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**Multiregional Input-Output Accounts, 1977 - Volumes 3 -  
Development of Value Added Estimates by MRIO Sector by State**

Jack Faucett Associates, Inc.

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**MULTIREGIONAL INPUT-OUTPUT ACCOUNTS, 1977.  
VOLUME 3. DEVELOPMENT OF VALUE ADDED  
ESTIMATES BY MRIO SECTOR BY STATE**

FAUCETT (JACK) ASSOCIATES, INC.  
CHEVY CHASE, MD

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THE MULTIREGIONAL INPUT-OUTPUT ACCOUNTS, 1977:  
DEVELOPMENT OF VALUE ADDED ESTIMATES  
BY MRIO SECTOR BY STATE

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<p>The multiregional Input-Output (MRIO) accounts provide estimates for 1977 of (1) output (by industry and commodity), (2) value added, (3) intermediate uses, and (4) final uses of goods and services, by sector and state. Interregional flows balance the production and consumption of goods and services between states. The project was also supported by the Department of Commerce (Economic Development Administration), the Federal Emergency Management Administration, and the Army Corps of Engineers.</p> <p>This volume describes the methodology used to estimate value-added measures for the MRIO accounts.</p>			
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DEVELOPMENT OF VALUE ADDED ESTIMATES BY MRIO SECTOR  
BY STATE, 1977

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DEVELOPMENT OF VALUE ADDED ESTIMATES BY MRIO SECTOR  
BY STATE, 1977

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The methods and procedures described in this report and the data compiled in accordance with these procedures were developed by Jack Faucett Associates for the Department of Health and Human Services. The data development was directed by Jack G. Faucett with the assistance of Joseph Morris and Hilary Kaufman. Members of the staff responsible for significant portions of statistical research include Jonathan Skolnik and Betsy Witte. Prakash Sanghvi, Nathaniel Ng, and Robert Drzyzgula provided computer programming support.

Secretarial effort was coordinated by Leila Snyder assisted by Gloria Reed and Pamela Brockington. Robert Skarr compiled the bibliographic material.



## CHAPTER 1

### INTRODUCTION

This report describes the methodology used to estimate value added measures for the Multi Regional Input-Output (MRIO) model under development by Jack Faucett Associates for the Office of the Assistant Secretary for Planning and Evaluation, Department of Health and Human Services. Estimates were produced for 1977 by state for the MRIO sectors. This report is the second in a series that will document the development of the MRIO model. The first report<sup>1</sup> describes the MRIO output, employment, and payroll estimates, and defines the MRIO sectors. The sectors are listed in Appendix D of this report. A computer tape containing the data developed according to the methods and procedures described in this report has been submitted to the Department of Health and Human Services.

In the input-output table, value added is the difference between an industry's output and the total of its intermediate inputs purchased from all other industries. Value added must therefore comprise the industry's factor payments to labor (wages and salaries and supplements to wages and salaries), to owned capital (interest and profits), and all nonfactor costs incurred other than costs for intermediate inputs: capital consumption, payments to the government that are not computed on the basis of net income (property taxes, excises, sales taxes, customs duties, fees, licenses, fines, etc.), and business transfer payments (bad debts and corporate gifts.)

The sum of value added in all industries equals gross national product, since the components of value added include the incomes of all persons and businesses in the economy.<sup>2</sup> The National Income and Product Accounts tabulate 14 components of value

<sup>1</sup> Jack Faucett Associates, *State Estimates of Outputs, Employment and Payrolls, 1977, for the U.S. Department of Health and Human Services, December, 1981* (referred to below as the Tasks 1 and 2 report).

<sup>2</sup> More precisely, GNP equals national income (payments to labor and property owners), plus indirect business taxes, business transfer payments, and capital consumption allowances, less government subsidies to businesses, plus current surplus of government enterprises.

added,<sup>1</sup> shown in Exhibit 1. The exhibit shows the relationship among the components of value added at the 14 component level, and at more aggregate five component and three component levels of detail.

For the MRIO accounts, three components of value added have been estimated for each MRIO industry in each state: compensation of employees, indirect business taxes plus business transfer payments (abbreviated IBT + BTP below), and property-type income (abbreviated PTI below.)

Although the definition of value added in the MRIO accounts is equivalent to the National Income and Product Accounts (NIPA) definitions, quantities appearing in the MRIO data files for state-level producing sector value added exclude two components of NIPA-definition value added: the inventory valuation adjustment, (except in the farm sectors), and all federal, state, and local excise, sales, and gross receipts taxes. Inventory valuation adjustments are excluded from non-farm sector PTI for consistency with the use of book-value change in business inventories in state-level sector final demands in MRIO. The sales and excise taxes excluded are treated as components of margins and are therefore added to producers' prices in the distribution sectors of the MRIO accounts, or in final demand. See Chapter 3 of the industry inputs report.<sup>2</sup>

The methodology for developing the MRIO accounts value added proceeded in two steps. First, data on the components and subcomponents of value added were collected at varying levels of sector and state disaggregation, as the available sources allowed. Second, these sets of value added totals and components were distributed by MRIO sector by state, using various allocation and scaling procedures. Chapter 2 below contains a summary of the method, and describes the allocation and scaling procedures. Chapter 3 describes the development of the initial value added data sets underlying the final component-by-sector-by-state estimates. Bibliographic information for all sources is contained in the MRIO Document Reference Guide, included as Appendix C of this report. All citations of data sources in the text include a source number reference to the Document Reference Guide.

<sup>1</sup>These components are defined in U.S. Department of Commerce, Bureau of Economic Analysis, *The National Income and Product Accounts 1929-1974*, pp. vii-ix, included as Appendix A in this report; and were most recently tabulated by BEA for 1977 in *National Income and Product Accounts, 1976-1979, Special Supplement to the Survey of Current Business (Source 03501)*, July 1981 (Referred to below as NIPA).

<sup>2</sup>Jack Faucett Associates, *State Estimates of Inputs to Industries - 1977*, for the U.S. Department of Health and Human Services, May 1982.

