to which is superior.

For the 1992 Benchmark I-O Tables, the BEA prepared and published two sets of make-use tables, which provide alternative presentations of a large subset of secondary products. For one set of tables, the outputs and inputs of secondary products with distinctive production processes compared to those of primary products produced by industries were moved "by hand" to where they are primary, using the CTA. In this paper, the authors use the two formats to compare the different results of using two assumptions to derive symmetric I-O tables. The differences are then evaluated.

I. Introduction

There are two kinds of input-output (I-O) models. The first is the Leontief I-O model, which was initially formulated by Wassily Leontief in the 1930s, the work for which he received the Nobel Prize in Economics in 1973. (Leontief 1936[2]) In the Leontief model, which is also referred to as the symmetric model, each industry produces only one commodity, and each commodity is produced by only one industry. The second model, which was introduced by the United Nations in its 1968 System of National Accounts (1968 SNA), expands upon the Leontief model by allowing industries to produce more than one product. Based on a recent survey by Japan, 83 countries around the world compile official input-output tables, of which 40 countries

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[2] Wassily Leontief (1936) "Quantitative Input-Output Relations in the Economic System of the United States." Review of Economics and Statistics 18, no.3, pp: 105-125.

have adopted the SNA make-use model.[3]

Although this make-use model is more descriptive of the real-world economy, the Leontief model is more analytical in that it provides measures of the relationships between commodities and between industries through its multipliers. The Leontief model is widely used because it provides important tools for studying economic linkages and impacts, as well as economic structural changes. Because these tools are very desirable, it is necessary to convert the asymmetric make-use system to fit the symmetric Leontief I-O system. The 1968 SNA proposed alternative methods for the conversion, which were then followed by other proposals from outside researchers. Because the asymmetry of the make-use tables is caused by secondary production, most of the discussion over the years has focused on two alternative assumptions for dealing with it--the industry-technology assumption (ITA) and the commodity-technology assumption (CTA). However, despite extensive research and debate over the years, no definitive consensus has emerged as to which is superior. In this paper, the authors join this continuing discussion by first explaining how the BEA treats secondary products in preparing its I-O tables, and then by examining the two technology assumptions, using information from BEA's 1992 U.S. Benchmark I-O Tables.

This paper is divided into six sections. This is section I, which introduces the paper. Section II presents the two technology assumptions and summarizes the findings of several studies from over the years. In section III, the treatment of secondary products by the BEA in preparing its U.S. Input-Output Accounts is discussed. In section IV, the methods used in this research to assess BEA's approach to the two technology assumptions are presented. In section V, the test results are discussed. And finally, section VI presents a summary of findings and identifies areas for future study.

[3] International survey by Statistics Bureau, Management and Coordination Agency, Japan, 2001.

II. Background, Issues, and Past Research

Description of the Two Input-Output Models

The Leontief model includes an intermediate transaction table (Z), which is a square matrix, a final demand vector (Y), and a value added vector (V). Total output (X) can be obtained by either adding intermediate output and final demand ($X=Zi+Y$), or by adding intermediate inputs and value added ($X=Z'i+V'$). The one-to-one relationship between industries and commodities defined by this framework implies that the direct-input-coefficient matrix $A=Z\hat{X}^{-1}$ and the total requirements matrix $[I-A]^{-1}$ produce both commodity-by-commodity (cxc) and industry-by-industry (ixi) matrices. That is, there is no distinction between commodities and industries in the Leontief model.

The make-use system, which is shown with its different components in Table 1, replaces the Leontief model with two matrices, including a make matrix (V) of outputs and a use matrix (U) of inputs.[4] The make-use (UV) system was designed to better handle the growing diversity of industrial production in the economy. By relaxing the assumption of one-to-one relationships between commodities and industries, this system allows industries to produce more than a single commodity. The implication of this model for compilers of statistical data is that survey data collected from establishments can be used directly for preparing use-make tables; the model is consistent with how industry output is collected and tabulated—that is, as the sum of secondary and primary product outputs of all establishments in the industry. Since industries and commodities are distinct in this system, the numbers of industries and commodities can differ. The use matrix (U) carries the dimensions of the commodities-by-industries, while the make (V) matrix carries the dimensions of the industries-by-commodities, which implies that they are not necessarily square.

[4] See A System of National Accounts, Studies in Methods, Series F /No. 2 / Rev. 3, United Nations, New York, 1968.

Table 1. Make-Use Input-Output Tables

	Commodities	Industries	Final Demand	Total Output
	1 2 ……………………m	1 2 …………… …n	1 2 ……..…..k	
Commodities 1 2 : m		Use Table U	E_C	q
Industries 1 2 : n	Make Table V			g
Value Added		W_I		
Total Input	q'	g'		

U: Use matrix (intermediate part), commodity by industry (cxi);
V: Make matrix, industry by commodity (ixc);
q: Commodity total output, column vector (cx1);
g: Industry total output, column vector (ix1);
E_C: Final demand, commodity by kind of final demand k (cxk);
W_I: Value added, industry by kind of value added h (ixh).

Alternative Technology Assumptions

Since the make-use I-O model was introduced by the United Nations in its 1968 SNA, there has been a debate on how to best translate the make-use tables to a symmetric form. These discussions have tended to focus on two alternative technology assumptions: the ITA and the CTA. The ITA proposes that all commodities made by an industry share the same input structure. In contrast, the CTA proposes that each commodity has a unique input structure that is independent of the producing industry. The derivations of symmetric tables based on these alternative assumptions are provided in this section. This is followed by a summary of conclusions from several major studies related to this topic from over the past thirty years.

Using the notation from the make-use model in Table 1, the commodity-by-industry, direct requirements matrix *(B)* is derived by multiplying the use matrix *(U)* by the vector for industry total output *(g),* or

$$B = U\hat{g}^{-1}$$

The ITA and CTA can each be used to transfer outputs and inputs through the B matrix to produce a symmetric matrix and coefficients of the commodity-by-commodity or industry-by-industry form.[5]

<u>*Industry technology assumption (ITA)*</u>.—To create symmetric, total requirements tables under the ITA, a "commodity-output proportions" matrix *(D)* must be created. This is derived from the make table *(V)* and commodity total output vector *(q)* as

$$D = V\hat{q}^{-1}$$

The commodity-output-proportions matrix shows the shares of each commodity's total output that is produced by each industry. From *B* and *D*, the commodity-by-commodity, direct coefficient matrix (${}_IA_C$) is then derived as

$${}_I A_C = BD$$

and the commodity-by-commodity, total requirements matrix (${}_IT_C$) is derived as

$${}_IT_C = [I - {}_I A_C]^{-1} = [I - BD]^{-1}$$

and the industry-by-commodity, total requirements matrix (${}_{\mathrm{I}}\mathrm{T}_{\mathrm{I.C}}$) is derived as

$${}_IT_{I.C} = D[I - BD]^{-1}$$

<u>*Commodity technology assumption (CTA)*</u>**.**—To create symmetric, total requirements tables under CTA, and "industry-output-proportion" (*C*) matrix must be created. This is derived from the make table *(V)* and the industry total output vector *(g)* as

$$C = V'\hat{g}^{-1}$$

The industry-output-proportion matrix shows the commodity composition of each industry's total output. Finally, from *B* and *C*, the commodity-by-commodity, direct requirements matrix (${}_CA_C$) is

[5] BEA also produces industry-by-commodity total requirements matrices, which provide the multiplier impacts between commodities and industries.

derived as

$$_C A_C = BC^{-1}$$

and the commodity-by-commodity, total requirements matrix ($_C T_C$) is derived as

$$_C T_C = [I - _C A_C]^{-1} = [I - BC^{-1}]^{-1}$$

and the industry-by-commodity, total requirements matrix ($_C T_{I.C}$) is derived as

$$_C T_{I.C} = [I - C^{-1}B]^{-1} C^{-1}$$

Overview of Past Research

When the United Nations first proposed the two alternative technology assumptions for translating the use-make tables into symmetric tables in its 1968 SNA, it did so without giving preference to one or the other. Each assumption has its own advantages and disadvantages. These tend to mirror one another—that is, the advantages of one tend to avoid or solve the disadvantages of the other.

Researchers have tended to characterize the ITA as implausible because of its inconsistency with some fundamental economic theories. (Almon (1970), (2000); ten Raa, et all, (1984); ten Raa, 1988; Steenge (1990)). Because of the ITA's failure to pass several tests of plausible behavior in the marketplace, many consider the CTA to be the preferred choice. (Jansen, and ten Raa. (1990)). Nonetheless, ITA has an important advantage over the CTA by always producing nonnegative results for its symmetric tables; in contrast, the CTA frequently produces negative coefficients. Also, unlike the CTA, the ITA can accommodate for make and use tables that are rectangular. This is a major advantage for data compilers, who must work with economic data with unequal numbers of commodities and industries.

Researchers who have advocated the CTA have tried to identify appropriate solutions for the problem of negative coefficients. Almon (1970, 2000) proposed an algorithm that removes negative values resulting from CTA. However, ten Raa et al. (1984, 1988) criticized this method as "arithmetic manipulation ….," and then tried to modify cells of the make-use matrices so that negative values would not be produced. Rainer and Richter (1992) used the CTA and hybrid solutions to determine if rearranging the data and/or extending the matrix would reduce the negative elements; their results support the conclusion that much can be accomplished to transform the descriptive make-use tables to analytical, symmetric tables without imposing arbitrary decisions. The approach and the "activity assumption" proposed by Konijn and Steenge (1995), which reorganizes collected data based on the input structures of commodities (activities), are similar to the redefinition process used by the BEA to prepare its Benchmark I-O Tables for the United States.

Researchers disagree about the sources of the negative values, resulting from the CTA method. The negatives are generally considered the result of measurement errors in the source data and of combining commodities at higher levels of aggregation (ten Raa et al. (1984), Konijn, and Steenge (1995)). These researchers believe that if data are handled properly, that is to say, all commodities (activities) are homogeneously combined, then the CTA would not generate negative coefficients. More recently, however, Mesnard (2002) rejected these notions, based on his research that negatives can be expected since the CTA breaks the internal linkages of commodity flows.

Table 2.—Major Contributions to the Research on Technology Assumptions

Author and year	Title and source	Brief summary
United Nations (1968)	A System of National Accounts, New York, United Nations.	The 1968 SNA proposed a break with Leontief's symmetric, "homogeneous" table format. The methodology requires the implementation of two matrices: A use matrix, which can be considered as an extension of the traditional input matrix, and the make matrix, which is viewed as an extension of the output matrix in standard Leontief theory. The 1968 SNA discussed several technology assumptions to deal with the non-homogeneous issue, including the well-known commodity technology assumption (CTA) and industry technology assumption (ITA).
Almon, C. (1970)	"Investment in Input-Output Models and The Treatment of Secondary Products," in A. P. Carter & A. Brody (editors) Applications of Input-output Analysis, pp. 103 – 116 (Amsterdam, North Holland).	The Inforum Model operates on the "purified" commodity-by-commodity table. The process of "purification" was based on the commodity technology assumption (CTA); negative entries arising in any stage of the computations are immediately balanced in an iterative procedure.
ten Raa, T., Chakraborty, D., and Small, J. A. (1984)	"An Alternative Treatment of Secondary Products in Input-Output Analysis," Review of Economics and Statistics, 66, pp. 88-97.	It evaluates a variety of technology assumptions – commodity (C), by-product (B), industry (I), and mixed (CI). The paper rejects the industry technology assumption on the grounds that it depends on the choice of base year prices. It proposes a model (CB), which rests on the assumptions that primary products and ordinary secondary products fulfill the commodity technology assumption and that by-products fulfill the by-product assumption.
Jansen, P. K., and Raa, T. T. (1990)	"The Choice of Model in the Construction of Input-Output Coefficients Matrices," International Economic Review, 31, pp. 213-227	Examines a variety of models based on different assumptions. It concludes that the commodity technology assumption is favored over others since it fulfills all axioms (material balance, financial balance, scale invariance, and price invariance) proposed by the authors. However, it does not settle

		the issue of negative coefficients generated by commodity technology assumptions. It also indicates that modification of other models would improve the results so that the commodity technology assumption might not be the best choice.
Steenge, A. E. (1990).	"The Commodity Technology Revisited: Theoretical Basis and an Application to Error Location in the Make-Use Frame-work," Economic Modeling, 7, pp. 376-387.	Proposes a method to calculate non-negative matrices, using the commodity technology assumption (CTA), via a systematic search of possible sources of inaccuracy in the base make and use tables.
Rainer N, & Richter, J. (1992	"Some Aspects of the Analytical Use of Descriptive Make and Absorption Tables," Economic Systems Research, 4, pp. 159-172.	Uses the commodity-technology assumption (CTA) and hybrid solutions to analyze the extent to which various rearrangements of data and matrix extensions can reduce the sum of the negative elements in the resulting commodity-by-commodity table. The empirical results suggest that much can be accomplished in proceeding from a strictly descriptive system to an analytical system without necessarily making arbitrary decisions.
Steenge, A. E. & Konijn, A. (1992)	"A New Approach to Irreducibility in Multisectoral Models with Joint Production," Economics Systems Research, 4, pp. 125-132.	Indicates that the negative values derived from the commodity-technology assumption (CTA) can result from source data errors. Proposed a method for calculating "non-negative" matrices by systematically searching for possible sources of inaccuracy in the base make-use tables. Tests methods, using highly aggregated U.S. 1977 Input-Output Tables, but concludes that "further research on larger tables is required before a definite verdict can be reached."
Konijn, P.J.A, and Steenge, A.E. (1995)	"Compilation of Input-output Data from the National Accounts," Economic Systems Research, 7, pp. 31-45.	Proposes the "activity technology", which is mathematically equivalent to the commodity technology assumption, but chooses another unit, that is, the activity. It argues that, in the activity technology model, negatives can only arise from causes such as heterogeneity and errors in the data.

The System of National Accounts *(1993)*	Published by the United Nations, the World Bank, the IMF, the OECD, and the European Union.	Recommends using the commodity technology assumption, but does not provide methods on how to solve the problem of negative values deriving from this assumption.
Almon, C. (2000)	"Product-to-Product Table via Product-Technology with No Negative Flows," Economics Systems Research, 12, pp. 27-43.	Shows an algorithm by which the negative values obtained from using the commodity (product) technology assumption can be removed. This approach can be used when negatives arise because of the inexactness in producing the tables or because of slight differences in the technologies in different industries. The method is applied using the 1992 U.S. Benchmark I-O Tables.
Mesnard de L. (2002)	On the Consistency of Commodity-based technology in the Make-Use Model: a New Interpretation, paper to be presented on 14th international Input-output Conference, Montreal, Canada.	It argues that make-use model can be interpreted in terms of circuit, and the commodity technology assumption is implausible because it breaks the circuit. It also rejects the notion that negative values derived from commodity technology assumption are due to errors of measurement since the negative values can not be avoid under this assumption.

III. Treatment of Secondary Product in the U.S. Input-Output Accounts

The 1972 Benchmark I-O Tables for the United States were the first prepared by the BEA that incorporated the use-make table framework recommended by the 1968 SNA. In addition to the use and make tables, the BEA publishes three coefficient tables, including commodity-by-industry direct requirements, commodity-by-commodity total requirements, and industry-by-commodity total requirements.

For the 1972, 1977, 1982, 1987, and 1992 Benchmark Tables, the BEA has used a "mixed" or "hybrid" technology assumption to create the symmetric tables--that is, a combination of both the CTA and the ITA has been used for the conversion.[6] This method involves a two-step process, in which some secondary products are first redefined or moved "by hand" to the industries where they are primary, based on the principle of homogeneity of the input structures of commodities. This step, which is called the "redefinition process," plays a role similar to that of the CTA. After the hand adjustments have been completed, all remaining secondary products are considered to have input structures similar to those of the primary products of their producing industries. The ITA method is used to transfer these secondary products mechanically, because it is considered to be most the appropriate choice.

Table 3 provides a perspective of the relative importance of secondary products in the 1992 tables and the difference between the two sets of make-use tables that were prepared. Although both sets of tables show total industry and commodity output as being $10,053 billion in 1992, they differ in their amounts of secondary production. The traditional tables show $489 billion, or

[6] For the 1958, 1963 and 1967 Benchmark I-O Tables, a "transfer process" was used to move some secondary products between industries. The transfer process was replaced by mechanical redefinition, described in this paper, beginning with the 1972 Benchmark I-O Tables. For the earlier tables, secondary products that were not redefined by hand were treated as if sold by the industries producing them to the industries for which the products were primary and added to the outputs of those industries for distribution to users of those commodities.

about 5 percent, of total output as secondary production of industries. In contrast, the alternative tables show $739 billion or about 7 percent of total output as secondary. Although the redefined secondary output comprises only 2 percent of total output, it accounts for 34 percent of all total secondary production ($249 billion / $739 billion). (See Table 3.)

Table 3.--Primary and Secondary Output in the Traditional and Alternative Use and Make Tables for 1992
[Millions of dollars]

Format of Make and Use Tables	Total output	Primary Output	Secondary output
Traditional	10,053,978	9,564,735	489,243
Alternative	10,053,978	9,315,355	738,623
Difference	0	249,380	-249,380

The $249 billion in redefinitions made for the traditional make-use tables cover a wide array of industries, and are especially important in trade, including both wholesale and retail, services, and utilities. A list of all I-O industries and the changes in their outputs, resulting from these redefinitions, is provided in Appendix Table 2.

The $489 billion of remaining secondary output in the traditional make-use tables were redefined mechanically using the ITA to create the symmetric tables. These mechanical redefinitions also affected a wide range of industries, including State and local government enterprises, manufacturing printing and publishing, radio and TV broadcasting, and finance. These ITA redefinitions are made only for the symmetric tables released by BEA, including the commodity-by-commodity and the industry-by-commodity total requirements table.

For the 1992 Benchmark I-O Tables, the BEA prepared and published two sets of make-use tables, both of which will be used later in this paper to evaluate the effects of the CTA and ITA on analytical results. The two sets of tables provide alternative presentations of a large subset of secondary products. For one set, the outputs and inputs of secondary products with distinctive production processes (nonhomogeneous) compared to those used to produce the primary products of industries were redefined or moved by hand to the industries where they are primary, using the CTA. For the other set, only own-account construction and real estate rental were moved to where they are primary; all other products were left in their originating industries. The BEA is making available the alternative make-use tables in order to provide users with a set of industry statistics that is consistent with other published industry data and that follows SIC definitions and conventions. No symmetric tables were produced from the alternative tables for official release.

IV. Tests to Evaluate Procedures Based on Alternative Technology Assumptions

The availability of the two sets of make and use tables for 1992 provide the opportunity to systematically evaluate differences in the symmetric I-O coefficients resulting from the ITA and CTA, both with and without hand adjustments for redefinitions. We prepared four versions of symmetric tables, using different combinations of procedures applied to BEA's 1992 make and use tables before redefinitions and after redefinitions (see table 4).

Table 4.–Alternative Procedures Examined for Redefining Secondary Products

Source data	Form of mechanical redefinitions used to prepare symmetric tables	
	ITA	***CTA***
Before redefinition *(^{A}U and ^{A}V)*	Procedure I_A	Procedure C_A
After redefinition *(^{T}U and ^{T}V)*	Procedure I_T (method used by BEA)	Procedure C_T

Based on the resulting symmetric tables, we wanted to answer the following questions: How are output multipliers affected by BEA redefinitions? And does BEA's methodology for redefinitions improve the results from applying the CTA? The tests we conducted include the following:

(1) Comparison of differences in total-output multipliers resulting from procedures I_A and $I_{T;}$

(2) Comparison of differences in total-output multipliers resulting from procedures C_A and C_T; and

(3) Comparison of numbers and sizes of negative elements resulting from C_T with to C_A in the total-requirement coefficient matrices.