EXHIBIT 1: VALUE ADDED BY COMPONENT

3 Components	5 Components	14 Components
<b>1. Employee Compensation</b>	<b>1. Employee Compensation</b>	<b>1. Wages and Salaries</b> <b>2. Supplements to Wages and Salaries</b>
<b>2. Indirect Business Taxes, etc.</b>	<b>2. Indirect Business Taxes, etc.</b>	<b>3. Indirect Business Taxes</b> <b>4. Business Transfer Payments</b>
<b>3. Property Type Income</b>	<b>3. Net Interest</b> <b>4. Capital Consumption Allowance</b> <b>5. Profit-type Income</b>	<b>5. Net Interest</b> <b>6. Corporate Capital Consumption Allowance</b> <b>7. Non-corporate Capital Consumption Allowance</b> <b>8. Corporate Profits</b> <b>9. Non-corporate profits</b> <b>10. Corporate Inventory Valuation Adjustment</b> <b>11. Non-corporate Inventory Valuation Adjustment</b> <b>12. Rental Income to Persons</b> <b>13. Surplus of Government Enterprises</b> <b>14. Government Subsidies</b>

The final step in the value added estimation was analysis of the validity and consistency of the value added estimates. The approach to these checking procedures is described in Chapter 1 of the Tasks 1 and 2 report.

## CHAPTER 2

### SUMMARY OF THE ESTIMATION METHOD

The components of value added in the MRIO accounts comprise a three dimensional matrix of 18,819 cells: three components in each of 123 industries in 51 states. In most instances no primary data were available for individual cells of the matrix. Rather, the general procedure was to obtain totals for components or subcomponents at the state level for all sectors (or for broad groups of sectors), or at the U.S. level for individual sectors, or both; and to allocate the totals to state-level MRIO sectors based on the distributions of output, employment or payroll by state by sector constructed in Tasks 1 and 2 of this project, or by other proxy distributions developed for this task.

Section 2.1 below summarizes the underlying value added data that were developed in Task 3. Section 2.2 describes the allocation procedures that produced the complete matrix of value added by component by sector by state. Finally, Section 2.3 compares the MRIO value added to the National Income and Product Accounts.

#### 2.1 Underlying Data and Totals Developed

The state and industry totals for components and subcomponents of value added, together with the proxy variables used in the allocation procedures, are the basic data underlying the value added estimates. The sets of data developed, by component of value added, are summarized in Exhibit 2.

The most frequently used sources included:

- the Economic Censuses,<sup>1</sup> which provided (with some exceptions) state-level data for supplements to wages and salaries and total value added in the manufacturing, construction, and mining sectors;

<sup>1</sup>U.S. Department of Commerce, Bureau of the Census, 1977 Census of Manufactures (Source 03105); 1977 Census of Mineral Industries (Source 03106); 1977 Census of Construction Industries (Source 03104).

EXHIBIT 2: SUMMARY OF DATA SETS UNDERLYING THE VALUE ADDED ESTIMATES

SECTORS

VALUE ADDED COMPONENTS	Farms MRIO 1-4 (excluding agricultural services)	Mining MRIO 7-13	Construction MRIO 14-19	Manufacturing MRIO 20-84	All other sectors MRIO 4 (ag. services), 5, 6, 85-119, 122, 123	All Sectors
Compensation of Employees	<ul style="list-style-type: none"> <li>Supplements, total for all farm sectors by state</li> </ul>	<ul style="list-style-type: none"> <li>Ratio of required supplements to wages &amp; salaries, U.S. average, by sector.</li> <li>Ratio of voluntary supplements to wages and salaries, U.S. average, by sector.</li> </ul>	<ul style="list-style-type: none"> <li>Required supplements, total for all construction sectors, by state</li> <li>Voluntary supplements, total for all construction sectors, by state</li> <li>Required supplements, U.S. total, by construction sector</li> <li>Voluntary supplements, U.S. total, by construction sector</li> </ul>	<ul style="list-style-type: none"> <li>Required supplements, total for all manufacturing sectors, by state</li> <li>Voluntary supplements, total for all manufacturing sectors, by state</li> <li>Required supplements, U.S. total, by manufacturing 4-digit SIC</li> <li>Voluntary supplements, U.S. total, by manufacturing 4-digit SIC</li> </ul>	<ul style="list-style-type: none"> <li>Ratio of required supplements to wages and salaries, U.S. average, by sector</li> <li>Ratio of voluntary supplements to wages &amp; salaries, U.S. average, by sector</li> <li>Federal government required supplements, U.S. total; state government pension contributions, by state; Railroad Retirement contributions, U.S. total</li> </ul>	<ul style="list-style-type: none"> <li>Wages &amp; salaries by sector by state (from Task 2)</li> <li>Required supplements, total for all sectors, by state</li> <li>Voluntary supplements total for all sectors, by state</li> </ul>
Indirect Business Taxes plus Business Transfer Payments (BT + BTP)	<ul style="list-style-type: none"> <li>Business taxes, total for all farm sectors, by state</li> </ul>	<ul style="list-style-type: none"> <li>Severance taxes, by sector by state.</li> </ul>	(See "All Sectors.")	<ul style="list-style-type: none"> <li>Federal manufacturers' excises, alcoholic beverage, and tobacco excises; U.S. totals by sector</li> </ul>	<ul style="list-style-type: none"> <li>State and local excises and sales taxes, by sector by state</li> <li>Federal retail excises, U.S. total by sector</li> <li>Customs duties by state</li> </ul>	<ul style="list-style-type: none"> <li>Property taxes, by three sector groups (industrial, real estate, other commercial) by state</li> <li>U.S. total IBT + BTP components by approximately 2-digit SIC industry</li> <li>U.S. average assets per employee, by sector (for allocating property taxes)</li> <li>State and local licenses, fees, and use taxes, totals by state</li> </ul>
Property-type Income (PTI); or Total Value Added	<ul style="list-style-type: none"> <li>PTI, total for all farm sectors, by state</li> <li>PTI, U.S. total by sector</li> </ul>	<ul style="list-style-type: none"> <li>Census-definition value added, by sector by state</li> <li>Estimated purchased services U.S. total, by mining sector</li> </ul>	<ul style="list-style-type: none"> <li>Census-definition value added, total for all construction sectors, by state</li> <li>Census-definition value added, U.S. total, by construction sector</li> <li>Estimated purchased services, U.S. total, by construction sector</li> </ul>	<ul style="list-style-type: none"> <li>Census-definition value added, by 4-digit SIC, by state</li> <li>Estimated purchased services, U.S. total by manufacturing sector</li> </ul>	<ul style="list-style-type: none"> <li>PTI, U.S. total, by approximately 2-digit SIC</li> </ul>	

- gross national product by industry (in approximately two-digit SIC industry detail) and by the 14 components listed in Exhibit 1, tabulated by the Bureau of Economic Analysis (BEA),<sup>1</sup> referred to below as the GPO (Gross Product Originating) data;
- Department of Agriculture state aggregate farm income statements;<sup>2</sup>
- a variety of U.S. Treasury, Census, and other sources on business taxes;
- the 1972 BEA input-output table,<sup>3</sup> which provided estimates of purchased services not deducted from value of production in the Census computations of value added;
- Department of Labor, Social Security Administration, and BEA sources on supplements to wages and salaries by state and by industry.