For each test, we also compared the relationship between the relative size of primary and secondary output and the negative elements in the total requirements table.

The notation introduced earlier is extended as follows for the two sets of make and use tables. ${}^{A}U$ and ${}^{A}V$ are defined as the alternative use and make tables, and ${}^{T}U$ and ${}^{T}V$ as the traditional use and make tables, respectively. Generalizing, both sets of tables have the following components and relationships:

$$
\begin{aligned}
&\mathrm{U} : \text{Use matrix} \\
&\mathrm{V} : \text{Make matrix} \\
&\quad \mathrm{V} = \mathrm{V}^{\mathrm{p}} + \mathrm{V}^{s} \\
&\mathrm{V}^{\mathrm{p}} : \text{Primary product matrix} \\
&\quad \mathrm{v}_{\mathrm{ij}}^{\mathrm{p}} = v_{ij} \text{ when } \mathrm{i} = \mathrm{j},\ \mathrm{v}_{\mathrm{ij}}^{\mathrm{p}} = 0 \text{ when } \mathrm{i} \neq \mathrm{j} \\
&\mathrm{V}^{\mathrm{s}} : \text{Secondary product matrix} \\
&\quad \mathrm{v}_{\mathrm{ij}}^{\mathrm{s}} = v_{ij} \text{ when } \mathrm{i} \neq \mathrm{j},\ \mathrm{v}_{\mathrm{ij}}^{\mathrm{p}} = 0 \text{ when } \mathrm{i} = \mathrm{j} \\
&\mathrm{g} : \text{industry output} \\
&\quad \mathrm{g} = \mathrm{g}^{\mathrm{p}} + g^{s} \\
&\mathrm{g}^{\mathrm{p}} : \text{industry primary output} \\
&\quad \mathrm{g}^{\mathrm{p}} = V^{p} i, \\
&\mathrm{g}^{\mathrm{s}} : \text{industry secondary output} \\
&\quad \mathrm{g}^{\mathrm{s}} = V^{s} i \\
&\mathrm{q} : \text{commodity output} \\
&\mathrm{q} = \mathrm{q}^{\mathrm{p}} + \mathrm{q}^{s} \\
&\mathrm{q}^{\mathrm{p}} : \text{commodity primary output} \\
&\quad \mathrm{q}^{\mathrm{p}} = V^{p\,\prime} i, \\
&\mathrm{q}^{\mathrm{s}} : \text{commodity secondary output} \\
&\quad \mathrm{q}^{\mathrm{s}} = V^{s\,\prime} i
\end{aligned}
$$

To compare the relative size of primary and secondary products, an index is introduced that measures the complexity of a commodity in terms of its primary and secondary product composition. Index *Ki* describes commodity *i* in terms of its dominance in its primary producing industry and in other industries. It is expressed as

$$Ki = q_i/g_i$$

If $k_i = 1$, it means that commodity i is produced uniquely by a single industry with only one product. If $k_i > 1$, it means that the total output for commodity i (q_i) is greater than that of commodity i's primary producing industry (g_i); or, alternatively, that the secondary production of commodity i by other industries (q^S) is larger than the secondary production of *i's* primary producing industry (g^S). On the other hand, if $k_i < 1$, it means that the total output for commodity i (qi) is smaller than that of the primary producing industry (g^S); or, that secondary production of commodity i by other industries is less than secondary production by commodity i's primary producing industry. The further K_i moves from 1--either smaller or larger--the more diverse the production involving the product; that is, either the more secondary production that is occurring by the primary producing industry, or the more important its production is by other industries as a secondary product. From a practical perspective, this index is designed to locate the sources of many of the negative values, resulting from the CTA, in the source data.

V. **Empirical Results**

This section provides the empirical results from the tests identified in the previous section.

Differences in Total Output Multipliers

Table 5 provides a summary of the differences in total output multipliers, resulting from Procedure I_A compared with I_T, and from Procedure C_T compared with C_A. The results indicate that BEA's hand adjustments to a subset of secondary commodities before using the ITA to mechanically redefine all remaining secondary commodities made only small differences to most 1992 Benchmark total output multipliers. For three-fifths of the total multipliers, the differences fall in the range from -0.5 and +0.5 percent. The results were similar for both the commodity-by-commodity (CxC) and the industry-by-commodity (IxC) total requirements tables. Also, when the CTA procedures are applied, three-fourths of the multipliers show differences in the range of –0.5 and +0.5 percent--again for both the commodity-by-commodity (CxC) and the industry-by-commodity (IxC) total requirements tables. These results suggest that the transfer by hand of about 2 percent of total output (and inputs) for secondary products does not greatly change the total multipliers for economic impact analyses.

Table 5.–Differences in Total Output Multipliers Resulting from Procedure I_T (BEA Method) vs. Procedure I_A and from Procedure C_T vs. Procedure C_A

Range of difference	I_T vs. I_A				C_T vs. C_A			
	IxC		CxC		IxC		CxC	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Less than –5.0 percent	4	1	4	1	8	2	8	2
–5.0 to –1.0 percent	13	3	13	3	18	4	18	4
-1.0 to –0.5 percent	4	1	3	1	13	3	13	3
-0.5 to 0.0 percent	**102**	**21**	**103**	**21**	**124**	**26**	**124**	**26**
0.0 to 0.5 percent	**183**	**37**	**186**	**38**	**232**	**49**	**232**	**49**
0.5 to 1.0 percent	87	18	86	18	50	11	50	11
1.0 to 5.0 percent	91	19	89	18	28	6	28	6
Greater than 5.0 percent	7	1	7	1	3	1	3	1
Total	491	100	491	100	476	100	476	100

These results do not necessarily imply that these same hand adjustments of secondary products do not have relatively large effects on some multipliers. Indeed, in cases where secondary products are concentrated, the effects can be large. To generalize, where secondary production either represents a large share of a commodity's total output or a large share of an industry's total output, the differences between the two total output multipliers can be large. This is particularly the case for the IxC matrix, which shows larger differences than the results from the CxC matrix. (See Table 6.) For these commodities and industries, these hand redefinitions using the CTA result in changes to the structure of the commodity-to-commodity and commodity-to-industry relationships at the detailed level. For analysts studying industries with large shares of output from secondary production or industries that use commodities produced in large proportions by several industries, this can be valuable information.

Table 6 - Top 20 largest total requirement coefficients differences between using I_T and I_A procedure

			IxC				
Rank	rowcode	rowdesc	colcode	coldesc	IA	IT	Diff
1	640102	Jewelers' materials and lapidary worl	640102	Jewelers' materials and lapidary work	0.380	1.170	0.790
2	750002	Automotive repair shops and service	750002	Automotive repair shops and services	0.567	1.006	0.438
3	720204	Electrical repair shops	720204	Electrical repair shops	0.587	1.001	0.414
4	141801	Bread, cake, and related products	141801	Bread, cake, and related products	0.608	0.989	0.382
5	720102	Other lodging places	720102	Other lodging places	0.619	1.000	0.381
6	160100	Broadwoven fabric mills and fabric fi	160100	Broadwoven fabric mills and fabric finishing p	0.893	1.264	0.371
7	720205	Watch, clock, jewelry, and furniture r	720205	Watch, clock, jewelry, and furniture repair	0.630	1.000	0.370
8	760206	Other amusement and recreation se	760206	Other amusement and recreation services	0.651	0.962	0.311
9	730101	Miscellaneous repair shops	730101	Miscellaneous repair shops	0.697	0.999	0.302
10	710201	Real estate agents, managers, opera	720102	Other lodging places	0.133	0.423	0.290
11	730107	Miscellaneous equipment rental and	730107	Miscellaneous equipment rental and leasing	0.743	1.003	0.260
12	680202	Natural gas distribution	680202	Natural gas distribution	0.926	1.182	0.256
13	141502	Prepared feeds, n.e.c.	141502	Prepared feeds, n.e.c.	0.838	1.048	0.211
14	740000	Eating and drinking places	740000	Eating and drinking places	0.840	1.012	0.172
15	760102	Video tape rental	760102	Video tape rental	0.823	0.985	0.162
16	610200	Boat building and repairing	610200	Boat building and repairing	0.858	1.000	0.142
17	160100	Broadwoven fabric mills and fabric fi	190100	Curtains and draperies	0.319	0.456	0.137
18	640102	Jewelers' materials and lapidary worl	640105	Costume jewelry	0.092	0.226	0.134
19	160100	Broadwoven fabric mills and fabric fi	190200	Housefurnishings, n.e.c.	0.514	0.645	0.131
20	640102	Jewelers' materials and lapidary worl	640101	Jewelry, precious metal	0.063	0.187	0.124
			CxC				
	rowcode	rowdesc	colcode	coldesc	IA	IT	Diff
1	710201	Real estate agents, managers, opera	720102	Other lodging places	0.136	0.431	0.295
2	640102	Jewelers' materials and lapidary worl	640102	Jewelers' materials and lapidary work	0.117	0.241	0.124
3	160100	Broadwoven fabric mills and fabric fi	160100	Broadwoven fabric mills and fabric finishing p	0.162	0.277	0.115
4	080001	Crude petroleum and natural gas	680202	Natural gas distribution	0.598	0.679	0.081
5	380501	Primary nonferrous metals, n.e.c.	640102	Jewelers' materials and lapidary work	0.087	0.165	0.077
6	590302	Motor vehicle parts and accessories	750002	Automotive repair shops and services	0.089	0.159	0.070
7	680202	Natural gas distribution	680202	Natural gas distribution	0.178	0.231	0.053
8	160100	Broadwoven fabric mills and fabric fi	190200	Housefurnishings, n.e.c.	0.369	0.419	0.050
9	020300	Tobacco	150200	Tobacco stemming and redrying	0.424	0.472	0.048
10	160100	Broadwoven fabric mills and fabric fi	190100	Curtains and draperies	0.410	0.457	0.047
11	020202	Feed grains	141502	Prepared feeds, n.e.c.	0.161	0.206	0.045
12	142500	Soybean oil mills	141502	Prepared feeds, n.e.c.	0.171	0.211	0.041
13	141401	Flour and other grain mill products	141801	Bread, cake, and related products	0.046	0.083	0.037
14	760101	Motion picture services and theaters	760102	Video tape rental	0.190	0.225	0.034
15	280400	Manmade organic fibers, except cell	160100	Broadwoven fabric mills and fabric finishing p	0.105	0.136	0.031
16	160100	Broadwoven fabric mills and fabric fi	190302	Canvas and related products	0.258	0.286	0.028
17	160100	Broadwoven fabric mills and fabric fi	190301	Textile bags	0.251	0.279	0.028
18	160100	Broadwoven fabric mills and fabric fi	180400	Apparel made from purchased materials	0.230	0.257	0.027
19	010200	Poultry and eggs	140105	Poultry slaughtering and processing	0.512	0.539	0.027
20	020600	Oil bearing crops	141502	Prepared feeds, n.e.c.	0.113	0.140	0.027

Changes to Negative Cells

As has been said earlier, a significant drawback from applying the CTA is that it can generate negative values in transforming the use-make tables to symmetric tables. There is little argument that these negative values are unacceptable. They are particularly problematic for statistical agencies using the CTA, unless effective, low cost methods can be found to solve the issue.

The process used by the BEA to move some secondary products by hand follows the CTA. By comparing the results from applying Procedure C_A with those from Procedure C_T, the effects of this process on negative values can be assessed. One school of thought is that the negative values are the result of the nonhomogeneity of the production processes used to produce a commodity. Therefore, if the classification of the commodity can be changed to reflect its input structures, then the negative values will be reduced or even eliminated. Based on data from the 1992 Benchmark I-O Accounts, the frequencies of negative values are reduced by 10 percent for the CxC and IxC total requirements matrices, when secondary products are redefined by hand before the CTA is applied mechanically (Procedure C_T), compared to results when these hand adjustments are not made (Procedure C_A). (See Table 7)

Table 7.--Numbers and Sums of Values of Negative Coefficients in the Total Requirements Matrices Resulting from Procedure C_A and Procedure C_T

Matrix	**Procedure C_A**		**Procedure C_T**		**Difference**		**Difference (percent)**	
	Number	Value	Number	Value	Number	Value	Number	Value
C x C	18,774	-10	16,868	-10.5	-1,906	-0.5	-10	1
I x C	42,932	-83	38,612	-77.2	-4,320	5.8	-10	-7

Although the roles that other factors play in producing negative values are still unclear, the results suggest that BEA's hand adjustment process using the CTA before applying the CTA mechanically is a workable approach to reduce the frequency of negative values in the total output requirements matrices.

It should be stressed that the purpose of identifying a subset of secondary products to be redefined by hand to where they are primary is based on the goal of achieving homogeneity for each product—that is, it is not an attempt to reduce or remove the negative values resulting from the CTA. On the contrary, it is believed that the input structure of the remaining secondary products after hand adjustments **should** be relatively homogeneous with their respective primary products. Therefore, using the ITA to mechanically adjust the remaining secondary products is the appropriate choice compared to the CTA.

However, as suggested by many researchers, one reason that negative values occurs using the CTA due to measurement error (or misclassification of products). Therefore, it is worth investigating further where negative values--especially large ones--are located in the total requirements matrices and to link them back to the source data. Table 8 lists the largest 50 negative values in the commodity-by-commodity, total requirements matrix, resulting from procedure C_T, together with the K index introduced in section V. Figure 1, which compares the K index for all products before and after the redefinition process, provides the information for the analysis used in this part. The largest negative total requirements coefficient is –0.7663, Radio and TV broadcasting requirements from Commercial Printing. The smallest value in the top 50 is –0.0318, which is the input from Electric services (utilities) to Nonferrous rolling and drawing, n.e.c. K values are provided for both the "providing" commodities (rows) and "receiving" commodities (columns). The results indicate the following:

- Almost all of the 50 biggest negative values are linked to products that have either very high or low K values. A very high K value means that the secondary production of the commodity is much larger than what is produced by the primary industry. An example is provided by Advertising with a K value of 5.84 before redefinitions and 4.64 after redefinition, where the largest producers are not the Advertising industry, but instead include the Radio and TV broadcasting industry and the Newspapers industry. A very low K value means that secondary production by its primary producing industry is much larger than the secondary production of the commodity itself. An example of such a commodity is Radio and TV broadcasting with a K value of 0.09 both before and after redefinitions.

In this case, the output of Advertising as a secondary product by the Radio and TV broadcasting industry is much larger than the industry's primary production of Radio and TV broadcasting.

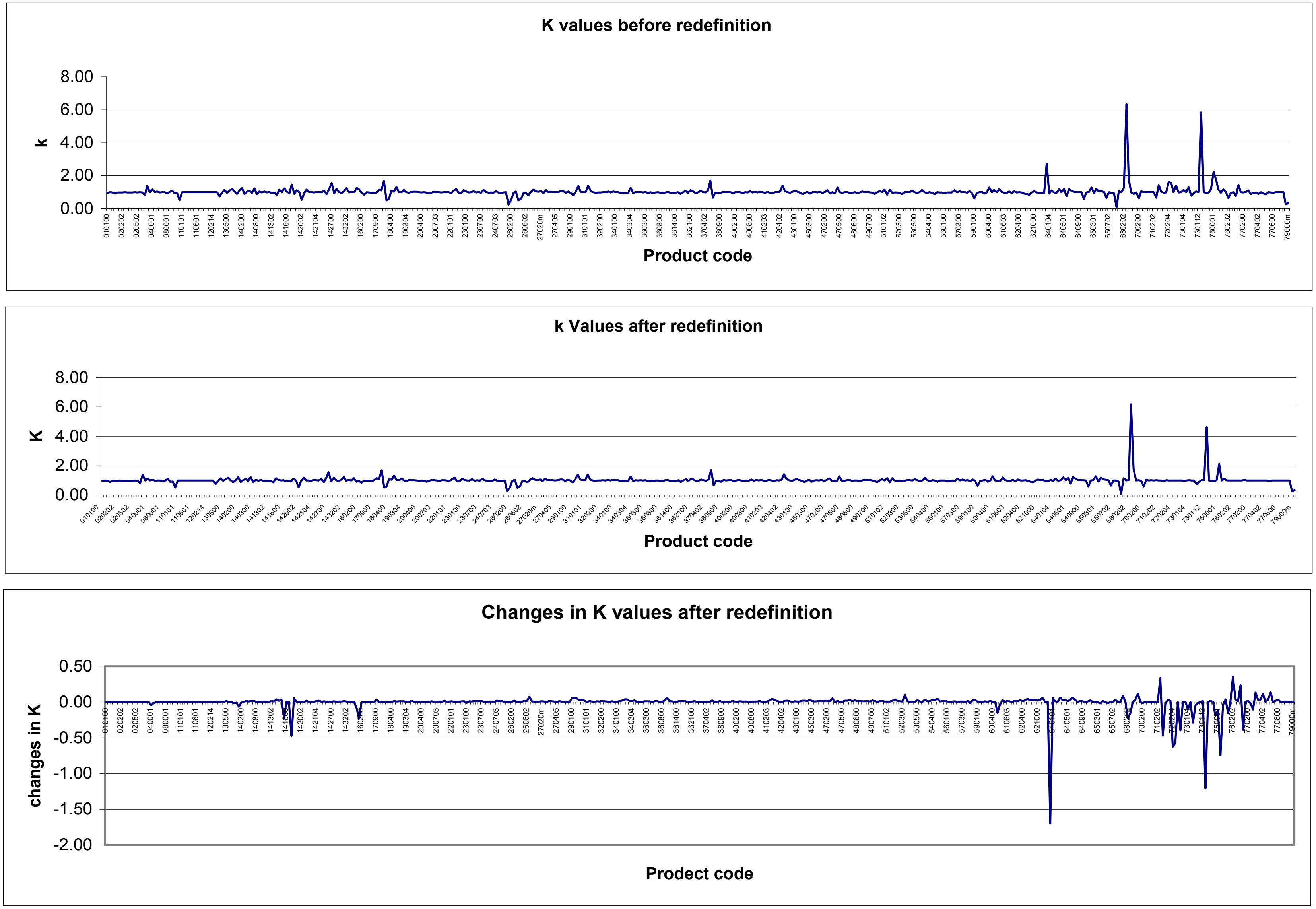
- There is a concentration in the input sectors (columns) with the largest negative coefficients. Radio and TV broadcasting and Newspapers account for a little less than one-third of the 50 largest negative input sectors--11 and 5, respectively. Their supplying sectors (rows) are concentrated among such products as Commercial printing, Photofinishing labs, and Commercial photography paper related products (Paper and paperboard mills, and Paper coating and glazing). Also, all of these products have K values less than 1.0.
- The sectors with larger than one K index values most likely appear in the rows (supplying). More than half of the row sectors have larger than one K values, which only 6 out of 50 are in the columns (before redefinition).
- Although we found some row sectors have K values close to one, it is most likely that their respective receiving sectors have either very small or large K values. For example, the input from Industrial inorganic and organic chemicals with K value of 1.03 to Chemical and Fertilizer minerals with small K of 0.51, and Copper ore (K=0.97) to Primary Nonferrous metals, n.e.c (K=2.38).