Chapter 3 below presents complete documentation of the sources and procedures for producing the data sets listed in Exhibit 2.

## 2.2 Estimation of State- and Sector-Specific Components of Value Added

The data sets described in the preceding section are for the most part not disaggregated to individual state-level MRIO sectors. The initial allocation of value added components to state-level sectors employed distribution procedures utilizing the sector-by-state distributions of output, employment, and payroll developed in Tasks 1 and 2, as well as distributions developed specifically for Task 3.

<sup>1</sup>U.S. Department of Commerce, Bureau of Economic Analysis "Gross National Product by Industry and Component" unpublished computer printout, August 25, 1981 (Source 03506). These data, in more aggregate form, appear in the GNP by industry tables of the NIPA (Tables 6.1 - 6.26, "Product, Income, and Employment by Industry").

<sup>2</sup>U.S. Department of Agriculture, Economic Statistics Service, Economic Indicators of the Farm Sector: State Income and Balance Sheet Statistics, 1979, March 1981 (Source 02111).

<sup>3</sup>U.S. Department of Commerce, Bureau of Economic Analysis, The Detailed Input-Output Structure of the U.S. Economy: 1972, 1979 (Source 03504).

Exhibit 3 is a summary of these estimating procedures. In the exhibit, each box indicates a common estimation procedure, employing analogous data sets, for the group of sectors and components of value added corresponding to the box's column and row position. These methods are described in the following sections, by sector group.

In Exhibit 3, and throughout this report, the phrases "allocated proportionally to ...," "scaled to ...," and "allocated by iterative scaling on ...," are used to describe three frequently applied procedures for distributing control totals. The first two phrases may be self-explanatory; iterative scaling refers to a distribution procedure employed when both row and column totals for a matrix were available. Appendix B contains definitions of the three procedures.

#### Farm Sectors (MRIO Sectors 001-003, 004 (excluding agricultural services))

Value added components by sector by state for the farm sectors were estimated independently of the estimates for all other sectors.

#### Supplements to Wages and Salaries

Supplements to wages and salaries, total for all farms by state, were available for the farm sectors, and were allocated proportionally to wages and salaries in each farm sector within each state. Compensation of employees is the sum of supplements, and wages and salaries (from Task 2).

#### Indirect Business Taxes plus Business Transfer Payments

IBT + BTP, total for all farms by state, was allocated proportionally to the output of each farm sector within each state. Farms are not charged any excise or sales taxes in the NIPA; therefore the total of farm producing sector IBT + PTI in the MRIO accounts equals the NIPA total.

#### Property-type Income

Both totals by state and U.S. totals by MRIO sector were available for farm PTI. Therefore PTI was allocated by iterative scaling on the matrix of output by farm sector by state from Task 1. The resulting PTI estimates sum across sectors to each state total, and across states to each sector total. Farm producing sector PTI in the MRIO includes the inventory valuation adjustment, and sums to the NIPA farm PTI total, since farm output inventory change is evaluated on a quantity basis in MRIO final demand.



EXHIBIT 3: METHODS OF ESTIMATING VALUE ADDED COMPONENTS BY SECTOR BY STATE

SECTORS

COMPONENTS OF VALUE ADDED			Farms MRIO 1-4 (excluding agricultural services)	Construction MRIO 14-19	Manufacturing MRIO 20-24	Mining MRIO 7-13	All Other Sectors (MRIO 4 (agricultural services) 5, 6, 85-119, 121, 123 and manufacturers administrative and auxiliaries.	
VALUE ADDED	Compensation of Employees	Wages & Salaries	Developed in Task 2					
		Required Supplements	Department of Agriculture data by state; scaled to GPO U.S. total; allocated to sectors within states proportionally to wages and salaries.	State totals for all sectors, and U.S. totals by sector, from Economic Censuses; allocated to sector by state by iterative scaling on payroll by sector by state.		U.S. average rates ((req. suppl.)/(wages & salaries)) times state payroll in sector; scaled to state total required supplements.		
		Voluntary Supplements		Same method as required supplements		Same method as required supplements		
	Indirect Business Taxes and Business Transfer Payments (IBT + BTP)	Property Taxes	Same method as supplements; except allocated proportionally to output.	State totals (by industrial, real estate, and other commercial and industry groups) allocated to sectors within each state proportionally to assets by sector by state. Assets estimated as U.S. average (assets/employment) by sector, times employment by sector by state.				
		Excises, Sales Taxes, Customs Duties		Federal excises allocated to appropriate sector (or subsector) in each state proportionally to state output in that sector (or subsector). Customs and state and local taxes assigned directly to appropriate sector within each state. Excluded from producing sector value-added; appear as margin component in distribution sectors.				
		Other IBT + BTP		U.S. IBT + BTP by five components by GPO sector (approximately two-digit SIC level) allocated proportionally to output by sector by state, then scaled to state totals by component.				
	Property-type income (PTI)		State totals for all farm sectors, and U.S. total by farm sector, allocated to sector by state, by iterative scaling on output by sector by state.	Residual: Value added less compensation of labor less (IBT + BTP). State total value added for all sectors, and U.S. total by sector, allocated to sector by state by iterative scaling on output by sector by state.	Residual: Economic Census value added by sector by state, plus excises, less estimated purchased services, less compensation of labor, less IBT + BTP.		GPO U.S. PTI (at approximately 2-digit SIC level) allocated to sector by state proportionally to output.	

the NIPA; therefore the total of farm producing sector IBT + PTI in the MRIO accounts equals the NIPA total.

#### Property-type Income

Both totals by state and U.S. totals by MRIO sector were available for farm PTI. Therefore PTI was allocated by iterative scaling on the matrix of output by farm sector by state from Task 1. The resulting PTI estimates sum across sectors to each state total, and across states to each sector total. Farm producing sector PTI in the MRIO includes the inventory valuation adjustment, and sums to the NIPA farm PTI total, since farm output inventory change is evaluated on a quantity basis in MRIO final demand.