From the above analysis, the large negative values in the total requirements matrix derived using the CTA are traced back to the source data, using the K index as a guide. Although it is not clear why these negatives occur, the index can help to identify those products with either very high or very low K values, and hopefully find ways to remove or get rid of the negative values. As stated earlier, if the negative values are the result of measurement errors, the analysis can be used as part of an error checking process. However, negative values may still persist when applying the CTA--even after correcting for errors in measurement and classification, because some secondary products do follow a homogenous industry structure. This could also be a source of negative values, if the CTA process is forced upon such data.

Table 8. The largest negative total requirement coefficients and K values, from procedure CT

Row code	Discription	$^AK=^Aq/^Ag$	$^TK=^Tq/^Tg$	Col Code	Discription	$^AK=^Aq/^Ag$	$^TK=^Tq/^Tg$	Coeff.
260501	Commercial printing	0.60	0.60	670000	Radio and TV broadcasting	0.09	0.09	-0.7663
730108	Photofinishing labs and commercial photography	0.79	0.75	670000	Radio and TV broadcasting	0.09	0.09	-0.6758
380400	Primary aluminum	1.70	1.73	38124m	Copper foundris and non ferrous casting	0.36	1.15	-0.4746
730303	Accounting, auditing and bookkeeping, and miscellaneous serv	0.95	0.95	670000	Radio and TV broadcasting	0.09	0.09	-0.2616
240800	Paper and paperboard mills	0.99	0.98	670000	Radio and TV broadcasting	0.09	0.09	-0.2572
270100	Industrial inorganic and organic chemicals	1.03	1.04	100000	Chemical and fertilizer minerals	0.51	0.51	-0.2457
380400	Primary aluminum	1.70	1.73	380501	Primary nonferrous metals, n.e.c.	2.34	2.38	-0.2255
680100	Electric services (utilities)	1.06	1.15	380501	Primary nonferrous metals, n.e.c.	2.34	2.38	-0.1718
730108	Photofinishing labs and commercial photography	0.79	0.75	260100	Newspapers	0.25	0.25	-0.1615
260501	Commercial printing	0.60	0.60	260100	Newspapers	0.25	0.25	-0.1463
760101	Motion picture services and theaters	0.97	1.00	260100	Newspapers	0.25	0.25	-0.1344
710201	Real estate agents, managers, operators, and lessors	1.02	1.02	670000	Radio and TV broadcasting	0.09	0.09	-0.1342
180400	Apparel made from purchased materials	1.09	1.09	18023m	Knit and related products	0.59	1.07	-0.1248
060100	Copper ore	0.97	0.97	380501	Primary nonferrous metals, n.e.c.	2.34	2.38	-0.1085
710201	Real estate agents, managers, operators, and lessors	1.02	1.02	260100	Newspapers	0.25	0.25	-0.0999
730108	Photofinishing labs and commercial photography	0.79	0.75	260400	Miscellaneous publishing	0.49	0.49	-0.0995
730303	Accounting, auditing and bookkeeping, and miscellaneous serv	0.95	0.95	260100	Newspapers	0.25	0.25	-0.0971
590302	Motor vehicle parts and accessories	1.03	1.04	590100	Truck and bus bodies	0.62	0.62	-0.0963
710201	Real estate agents, managers, operators, and lessors	1.02	1.02	78025m	Federal electric utilities and other government enterprises	0.26	1.00	-0.0882
380100	Primary smelting and refining of copper	1.07	1.07	380501	Primary nonferrous metals, n.e.c.	2.34	2.38	-0.0857
760101	Motion picture services and theaters	0.97	1.00	260400	Miscellaneous publishing	0.49	0.49	-0.0835
680100	Electric services (utilities)	1.06	1.15	38124m	Copper foundris and non ferrous casting	0.36	1.15	-0.0814
260803	Typesetting	1.15	1.15	670000	Radio and TV broadcasting	0.09	0.09	-0.0810
380400	Primary aluminum	1.70	1.73	380900	Nonferrous rolling and drawing, n.e.c.	0.92	0.92	-0.0746
260806	Platemaking and related services	1.05	1.05	670000	Radio and TV broadcasting	0.09	0.09	-0.0717
380400	Primary aluminum	1.70	1.73	640101	Jewelry, precious metal	0.95	0.96	-0.0628
730303	Accounting, auditing and bookkeeping, and miscellaneous serv	0.95	0.95	260400	Miscellaneous publishing	0.49	0.49	-0.0599
590302	Motor vehicle parts and accessories	1.03	1.04	361700	Asbestos products	0.99	1.00	-0.0599
760101	Motion picture services and theaters	0.97	1.00	260200	Periodicals	0.51	0.51	-0.0534
370101	Blast furnaces and steel mills	1.27	1.27	361700	Asbestos products	0.99	1.00	-0.0532
040001	Agricultural, forestry, and fishery services	1.16	1.12	02070m	Forest and related products	0.82	1.00	-0.0499
730109	Other business services	0.91	0.90	18023m	Knit and related products	0.59	1.07	-0.0458
160100	Broadwoven fabric mills and fabric finishing plants	1.15	0.92	18023m	Knit and related products	0.59	1.07	-0.0457
710201	Real estate agents, managers, operators, and lessors	1.02	1.02	260400	Miscellaneous publishing	0.49	0.49	-0.0449
730108	Photofinishing labs and commercial photography	0.79	0.75	260501	Commercial printing	0.60	0.60	-0.0443
240701	Paper coating and glazing	0.97	0.98	670000	Radio and TV broadcasting	0.09	0.09	-0.0442
730200	Advertising	5.84	4.64	78025m	Federal electric utilities and other government enterprises	0.26	1.00	-0.0435
060100	Copper ore	0.97	0.97	380900	Nonferrous rolling and drawing, n.e.c.	0.92	0.92	-0.0424
270404	Printing ink	1.01	1.02	670000	Radio and TV broadcasting	0.09	0.09	-0.0401
680100	Electric services (utilities)	1.06	1.15	640101	Jewelry, precious metal	0.95	0.96	-0.0396
260501	Commercial printing	0.60	0.60	641100	Signs and advertising specialties	0.59	0.60	-0.0391
760101	Motion picture services and theaters	0.97	1.00	260501	Commercial printing	0.60	0.60	-0.0377
380100	Primary smelting and refining of copper	1.07	1.07	380900	Nonferrous rolling and drawing, n.e.c.	0.92	0.92	-0.0377
270100	Industrial inorganic and organic chemicals	1.03	1.04	670000	Radio and TV broadcasting	0.09	0.09	-0.0374
630300	Photographic equipment and supplies	0.94	0.93	670000	Radio and TV broadcasting	0.09	0.09	-0.0369
190304	Automotive and apparel trimmings	0.99	0.99	18023m	Knit and related products	0.59	1.07	-0.0336
380400	Primary aluminum	1.70	1.73	580100	Storage batteries	1.00	1.00	-0.0336
760101	Motion picture services and theaters	0.97	1.00	641100	Signs and advertising specialties	0.59	0.60	-0.0329
380400	Primary aluminum	1.70	1.73	640102	Jewelers' materials and lapidary work	2.73	1.03	-0.0325
680100	Electric services (utilities)	1.06	1.15	380900	Nonferrous rolling and drawing, n.e.c.	0.92	0.92	-0.0318

Figure 1. K index before and after redefinition



VI. Conclusions and Recommendations for Future Study

This paper discussed the two primary methods for transforming the make-use I-O tables to the symmetric Leontief model. BEA's method was described as a hybrid of the two methods, which has been used for all tables prepared by the BEA since the mid-1970's. Specifically, the method involves a two-step process where the commodity-technology assumption (CTA) is first used to redefine about one-third of all secondary products to their respective primary products, and then the industry-technology assumption (ITA) is used to mechanically shift the remaining products.

For the 1992 Benchmark I-O Accounts, the BEA prepared two sets of make-use tables. The two sets differed in their treatments of secondary products—the first with selected secondary products redefined using the CTA, and the second with all secondary products shown in their originating industries. Using the two presentations of tables, a series of tests were performed to evaluate the different results from applying the ITA and CTA for redefining secondary products. The conclusions from the study include the following:

- For 1992, the U.S. Benchmark I-O Accounts show that secondary products represented only about 7 percent of total gross output ($739 billion out of total $10,054 billion); of these secondary products, approximately one-third are moved or redefined by hand to the industries where they are considered to be primary, using the CTA, and the remaining two thirds are moved mechanically, using the ITA.
- For most industries and commodities examined, the differences between total output multipliers (IxC and CxC), resulting from the two-step, hybrid process used by the

United States to transfer secondary products compared with a one-step, mechanical process were not significant. This suggests that, because of their overall, relatively small size, the choice of method does not greatly affect the total multipliers for economic-impact analyses.

- The results show that for some commodities and industries, the choice between BEA's two-step method and a one-step method does make a large difference. For analysts interested in studying these related areas of the economy, it is important to understand the potential effects from estimating methods on input structures and total multipliers.
- Although many researchers favor using the CTA for transferring secondary products, there is no consensus about what causes negative values to occur and what methods can be used to produce "ideal" results without negative values.
- Empirical results based on the 1992 U.S. Tables suggest that hand redefinitions of nonhomogeneous secondary products, using the CTA, can reduce the frequency of negative values, compared with using the CTA to transfer all secondary products mechanically.
- Empirical results based on the 1992 U.S. Tables indicate that most large negative values in the total requirements matrices, resulting from the CTA, are related to secondary products that represent either a large proportion of an industry's total output or of a commodity's total output. This finding is important, because it can provide valuable information for tracing negative values to the original data set, and for removing negative values by making appropriate adjustments to the original data.

The results of the current research raise additional questions and issues to be addressed by future studies. Two of the more important include the following:

- Has the BEA identified those secondary products that require hand adjustments, using the CTA, from all other secondary products that require only a mechanical transfer, is appropriate, using the ITA? If the hand adjustments, using the CTA, results in only a 10 percent reduction in the frequency of negative values, is this an indicator that additional secondary products require hand adjustments?
- If a hybrid solution is optimal for handling secondary products, is there an effective test to distinguish between those secondary products that require hand adjustments, using the CTA, and all other secondary products for which the mechanical transfer, using the ITA, is more appropriate?
- Are large negative values resulting from the CTA indicators that classification and/or measure errors have occurred in the original data—that is, that the source data should be re-examined?

Table Appendix1. Comparison of Total output Multipliers for the IXC and CXC Matrces -- BEA

ITA

		BEA (IO)		Mechanical (SIC)		Difference (%)	
		IXC	CXC	IXC	CXC	IXC	CXC
IO Code	**Description**	(Col 1)	(Col 2)	(Col 3)	Col 4)	[(Col 1) - (Col 3)]/(col 3)	[(Col 2) - (Col 4)]/(col 4)
010100	Dairy farm products	2.7428	2.7428	2.7173	2.7173	0.94%	0.94%
010200	Poultry and eggs	3.0669	3.0669	2.9569	2.9569	3.72%	3.72%
010301	Meat animals	2.8964	2.8964	2.8717	2.8717	0.86%	0.86%
010302	Miscellaneous livestock	2.5953	2.5953	2.5596	2.5596	1.39%	1.39%
020100	Cotton	2.0236	2.0236	2.0288	2.0289	-0.26%	-0.26%
020201	Food grains	1.8941	1.8941	1.8988	1.8988	-0.25%	-0.25%
020202	Feed grains	2.0173	2.0173	2.0212	2.0212	-0.20%	-0.20%
020203	Grass seeds	1.7640	1.7640	1.7659	1.7659	-0.10%	-0.10%
020300	Tobacco	2.0578	2.0578	2.0464	2.0464	0.56%	0.56%
020401	Fruits	2.0883	2.0883	2.0938	2.0938	-0.26%	-0.26%
020402	Tree nuts	1.8419	1.8419	1.8449	1.8449	-0.16%	-0.16%
020501	Vegetables	1.8121	1.8121	1.8161	1.8161	-0.22%	-0.22%
020502	Sugar crops	1.6077	1.6078	1.6100	1.6100	-0.14%	-0.14%
020503	Miscellaneous crops	2.1233	2.1233	2.1275	2.1275	-0.20%	-0.20%
020600	Oil bearing crops	1.9063	1.9063	1.9110	1.9110	-0.25%	-0.25%
020701	Forest products	0.1197	1.0288	0.1198	1.0289	-0.08%	-0.01%
020702	Greenhouse and nursery products	1.3328	1.3328	1.3351	1.3351	-0.18%	-0.18%
030001	Forestry products	2.0097	2.0097	2.0028	2.0028	0.35%	0.35%
030002	Commercial fishing	1.7195	1.7195	1.7206	1.7206	-0.07%	-0.07%
040001	Agricultural, forestry, and fishery services	2.0165	2.0165	2.0224	2.0224	-0.29%	-0.29%
040002	Landscape and horticultural services	1.5416	1.5416	1.5464	1.5464	-0.31%	-0.31%
050001	Iron and ferroalloy ores, and miscellaneous metal ores, n.e.c.	2.2541	2.2541	2.2564	2.2564	-0.10%	-0.10%
060100	Copper ore	1.9426	1.9426	1.9462	1.9462	-0.19%	-0.19%
060200	Nonferrous metal ores, except copper	2.3746	2.3746	2.3765	2.3765	-0.08%	-0.08%
070000	Coal	1.7553	1.7553	1.7542	1.7542	0.06%	0.06%
080001	Crude petroleum and natural gas	1.8349	1.8349	1.8350	1.8350	-0.01%	-0.01%
090001	Dimension, crushed and broken stone	1.7980	1.7980	1.7984	1.7984	-0.02%	-0.02%
090002	Sand and gravel	1.7615	1.7615	1.7605	1.7605	0.06%	0.06%
090003	Clay, ceramic, and refractory minerals	1.8185	1.8185	1.8149	1.8149	0.20%	0.20%
090004	Nonmetallic mineral services and miscellaneous	1.8410	1.8410	1.8374	1.8374	0.20%	0.20%
100000	Chemical and fertilizer minerals	1.7894	1.7894	1.7873	1.7873	0.12%	0.12%
110101	New residential 1 unit structures, nonfarm	2.1312	2.1312	2.1363	2.1363	-0.24%	-0.24%
110102	New residential 2-4 unit structures, nonfarm	2.1809	2.1809	2.1827	2.1827	-0.09%	-0.09%
110105	New residential additions and alterations, nonfarm	2.0805	2.0805	2.0846	2.0846	-0.20%	-0.20%
110108	New residential garden and high-rise apartments construction	2.1939	2.1939	2.1958	2.1958	-0.08%	-0.08%
110400	New highways, bridges, and other horizontal construction	2.0961	2.0961	2.0955	2.0955	0.03%	0.03%
110501	New farm residential construction	2.0831	2.0831	2.0857	2.0857	-0.13%	-0.13%
110601	Petroleum and natural gas well drilling	1.5624	1.5624	1.5623	1.5623	0.01%	0.01%
110602	Petroleum, natural gas, and solid mineral exploration	1.3953	1.3953	1.3949	1.3949	0.03%	0.03%
110603	Access structures for solid mineral development	1.7737	1.7737	1.7714	1.7714	0.13%	0.13%
110800	New office, industrial and commercial buildings construction	2.1306	2.1306	2.1326	2.1326	-0.10%	-0.10%
110900	Other new construction	2.0220	2.0220	2.0240	2.0240	-0.10%	-0.10%
120101	Maintenance and repair of farm and nonfarm residential structures	2.1140	2.1140	2.1188	2.1188	-0.23%	-0.23%
120214	Maintenance and repair of highways & streets	1.9791	1.9791	1.9793	1.9793	-0.01%	-0.01%
120215	Maintenance and repair of petroleum and natural gas wells	1.5358	1.5358	1.5360	1.5360	-0.02%	-0.02%
120300	Other repair and maintenance construction	1.9329	1.9329	1.9366	1.9366	-0.19%	-0.19%
130100	Guided missiles and space vehicles	1.7794	1.7794	1.7717	1.7717	0.44%	0.44%
130200	Ammunition, except for small arms, n.e.c.	1.8730	1.8730	1.8687	1.8687	0.23%	0.23%
130300	Tanks and tank components	1.9876	1.9876	1.9852	1.9852	0.13%	0.13%
130500	Small arms	1.7376	1.7376	1.7286	1.7286	0.52%	0.52%
130600	Small arms ammunition	1.9108	1.9108	1.9112	1.9112	-0.02%	-0.02%
130700	Ordnance and accessories, n.e.c.	1.5074	1.5074	1.5059	1.5059	0.10%	0.10%
140101	Meat packing plants	3.5093	3.5093	3.4662	3.4662	1.24%	1.24%
140102	Sausages and other prepared meat products	3.4055	3.4055	3.3184	3.3184	2.63%	2.63%
140105	Poultry slaughtering and processing	3.1396	3.1396	3.0269	3.0269	3.72%	3.72%
140200	Creamery butter	3.1380	3.1380	3.1066	3.1066	1.01%	1.01%
140300	Natural, processed, and imitation cheese	3.1569	3.1569	3.1371	3.1371	0.63%	0.63%
140400	Dry, condensed, and evaporated dairy products	2.6599	2.6599	2.6287	2.6287	1.19%	1.19%
140500	Ice cream and frozen desserts	2.6939	2.6939	2.6710	2.6710	0.86%	0.86%
140600	Fluid milk	3.0015	3.0015	2.9521	2.9521	1.67%	1.67%
140700	Canned and cured fish and seafoods	2.3460	2.3460	2.3385	2.3385	0.32%	0.32%
140800	Canned specialties	2.2862	2.2862	2.2763	2.2763	0.44%	0.44%
140900	Canned fruits, vegetables, preserves, jams, and jellies	2.3200	2.3200	2.3155	2.3155	0.20%	0.20%
141000	Dehydrated fruits, vegetables, and soups	2.2308	2.2308	2.2236	2.2236	0.32%	0.32%
141100	Pickles, sauces, and salad dressings	2.1272	2.1272	2.1239	2.1239	0.16%	0.16%
141200	Prepared fresh or frozen fish and seafoods	2.5103	2.5103	2.5061	2.5061	0.17%	0.17%
141301	Frozen fruits, fruit juices, and vegetables	2.4064	2.4064	2.4094	2.4094	-0.12%	-0.12%
141302	Frozen specialties, n.e.c.	2.3808	2.3808	2.3514	2.3514	1.25%	1.25%
141401	Flour and other grain mill products	2.5462	2.5462	2.5464	2.5464	-0.01%	-0.01%

		BEA (IO)		Mechanical (SIC)		Difference (%)	
		IXC	CXC	IXC	CXC	IXC	CXC
IO Code	**Description**	(Col 1)	(Col 2)	(Col 3)	Col 4)	[(Col 1) - (Col 3)]/(col 3)	[(Col 2) - (Col 4)]/(col 4)
142104	Distilled and blended liquors	1.5988	1.5988	1.5964	1.5964	0.15%	0.15%
142200	Bottled and canned soft drinks	2.5529	2.5529	2.5245	2.5245	1.13%	1.13%
142300	Flavoring extracts and flavoring syrups, n.e.c.	1.6742	1.6742	1.6731	1.6731	0.07%	0.07%
142400	Cottonseed oil mills	2.6941	2.6941	2.6896	2.6896	0.17%	0.17%
142500	Soybean oil mills	2.8315	2.8315	2.8380	2.8380	-0.23%	-0.23%
142600	Vegetable oil mills, n.e.c.	2.8157	2.8157	2.8233	2.8233	-0.27%	-0.27%
142700	Animal and marine fats and oils	2.8445	2.8445	2.8352	2.8352	0.33%	0.33%
142800	Roasted coffee	2.3232	2.3232	2.3162	2.3162	0.30%	0.30%
142900	Edible fats and oils, n.e.c.	2.8924	2.8924	2.8902	2.8902	0.08%	0.08%
143000	Manufactured ice	1.6359	1.6359	1.6315	1.6315	0.27%	0.27%
143100	Macaroni, spaghetti, vermicelli, and noodles	2.4236	2.4236	2.4186	2.4186	0.21%	0.21%
143201	Potato chips and similar snacks	2.1420	2.1420	2.1293	2.1293	0.59%	0.59%
143202	Food preparations, n.e.c.	2.2767	2.2767	2.2695	2.2695	0.32%	0.32%
150101	Cigarettes	1.6345	1.6345	1.6273	1.6273	0.44%	0.44%
150102	Cigars	1.8604	1.8604	1.8433	1.8433	0.93%	0.93%
150103	Chewing and smoking tobacco and snuff	1.7261	1.7261	1.7157	1.7157	0.61%	0.61%
150200	Tobacco stemming and redrying	2.6043	2.6043	2.5110	2.5110	3.71%	3.71%
160100	Broadwoven fabric mills and fabric finishing plants	2.4133	2.4133	2.2203	2.2203	8.70%	8.70%
160200	Narrow fabric mills	2.2236	2.2236	2.2247	2.2247	-0.05%	-0.05%
160300	Yarn mills and finishing of textiles, n.e.c.	2.4619	2.4619	2.4661	2.4661	-0.17%	-0.17%
160400	Thread mills	2.5176	2.5176	2.5195	2.5195	-0.08%	-0.08%
170100	Carpets and rugs	2.5929	2.5929	2.5848	2.5848	0.31%	0.31%
170600	Coated fabrics, not rubberized	2.5252	2.5252	2.4930	2.4930	1.29%	1.29%
170700	Tire cord and fabrics	2.4237	2.4237	2.4250	2.4250	-0.06%	-0.06%
170900	Cordage and twine	2.3427	2.3427	2.3027	2.3027	1.74%	1.74%
171001	Nonwoven fabrics	2.2684	2.2684	2.2553	2.2553	0.58%	0.58%
171100	Textile goods, n.e.c.	2.2706	2.2706	2.2672	2.2672	0.15%	0.15%
180101	Women's hosiery, except socks	2.3669	2.3669	2.3622	2.3622	0.20%	0.20%
180102	Hosiery, n.e.c.	2.3907	2.3907	2.3821	2.3821	0.36%	0.36%
180201	Knit outerwear mills	0.2235	1.1326	0.2212	1.1303	1.03%	0.20%
180202	Knit underwear and nightwear mills	0.2193	1.1284	0.2178	1.1269	0.68%	0.13%
180203	Knitting mills, n.e.c.	0.2052	1.1143	0.2044	1.1135	0.41%	0.08%
180300	Knit fabric mills	2.7211	2.7211	2.7101	2.7101	0.41%	0.41%
180400	Apparel made from purchased materials	2.4733	2.4733	2.4205	2.4205	2.18%	2.18%
190100	Curtains and draperies	2.4735	2.4735	2.3877	2.3877	3.59%	3.59%
190200	Housefurnishings, n.e.c.	2.4581	2.4581	2.4019	2.4019	2.34%	2.34%
190301	Textile bags	2.2951	2.2951	2.2423	2.2423	2.35%	2.35%
190302	Canvas and related products	2.1733	2.1733	2.1202	2.1202	2.50%	2.50%
190303	Pleating and stitching	1.7555	1.7555	1.7401	1.7401	0.89%	0.89%
190304	Automotive and apparel trimmings	2.4650	2.4650	2.4395	2.4395	1.04%	1.04%
190305	Schiffli machine embroideries	1.9579	1.9579	1.9406	1.9406	0.89%	0.89%
190306	Fabricated textile products, n.e.c.	2.2431	2.2431	2.1963	2.1963	2.13%	2.13%
200100	Logging	2.2110	2.2110	2.2064	2.2064	0.20%	0.20%
200200	Sawmills and planing mills, general	2.4160	2.4160	2.4123	2.4123	0.15%	0.15%
200300	Hardwood dimension and flooring mills	2.1441	2.1442	2.1427	2.1428	0.07%	0.07%
200400	Special product sawmills, n.e.c.	2.0191	2.0191	2.0117	2.0117	0.37%	0.37%
200501	Millwork	2.3783	2.3783	2.3746	2.3746	0.16%	0.16%
200502	Wood kitchen cabinets	2.0961	2.0961	2.0959	2.0959	0.01%	0.01%
200600	Veneer and plywood	2.3972	2.3972	2.3949	2.3949	0.10%	0.10%
200701	Structural wood members, n.e.c.	2.3664	2.3664	2.3585	2.3585	0.34%	0.34%
200702	Prefabricated wood buildings and components	2.3968	2.3968	2.3958	2.3958	0.04%	0.04%
200703	Mobile homes	2.3900	2.3900	2.3906	2.3906	-0.02%	-0.02%
200800	Wood preserving	2.6677	2.6677	2.6622	2.6622	0.21%	0.21%
200901	Wood pallets and skids	2.3464	2.3464	2.3448	2.3448	0.07%	0.07%
200903	Wood products, n.e.c.	2.1312	2.1312	2.1124	2.1124	0.89%	0.89%
200904	Reconstituted wood products	2.1550	2.1550	2.1547	2.1547	0.02%	0.02%
210000	Wood containers, n.e.c.	2.2327	2.2327	2.2289	2.2289	0.17%	0.17%
220101	Wood household furniture, except upholstered	2.0447	2.0447	2.0327	2.0327	0.59%	0.59%
220102	Household furniture, n.e.c.	2.2961	2.2961	2.2885	2.2885	0.34%	0.34%
220103	Wood television and radio cabinets	2.2102	2.2102	2.2078	2.2078	0.11%	0.11%
220200	Upholstered household furniture	2.2493	2.2493	2.2210	2.2210	1.28%	1.28%
220300	Metal household furniture	2.1708	2.1708	2.1606	2.1606	0.47%	0.47%
220400	Mattresses and bedsprings	2.2734	2.2734	2.2393	2.2393	1.53%	1.53%
230100	Wood office furniture	2.1197	2.1197	2.1201	2.1201	-0.02%	-0.02%
230200	Office furniture, except wood	2.1453	2.1453	2.1310	2.1310	0.67%	0.67%
230300	Public building and related furniture	2.3310	2.3310	2.3118	2.3118	0.83%	0.83%
230400	Wood partitions and fixtures	1.9784	1.9784	1.9635	1.9635	0.76%	0.76%
230500	Partitions and fixtures, except wood	2.0642	2.0642	2.0563	2.0563	0.39%	0.39%
230600	Drapery hardware and window blinds and shades	1.9046	1.9046	1.8894	1.8894	0.81%	0.81%
230700	Furniture and fixtures, n.e.c.	1.9126	1.9126	1.9014	1.9014	0.59%	0.59%
240100	Pulp mills	2.2624	2.2624	2.2634	2.2634	-0.04%	-0.04%

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IO Code	**Description**	(Col 1)	(Col 2)	(Col 3)	Col 4)	[(Col 1) - (Col 3)]/(col 3)	[(Col 2) - (Col 4)]/(col 4)
260501	Commercial printing	2.0133	2.0133	2.0086	2.0086	0.23%	0.23%
260601	Manifold business forms	2.1072	2.1072	2.0914	2.0914	0.76%	0.76%
260602	Blankbooks, looseleaf binders and devices	1.8456	1.8456	1.8355	1.8355	0.55%	0.55%
260700	Greeting cards	1.6844	1.6844	1.6285	1.6285	3.43%	3.43%
260802	Bookbinding and related work	1.6422	1.6422	1.6375	1.6375	0.29%	0.29%
260803	Typesetting	1.5909	1.5909	1.5892	1.5892	0.10%	0.10%
260806	Platemaking and related services	1.5602	1.5602	1.5620	1.5620	-0.12%	-0.12%
270100	Industrial inorganic and organic chemicals	2.2967	2.2967	2.2888	2.2888	0.34%	0.34%
270201	Nitrogenous and phosphatic fertilizers	2.5207	2.5207	2.5026	2.5026	0.72%	0.72%
270202	Fertilizers, mixing only	0.2489	1.1580	0.2438	1.1528	2.12%	0.45%
270300	Pesticides and agricultural chemicals, n.e.c.	2.1232	2.1232	2.1120	2.1120	0.53%	0.53%
270401	Gum and wood chemicals	2.0875	2.0875	2.0837	2.0837	0.18%	0.18%
270402	Adhesives and sealants	2.3126	2.3126	2.2966	2.2966	0.70%	0.70%
270403	Explosives	1.7874	1.7874	1.7799	1.7799	0.42%	0.42%
270404	Printing ink	2.4501	2.4501	2.4380	2.4380	0.50%	0.50%
270405	Carbon black	2.1343	2.1343	2.1360	2.1360	-0.08%	-0.08%
270406	Chemicals and chemical preparations, n.e.c.	2.2367	2.2367	2.2210	2.2210	0.71%	0.71%
280100	Plastics materials and resins	2.4663	2.4663	2.4616	2.4616	0.19%	0.19%
280200	Synthetic rubber	2.3222	2.3222	2.3158	2.3158	0.28%	0.28%
280300	Cellulosic manmade fibers	2.4184	2.4184	2.4159	2.4159	0.11%	0.11%
280400	Manmade organic fibers, except cellulosic	2.3545	2.3545	2.3558	2.3558	-0.05%	-0.05%
290100	Drugs	1.8464	1.8464	1.8067	1.8067	2.19%	2.19%
290201	Soap and other detergents	2.2062	2.2062	2.1363	2.1363	3.27%	3.27%
290202	Polishes and sanitation goods	2.0099	2.0099	1.9631	1.9631	2.38%	2.38%
290203	Surface active agents	2.2674	2.2674	2.2459	2.2459	0.95%	0.95%
290300	Toilet preparations	2.0009	2.0009	1.9682	1.9682	1.66%	1.66%
300000	Paints and allied products	2.2900	2.2900	2.2636	2.2636	1.17%	1.17%
310101	Petroleum refining	2.6159	2.6159	2.6161	2.6161	-0.01%	-0.01%
310102	Lubricating oils and greases	2.7858	2.7858	2.7727	2.7727	0.47%	0.47%
310103	Products of petroleum and coal, n.e.c.	2.2929	2.2929	2.2867	2.2867	0.27%	0.27%
310200	Asphalt paving mixtures and blocks	2.3889	2.3889	2.3860	2.3860	0.12%	0.12%
310300	Asphalt felts and coatings	2.2201	2.2201	2.2078	2.2078	0.56%	0.56%
320100	Tires and inner tubes	2.1120	2.1120	2.1029	2.1029	0.43%	0.43%
320200	Rubber and plastics footwear	2.3284	2.3284	2.2890	2.2890	1.72%	1.72%
320300	Fabricated rubber products, n.e.c.	2.1184	2.1184	2.1039	2.1039	0.69%	0.69%
320400	Miscellaneous plastics products, n.e.c.	2.2155	2.2155	2.2078	2.2078	0.35%	0.35%
320500	Rubber and plastics hose and belting	2.1952	2.1952	2.1739	2.1739	0.98%	0.98%
320600	Gaskets, packing, and sealing devices	1.9540	1.9540	1.9434	1.9434	0.55%	0.55%
330001	Leather tanning and finishing	3.1568	3.1568	3.1388	3.1388	0.58%	0.58%
340100	Boot and shoe cut stock and findings	2.5887	2.5887	2.5741	2.5741	0.57%	0.57%
340201	Shoes, except rubber	2.5454	2.5454	2.5188	2.5188	1.06%	1.06%
340202	House slippers	2.0316	2.0316	2.0049	2.0049	1.33%	1.33%
340301	Leather gloves and mittens	2.6255	2.6255	2.5466	2.5466	3.10%	3.10%
340302	Luggage	2.2830	2.2830	2.2062	2.2062	3.48%	3.48%
340303	Women's handbags and purses	2.1576	2.1576	2.1342	2.1342	1.10%	1.10%
340304	Personal leather goods, n.e.c.	2.0285	2.0285	1.9992	1.9992	1.47%	1.47%
340305	Leather goods, n.e.c.	2.2511	2.2511	2.2095	2.2095	1.88%	1.88%
350100	Glass and glass products, except containers	1.9005	1.9005	1.8982	1.8982	0.13%	0.13%
350200	Glass containers	1.9321	1.9321	1.9322	1.9322	-0.01%	-0.01%
360100	Cement, hydraulic	2.0632	2.0632	2.0574	2.0574	0.28%	0.28%
360200	Brick and structural clay tile	1.9023	1.9023	1.8909	1.8909	0.61%	0.61%
360300	Ceramic wall and floor tile	1.9083	1.9083	1.9001	1.9001	0.43%	0.43%
360400	Clay refractories	2.1520	2.1520	2.1347	2.1347	0.81%	0.81%
360500	Structural clay products, n.e.c.	1.9477	1.9477	1.9391	1.9392	0.44%	0.44%
360600	Vitreous china plumbing fixtures	1.6787	1.6787	1.6722	1.6722	0.39%	0.39%
360701	Vitreous china table and kitchenware	1.6773	1.6773	1.6669	1.6669	0.62%	0.62%
360702	Fine earthenware table and kitchenware	2.0656	2.0656	2.0601	2.0601	0.27%	0.27%
360800	Porcelain electrical supplies	1.7372	1.7372	1.7343	1.7343	0.17%	0.17%
360900	Pottery products, n.e.c.	1.8349	1.8349	1.8165	1.8165	1.01%	1.01%
361000	Concrete block and brick	2.0164	2.0164	1.9615	1.9615	2.80%	2.80%
361100	Concrete products, except block and brick	2.0029	2.0029	1.9933	1.9933	0.48%	0.48%
361200	Ready-mixed concrete	2.1789	2.1789	2.1650	2.1650	0.64%	0.64%
361300	Lime	2.1670	2.1670	2.1575	2.1575	0.44%	0.44%
361400	Gypsum products	2.3579	2.3579	2.3503	2.3503	0.33%	0.33%
361500	Cut stone and stone products	1.9111	1.9111	1.8970	1.8970	0.74%	0.74%
361600	Abrasive products	2.0575	2.0575	2.0419	2.0419	0.77%	0.77%
361700	Asbestos products	2.1047	2.1047	2.0907	2.0907	0.67%	0.67%
361900	Minerals, ground or treated	1.9302	1.9302	1.9261	1.9261	0.21%	0.21%
362000	Mineral wool	1.9488	1.9488	1.9449	1.9449	0.20%	0.20%
362100	Nonclay refractories	2.0087	2.0087	2.0001	2.0001	0.43%	0.43%
362200	Nonmetallic mineral products, n.e.c.	1.9719	1.9719	1.9582	1.9582	0.70%	0.70%

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		IXC	CXC	IXC	CXC	IXC	CXC
IO Code	**Description**	(Col 1)	(Col 2)	(Col 3)	Col 4)	[(Col 1) - (Col 3)]/(col 3)	[(Col 2) - (Col 4)]/(col 4)
380800	Aluminum rolling and drawing	2.5671	2.5671	2.5427	2.5427	0.96%	0.96%
380900	Nonferrous rolling and drawing, n.e.c.	2.3141	2.3141	2.3168	2.3168	-0.12%	-0.12%
381000	Nonferrous wiredrawing and insulating	2.6109	2.6109	2.6079	2.6079	0.12%	0.12%
381100	Aluminum castings	2.0612	2.0612	2.0576	2.0576	0.18%	0.18%
381200	Copper foundries	0.1895	1.0986	0.1890	1.0981	0.27%	0.05%
381300	Nonferrous castings, n.e.c.	0.1814	1.0905	0.1811	1.0902	0.14%	0.02%
381400	Nonferrous forgings	2.3406	2.3406	2.3397	2.3397	0.04%	0.04%
390100	Metal cans	2.9062	2.9062	2.9010	2.9010	0.18%	0.18%
390200	Metal shipping barrels, drums, kegs, and pails	2.5134	2.5134	2.4985	2.4985	0.59%	0.59%
400100	Enameled iron and metal sanitary ware	1.9918	1.9918	1.9874	1.9874	0.22%	0.22%
400200	Plumbing fixture fittings and trim	2.3312	2.3312	2.3304	2.3304	0.03%	0.03%
400300	Heating equipment, except electric and warm air furnaces	2.0290	2.0291	2.0203	2.0203	0.43%	0.43%
400400	Fabricated structural metal	2.2091	2.2091	2.2049	2.2049	0.19%	0.19%
400500	Metal doors, sash, frames, molding, and trim	2.2489	2.2489	2.2418	2.2418	0.31%	0.31%
400600	Fabricated plate work (boiler shops)	2.1087	2.1087	2.1036	2.1036	0.24%	0.24%
400700	Sheet metal work	2.1952	2.1952	2.1953	2.1953	-0.01%	-0.01%
400800	Architectural and ornamental metal work	2.0770	2.0770	2.0711	2.0711	0.28%	0.28%
400901	Prefabricated metal buildings and components	2.3191	2.3191	2.3156	2.3156	0.15%	0.15%
400902	Miscellaneous structural metal work	2.5104	2.5104	2.5051	2.5051	0.21%	0.21%
410100	Screw machine products, bolts, etc.	1.9927	1.9927	1.9837	1.9837	0.45%	0.45%
410201	Automotive stampings	2.2571	2.2571	2.2584	2.2584	-0.06%	-0.06%
410202	Crowns and closures	2.2754	2.2754	2.2741	2.2741	0.06%	0.06%
410203	Metal stampings, n.e.c.	2.1551	2.1551	2.1487	2.1487	0.30%	0.30%
420100	Cutlery	1.8123	1.8123	1.7926	1.7926	1.10%	1.10%
420201	Hand and edge tools, except machine tools and handsaws	1.8938	1.8938	1.8587	1.8587	1.89%	1.89%
420202	Saw blades and handsaws	2.0068	2.0068	1.9790	1.9790	1.40%	1.40%
420300	Hardware, n.e.c.	2.0947	2.0947	2.0828	2.0828	0.57%	0.57%
420401	Plating and polishing	1.8343	1.8343	1.8321	1.8321	0.12%	0.12%
420402	Coating,engraving, and allied services, n.e.c.	2.2651	2.2651	2.2636	2.2636	0.07%	0.07%
420500	Miscellaneous fabricated wire products	2.1593	2.1593	2.1513	2.1513	0.37%	0.37%
420700	Steel springs, except wire	2.0855	2.0855	2.0688	2.0688	0.81%	0.81%
420800	Pipe, valves, and pipe fittings	2.0344	2.0344	2.0269	2.0269	0.37%	0.37%
421000	Metal foil and leaf	2.4131	2.4131	2.4102	2.4102	0.12%	0.12%
421100	Fabricated metal products, n.e.c.	2.1141	2.1141	2.1045	2.1045	0.46%	0.46%
430100	Turbines and turbine generator sets	2.0021	2.0021	1.9941	1.9941	0.40%	0.40%
430200	Internal combustion engines, n.e.c.	2.2974	2.2974	2.2901	2.2901	0.32%	0.32%
440001	Farm machinery and equipment	2.0477	2.0477	2.0290	2.0290	0.92%	0.92%
440002	Lawn and garden equipment	2.3381	2.3381	2.3064	2.3064	1.37%	1.37%
450100	Construction machinery and equipment	2.1812	2.1812	2.1662	2.1662	0.69%	0.69%
450200	Mining machinery, except oil field	2.1312	2.1312	2.0990	2.0990	1.53%	1.53%
450300	Oil and gas field machinery and equipment	2.2390	2.2390	2.2237	2.2237	0.69%	0.69%
460100	Elevators and moving stairways	2.3060	2.3060	2.3028	2.3028	0.14%	0.14%
460200	Conveyors and conveying equipment	1.9561	1.9561	1.9484	1.9484	0.40%	0.40%
460300	Hoists, cranes, and monorails	2.0515	2.0515	2.0332	2.0332	0.90%	0.90%
460400	Industrial trucks and tractors	2.3013	2.3013	2.2901	2.2901	0.49%	0.49%
470100	Machine tools, metal cutting types	2.0249	2.0249	2.0095	2.0095	0.76%	0.76%
470200	Machine tools, metal forming types	2.0431	2.0431	2.0304	2.0304	0.63%	0.63%
470300	Special dies and tools and machine tool accessories	1.7539	1.7539	1.7484	1.7484	0.32%	0.32%
470401	Power-driven handtools	2.1165	2.1165	2.0658	2.0658	2.45%	2.45%
470402	Rolling mill machinery and equipment	1.9996	1.9996	1.9986	1.9986	0.05%	0.05%
470404	Electric and gas welding and soldering equipment	2.0356	2.0356	2.0227	2.0227	0.63%	0.63%
470405	Industrial patterns	1.6016	1.6016	1.6004	1.6004	0.08%	0.08%
470500	Metalworking machinery, n.e.c.	1.8988	1.8988	1.8963	1.8963	0.13%	0.13%
480100	Food products machinery	2.0206	2.0206	2.0032	2.0032	0.87%	0.87%
480200	Textile machinery	2.0489	2.0489	2.0300	2.0300	0.93%	0.93%
480300	Woodworking machinery	2.1888	2.1888	2.1575	2.1575	1.45%	1.45%
480400	Paper industries machinery	2.0375	2.0375	2.0235	2.0235	0.69%	0.69%
480500	Printing trades machinery and equipment	2.1101	2.1101	2.0854	2.0854	1.19%	1.19%
480600	Special industry machinery, n.e.c.	1.9709	1.9709	1.9621	1.9621	0.45%	0.45%
490100	Pumps and compressors	2.0894	2.0894	2.0752	2.0752	0.68%	0.68%
490200	Ball and roller bearings	1.9962	1.9962	1.9906	1.9906	0.28%	0.28%
490300	Blowers and fans	2.0257	2.0257	2.0176	2.0176	0.40%	0.40%
490500	Mechanical power transmission equipment	1.9461	1.9461	1.9375	1.9375	0.44%	0.44%
490600	Industrial process furnaces and ovens	2.0024	2.0024	1.9946	1.9946	0.39%	0.39%
490700	General industrial machinery and equipment, n.e.c.	1.9561	1.9561	1.9363	1.9363	1.02%	1.02%
490800	Packaging machinery	1.8758	1.8758	1.8653	1.8653	0.56%	0.56%
500100	Carburetors, pistons, rings, and valves	2.1408	2.1408	2.1400	2.1400	0.04%	0.04%
500200	Fluid power equipment	1.9434	1.9434	1.9361	1.9361	0.38%	0.38%
500300	Scales and balances, except laboratory	1.9545	1.9545	1.9422	1.9422	0.63%	0.63%
500400	Industrial and commercial machinery and equipment, n.e.c.	1.8091	1.8091	1.8048	1.8048	0.24%	0.24%
510102	Calculating and accounting machines	2.0487	2.0487	2.0452	2.0452	0.17%	0.17%