#### Construction (MRIO Sector 014-019)

#### Supplements to Wages and Salaries

Required supplements<sup>1</sup> for all construction sectors at the state level, and U.S. total required supplements by MRIO construction sector, were available. These row and column totals were allocated to state-level construction sectors by iterative scaling on the matrix of payroll by sector by state from Task 2.

State totals, and U.S. totals by sector were also available for voluntary supplements, and these were allocated by the same method as required supplements. Compensation of employees is the sum of required supplements, voluntary supplements, and payroll in each state-level construction sector.

#### Indirect Business Taxes plus Business Transfer Payments

Property taxes were estimated simultaneously for all construction, manufacturing, mining, agricultural services, forestry and fisheries, transportation, and utilities sectors (MRIO 004 (agricultural services part), 005-092, 094-096), the group of sectors corresponding most closely to the "industrial" classification of assessments reported in the Census of Governments. Estimated control totals for property taxes paid by this group of sectors were available by state. The state control totals were allocated to sectors proportionally to estimated taxable assets in each sector in each state. Taxable assets in a state-level construction sector were estimated as U.S. average assets per employee for the sector, times employment in that sector in the state.

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<sup>1</sup>Required supplements and voluntary supplements are defined in Section 3.1 below.

Four components of IBT (motor vehicle, corporation, and other licenses, and severance taxes) were estimated for construction, as well as all other non-farm sectors, by allocating state-level totals for each tax proportionally to U.S. average rates (per dollar of output) by GPO sector for each tax times output in each sector in the state. NIPA U.S. totals by GPO sector for the "non-taxes" component of IBT, and for BTP, were allocated to state-level sectors proportionally to output in each sector in each state. All sales and excise taxes were excluded from the IBT estimates in all sectors; these taxes appear in the distribution sectors in the MRIO table.

#### Property-type Income

PTI in construction was computed as a residual: total value added in each state-level sector less the included components of (IBT + BTP) less compensation of labor. Since the Census-definition value added includes inventory change at book value, and is computed before excise or sales taxes, the inventory valuation adjustment and excise and sales tax components of NIPA-definition value added are automatically excluded by this method of computing value added.

Value added was available for the total of all construction sectors by state, and for U.S. total by MRIO construction sector. The totals are allocated to state-level sectors by iterative scaling on the matrix of output by construction sector by state.

#### Manufacturing (MRIO Sectors 020-084)

#### Supplements to Wages and Salaries

All value added computations in the manufacturing sectors were carried out for state-level four-digit SIC industries, and aggregated to MRIO sectors as the final step. With this exception, the available data and allocation procedures for supplements in the manufacturing sectors were analogous to those for supplements in construction, described above.

#### Indirect Business Taxes and Business Transfer Payments

The estimation method for IBT + PTI in manufacturing was that described in the section on construction IBT + BTP above. The manufacturing estimates were carried out for four-digit SIC industries. Gross assets-per-employee ratios by SIC in the Census of Manufactures were employed in allocating state control totals for property taxes to manufacturing sectors.

### Property-type Income

Total value added was available by four-digit SIC manufacturing industry by state. PTI was computed for state-level four-digit SIC industries as value added, less compensation of labor, less the included components of (IBT + BTP). As in the estimation of construction PTI, this method excludes inventory valuation adjustment and excise taxes from the estimates of MRIO manufacturing producing sector value added.

### Manufacturers' Administrative Offices and Auxiliaries

These establishments' value added comprises compensation of labor only, since all PTI and IBT + BTP in manufacturing have been allocated to operating establishments. Payroll in administrative and auxiliary establishments was available by state. Supplements to wages and salaries by state were estimated in the procedure, described below, that was employed to estimate supplements for all sectors other than manufacturing, construction, and farms. Employee compensation in these establishments appears only implicitly in the MRIO value added data file, as a component of PTI in the manufacturing sectors, since there is no administrative and auxiliary MRIO sector, and the state totals for these establishments were not allocated to individual MRIO manufacturing sectors.

### Mining (MRIO Sectors 007-013)

#### Supplements to Wages and Salaries

Supplements were estimated in a single procedure for the mining sectors together with MRIO sectors 005, 006, 085-119, 122, 123, and 004 (agricultural services part), and manufacturers' administrative and auxiliary establishments (i.e., all sectors other than farms, construction, and manufacturing). The available data were state total required supplements for all sectors, state total voluntary supplements for all sectors, and U.S. average ratios of required supplements to payroll and of voluntary supplements to payroll for each MRIO sector. An initial estimate of required supplements in each sector (excluding farms, construction, and manufacturing) in each state was made as the product of the U.S. average required supplements to payroll ratio times payroll in the sector in each state. These initial estimates were then scaled within each state to state total required supplements less required supplements in farms, construction, and manufacturing. The procedure was repeated for voluntary supplements.

#### Indirect Business Taxes and Business Transfer Payments

Property taxes, licenses, non-tax payments to government, and BTP for the mining sectors were estimated by the methods described in the section on construction IBT + BTP above.

#### Property-type Income

Total value added by sector by state was available for mining. PTI by sector by state was computed as value added less compensation of labor less the included components of (IBT + BTP). As in the construction and manufacturing sectors, mining value added computed by this method excludes inventory valuation adjustment and excise and sales taxes.

All Other Sectors (MRIO Sectors 004 (agricultural services part),  
005, 006, 085-119, 122, 123)

#### Supplements to Wages and Salaries

Supplements in this group of sectors were estimated in the procedure described above in the section on supplements in mining. Employer contributions to social insurance funds in the Federal, and state and local government sectors, and Railroad Retirement contributions in MRIO 085, were allocated explicitly to these sectors as a final step.

#### Indirect Business Taxes and Business Transfer Payments

The components of IBT + BTP included in producing sector value added in MRIO were estimated for these sectors by the methods described in the section on construction IBT + BTP above.

#### Property-type Income

PTI for these sectors was available only as U.S. total by approximately two-digit SIC industry from the GPO. The totals (less the inventory valuation adjustment) were allocated to all MRIO state-level sectors within each GPO industry proportionally to output. In the cases of some MRIO sectors comprised of parts of several two-digit SIC industries, PTI values for the corresponding GPO industries were first allocated to MRIO sectors at the U.S. level proportionally to output, and then allocated to states within each sector. Within an MRIO sector in this group of sectors, the ratio of PTI to output is constant across all states.

### 2.3 Comparison of U.S. Total Value Added Components to the National Income and Product Accounts

Exhibit 4 shows totals for value added components for five sector groupings, and the total for all sectors, compared to the corresponding GPO totals. The exhibit also indicates the nature of the sources or control total for each MRIO value added component shown. In the MRIO producing sector value added estimates, included IBT + BTP components other than property taxes are controlled to GPO totals by component at the GPO U.S. industry level, and property taxes and supplements to wages and salaries are controlled to GPO at the all-industries level only. Wages and salaries in manufacturing, construction, and mining; and supplements in manufacturing (excluding administrative and auxiliary establishments) and construction, sum to the respective Economic Censuses totals. Total value added in manufacturing and mining sum to the respective Economic Censuses totals (which exclude excises), less estimated purchased services that are included in Census-definition value added. Construction value added sums to the Census of Construction total adjusted to reflect purchased services and undercoverage of certain construction activities in the Census. Wages and salaries in farms and the All Other Sectors group are based on a variety of Census and other data sources, as documented in the Tasks 1 and 2 report, and have not been controlled to any single external source total.

In general, Economic Census values were allowed to remain unscaled to NIPA when the censuses provided detailed state-level data. For sectors and value added components for which state-level Census data were not available, the GPO values were often the most reliable data available, and controlling to the GPO totals in these cases was a natural choice.

Discrepancies between the MRIO value added components and GPO are apparent in property-type income in manufacturing and mining, payrolls in the All Other Sectors group, and supplements in construction. A possible explanation of the PTI discrepancies is that the estimates of purchased services not deducted from output in the Economic Censuses value added were too low. Services inputs to manufacturing and mining will be examined in detail during balancing of the table. Supplements in MRIO construction sectors are markedly greater than the corresponding GPO value. GPO construction supplements seem implausibly low, considering the magnitude of supplements reported in the Census of Construction and the ratios of supplements to payroll appearing in other GPO sectors.

EXHIBIT 4: COMPARISON OF MRIO AND GPO COMPONENTS OF VALUE ADDED, BY MAJOR INDUSTRY

Sector	Component	(millions of dollars)	
		MRIO <sup>a</sup>	GPO
Farms (MRIO 001-003, 004 (excluding agricultural services))	Wages & Salaries	6,708 +++	7,383
	Supplements	869 *	869
	IBT + BTP	2,994 *	2,994
	PTI	38,366 *	36,366
	Total Value Added	48,935 +	47,612
Mining (MRIO 007-013)	Wages & Salaries	13,167 **	13,991
	Supplements	3,102 ++	2,745
	IBT + BTP	b	3,709
	less excise & sales taxes equals	3,197 ++	3,387
	PTI	b	28,186
	less IVA equals	25,069 +	28,502
Total Value Added	b	48,631	
less IVA, excise, sales taxes equals	54,535 ***	48,825	
Construction (MRIO 014-019)	Wages & Salaries	54,960 **	53,495
	Supplements	10,513 **	7,427
	IBT + BTP	b	3,988
	less excise & sales taxes equals	2,679 ++	2,565
	PTI	b	21,821
	less IVA equals	22,995 +	23,013
Total Value Added	b	86,731	
less IVA, excise, sales taxes equals	91,187 ***	86,500	
Manufacturing (MRIO 020- 084, plus administrative & auxiliaries)	Wages & Salaries, operating est. plus admin. & auxil. equals	241,959 **	c
	Supplements, operating est. plus admin. & auxil. equals	263,951 **	265,956
	IBT + BTP	49,977 **	c
	less excise & sales taxes equals	54,730 ***	56,717
	PTI	b	28,411
	less IVA, admin. & auxil. VA, equals	11,759 ++	12,459
	PTI	b	111,300
	less IVA, admin. & auxil. VA, equals	163,276 +	118,115
	Total Value Added	b	462,384
less IVA, excise, sales taxes equals	493,715 ***	453,247	
All Other Sectors (MRIO 004 (agricultural services part), 005, 006, 085-119, 122, 123)	Wages & Salaries	800,176 +++	643,057
	Supplements	99,285 ++	100,741
	IBT + BTP	b	135,102
	less excise & sales taxes equals	66,828 ++	66,052
	PTI	b	365,891
	less IVA equals	374,676 *	374,676
Total Value Added	b	1,244,791	
less IVA, excise, sales taxes equals	1,140,965 +	1,184,526	
All Sectors (gross domestic product less statistical dis- crepancy; sum of all above)	Wages & Salaries (incl. admin. & auxil.)	938,980 +	983,882
	Supplements (incl. admin. & auxil.)	168,499 *	168,499
	IBT + BTP	b	174,204
	less excise & sales taxes equals	87,457 *	87,457
	PTI	b	563,584
	less IVA, admin. & auxil. VA, equals	632,382 +	580,672
Total Value Added	b	1,890,149	
less IVA, excise, sales taxes equals	1,827,318 +	1,820,510	

EXHIBIT 4: COMPARISON OF MRIO AND GPO COMPONENTS OF VALUE ADDED,  
BY MAJOR INDUSTRY (Continued)

Abbreviations:

GPO:	(Gross Product Originating) gross national product by industry from the National Income and Product Accounts
IBT:	Indirect Business Taxes
BTP:	Business Transfer Payments
PTI:	Property-type Income
IVA:	Inventory Valuation Adjustment
VA:	Valued Added
admin. & auxil.:	manufacturers' administrative offices and auxiliaries

Key to Sources:

- \* Controlled to corresponding GPO total.
- \*\* Controlled to corresponding Economic Census total.
- \*\*\* Controlled to adjusted Economic Census total (estimated purchased services deducted from Census value added; estimated supplements in manufacturers' auxiliaries added to Census supplements).
- + Derived as a sum or difference, from other values in Exhibit 4.
- ++ Controlled to GPO total, but at a broader level of aggregation than the five major industry groups shown in the exhibit.
- +++ Estimated from sources other than, or in addition to, Economic Censuses or GPO.

Notes:

<sup>a</sup>MRIO totals by industry are before force-account construction and certain other redefinitions.

<sup>b</sup>Comparable producing sector total was not computed for MRIO.

<sup>c</sup>Total is not available in GPO tabulations.



## CHAPTER 3

### DETAILED SOURCES AND METHODS FOR THE UNDERLYING DATA AND CONTROL TOTALS

This chapter describes the development of each of the data sets listed in Exhibit 2. The order of presentation is by component of value added.