		BEA (IO)		Mechanical (SIC)		Difference (%)	
		IXC	CXC	IXC	CXC	IXC	CXC
IO Code	Description	(Col 1)	(Col 2)	(Col 3)	Col 4)	[(Col 1) - (Col 3)]/(col 3)	[(Col 2) - (Col 4)]/(col 4)
540100	Household cooking equipment	2.4577	2.4577	2.4181	2.4181	1.64%	1.64%
540200	Household refrigerators and freezers	2.3585	2.3585	2.3447	2.3447	0.59%	0.59%
540300	Household laundry equipment	2.3209	2.3209	2.3077	2.3077	0.57%	0.57%
540400	Electric housewares and fans	2.2058	2.2058	2.1677	2.1677	1.76%	1.76%
540500	Household vacuum cleaners	2.1235	2.1235	2.0866	2.0866	1.77%	1.77%
540700	Household appliances, n.e.c.	2.4079	2.4079	2.3458	2.3458	2.65%	2.65%
550100	Electric lamp bulbs and tubes	1.8287	1.8287	1.8299	1.8299	-0.06%	-0.06%
550200	Lighting fixtures and equipment	2.1912	2.1912	2.1783	2.1783	0.59%	0.59%
550300	Wiring devices	1.9435	1.9435	1.9318	1.9318	0.61%	0.61%
560100	Household audio and video equipment	2.6561	2.6561	2.6487	2.6487	0.28%	0.28%
560200	Prerecorded records and tapes	1.8955	1.8955	1.8896	1.8896	0.31%	0.31%
560300	Telephone and telegraph apparatus	1.9495	1.9495	1.9470	1.9470	0.13%	0.13%
560500	Communication equipment	1.8708	1.8708	1.8642	1.8642	0.35%	0.35%
570100	Electron tubes	2.3029	2.3029	2.3033	2.3033	-0.02%	-0.02%
570200	Semiconductors and related devices	1.7514	1.7514	1.7497	1.7497	0.10%	0.10%
570300	Other electronic components	2.1537	2.1537	2.1485	2.1485	0.24%	0.24%
580100	Storage batteries	2.1629	2.1629	2.1688	2.1688	-0.27%	-0.27%
580200	Primary batteries, dry and wet	2.1292	2.1292	2.1166	2.1166	0.60%	0.60%
580400	Electrical equipment for internal combustion engines	2.0456	2.0456	2.0292	2.0292	0.81%	0.81%
580600	Magnetic and optical recording media	2.2742	2.2742	2.2488	2.2488	1.13%	1.13%
580700	Electrical machinery, equipment, and supplies, n.e.c.	2.0800	2.0800	2.0511	2.0511	1.41%	1.41%
590100	Truck and bus bodies	2.4046	2.4046	2.3942	2.3942	0.44%	0.44%
590200	Truck trailers	2.5816	2.5816	2.5696	2.5696	0.47%	0.47%
590301	Motor vehicles and passenger car bodies	2.7839	2.7839	2.7706	2.7706	0.48%	0.48%
590302	Motor vehicle parts and accessories	2.3892	2.3892	2.3760	2.3760	0.55%	0.55%
600100	Aircraft	2.2594	2.2594	2.2570	2.2570	0.10%	0.10%
600200	Aircraft and missile engines and engine parts	1.9459	1.9459	1.9264	1.9264	1.01%	1.01%
600400	Aircraft and missile equipment, n.e.c.	1.7957	1.7957	1.7941	1.7941	0.09%	0.09%
610100	Ship building and repairing	1.7391	1.7391	1.7405	1.7405	-0.08%	-0.08%
610200	Boat building and repairing	2.0498	2.0498	2.1074	2.1074	-2.73%	-2.73%
610300	Railroad equipment	2.1695	2.1695	2.1583	2.1583	0.52%	0.52%
610500	Motorcycles, bicycles, and parts	2.1368	2.1368	2.1139	2.1139	1.08%	1.08%
610601	Travel trailers and campers	2.5326	2.5326	2.5232	2.5232	0.37%	0.37%
610603	Motor homes	2.7345	2.7345	2.7008	2.7008	1.25%	1.25%
610700	Transportation equipment, n.e.c.	2.1482	2.1482	2.1398	2.1398	0.39%	0.39%
620101	Search and navigation equipment	1.7724	1.7724	1.7708	1.7708	0.09%	0.09%
620102	Laboratory apparatus and furniture	1.8802	1.8802	1.8602	1.8602	1.08%	1.08%
620200	Mechanical measuring devices	1.8491	1.8491	1.8419	1.8419	0.39%	0.39%
620300	Environmental controls	1.9501	1.9501	1.9258	1.9258	1.26%	1.26%
620400	Surgical and medical instruments and apparatus	1.7650	1.7650	1.7556	1.7556	0.53%	0.53%
620500	Surgical appliances and supplies	1.8437	1.8437	1.8181	1.8181	1.41%	1.41%
620600	Dental equipment and supplies	1.9866	1.9866	1.9467	1.9467	2.05%	2.05%
620700	Watches, clocks, watchcases, and parts	2.0822	2.0822	2.0536	2.0536	1.39%	1.39%
620800	X-ray apparatus and tubes	1.9749	1.9749	1.9378	1.9378	1.92%	1.92%
620900	Electromedical and electrotherapeutic apparatus	1.9322	1.9322	1.9048	1.9048	1.44%	1.44%
621000	Laboratory and optical instruments	1.9214	1.9214	1.9048	1.9048	0.88%	0.88%
621100	Instruments to measure electricity	1.8264	1.8264	1.8036	1.8036	1.26%	1.26%
630200	Ophthalmic goods	1.7997	1.7997	1.7568	1.7568	2.44%	2.44%
630300	Photographic equipment and supplies	1.7622	1.7622	1.7657	1.7657	-0.20%	-0.20%
640101	Jewelry, precious metal	2.2245	2.2245	2.2272	2.2272	-0.12%	-0.12%
640102	Jewelers' materials and lapidary work	1.8109	1.8109	1.8501	1.8501	-2.12%	-2.12%
640104	Silverware and plated ware	2.1951	2.1951	2.1185	2.1185	3.62%	3.62%
640105	Costume jewelry	1.8808	1.8808	1.8926	1.8926	-0.62%	-0.62%
640200	Musical instruments	1.9644	1.9644	1.9637	1.9637	0.04%	0.04%
640301	Games, toys, and children's vehicles	2.2994	2.2994	2.2278	2.2278	3.21%	3.21%
640302	Dolls and stuffed toys	2.1887	2.1887	2.1501	2.1502	1.79%	1.79%
640400	Sporting and athletic goods, n.e.c.	2.2087	2.2087	2.1759	2.1759	1.51%	1.51%
640501	Pens, mechanical pencils, and parts	2.1030	2.1030	2.0876	2.0876	0.73%	0.73%
640502	Lead pencils and art goods	2.1617	2.1617	2.1184	2.1184	2.04%	2.04%
640503	Marking devices	1.9748	1.9748	1.9365	1.9365	1.97%	1.97%
640504	Carbon paper and inked ribbons	2.2580	2.2580	2.2236	2.2236	1.55%	1.55%
640700	Fasteners, buttons, needles, and pins	2.0568	2.0568	2.0426	2.0426	0.70%	0.70%
640800	Brooms and brushes	2.1829	2.1829	2.1633	2.1633	0.91%	0.91%
640900	Hard surface floor coverings, n.e.c.	2.0008	2.0008	1.9923	1.9923	0.43%	0.43%
641000	Burial caskets	1.8892	1.8892	1.8791	1.8791	0.54%	0.54%
641100	Signs and advertising specialties	2.0398	2.0398	2.0295	2.0295	0.51%	0.51%
641200	Manufacturing industries, n.e.c.	2.1436	2.1436	2.1145	2.1145	1.37%	1.37%
650100	Railroads and related services	1.7274	1.7274	1.7304	1.7304	-0.18%	-0.18%
650200	Local and suburban transit and interurban highway passenger transportation	2.1265	2.1265	2.1300	2.1300	-0.17%	-0.17%
650301	Trucking and courier services, except air	1.9639	1.9639	1.9650	1.9650	-0.05%	-0.05%
650302	Warehousing and storage	1.7534	1.7534	1.7632	1.7632	-0.56%	-0.56%

		BEA (IO)		Mechanical (SIC)		Difference (%)	
		IXC	CXC	IXC	CXC	IXC	CXC
IO Code	**Description**	(Col 1)	(Col 2)	(Col 3)	Col 4)	[(Col 1) - (Col 3)]/(col 3)	[(Col 2) - (Col 4)]/(col 4)
690200	Retail trade, except eating and drinking	1.5327	1.5327	1.5859	1.5859	-3.36%	-3.36%
700100	Banking	1.6300	1.6300	1.6304	1.6304	-0.02%	-0.02%
700200	Credit agencies other than banks	1.7737	1.7737	1.7848	1.7848	-0.62%	-0.62%
700300	Security and commodity brokers	1.5913	1.5913	1.5898	1.5898	0.09%	0.09%
700400	Insurance carriers	1.9959	1.9959	1.9965	1.9965	-0.03%	-0.03%
700500	Insurance agents, brokers, and services	1.5597	1.5597	1.5601	1.5601	-0.02%	-0.02%
710100	Owner-occupied dwellings	1.2298	1.2298	1.2303	1.2303	-0.04%	-0.04%
710201	Real estate agents, managers, operators, and lessors	1.4900	1.4900	1.4902	1.4902	-0.02%	-0.02%
710202	Royalties	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%
720101	Hotels	1.7033	1.7033	1.6840	1.6840	1.14%	1.14%
720102	Other lodging places	2.0726	2.0726	1.8529	1.8529	11.85%	11.85%
720201	Laundry, cleaning, garment services, and shoe repair	1.7392	1.7392	1.7469	1.7469	-0.44%	-0.44%
720202	Funeral service and crematories	1.6691	1.6691	1.6471	1.6471	1.34%	1.34%
720203	Portrait photographic studios, and other miscellaneous personal services	1.8458	1.8458	1.8264	1.8264	1.06%	1.06%
720204	Electrical repair shops	1.5440	1.5440	1.6097	1.6097	-4.08%	-4.08%
720205	Watch, clock, jewelry, and furniture repair	1.5812	1.5812	1.7773	1.7773	-11.03%	-11.03%
720300	Beauty and barber shops	1.8435	1.8435	1.8395	1.8395	0.22%	0.22%
730101	Miscellaneous repair shops	1.4341	1.4341	1.5636	1.5636	-8.28%	-8.28%
730102	Services to dwellings and other buildings	1.4073	1.4073	1.4069	1.4069	0.03%	0.03%
730103	Personnel supply services	1.1446	1.1446	1.1446	1.1446	0.00%	0.00%
730104	Computer and data processing services	1.6848	1.6848	1.6887	1.6887	-0.23%	-0.23%
730106	Detective and protective services	1.2521	1.2521	1.2521	1.2521	0.00%	0.00%
730107	Miscellaneous equipment rental and leasing	1.4095	1.4095	1.5142	1.5142	-6.91%	-6.91%
730108	Photofinishing labs and commercial photography	1.5436	1.5436	1.5687	1.5687	-1.60%	-1.60%
730109	Other business services	1.5226	1.5226	1.5294	1.5294	-0.45%	-0.45%
730111	Management and public relations services	1.6098	1.6098	1.6095	1.6095	0.02%	0.02%
730112	Research, development, and testing services, except noncommercial	1.6045	1.6045	1.5974	1.5974	0.44%	0.44%
730200	Advertising	1.8175	1.8175	1.8136	1.8136	0.22%	0.22%
730301	Legal services	1.4471	1.4471	1.4469	1.4469	0.02%	0.02%
730302	Engineering, architectural, and surveying services	1.5710	1.5710	1.5661	1.5661	0.32%	0.32%
730303	Accounting, auditing and bookkeeping, and miscellaneous services, n.e.c.	1.6671	1.6671	1.6675	1.6675	-0.02%	-0.02%
740000	Eating and drinking places	2.0747	2.0747	2.0160	2.0160	2.91%	2.91%
750001	Automotive rental and leasing, without drivers	1.8233	1.8233	1.8424	1.8424	-1.04%	-1.04%
750002	Automotive repair shops and services	1.9431	1.9431	1.7733	1.7733	9.58%	9.58%
750003	Automobile parking and car washes	1.6671	1.6671	1.6720	1.6720	-0.29%	-0.29%
760101	Motion picture services and theaters	2.1573	2.1573	2.1185	2.1185	1.83%	1.83%
760102	Video tape rental	1.8463	1.8463	1.8366	1.8366	0.53%	0.53%
760201	Theatrical producers (except motion picture), bands, orchestras and entertainers	1.9451	1.9451	1.9397	1.9397	0.28%	0.28%
760202	Bowling centers	1.6176	1.6176	1.6346	1.6346	-1.04%	-1.04%
760203	Professional sports clubs and promoters	1.4511	1.4511	1.4298	1.4298	1.49%	1.49%
760204	Racing, including track operation	1.8688	1.8688	1.8549	1.8549	0.75%	0.75%
760205	Physical fitness facilities and membership sports and recreation clubs	1.7053	1.7053	1.7241	1.7241	-1.09%	-1.09%
760206	Other amusement and recreation services	1.5384	1.5384	1.6683	1.6683	-7.78%	-7.78%
770100	Doctors and dentists	1.4751	1.4751	1.4742	1.4742	0.06%	0.06%
770200	Hospitals	1.7239	1.7239	1.7163	1.7163	0.45%	0.45%
770301	Nursing and personal care facilities	1.5695	1.5695	1.5771	1.5771	-0.48%	-0.48%
770303	Other medical and health services	1.4483	1.4483	1.5084	1.5084	-3.99%	-3.99%
770304	Veterinary services	1.9992	1.9992	1.8616	1.8616	7.40%	7.40%
770305	Other medical and health services	1.5762	1.5762	1.5581	1.5581	1.17%	1.17%
770401	Elementary and secondary schools	1.7254	1.7254	1.7532	1.7532	-1.59%	-1.59%
770402	Colleges, universities, and professional schools	1.7617	1.7617	1.8359	1.8359	-4.04%	-4.04%
770403	Private libraries, vocational schools, and educational services, n.e.c.	1.6949	1.6949	1.6943	1.6943	0.03%	0.03%
770501	Business associations and professional membership organizations	2.0010	2.0010	1.9641	1.9641	1.87%	1.87%
770502	Labor organizations, civic, social, and fraternal associations	2.0156	2.0156	1.9850	1.9850	1.54%	1.54%
770503	Religious organizations	1.4339	1.4339	1.4341	1.4341	-0.02%	-0.02%
770504	Other membership organizations	2.1092	2.1092	2.0929	2.0929	0.78%	0.78%
770600	Job training and related services	1.6474	1.6474	1.6252	1.6252	1.37%	1.37%
770700	Child day care services	1.7072	1.7072	1.7057	1.7057	0.09%	0.09%
770800	Residential care	1.7439	1.7439	1.7378	1.7378	0.35%	0.35%
770900	Social services, n.e.c.	1.8711	1.8711	1.8654	1.8654	0.30%	0.30%
780100	U.S. Postal Service	1.3375	1.3375	1.3370	1.3370	0.04%	0.04%
780200	Federal electric utilities	0.1831	1.0922	0.1829	1.0920	0.08%	0.01%
780500	Other Federal Government enterprises	1.2520	1.2520	1.2515	1.2515	0.04%	0.04%
790100	State and local government passenger transit	0.3101	1.2192	0.3106	1.2197	-0.17%	-0.04%
790200	State and local government electric utilities	0.1510	1.0601	0.1506	1.0596	0.30%	0.04%
790300	Other State and local government enterprises	2.1092	2.1092	2.1099	2.1099	-0.03%	-0.03%