#### 3.1 Supplements to Wages and Salaries

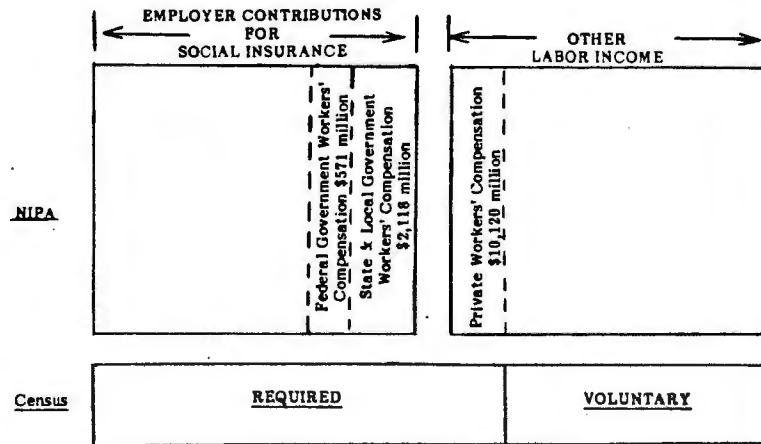
##### Introduction

Supplements to wages and salaries comprise: legally required employer contributions for Federal old age and survivors' insurance, unemployment compensation insurance and tax, workers' compensation insurance, railroad retirement and unemployment, government employees' retirement, veterans' life insurance, and temporary disability insurance; and voluntary employer contributions, whether employer initiated or the result of collective bargaining. These voluntary payments include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, and deferred stocks and profit-sharing plans. They exclude vacation or holiday pay, company in-plant benefits, employee discounts, and employer-provided food or clothing. Director's fees are included in supplements to wages and salaries in the NIPA.

This section describes the development of state totals for supplement components and the development of industry ratios of supplements to wages and salaries. Development of these supplements estimates required the melding of data from two sources: the Bureau of the Census and the NIPA. The Census Bureau reports supplements divided into "required" and "voluntary" components. The NIPA reports supplements divided into "contributions for social insurance" and "other labor income." It is possible to transpose NIPA's two supplement categories into Census categories through the following step:

<u>NIPA</u>		<u>Census</u>
Contributions for Social Insurance plus Private Workers' Compensation	=	Required Supplements
Other Labor Income less Private Workers' Compensation	=	Voluntary Supplements

The figure below illustrates this relationship:



RELATIONSHIP OF SUPPLEMENT CATEGORIES

The classification of workers' compensation as Federal, state and local, and private refers to the administration of the funds, rather than to the groups of employees benefiting.

By the above procedure it is possible to develop national industry estimates of required and voluntary supplements for all industries that can be controlled to the NIPA totals for supplements. The following discussion describes the steps in the method and the data sources in detail.

### Step 1: Development of State Totals for Components of Supplements

Using the relationship indicated above, this step produces a total for each state for legally required supplements. Voluntary supplements then becomes the difference between total supplements and required supplements. This procedure was modified to treat government employees as a separate employee class, inasmuch as certain supplements are known to apply only to these employees. Therefore, while Federal workers' compensation was computed during the step described here, it was later removed from the required supplements total and distributed according to the Federal payroll by state.

#### Required Supplements

Components of required supplements and data sources are shown below and discussed individually. Required supplements is the sum of OASDHI, unemployment insurance, Federal unemployment tax, workers' compensation, and temporary disability insurance.

<u>Supplement</u>	<u>Source #</u>	<u>Source Description</u>
OASDHI	07111	● Department of Health & Human Services, Social Security Administration, <u>Social Security Bulletin, Annual Statistical Supplement, 1977-79, Table 45, p. 98.</u>
Unemployment insurance	12110	● Bureau of Labor Statistics, <u>Employment &amp; Wages: Monthly Employment &amp; Quarterly Wage Data, 1977, Computer Tape No. 120380 (1981).</u>
Federal Unemployment Tax	07111	● Department of Health & Human Services, <u>Social Security Bulletin, Annual Statistical Supplement, Table 24, p. 75.</u>
Workers' Compensation	12105	● Bureau of Labor Statistics, <u>Monthly Labor Review, March 1981, "Workers' Compensation Insurance: Recent Trends in Employer Costs," Martin W. Elson and John F. Burton, Jr.; Table 1, p. 46.</u>

- |                                |       |   |
|--------------------------------|-------|---|
|                                | 03501 | <ul style="list-style-type: none"> <li>● Bureau of Economic Analysis, <u>Survey of Current Business</u>, July 1981, Table 3: "Personal Income by Major Sources, Selected Years 1969-80."</li> </ul> |
| Temporary Disability Insurance | 03501 | <ul style="list-style-type: none"> <li>● Telephone inquiry to BEA staff identified two affected states (New Jersey and New York).</li> </ul>  |

#### OASDHI

Old-age, survivors, disability, and health insurance (Social Security and Medicare) contributions by employers through the FICA (Federal Insurance Contributions Act) tax were paid in 1977 at a rate of 5.85 percent of taxable earnings up to a taxable earnings maximum of \$16,500. The Social Security Bulletin, Annual Statistical Supplement shows OASDHI contributions, for wage and salary employment, by state. After removing the Armed Forces, Puerto Rico, the Virgin Islands, and Other, the state totals were scaled to equal the NIPA total for employer contributions of \$44,253 million.

#### Unemployment Insurance

Data from Employment and Wages were tabulated to yield state totals for employer contributions for both private sector and government employees. After removing the Virgin Islands and Puerto Rico, contributions were scaled to equal the NIPA total for employer contributions of \$9,643 million.

#### Federal Unemployment Tax

The U.S. total Federal unemployment tax was allocated proportionally to the number of covered workers in the state. The Social Security Bulletin, Annual Statistical Supplement shows average monthly number of covered workers by state. After removing Puerto Rico, contributions were scaled to equal the NIPA total for Federal unemployment tax of \$2,270 million.

#### Temporary Disability Insurance

Temporary disability insurance is funded on a state level. Two states — New Jersey and New York — require employer contributions to fund this supplement. The New Jersey

total of \$30 million and the New York total of \$4 million are included in the respective state totals.

#### Workers' Compensation

Workers' compensation is provided under three programs: Federal, state, and private insurers. State and local government employees were assumed to be covered by state workers' compensation.

To develop state totals for employer contributions to workers' compensation under all programs, an estimate was developed using rate per dollar of payroll. The rate utilized comes from a BLS study (Source 12105) that developed average July 1, 1978 rates (adjusted for dividends, discounts, and accident experience ratings) by state for 79 types of industries accounting for 72 percent of covered payroll. The 79 industries include 30 manufacturing, 13 contracting, and 36 other types of employers. State rates were applied to state wage and salary disbursements for 1977 from the Survey of Current Business, "Personal Income by Major Sources, Selected Years 1969-80," (Source 03501). These state totals were scaled to equal the NIPA total for employer contributions to workers' compensation — Federal, state and local, and private — of \$12,809 million.

Because workers' compensation components are used to adjust the NIPA's other labor income category to Census' voluntary category, the breakdown of the \$12,809 total into separate components is discussed below.

#### Voluntary Supplements

The development of state totals for employer contributions to voluntary wage supplements utilized the data sources listed below.

<u>Supplement</u>	<u>Source</u>	<u>Source Description</u>
Other Labor Income	03501	● Department of Commerce, <u>Survey of Current Business</u> , July, 1981, Table 3: "Personal Income by Major Sources, Selected Years 1969-80".
Federal Workers' Compensation	03501	● Table 3 identified above, and estimating procedure described below.

State & Local  
Workers'  
Compensation

03117

- Department of Commerce, Bureau of the Census, State Government Finances in 1977 (Table 19), and State Government Finances in 1978 (Table 20).

Voluntary supplements were estimated by removing payments for private-carrier workers' compensation from the NIPA's category of other labor income. Of the NIPA total for workers' compensation of \$12,809 million, private-carrier workers' compensation is \$10,120 million, Federal workers' compensation is \$571 million and state workers' compensation is \$2,118 million.

Other labor income is reported by state (place of work) in the Survey of Current Business Table 3 cited above. The removal of private carrier workers' compensation was accomplished by first adding state estimates of Federal and state workers' compensation to other labor income, and then subtracting total workers' compensation - Federal, state and private - that was derived under required supplements. State estimates of Federal workers' compensation (workers' compensation for Federal employees) were obtained by taking the ratio of Federal civilian payroll in the state to Federal civilian payroll for the U.S., obtained from the Survey of Current Business Personal Income table, times the NIPA total for Federal workers' compensation of \$517 million. State estimates of state workers' compensation were obtained from the State Government Finances table, "Finances of State-Administered Workmen's Compensation Systems." Since state governments are almost exclusively on a July 1 through June 30 fiscal year, the data for FY 77 and FY 78 are averaged. The result needs no scaling to equal the NIPA total of \$2,118 million.

#### Step 2: Development of Industry Ratios of Required and Voluntary Supplements

The development of industry ratios utilizes NIPA and Census data augmented by other sources. The procedure utilized NIPA wages and salaries and total supplements by industry as control totals, and developed ratios of required and voluntary supplements using a combination of Census and NIPA data. The NIPA data are from Survey of Current Business, National Income and Product Accounts, 1976-79, a Special Supplement, July, 1981 (Source 03501). Supplements by industry is the difference between "Compensation of Employees by Industry" (Table 6.5B) and "Wages and Salaries by Industry" (Table 6.6B, p. 52). The difference equals the total in "Supplements to Wages and Salaries by Type" (Table 8.4, p. 76).

The NIPA presents wages and supplements for about 80 industries or groups of industries, and data on employer contributions for social insurance and other labor income for 17 industries or industry groups. The broader industry ratios were used to develop required and voluntary allocations where such allocations are not available from Census data. A detailed description of the procedures by major MRIO sector group is provided below.

Data on supplements for the farm sector are based on Department of Agriculture worksheet data supporting "Wages to hired labor" shown in Table 2: Farm Production Transactions, by States (new methodology), 1977-1979, Economic Indicators of the Farm Sector: State Income and Balance Sheet Statistics, 1979 (Source 02111). These data were then scaled to the NIPA total for farm supplements.

The Census of Manufactures and Census of Construction provide supplements data for detailed SIC industries. These were mapped to MRIO sectors to yield required and voluntary supplements. These national industry ratios were then applied to state payroll data as the initial step described under Step 1 above.

The NIPA sector detail closely matches MRIO sectors for finance, communications, and transportation. Through the use of the workers' compensation adjustment previously described, national ratios for required and voluntary payments were obtained. Within transportation, an adjustment for transfers into MRIO 086 to cover local government passenger transit from local government enterprises was made. An additional adjustment was made for MRIO 085 to incorporate the Railroad Retirement Fund and railroad unemployment insurance.

Retail trade and public utilities are treated in a similar fashion since for these sectors there are only highly aggregated NIPA data to serve as control totals. For utilities, NIPA data are transposed to Census categories and then supplements are allocated proportionally to the share of wages and salaries for those MRIO sectors falling within the NIPA industry group. There is an additional transfer of wages and salaries from Federal and state and local government enterprises to corresponding private sectors. NIPA retail industry data encompass MRIO sectors 098 through 102. Census data on supplements are available in 1977 Selected Characteristics of Retail Trade: Measures of Value Produced, Capital Expenditures, Depreciable Assets, and Operating Expenses (Source 03124), a study supplemental to the 1977 Census for a variety of retail classifications. These were scaled to NIPA controls.

Wholesale trade received straightforward treatment: required and voluntary ratios came from a supplemental Census study, 1977 Merchant Wholesalers: Measures of Value Produced, Capital Expenditures, Depreciable Assets, and Operating Expenses (Source 03121), and then were scaled to the NIPA control.

Services in the NIPA classification include MRIO sectors 106 through 117. There is frequently a close match between NIPA and MRIO sectors. Census data are again available from a supplemental study 1977 Selected Service Industries: Capital Expenditures, Depreciable Assets, and Operating Expenses (Source 03123), for a number of sectors: MRIO 106, 107, 108, 110, and 111. Allocation of supplements for these sectors followed the procedure described above for the retail sectors. Remaining supplements were allocated by apportioning the residual among remaining service sectors.

Government and government enterprises are shown in detail in the NIPA data for wages and salaries, with a single ratio available for social insurance contributions and other labor income. Supplements were allocated among these sectors followed by several adjustments. Federal, state and local utilities and municipal transit system shares were transferred out of government enterprises and into the appropriate operating sectors. Because there are several wage supplement programs unique to government workers, these employees were set apart and a separate allocation of contributions was ascribed to them. This separate allocation included Federal workers' compensation, veterans' life insurance, and Federal civilian employees' retirement fund. In a similar manner, state and local government workers receive the full share of state and local employee retirement contributions.