Table Appendix 2 - Primary, secondary and total output before and after refefinition

Code	Discription	${}^{A}g$	${}^{A}q$	${}^{A}g^{P}$	${}^{A}g^{S}$	${}^{A}q^{S}$	${}^{T}g$	${}^{T}q$	${}^{T}g^{P}$	${}^{T}g^{S}$	${}^{T}q^{S}$	${}^{A}K={}^{A}q/{}^{A}g$	${}^{T}K={}^{T}q/{}^{T}g$
010100	Dairy farm products	20285	19646	19646	639	0	20285	19646	19646	639	0	0.97	0.97
010200	Poultry and eggs	15611	15514	15514	97	0	15611	15514	15514	97	0	0.99	0.99
010301	Meat animals	52103	51069	51069	1034	0	52103	51069	51069	1034	0	0.98	0.98
010302	Miscellaneous livestock	3505	3146	3146	359	0	3505	3146	3146	359	0	0.90	0.90
020100	Cotton	4801	4724	4724	77	0	4801	4724	4724	77	0	0.98	0.98
020201	Food grains	9643	9459	9459	184	0	9643	9459	9459	184	0	0.98	0.98
020202	Feed grains	38458	37945	37945	513	0	38458	37945	37945	513	0	0.99	0.99
020203	Grass seeds	547	545	545	2	0	547	545	545	2	0	1.00	1.00
020300	Tobacco	3125	3061	3061	64	0	3125	3061	3061	64	0	0.98	0.98
020401	Fruits	8882	8708	8708	174	0	8882	8708	8708	174	0	0.98	0.98
020402	Tree nuts	1585	1561	1561	24	0	1585	1561	1561	24	0	0.98	0.98
020501	Vegetables	12124	11993	11993	131	0	12124	11993	11993	131	0	0.99	0.99
020502	Sugar crops	2196	2162	2162	34	0	2196	2162	2162	34	0	0.98	0.98
020503	Miscellaneous crops	795	787	787	8	0	795	787	787	8	0	0.99	0.99
020600	Oil bearing crops	13905	13629	13629	276	0	13905	13629	13629	276	0	0.98	0.98
02070m	Forest and related products	12233	9972	9972	2261	0	12233	9972	9972	2261	0	0.82	0.82
030001	Forestry products	5877	8129	5877	0	2252	5877	8129	5877	0	2252	1.38	1.38
030002	Commercial fishing	3736	3736	3736	0	0	3736	3736	3736	0	0	1.00	1.00
040001	Agricultural, forestry, and fishery services	12293	14321	12118	175	2203	12767	14321	12767	0	1554	1.16	1.12
040002	Landscape and horticultural services	15251	15484	15011	240	473	15484	15484	15484	0	0	1.02	1.00
050001	Iron and ferroalloy ores, and miscellaneous metal ores, n.e.c.	2038	2129	2028	10	101	2037	2129	2028	9	101	1.04	1.05
060100	Copper ore	3458	3365	3350	108	15	3458	3365	3350	108	15	0.97	0.97
060200	Nonferrous metal ores, except copper	5255	5245	5227	28	18	5254	5245	5227	27	18	1.00	1.00
070000	Coal	26979	26917	26907	72	10	26917	26917	26907	10	10	1.00	1.00
080001	Crude petroleum and natural gas	105371	97623	97613	7758	10	105369	97623	97613	7756	10	0.93	0.93
090001	Dimension, crushed and broken stone	5147	5157	4886	261	271	5143	5157	4886	257	271	1.00	1.00
090002	Sand and gravel	3207	3500	3035	172	465	3203	3500	3035	168	465	1.09	1.09
090003	Clay, ceramic, and refractory minerals	1401	1277	1268	133	9	1399	1277	1268	131	9	0.91	0.91
090004	Nonmetallic mineral services and miscellaneous	788	728	609	179	119	784	728	609	175	119	0.92	0.93
100000	Chemical and fertilizer minerals	3158	1621	1616	1542	5	3153	1621	1616	1537	5	0.51	0.51
110101	New residential 1 unit structures, nonfarm	115450	115450	115450	0	0	115450	115450	115450	0	0	1.00	1.00
110102	New residential 2-4 unit structures, nonfarm	3274	3274	3274	0	0	3274	3274	3274	0	0	1.00	1.00
110105	New residential additions and alterations, nonfarm	43239	43239	43239	0	0	43239	43239	43239	0	0	1.00	1.00
110108	New residential garden and high-rise apartments construction	10910	10910	10910	0	0	10910	10910	10910	0	0	1.00	1.00
110400	New highways, bridges, and other horizontal construction	33596	33596	33596	0	0	33596	33596	33596	0	0	1.00	1.00
110501	New farm residential construction	1833	1833	1833	0	0	1833	1833	1833	0	0	1.00	1.00
110601	Petroleum and natural gas well drilling	11633	11633	11633	0	0	11633	11633	11633	0	0	1.00	1.00
110602	Petroleum, natural gas, and solid mineral exploration	1673	1673	1673	0	0	1673	1673	1673	0	0	1.00	1.00
110603	Access structures for solid mineral development	1061	1061	1061	0	0	1061	1061	1061	0	0	1.00	1.00
110800	New office, industrial and commercial buildings construction	91887	91887	91887	0	0	91887	91887	91887	0	0	1.00	1.00
110900	Other new construction	142393	142393	142393	0	0	142393	142393	142393	0	0	1.00	1.00
120101	Maintenance and repair of farm and nonfarm residential structures	63282	63282	63282	0	0	63282	63282	63282	0	0	1.00	1.00
120214	Maintenance and repair of highways & streets	23061	23061	23061	0	0	23061	23061	23061	0	0	1.00	1.00
120215	Maintenance and repair of petroleum and natural gas wells	1719	1719	1719	0	0	1719	1719	1719	0	0	1.00	1.00
120300	Other repair and maintenance construction	134319	134319	134319	0	0	134319	134319	134319	0	0	1.00	1.00
130100	Guided missiles and space vehicles	16706	12445	12082	4624	363	16558	12445	12082	4476	363	0.74	0.75
130200	Ammunition, except for small arms, n.e.c.	3058	2973	2569	489	404	3042	2973	2569	473	404	0.97	0.98
130300	Tanks and tank components	2280	2591	2223	57	368	2274	2591	2223	51	368	1.14	1.14
130500	Small arms	1396	1342	1295	101	47	1375	1342	1295	80	47	0.96	0.98
130600	Small arms ammunition	1165	1267	1130	35	137	1164	1267	1130	34	137	1.09	1.09
130700	Ordnance and accessories, n.e.c.	1350	1599	1323	27	276	1347	1599	1323	24	276	1.18	1.19
140101	Meat packing plants	48134	49876	44249	3885	5627	48871	49876	45001	3870	4875	1.04	1.02
140102	Sausages and other prepared meat products	18506	16498	13059	5447	3439	18670	16498	13458	5212	3040	0.89	0.88

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140105	Poultry slaughtering and processing	23301	25130	22963	338	2167	24800	25130	24473	327	657	1.08	1.01
140200	Creamery butter	1004	1233	759	245	474	1003	1233	759	244	474	1.23	1.23
140300	Natural, processed, and imitation cheese	17777	15901	15392	2385	509	17720	15901	15392	2328	509	0.89	0.90
140400	Dry, condensed, and evaporated dairy products	7283	7429	6007	1276	1422	7187	7429	6007	1180	1422	1.02	1.03
140500	Ice cream and frozen desserts	4863	5311	4482	381	829	4828	5311	4482	346	829	1.09	1.10
140600	Fluid milk	20078	18985	17149	2929	1836	19689	18985	17149	2540	1836	0.95	0.96
140700	Canned and cured fish and seafoods	949	1160	853	96	307	938	1160	853	85	307	1.22	1.24
140800	Canned specialties	6603	5757	5033	1570	724	6566	5757	5033	1533	724	0.87	0.88
140900	Canned fruits, vegetables, preserves, jams, and jellies	14574	15202	12735	1839	2467	14497	15202	12735	1762	2467	1.04	1.05
141000	Dehydrated fruits, vegetables, and soups	2805	2767	2528	277	239	2798	2767	2528	270	239	0.99	0.99
141100	Pickles, sauces, and salad dressings	6343	6565	5201	1142	1364	6324	6565	5201	1123	1364	1.03	1.04
141200	Prepared fresh or frozen fish and seafoods	6691	6537	6416	275	121	6665	6537	6416	249	121	0.98	0.98
141301	Frozen fruits, fruit juices, and vegetables	7432	7449	6897	535	552	7420	7449	6897	523	552	1.00	1.00
141302	Frozen specialties, n.e.c.	7643	7239	6998	645	241	7513	7239	6998	515	241	0.95	0.96
141401	Flour and other grain mill products	6100	5878	5601	499	277	6053	5878	5601	452	277	0.96	0.97
141402	Cereal breakfast foods	9400	7815	7527	1873	288	8974	7815	7527	1447	288	0.83	0.87
141403	Prepared flour mixes and doughs	3729	4247	3345	384	902	3669	4247	3345	324	902	1.14	1.16
141501	Dog and cat food	6360	6329	6141	219	188	6176	6329	6141	35	188	1.00	1.02
141502	Prepared feeds, n.e.c.	13626	16695	13233	393	3462	16790	16695	16528	262	167	1.23	0.99
141600	Rice milling	1598	1626	1552	46	74	1593	1626	1552	41	74	1.02	1.02
141700	Wet corn milling	6916	6402	6084	832	318	6907	6402	6084	823	318	0.93	0.93
141801	Bread, cake, and related products	16292	23834	14373	1919	9461	24073	23834	23393	680	441	1.46	0.99
141802	Cookies and crackers	8048	7126	6688	1360	438	7604	7126	6688	916	438	0.89	0.94
141803	Frozen bakery products, except bread	1661	1855	1476	185	379	1653	1855	1476	177	379	1.12	1.12
141900	Sugar	6649	6653	6637	12	16	6644	6653	6637	7	16	1.00	1.00
142002	Chocolate and cocoa products	3064	1618	1378	1686	240	3038	1618	1378	1660	240	0.53	0.53
142004	Salted and roasted nuts and seeds	2837	2712	2555	282	157	2832	2712	2555	277	157	0.96	0.96
142005	Candy and other confectionery products	10047	11708	9619	428	2089	9859	11708	9621	238	2087	1.17	1.19
142101	Malt beverages	20599	20585	20583	16	2	20593	20585	20583	10	2	1.00	1.00
142102	Malt	566	567	566	0	1	566	567	566	0	1	1.00	1.00
142103	Wines, brandy, and brandy spirits	5105	5032	4987	118	45	5089	5032	4987	102	45	0.99	0.99
142104	Distilled and blended liquors	6655	6750	6548	107	202	6576	6750	6548	28	202	1.01	1.03
142200	Bottled and canned soft drinks	24238	24022	23108	1130	914	23756	24022	23108	648	914	0.99	1.01
142300	Flavoring extracts and flavoring syrups, n.e.c.	6894	6847	6316	578	531	6876	6847	6316	560	531	0.99	1.00
142400	Cottonseed oil mills	664	723	638	26	85	658	723	638	20	85	1.09	1.10
142500	Soybean oil mills	10228	8980	8578	1650	402	10204	8980	8578	1626	402	0.88	0.88
142600	Vegetable oil mills, n.e.c.	638	752	576	62	176	637	752	576	61	176	1.18	1.18
142700	Animal and marine fats and oils	1792	2804	1736	56	1068	1787	2804	1736	51	1068	1.56	1.57
142800	Roasted coffee	5147	4710	4686	461	24	5083	4710	4686	397	24	0.92	0.93
142900	Edible fats and oils, n.e.c.	4631	5501	3900	731	1601	4614	5501	3900	714	1601	1.19	1.19
143000	Manufactured ice	358	359	355	3	4	355	359	355	0	4	1.00	1.01
143100	Macaroni, spaghetti, vermicelli, and noodles	1370	1295	1286	84	9	1360	1295	1286	74	9	0.95	0.95
143201	Potato chips and similar snacks	7165	7558	6968	197	590	7076	7558	6968	108	590	1.05	1.07
143202	Food preparations, n.e.c.	11962	14735	11230	732	3505	11898	14735	11230	668	3505	1.23	1.24
150101	Cigarettes	34766	34156	34154	612	2	34720	34156	34154	566	2	0.98	0.98
150102	Cigars	316	325	305	11	20	315	325	305	10	20	1.03	1.03
150103	Chewing and smoking tobacco and snuff	1539	1539	1514	25	25	1539	1539	1514	25	25	1.00	1.00
150200	Tobacco stemming and redrying	3308	4127	3257	51	870	3567	4127	3566	1	561	1.25	1.16
160100	Broadwoven fabric mills and fabric finishing plants	22283	25731	19695	2588	6036	27952	25731	25380	2572	351	1.15	0.92
160200	Narrow fabric mills	1324	1282	1244	80	38	1322	1282	1244	78	38	0.97	0.97
160300	Yarn mills and finishing of textiles, n.e.c.	11527	9670	9236	2291	434	11525	9670	9236	2289	434	0.84	0.84
160400	Thread mills	847	845	829	18	16	847	845	829	18	16	1.00	1.00
170100	Carpets and rugs	9822	9686	9659	163	27	9807	9686	9659	148	27	0.99	0.99

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170600	Coated fabrics, not rubberized	1514	1471	1315	199	156	1510	1471	1315	195	156	0.97	0.97
170700	Tire cord and fabrics	983	936	936	47	0	982	936	936	46	0	0.95	0.95
170900	Cordage and twine	647	638	593	54	45	626	638	593	33	45	0.99	1.02
171001	Nonwoven fabrics	2896	3297	2711	185	586	2886	3297	2711	175	586	1.14	1.14
171100	Textile goods, n.e.c.	1769	1955	1689	80	266	1769	1955	1689	80	266	1.11	1.11
180101	Women's hosiery, except socks	1859	3127	1827	32	1300	1857	3127	1827	30	1300	1.68	1.68
180102	Hosiery, n.e.c.	2536	1266	1231	1305	35	2529	1266	1231	1298	35	0.50	0.50
18023m	Knit and related products	12573	7444	6947	5626	497	12559	7444	6947	5612	497	0.59	0.59
180400	Apparel made from purchased materials	52132	56800	51327	805	5473	52187	56800	51818	369	4982	1.09	1.09
190100	Curtains and draperies	1288	1323	1184	104	139	1270	1323	1184	86	139	1.03	1.04
190200	Housefurnishings, n.e.c.	5626	7375	5268	358	2107	5602	7375	5268	334	2107	1.31	1.32
190301	Textile bags	749	750	691	58	59	741	750	691	50	59	1.00	1.01
190302	Canvas and related products	1142	1143	1081	61	62	1131	1143	1081	50	62	1.00	1.01
190303	Pleating and stitching	754	849	701	53	148	747	849	701	46	148	1.13	1.14
190304	Automotive and apparel trimmings	6166	6098	5976	190	122	6166	6098	5976	190	122	0.99	0.99
190305	Schiffli machine embroideries	315	305	293	22	12	314	305	293	21	12	0.97	0.97
190306	Fabricated textile products, n.e.c.	3135	3178	2949	186	229	3084	3178	2949	135	229	1.01	1.03
200100	Logging	19327	19674	18981	346	693	19287	19674	18981	306	693	1.02	1.02
200200	Sawmills and planing mills, general	21027	21415	19914	1113	1501	20951	21415	19914	1037	1501	1.02	1.02
200300	Hardwood dimension and flooring mills	2064	2051	1933	131	118	2054	2051	1933	121	118	0.99	1.00
200400	Special product sawmills, n.e.c.	163	159	157	6	2	162	159	157	5	2	0.98	0.98
200501	Millwork	9553	9550	9065	488	485	9580	9550	9158	422	392	1.00	1.00
200502	Wood kitchen cabinets	5112	5035	4915	197	120	5095	5035	4915	180	120	0.98	0.99
200600	Veneer and plywood	7479	6867	6630	849	237	7460	6867	6630	830	237	0.92	0.92
200701	Structural wood members, n.e.c.	2469	2395	2338	131	57	2444	2395	2338	106	57	0.97	0.98
200702	Prefabricated wood buildings and components	2101	2162	2058	43	104	2094	2162	2058	36	104	1.03	1.03
200703	Mobile homes	4483	4515	4464	19	51	4482	4515	4464	18	51	1.01	1.01
200800	Wood preserving	2700	2700	2604	96	96	2684	2700	2604	80	96	1.00	1.01
200901	Wood pallets and skids	2175	2122	1992	183	130	2164	2122	1992	172	130	0.98	0.98
200903	Wood products, n.e.c.	3741	3730	3482	259	248	3665	3730	3482	183	248	1.00	1.02
200904	Reconstituted wood products	3940	3975	3892	48	83	3933	3975	3892	41	83	1.01	1.01
210000	Wood containers, n.e.c.	779	777	690	89	87	774	777	690	84	87	1.00	1.00
220101	Wood household furniture, except upholstered	8585	8185	8009	576	176	8477	8185	8009	468	176	0.95	0.97
220102	Household furniture, n.e.c.	454	490	417	37	73	453	490	417	36	73	1.08	1.08
220103	Wood television and radio cabinets	328	388	303	25	85	328	388	303	25	85	1.18	1.18
220200	Upholstered household furniture	6226	5897	5746	480	151	6209	5897	5746	463	151	0.95	0.95
220300	Metal household furniture	2044	1906	1834	210	72	2025	1906	1834	191	72	0.93	0.94
220400	Mattresses and bedsprings	2839	3155	2708	131	447	2813	3155	2708	105	447	1.11	1.12
230100	Wood office furniture	1944	2016	1793	151	223	1963	2016	1827	136	189	1.04	1.03
230200	Office furniture, except wood	5905	5788	5550	355	238	5842	5788	5550	292	238	0.98	0.99
230300	Public building and related furniture	4435	4402	4195	240	207	4411	4402	4195	216	207	0.99	1.00
230400	Wood partitions and fixtures	3067	3251	2852	215	399	3013	3251	2852	161	399	1.06	1.08
230500	Partitions and fixtures, except wood	3361	3285	2995	366	290	3329	3285	2995	334	290	0.98	0.99
230600	Drapery hardware and window blinds and shades	1835	1839	1794	41	45	1805	1839	1794	11	45	1.00	1.02
230700	Furniture and fixtures, n.e.c.	2332	2247	2069	263	178	2297	2247	2069	228	178	0.96	0.98
240100	Pulp mills	5515	6200	4488	1027	1712	5515	6200	4488	1027	1712	1.12	1.12
240400	Envelopes	2650	2678	2561	89	117	2641	2678	2561	80	117	1.01	1.01
240500	Sanitary paper products	15466	14924	14669	797	255	15338	14924	14669	669	255	0.96	0.97
240701	Paper coating and glazing	11071	10774	9413	1658	1361	11011	10774	9413	1598	1361	0.97	0.98
240702	Bags, except textile	8395	8056	7548	847	508	8377	8056	7548	829	508	0.96	0.96
240703	Die-cut paper and paperboard and cardboard	1947	2049	1810	137	239	1910	2049	1810	100	239	1.05	1.07
240705	Stationery, tablets, and related products	1347	1290	1053	294	237	1326	1290	1053	273	237	0.96	0.97
240706	Converted paper products, n.e.c.	4412	4287	3898	514	389	4339	4287	3898	441	389	0.97	0.99

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240800	Paper and paperboard mills	48918	48239	46713	2205	1526	49077	48239	46908	2169	1331	0.99	0.98
250000	Paperboard containers and boxes	31912	31743	31260	652	483	31806	31743	31260	546	483	0.99	1.00
260100	Newspapers	34401	8541	8541	25860	0	34388	8541	8541	25847	0	0.25	0.25
260200	Periodicals	22463	11354	10307	12156	1047	22304	11354	10307	11997	1047	0.51	0.51
260301	Book publishing	16816	15875	15209	1607	666	16482	15875	15209	1273	666	0.94	0.96
260302	Book printing	4660	4849	4135	525	714	4644	4849	4135	509	714	1.04	1.04
260400	Miscellaneous publishing	11072	5432	4339	6733	1093	11021	5432	4339	6682	1093	0.49	0.49
260501	Commercial printing	57887	34600	31837	26050	2763	57545	34600	31850	25695	2750	0.60	0.60
260601	Manifold business forms	7148	6818	6533	615	285	7026	6818	6533	493	285	0.95	0.97
260602	Blankbooks, looseleaf binders and devices	3674	3435	3248	426	187	3622	3435	3248	374	187	0.93	0.95
260700	Greeting cards	3958	3213	3113	845	100	3635	3213	3113	522	100	0.81	0.88
260802	Bookbinding and related work	1325	1348	1246	79	102	1316	1348	1246	70	102	1.02	1.02
260803	Typesetting	1745	2005	1655	90	350	1736	2005	1655	81	350	1.15	1.15
260806	Platemaking and related services	3468	3627	3348	120	279	3465	3627	3348	117	279	1.05	1.05
270100	Industrial inorganic and organic chemicals	89685	92325	77080	12605	15245	89100	92325	77080	12020	15245	1.03	1.04
27020m	Fertilizers	9018	9472	6790	2228	2682	8928	9472	6790	2138	2682	1.05	1.06
270300	Pesticides and agricultural chemicals, n.e.c.	8983	8378	7357	1626	1021	8901	8378	7357	1544	1021	0.93	0.94
270401	Gum and wood chemicals	730	811	637	93	174	728	811	637	91	174	1.11	1.11
270402	Adhesives and sealants	5491	5478	4908	583	570	5420	5478	4908	512	570	1.00	1.01
270403	Explosives	1199	1220	1183	16	37	1187	1220	1183	4	37	1.02	1.03
270404	Printing ink	3055	3091	2976	79	115	3034	3091	2976	58	115	1.01	1.02
270405	Carbon black	618	618	618	0	0	618	618	618	0	0	1.00	1.00
270406	Chemicals and chemical preparations, n.e.c.	9861	9816	8325	1536	1491	9736	9816	8325	1411	1491	1.00	1.01
280100	Plastics materials and resins	31091	33250	26680	4411	6570	31027	33250	26680	4347	6570	1.07	1.07
280200	Synthetic rubber	4124	4361	3267	857	1094	4115	4361	3267	848	1094	1.06	1.06
280300	Cellulosic manmade fibers	1780	1725	1656	124	69	1780	1725	1656	124	69	0.97	0.97
280400	Manmade organic fibers, except cellulosic	11089	11608	8981	2108	2627	11089	11608	8981	2108	2627	1.05	1.05
290100	Drugs	66394	62321	60829	5565	1492	62656	62321	60829	1827	1492	0.94	0.99
290201	Soap and other detergents	13733	11168	10155	3578	1013	12902	11168	10155	2747	1013	0.81	0.87
290202	Polishes and sanitation goods	6406	6563	4637	1769	1926	6104	6563	4637	1467	1926	1.02	1.08
290203	Surface active agents	2792	3813	2384	408	1429	2744	3813	2384	360	1429	1.37	1.39
290300	Toilet preparations	18446	19013	17078	1368	1935	17867	19013	17078	789	1935	1.03	1.06
300000	Paints and allied products	14499	14379	13893	606	486	14198	14379	13893	305	486	0.99	1.01
310101	Petroleum refining	132377	134555	124827	7550	9728	132262	134555	124827	7435	9728	1.02	1.02
310102	Lubricating oils and greases	4874	6737	4521	353	2216	4824	6737	4521	303	2216	1.38	1.40
310103	Products of petroleum and coal, n.e.c.	817	858	634	183	224	812	858	634	178	224	1.05	1.06
310200	Asphalt paving mixtures and blocks	4067	4047	3837	230	210	4061	4047	3837	224	210	1.00	1.00
310300	Asphalt felts and coatings	3775	3634	3578	197	56	3731	3634	3578	153	56	0.96	0.97
320100	Tires and inner tubes	11966	11771	11640	326	131	11862	11771	11640	222	131	0.98	0.99
320200	Rubber and plastics footwear	845	823	813	32	10	831	823	813	18	10	0.97	0.99
320300	Fabricated rubber products, n.e.c.	11278	11243	10418	860	825	11160	11243	10418	742	825	1.00	1.01
320400	Miscellaneous plastics products, n.e.c.	82229	82141	78021	4208	4120	81693	82141	78021	3672	4120	1.00	1.01
320500	Rubber and plastics hose and belting	2577	2665	2433	144	232	2567	2665	2433	134	232	1.03	1.04
320600	Gaskets, packing, and sealing devices	3221	3170	2939	282	231	3184	3170	2939	245	231	0.98	1.00
330001	Leather tanning and finishing	2945	3047	2894	51	153	2940	3047	2894	46	153	1.03	1.04
340100	Boot and shoe cut stock and findings	313	317	292	21	25	312	317	292	20	25	1.01	1.02
340201	Shoes, except rubber	3442	3414	3363	79	51	3389	3414	3363	26	51	0.99	1.01
340202	House slippers	274	260	255	19	5	268	260	255	13	5	0.95	0.97
340301	Leather gloves and mittens	126	115	106	20	9	121	115	106	15	9	0.91	0.95
340302	Luggage	936	876	841	95	35	899	876	841	58	35	0.94	0.97
340303	Women's handbags and purses	464	433	424	40	9	458	433	424	34	9	0.93	0.95
340304	Personal leather goods, n.e.c.	433	546	419	14	127	428	546	419	9	127	1.26	1.28
340305	Leather goods, n.e.c.	568	530	504	64	26	553	530	504	49	26	0.93	0.96

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350100	Glass and glass products, except containers	12955	13114	12684	271	430	12903	13114	12684	219	430	1.01	1.02
350200	Glass containers	4901	4867	4867	34	0	4900	4867	4867	33	0	0.99	0.99
360100	Cement, hydraulic	3930	3957	3886	44	71	3914	3957	3886	28	71	1.01	1.01
360200	Brick and structural clay tile	1062	1042	1038	24	4	1052	1042	1038	14	4	0.98	0.99
360300	Ceramic wall and floor tile	666	669	659	7	10	659	669	659	0	10	1.00	1.02
360400	Clay refractories	859	798	758	101	40	848	798	758	90	40	0.93	0.94
360500	Structural clay products, n.e.c.	126	125	123	3	2	126	125	123	3	2	0.99	0.99
360600	Vitreous china plumbing fixtures	865	805	801	64	4	855	805	801	54	4	0.93	0.94
360701	Vitreous china table and kitchenware	313	307	305	8	2	309	307	305	4	2	0.98	0.99
360702	Fine earthenware table and kitchenware	45	45	43	2	2	45	45	43	2	2	1.00	1.00
360800	Porcelain electrical supplies	897	869	829	68	40	894	869	829	65	40	0.97	0.97
360900	Pottery products, n.e.c.	668	635	611	57	24	654	635	611	43	24	0.95	0.97
361000	Concrete block and brick	1743	1703	1509	234	194	1638	1703	1509	129	194	0.98	1.04
361100	Concrete products, except block and brick	5708	5734	5524	184	210	5652	5734	5524	128	210	1.00	1.01
361200	Ready-mixed concrete	12048	11528	11331	717	197	11900	11528	11331	569	197	0.96	0.97
361300	Lime	897	857	807	90	50	896	857	807	89	50	0.96	0.96
361400	Gypsum products	2014	1939	1920	94	19	2005	1939	1920	85	19	0.96	0.97
361500	Cut stone and stone products	1009	1001	975	34	26	993	1001	975	18	26	0.99	1.01
361600	Abrasive products	3611	3193	3025	586	168	3572	3193	3025	547	168	0.88	0.89
361700	Asbestos products	72	71	41	31	30	71	71	41	30	30	0.99	1.00
361900	Minerals, ground or treated	1742	1893	1578	164	315	1738	1893	1578	160	315	1.09	1.09
362000	Mineral wool	3199	3069	3058	141	11	3191	3069	3058	133	11	0.96	0.96
362100	Nonclay refractories	1170	1305	1075	95	230	1162	1305	1075	87	230	1.12	1.12
362200	Nonmetallic mineral products, n.e.c.	711	746	665	46	81	702	746	665	37	81	1.05	1.06
37010m	Steel sheet and related	57989	55264	42538	15451	12726	57885	55264	42538	15347	12726	0.95	0.95
370200	Iron and steel foundries	11658	11469	11291	367	178	11653	11469	11291	362	178	0.98	0.98
370300	Iron and steel forgings	3185	3408	2960	225	448	3182	3408	2960	222	448	1.07	1.07
370401	Metal heat treating	1978	1989	1924	54	65	1976	1989	1924	52	65	1.01	1.01
370402	Primary metal products, n.e.c.	1843	1792	1520	323	272	1838	1792	1520	318	272	0.97	0.97
380100	Primary smelting and refining of copper	5466	5822	4967	499	855	5457	5822	4967	490	855	1.07	1.07
380400	Primary aluminum	5679	9673	5437	242	4236	5601	9673	5437	164	4236	1.70	1.73
38056m	Nonferrous metals	8548	5721	2244	6304	3477	8505	5721	2244	6261	3477	0.67	0.67
380700	Rolling, drawing, and extruding of copper	5909	5780	5701	208	79	5905	5780	5701	204	79	0.98	0.98
380800	Aluminum rolling and drawing	14986	14173	13824	1162	349	14753	14173	13824	929	349	0.95	0.96
380900	Nonferrous rolling and drawing, n.e.c.	2653	2435	2296	357	139	2647	2435	2296	351	139	0.92	0.92
381000	Nonferrous wiredrawing and insulating	12836	13157	12266	570	891	12779	13157	12266	513	891	1.03	1.03
38124m	Copper foundris and non ferrous casting	8092	8052	5619	2473	2433	8069	8052	5619	2450	2433	1.00	1.00
390100	Metal cans	11955	12093	11835	120	258	11948	12093	11835	113	258	1.01	1.01
390200	Metal shipping barrels, drums, kegs, and pails	1131	1145	1031	100	114	1117	1145	1031	86	114	1.01	1.03
400100	Enameled iron and metal sanitary ware	793	729	699	94	30	787	729	699	88	30	0.92	0.93
400200	Plumbing fixture fittings and trim	2572	2566	2440	132	126	2562	2566	2440	122	126	1.00	1.00
400300	Heating equipment, except electric and warm air furnaces	2286	2321	2120	166	201	2264	2321	2120	144	201	1.02	1.03
400400	Fabricated structural metal	8361	8304	7901	460	403	8309	8304	7901	408	403	0.99	1.00
400500	Metal doors, sash, frames, molding, and trim	6986	6572	6326	660	246	6947	6572	6326	621	246	0.94	0.95
400600	Fabricated plate work (boiler shops)	8963	8915	8282	681	633	8900	8915	8282	618	633	0.99	1.00
400700	Sheet metal work	11314	11101	10415	899	686	11307	11101	10415	892	686	0.98	0.98
400800	Architectural and ornamental metal work	2377	2508	2151	226	357	2360	2508	2151	209	357	1.06	1.06
400901	Prefabricated metal buildings and components	2781	2708	2609	172	99	2765	2708	2609	156	99	0.97	0.98
400902	Miscellaneous structural metal work	3260	3326	2976	284	350	3240	3326	2976	264	350	1.02	1.03
410100	Screw machine products, bolts, etc.	8757	8617	8362	395	255	8644	8617	8362	282	255	0.98	1.00
410201	Automotive stampings	15544	15949	14543	1001	1406	15527	15949	14543	984	1406	1.03	1.03
410202	Crowns and closures	841	830	806	35	24	840	830	806	34	24	0.99	0.99
410203	Metal stampings, n.e.c.	9443	9168	8352	1091	816	9375	9168	8352	1023	816	0.97	0.98

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420100	Cutlery	1505	1512	1371	134	141	1468	1512	1371	97	141	1.00	1.03
420201	Hand and edge tools, except machine tools and handsaws	3935	3737	3421	514	316	3759	3737	3421	338	316	0.95	0.99
420202	Saw blades and handsaws	792	745	671	121	74	768	745	671	97	74	0.94	0.97
420300	Hardware, n.e.c.	8598	8548	8174	424	374	8493	8548	8184	309	364	0.99	1.01
420401	Plating and polishing	4771	4736	4449	322	287	4758	4736	4449	309	287	0.99	1.00
420402	Coating,engraving, and allied services, n.e.c.	5215	5414	5003	212	411	5213	5414	5016	197	398	1.04	1.04
420500	Miscellaneous fabricated wire products	5113	7152	4748	365	2404	5045	7152	4748	297	2404	1.40	1.42
420700	Steel springs, except wire	446	471	386	60	85	438	471	386	52	85	1.06	1.08
420800	Pipe, valves, and pipe fittings	14405	14355	13186	1219	1169	14258	14355	13186	1072	1169	1.00	1.01
421000	Metal foil and leaf	3085	2962	2553	532	409	3085	2962	2553	532	409	0.96	0.96
421100	Fabricated metal products, n.e.c.	6746	6886	6274	472	612	6672	6886	6274	398	612	1.02	1.03
430100	Turbines and turbine generator sets	5664	6184	4985	679	1199	5624	6184	4985	639	1199	1.09	1.10
430200	Internal combustion engines, n.e.c.	11482	11711	10591	891	1120	11403	11711	10591	812	1120	1.02	1.03
440001	Farm machinery and equipment	9383	9088	8655	728	433	9191	9088	8655	536	433	0.97	0.99
440002	Lawn and garden equipment	5075	4436	4121	954	315	4953	4436	4121	832	315	0.87	0.90
450100	Construction machinery and equipment	12979	12584	12096	883	488	12788	12584	12096	692	488	0.97	0.98
450200	Mining machinery, except oil field	1457	1468	1253	204	215	1411	1468	1253	158	215	1.01	1.04
450300	Oil and gas field machinery and equipment	3717	3370	3271	446	99	3667	3370	3271	396	99	0.91	0.92
460100	Elevators and moving stairways	947	937	910	37	27	942	937	910	32	27	0.99	0.99
460200	Conveyors and conveying equipment	3763	3775	3451	312	324	3721	3775	3451	270	324	1.00	1.01
460300	Hoists, cranes, and monorails	880	861	792	88	69	865	861	792	73	69	0.98	1.00
460400	Industrial trucks and tractors	2655	2717	2507	148	210	2620	2717	2507	113	210	1.02	1.04
470100	Machine tools, metal cutting types	3474	3302	3088	386	214	3416	3302	3088	328	214	0.95	0.97
470200	Machine tools, metal forming types	1440	1459	1303	137	156	1418	1459	1303	115	156	1.01	1.03
470300	Special dies and tools and machine tool accessories	13050	14552	12318	732	2234	12925	14552	12318	607	2234	1.12	1.13
470401	Power-driven handtools	2641	2432	2118	523	314	2499	2432	2118	381	314	0.92	0.97
470402	Rolling mill machinery and equipment	580	576	549	31	27	579	576	549	30	27	0.99	0.99
470404	Electric and gas welding and soldering equipment	2649	2435	2346	303	89	2610	2435	2346	264	89	0.92	0.93
470405	Industrial patterns	554	712	526	28	186	553	712	526	27	186	1.29	1.29
470500	Metalworking machinery, n.e.c.	1597	1578	1408	189	170	1603	1578	1435	168	143	0.99	0.98
480100	Food products machinery	2308	2210	2022	286	188	2261	2210	2022	239	188	0.96	0.98
480200	Textile machinery	1475	1463	1432	43	31	1447	1463	1432	15	31	0.99	1.01
480300	Woodworking machinery	820	816	762	58	54	797	816	762	35	54	1.00	1.02
480400	Paper industries machinery	2371	2303	2159	212	144	2340	2303	2159	181	144	0.97	0.98
480500	Printing trades machinery and equipment	2450	2375	2267	183	108	2393	2375	2267	126	108	0.97	0.99
480600	Special industry machinery, n.e.c.	11126	11051	10374	752	677	10988	11051	10374	614	677	0.99	1.01
490100	Pumps and compressors	8823	8412	7939	884	473	8691	8412	7939	752	473	0.95	0.97
490200	Ball and roller bearings	4214	4154	4082	132	72	4174	4154	4082	92	72	0.99	1.00
490300	Blowers and fans	2942	3060	2761	181	299	2916	3060	2761	155	299	1.04	1.05
490500	Mechanical power transmission equipment	4086	4084	3834	252	250	4029	4084	3834	195	250	1.00	1.01
490600	Industrial process furnaces and ovens	1724	1762	1592	132	170	1710	1762	1592	118	170	1.02	1.03
490700	General industrial machinery and equipment, n.e.c.	5318	5224	4667	651	557	5193	5224	4667	526	557	0.98	1.01
490800	Packaging machinery	3066	2982	2815	251	167	3023	2982	2815	208	167	0.97	0.99
500100	Carburetors, pistons, rings, and valves	2067	1831	1538	529	293	2067	1831	1538	529	293	0.89	0.89
500200	Fluid power equipment	3173	3146	2755	418	391	3134	3146	2755	379	391	0.99	1.00
500300	Scales and balances, except laboratory	633	673	622	11	51	625	673	622	3	51	1.06	1.08
500400	Industrial and commercial machinery and equipment, n.e.c.	19363	19296	18436	927	860	19228	19296	18436	792	860	1.00	1.00
510102	Calculating and accounting machines	1269	1455	1164	105	291	1263	1455	1164	99	291	1.15	1.15
510103	Electronic computers	37684	31866	29836	7848	2030	37302	31866	29836	7466	2030	0.85	0.85
510104	Computer peripheral equipment	22693	25692	20725	1968	4967	22296	25692	20725	1571	4967	1.13	1.15
510400	Office machines, n.e.c.	3184	3075	2875	309	200	3060	3075	2879	181	196	0.97	1.00
520100	Automatic vending machines	782	762	754	28	8	772	762	754	18	8	0.97	0.99
520200	Commercial laundry equipment	552	543	508	44	35	546	543	508	38	35	0.98	0.99

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520300	Refrigeration and heating equipment	19284	18442	18139	1145	303	19159	18442	18139	1020	303	0.96	0.96
520400	Measuring and dispensing pumps	869	764	720	149	44	779	764	720	59	44	0.88	0.98
520500	Service industry machinery, n.e.c.	5209	5290	4795	414	495	5163	5290	4845	318	445	1.02	1.02
530200	Power, distribution, and specialty transformers	4019	4044	3931	88	113	4008	4044	3931	77	113	1.01	1.01
530300	Switchgear and switchboard apparatus	5460	5412	5054	406	358	5421	5412	5054	367	358	0.99	1.00
530400	Motors and generators	7999	8622	7504	495	1118	7975	8622	7504	471	1118	1.08	1.08
530500	Relays and industrial controls	7363	7314	6706	657	608	7170	7314	6706	464	608	0.99	1.02
530700	Carbon and graphite products	1267	1207	1199	68	8	1259	1207	1199	60	8	0.95	0.96
530800	Electrical industrial apparatus, n.e.c.	1983	1975	1798	185	177	1976	1975	1798	178	177	1.00	1.00
540100	Household cooking equipment	2685	3046	2509	176	537	2604	3046	2509	95	537	1.13	1.17
540200	Household refrigerators and freezers	4078	4076	3959	119	117	4030	4076	3959	71	117	1.00	1.01
540300	Household laundry equipment	3129	2968	2934	195	34	3098	2968	2934	164	34	0.95	0.96
540400	Electric housewares and fans	2726	2693	2464	262	229	2635	2693	2464	171	229	0.99	1.02
540500	Household vacuum cleaners	1890	1827	1728	162	99	1828	1827	1728	100	99	0.97	1.00
540700	Household appliances, n.e.c.	2565	2223	1978	587	245	2441	2223	1978	463	245	0.87	0.91
550100	Electric lamp bulbs and tubes	2963	2964	2888	75	76	2946	2964	2888	58	76	1.00	1.01
550200	Lighting fixtures and equipment	8692	8540	8089	603	451	8579	8540	8089	490	451	0.98	1.00
550300	Wiring devices	7706	7551	6637	1069	914	7583	7551	6637	946	914	0.98	1.00
560100	Household audio and video equipment	8407	7727	7272	1135	455	8355	7727	7284	1071	443	0.92	0.92
560200	Prerecorded records and tapes	1872	1843	1790	82	53	1863	1843	1790	73	53	0.98	0.99
560300	Telephone and telegraph apparatus	20250	19933	19163	1087	770	20139	19933	19163	976	770	0.98	0.99
560500	Communication equipment	21997	21478	19497	2500	1981	21798	21478	19497	2301	1981	0.98	0.99
570100	Electron tubes	3090	3461	2951	139	510	3086	3461	2951	135	510	1.12	1.12
570200	Semiconductors and related devices	30314	29871	28901	1413	970	30125	29871	28901	1224	970	0.99	0.99
570300	Other electronic components	37952	39966	33930	4022	6036	37729	39966	33930	3799	6036	1.05	1.06
580100	Storage batteries	3403	3400	3349	54	51	3401	3400	3349	52	51	1.00	1.00
580200	Primary batteries, dry and wet	1802	1812	1738	64	74	1780	1812	1738	42	74	1.01	1.02
580400	Electrical equipment for internal combustion engines	7127	6874	5821	1306	1053	7244	6874	6093	1151	781	0.96	0.95
580600	Magnetic and optical recording media	4304	4507	3832	472	675	4205	4507	3832	373	675	1.05	1.07
580700	Electrical machinery, equipment, and supplies, n.e.c.	4745	4510	3807	938	703	4593	4510	3807	786	703	0.95	0.98
590100	Truck and bus bodies	4501	2784	2671	1830	113	4470	2784	2671	1799	113	0.62	0.62
590200	Truck trailers	3436	3272	3188	248	84	3411	3272	3188	223	84	0.95	0.96
590301	Motor vehicles and passenger car bodies	150848	149684	147890	2958	1794	150714	149684	147890	2824	1794	0.99	0.99
590302	Motor vehicle parts and accessories	72979	75202	69995	2984	5207	72154	75202	69995	2159	5207	1.03	1.04
600100	Aircraft	56448	51201	49437	7011	1764	56448	51201	49437	7011	1764	0.91	0.91
600200	Aircraft and missile engines and engine parts	25357	24813	23320	2037	1493	24885	24813	23321	1564	1492	0.98	1.00
600400	Aircraft and missile equipment, n.e.c.	20393	26140	17760	2633	8380	20376	26140	17760	2616	8380	1.28	1.28
610100	Ship building and repairing	10365	10347	10275	90	72	10360	10347	10275	85	72	1.00	1.00
610200	Boat building and repairing	4550	5153	4409	141	744	5237	5153	5139	98	14	1.13	0.98
610300	Railroad equipment	4638	4599	4384	254	215	4782	4599	4545	237	54	0.99	0.96
610500	Motorcycles, bicycles, and parts	1761	2060	1589	172	471	1720	2060	1589	131	471	1.17	1.20
610601	Travel trailers and campers	2052	2059	1997	55	62	2043	2059	1997	46	62	1.00	1.01
610603	Motor homes	2897	2794	2717	180	77	2846	2794	2717	129	77	0.96	0.98
610700	Transportation equipment, n.e.c.	3028	2895	2754	274	141	3001	2895	2754	247	141	0.96	0.96
620101	Search and navigation equipment	34524	35906	31448	3076	4458	34438	35906	31448	2990	4458	1.04	1.04
620102	Laboratory apparatus and furniture	2053	1915	1716	337	199	2012	1915	1735	277	180	0.93	0.95
620200	Mechanical measuring devices	13167	13832	12238	929	1594	13031	13832	12238	793	1594	1.05	1.06
620300	Environmental controls	2508	2450	2254	254	196	2437	2450	2254	183	196	0.98	1.01
620400	Surgical and medical instruments and apparatus	13245	13109	12171	1074	938	13089	13109	12171	918	938	0.99	1.00
620500	Surgical appliances and supplies	13374	13137	11952	1422	1185	13020	13137	11952	1068	1185	0.98	1.01
620600	Dental equipment and supplies	1823	1661	1614	209	47	1738	1661	1614	124	47	0.91	0.96
620700	Watches, clocks, watchcases, and parts	747	659	625	122	34	727	659	625	102	34	0.88	0.91
620800	X-ray apparatus and tubes	3029	2511	2444	585	67	2908	2511	2444	464	67	0.83	0.86

Code	Discription	${}^{A}g$	${}^{A}q$	${}^{A}g^{P}$	${}^{A}g^{S}$	${}^{A}q^{S}$	${}^{T}g$	${}^{T}q$	${}^{T}g^{P}$	${}^{T}g^{S}$	${}^{T}q^{S}$	${}^{A}K={}^{A}q/{}^{A}g$	${}^{T}K={}^{T}q/{}^{T}g$
620900	Electromedical and electrotherapeutic apparatus	6924	6744	6339	585	405	6714	6744	6352	362	392	0.97	1.00
621000	Laboratory and optical instruments	7279	7640	6450	829	1190	7129	7640	6450	679	1190	1.05	1.07
621100	Instruments to measure electricity	8493	8351	7784	709	567	8237	8351	7784	453	567	0.98	1.01
630200	Ophthalmic goods	2549	2474	2369	180	105	2406	2474	2369	37	105	0.97	1.03
630300	Photographic equipment and supplies	21667	20271	19669	1998	602	21725	20271	19774	1951	497	0.94	0.93
640101	Jewelry, precious metal	4669	4430	4387	282	43	4630	4430	4387	243	43	0.95	0.96
640102	Jewelers' materials and lapidary work	917	2505	853	64	1652	2426	2505	2362	64	143	2.73	1.03
640104	Silverware and plated ware	634	570	560	74	10	595	570	560	35	10	0.90	0.96
640105	Costume jewelry	1468	1615	1406	62	209	1453	1615	1406	47	209	1.10	1.11
640200	Musical instruments	977	950	930	47	20	972	950	930	42	20	0.97	0.98
640301	Games, toys, and children's vehicles	4002	3831	3465	537	366	3758	3831	3465	293	366	0.96	1.02
640302	Dolls and stuffed toys	252	298	241	11	57	247	298	241	6	57	1.18	1.21
640400	Sporting and athletic goods, n.e.c.	7689	7602	7298	391	304	7469	7602	7298	171	304	0.99	1.02
640501	Pens, mechanical pencils, and parts	1128	1328	1067	61	261	1116	1328	1067	49	261	1.18	1.19
640502	Lead pencils and art goods	916	685	653	263	32	879	685	653	226	32	0.75	0.78
640503	Marking devices	565	663	495	70	168	536	663	495	41	168	1.17	1.24
640504	Carbon paper and inked ribbons	811	867	752	59	115	789	867	752	37	115	1.07	1.10
640700	Fasteners, buttons, needles, and pins	838	864	829	9	35	836	864	829	7	35	1.03	1.03
640800	Brooms and brushes	1230	1229	1126	104	103	1212	1229	1126	86	103	1.00	1.01
640900	Hard surface floor coverings, n.e.c.	1494	1491	1480	14	11	1481	1491	1480	1	11	1.00	1.01
641000	Burial caskets	1043	1040	1040	3	0	1043	1040	1040	3	0	1.00	1.00
641100	Signs and advertising specialties	6015	3552	3417	2598	135	5943	3552	3417	2526	135	0.59	0.60
641200	Manufacturing industries, n.e.c.	6075	5930	5636	439	294	5928	5930	5636	292	294	0.98	1.00
650100	Railroads and related services	35745	36196	35584	161	612	35584	36196	35584	0	612	1.01	1.02
650200	Local and suburban transit and interurban highway passenger transportation	20166	25862	19992	174	5870	20166	25862	19992	174	5870	1.28	1.28
650301	Trucking and courier services, except air	156260	145511	143011	13249	2500	157105	145511	143961	13144	1550	0.93	0.93
650302	Warehousing and storage	9691	11599	9602	89	1997	9848	11599	9764	84	1835	1.20	1.18
650400	Water transportation	32924	34347	32347	577	2000	32440	34347	32440	0	1907	1.04	1.06
650500	Air transportation	93998	98819	93779	219	5040	94141	98819	94141	0	4678	1.05	1.05
650600	Pipelines, except natural gas	7227	7315	7227	0	88	7315	7315	7315	0	0	1.01	1.00
650701	Freight forwarders and other transportation services	13193	8543	8505	4688	38	13193	8543	8505	4688	38	0.65	0.65
650702	Arrangement of passenger transportation	13108	13108	13108	0	0	13108	13108	13108	0	0	1.00	1.00
660100	Telephone, telgraph communications, and communications services n.e.c.	186750	180317	180317	6433	0	180317	180317	180317	0	0	0.97	1.00
660200	Cable and other pay television services	27777	25624	25624	2153	0	27777	25624	25624	2153	0	0.92	0.92
670000	Radio and TV broadcasting	29359	2674	2674	26685	0	29359	2674	2674	26685	0	0.09	0.09
680100	Electric services (utilities)	184738	195695	170193	14545	25502	170896	195695	170428	468	25267	1.06	1.15
680201	Natural gas transportation	15778	15778	15778	0	0	15778	15778	15778	0	0	1.00	1.00
680202	Natural gas distribution	63725	80377	63214	511	17163	77379	80377	77175	204	3202	1.26	1.04
680301	Water supply and sewerage systems	3622	22981	3198	424	19783	3715	22981	3291	424	19690	6.34	6.19
680302	Sanitary services, steam supply, and irrigation systems	15341	27284	15320	21	11964	15353	27284	15347	6	11937	1.78	1.78
690100	Wholesale trade	588997	568970	537962	51035	31008	568970	568970	568970	0	0	0.97	1.00
690200	Retail trade, except eating and drinking	591265	526178	508581	82684	17597	522519	526178	522519	0	3659	0.89	1.01
700100	Banking	268591	263660	263596	4995	64	268591	263660	263596	4995	64	0.98	0.98
700200	Credit agencies other than banks	60557	37183	35691	24866	1492	62049	37183	37183	24866	0	0.61	0.60
700300	Security and commodity brokers	85821	89931	85632	189	4299	85632	89931	85632	0	4299	1.05	1.05
700400	Insurance carriers	168993	168873	168993	0	-120	168993	168873	168993	0	-120	1.00	1.00
700500	Insurance agents, brokers, and services	62073	62781	61988	85	793	62104	62781	62104	0	677	1.01	1.01
710100	Owner-occupied dwellings	457250	457250	457250	0	0	457250	457250	457250	0	0	1.00	1.00
710201	Real estate agents, managers, operators, and lessors	494601	504027	494088	513	9939	494402	504027	494173	229	9854	1.02	1.02
710202	Royalties	55711	55711	55711	0	0	55711	55711	55711	0	0	1.00	1.00
720101	Hotels	79415	52047	51740	27675	307	52407	52047	52047	360	0	0.66	0.99
720102	Other lodging places	4828	6889	4265	563	2624	7195	6889	6889	306	0	1.43	0.96

Code	Discription	^{A}g	^{A}q	$^{A}g^{P}$	$^{A}g^{S}$	$^{A}q^{S}$	^{T}g	^{T}q	$^{T}g^{P}$	$^{T}g^{S}$	$^{T}q^{S}$	$^{A}K={}^{A}q/{}^{A}g$	$^{T}K={}^{T}q/{}^{T}g$
720201	Laundry, cleaning, garment services, and shoe repair	20404	21160	20311	93	849	20796	21160	20796	0	364	1.04	1.02
720202	Funeral service and crematories	7150	6928	6928	222	0	6928	6928	6928	0	0	0.97	1.00
720203	Portrait photographic studios, and other miscellaneous personal services	23033	22601	22078	955	523	22608	22601	22512	96	89	0.98	1.00
720204	Electrical repair shops	11938	19302	11307	631	7995	19433	19302	19302	131	0	1.62	0.99
720205	Watch, clock, jewelry, and furniture repair	2445	3843	2421	24	1422	3843	3843	3843	0	0	1.57	1.00
720300	Beauty and barber shops	18158	18182	17997	161	185	18164	18182	18164	0	18	1.00	1.00
730101	Miscellaneous repair shops	22168	31027	21539	629	9488	30896	31027	30896	0	131	1.40	1.00
730102	Services to dwellings and other buildings	26948	26522	26522	426	0	26882	26522	26522	360	0	0.98	0.99
730103	Personnel supply services	39803	39756	39756	47	0	39803	39756	39756	47	0	1.00	1.00
730104	Computer and data processing services	104909	118038	104246	663	13792	115730	118038	115730	0	2308	1.13	1.02
730106	Detective and protective services	13692	13732	13668	24	64	13675	13732	13668	7	64	1.00	1.00
730107	Miscellaneous equipment rental and leasing	23855	30775	22606	1249	8169	30694	30775	30490	204	285	1.29	1.00
730108	Photofinishing labs and commercial photography	14914	11788	10715	4199	1073	15728	11788	11630	4098	158	0.79	0.75
730109	Other business services	78049	71236	69938	8111	1298	78858	71236	71165	7693	71	0.91	0.90
730111	Management and public relations services	75869	78848	74138	1731	4710	75894	78848	74314	1580	4534	1.04	1.04
730112	Research, development, and testing services, except noncommercial	28356	28701	27616	740	1085	28015	28701	28015	0	686	1.01	1.02
730200	Advertising	23705	138530	23433	272	115097	29865	138530	29651	214	108879	5.84	4.64
730301	Legal services	116396	116396	116396	0	0	116396	116396	116396	0	0	1.00	1.00
730302	Engineering, architectural, and surveying services	86270	83570	83142	3128	428	84850	83570	83381	1469	189	0.97	0.98
730303	Accounting, auditing and bookkeeping, and miscellaneous services, n.e.c.	55144	52631	51924	3220	707	55115	52631	51924	3191	707	0.95	0.95
740000	Eating and drinking places	235603	282017	234554	1049	47463	280187	282017	280187	0	1830	1.20	1.01
750001	Automotive rental and leasing, without drivers	21410	47630	21180	230	26450	22590	47630	22444	146	25186	2.22	2.11
750002	Automotive repair shops and services	61402	107056	60428	974	46628	107056	107056	107056	0	0	1.74	1.00
750003	Automobile parking and car washes	8476	9722	8405	71	1317	8735	9722	8735	0	987	1.15	1.11
760101	Motion picture services and theaters	38072	36794	36647	1425	147	36660	36794	36647	13	147	0.97	1.00
760102	Video tape rental	5434	6297	5181	253	1116	6278	6297	6204	74	93	1.16	1.00
760201	Theatrical producers (except motion picture), bands, orchestras and entertainers	16405	16321	16321	84	0	16321	16321	16321	0	0	0.99	1.00
760202	Bowling centers	3104	1983	1983	1121	0	1988	1983	1983	5	0	0.64	1.00
760203	Professional sports clubs and promoters	6444	6179	6179	265	0	6179	6179	6179	0	0	0.96	1.00
760204	Racing, including track operation	5607	5542	5542	65	0	5542	5542	5542	0	0	0.99	1.00
760205	Physical fitness facilities and membership sports and recreation clubs	16473	12603	12603	3870	0	12603	12603	12603	0	0	0.77	1.00
760206	Other amusement and recreation services	26074	37218	24230	1844	12988	35797	37218	35797	0	1421	1.43	1.04
770100	Doctors and dentists	216111	216111	216111	0	0	216111	216111	216111	0	0	1.00	1.00
770200	Hospitals	223398	219060	219060	4338	0	219439	219060	219060	379	0	0.98	1.00
770301	Nursing and personal care facilities	49709	50459	49377	332	1082	50459	50459	50459	0	0	1.02	1.00
770303	Other medical and health services	17171	18971	17171	0	1800	18971	18971	18971	0	0	1.10	1.00
770304	Veterinary services	7584	6593	6585	999	8	6593	6593	6593	0	0	0.87	1.00
770305	Other medical and health services	55179	53413	53311	1868	102	53413	53413	53413	0	0	0.97	1.00
770401	Elementary and secondary schools	18645	18001	18001	644	0	18001	18001	18001	0	0	0.97	1.00
770402	Colleges, universities, and professional schools	49372	43704	43704	5668	0	43704	43704	43704	0	0	0.89	1.00
770403	Private libraries, vocational schools, and educational services, n.e.c.	13015	12985	12859	156	126	12985	12985	12985	0	0	1.00	1.00
770501	Business associations and professional membership organizations	14184	13070	13070	1114	0	13666	13070	13070	596	0	0.92	0.96
770502	Labor organizations, civic, social, and fraternal associations	20781	17859	17859	2922	0	17964	17859	17859	105	0	0.86	0.99
770503	Religious organizations	30605	30605	30605	0	0	30605	30605	30605	0	0	1.00	1.00
770504	Other membership organizations	21898	21534	21534	364	0	21534	21534	21534	0	0	0.98	1.00
770600	Job training and related services	7093	6851	6851	242	0	6851	6851	6851	0	0	0.97	1.00
770700	Child day care services	17544	17566	17538	6	28	17566	17566	17566	0	0	1.00	1.00
770800	Residential care	15386	15374	15374	12	0	15374	15374	15374	0	0	1.00	1.00
770900	Social services, n.e.c.	30263	30082	30082	181	0	30082	30082	30082	0	0	0.99	1.00
780100	U.S. Postal Service	46506	46449	46449	57	0	46506	46449	46449	57	0	1.00	1.00
78025m	Federal electric utilities and other government enterprises	14466	3751	3751	10715	0	14466	3751	3751	10715	0	0.26	0.26
79000m	State and local government transit, utilities and other enterprises	92806	30162	29738	63068	424	92806	30162	29738	63068	424	0.33	0.33
	Total	10053978	10053978	9315355	738623	738623	10053978	10053978	9564735	489243	489243	1.00	1.00