### 3.2 Indirect Business Taxes and Business Transfer Payments

Seven components of indirect business tax (IBT) accruals and business transfer payments (BTP) were estimated for MRIO state-level producing sectors, as follow:

1. state and local property taxes;
2. state severance taxes;
3. state and local motor vehicle registration and license fees;
4. state corporation license fees;
5. other state license fees;
6. Federal highway and aircraft use taxes;
7. non-tax payments to Federal, state, and local general government and business transfer payments.



The following components of NIPA-definition IBT were not allocated to producing sectors:

1. Federal excises other than use taxes;
2. customs duties;
3. state and local wholesale excise and sales taxes.

The taxes excluded from the producing sector IBT + BTP estimates appear in the MRIO accounts as components of margins added in the distribution sectors or in final demand. The estimates of these taxes are described in the MRIO industry inputs report.

Data sources and estimation methods for each of the components of IBT + BTP allocated to producing sectors are described in the following sections.

#### State and Local Property Taxes

Property taxes were assigned to all sectors except nonprofit organizations (MRIO 116) and government. The methodology involved allocating a variety of control totals based on the procedures described in Chapter 2. Control totals by state were developed for all property taxes, commercial property taxes, and industrial property taxes. In addition, estimates of assets were developed for sectors considered commercial and sectors considered industrial.

Control totals for all property taxes were developed from Governmental Finances in 1976-77 (Source 03117) and Governmental Finances 1977-78 (Source 03117). State level data for state property taxes and for local property taxes for fiscal years were averaged to provide calendar year taxes for each level of government. State and local property taxes were then summed to provide total taxes by state.

Control totals for commercial property taxes and for industrial property taxes were developed by using data on the assessed value of property subject to local general property taxation from the 1977 Census of Governments (Source 03110) and data on property tax categories for state governments from State Government Tax Collections in 1977 (Source 03117). First, where the detail on property tax categories for state taxes allowed, property taxes were distributed to industrial or commercial property taxes. The remainder of state taxes were included with local taxes to be distributed based on assessments. Next, data on the amounts of real property assessments for commercial and industrial were added to data on personal property assessments for

commercial and industrial sectors. Personal property assessment data were available only for selected states and were given as a total for both commercial and industrial. Where data on personal property assessments for commercial and industrial sectors were not available, the percentage for all states reporting this breakdown was used. Commercial and industrial personal property assessments were divided based on the ratio of their real property assets. Finally, assessments for each subgroup were divided by total assessments to provide a percentage of assessments for the commercial and industrial sectors. These percentages were multiplied by total taxes, less state taxes already allocated, to provide preliminary control totals by state. Final control totals were developed by re-adding state taxes already allocated.

MRIO sector estimates were developed for the total amount of depreciable assets and land for each MRIO sector defined as commercial. This was accomplished by multiplying output for each commercial sector, developed in Task 1, by the ratio of depreciable assets and land to business receipts from the 1976 Corporation Income Tax Returns, Source Book (Source 15101).

MRIO sector estimates were developed for depreciable assets per employee for each MRIO sector defined as industrial. For manufacturing, depreciable assets and employees were available by four-digit SIC group from the 1977 Census of Manufactures (Source 03105). For the mining sectors, depreciable assets and employees were available from the 1977 Census of Mineral Industries (Source 03104). For the remaining sectors a number of publications were used including National Transportation Statistics (Source 14104), Statistics of Communication Common Carriers (Source 16203) Gas Facts (Source 22011), Statistical Year Book of the Electric Utility Industry (Source 22021) and the 1976 Corporation Income Tax Returns, Source Book (Source 15101). No estimates of land assets were made for the industrial sectors, but since industrial property taxes were controlled to state-level totals, the resulting bias is believed to be slight.

The difference between total property taxes and industrial plus commercial property taxes equals residential property taxes. These were assigned directly to the real estate sector (MRIO 105) in each state.

### Other Indirect Business Taxes

State severance taxes, motor vehicle registration and license fees paid by business, corporation fees, and other business license fees were individually allocated to state-level MRIO sectors by the following two-step procedure:

1. State totals for all sectors were estimated for each of the four taxes by allocating the U.S. total accruals for each tax from NIPA worksheets (Source 03520) proportionally to the state distribution of collections for the most closely related tax for which state-level data are available from the Census State Government Tax Collections (Source 03117), Census of Governments, (Source 03110), or Highway Statistics (Source 14401). Specifically the allocators were as follow:

<u>NIPA Tax (03520)</u>	<u>State Allocator and Source</u>
severance taxes	severance taxes
corporation franchise	corporations in general (03117)
motor vehicle taxes	truck, trailer, and bus registration fees (14401)
occupational, business n.e.c., and other licenses	other taxes (03110, 03117)

2. The estimated state total for each tax was allocated to MRIO sectors within each state proportionally to output in each sector in the state times a U.S. average tax rate for the sector, computed as the U.S. total for the tax in the GPO sector (from Source 03117) containing the MRIO sector, divided by U.S. total output in the MRIO sectors comprising that GPO sector.

U.S. totals for the Federal highway use and aircraft use taxes (from Sources 03519 and 15102) were available by GPO sector, and were allocated to the state-level MRIO sectors comprising each GPO sector proportionally to output.

The remaining components of IBT + BTP to be allocated to MRIO producing sectors -- non-tax payments by business to Federal, state, and local general government, and business transfer payments -- were available from the NIPA worksheets (Sources 03519, 03520), U.S. totals by GPO sector. Each GPO total (non-taxes + BTP) was allocated to the state-level MRIO sectors comprising the GPO sector proportionally to output.

## GPO Control Totals

Indirect business taxes and business transfer payment components for GPO industries were used as control totals in the estimates of the included components of MRIO producing sector IBT + BTP. For MRIO sectors that correspond to parts of several GPO sectors, control totals were developed by allocating GPO IBT + BTP components to MRIO sectors proportionally to output by MRIO sector within each GPO industry.

### 3.3 Property-type Income and Total Value Added

As Chapter 2 describes, property-type income was estimated for state-level sectors either as the residual value added after deducting compensation of employees and IBT + BTP (in the manufacturing, construction, and mining sectors); or by allocating a U.S. control total PTI across states (in all other sectors). Exhibit 2 lists the data sets for total value added and PTI that were the basis of the PTI estimates by state by sector. This section describes the development of those data sets, by MRIO sector group.

#### Farms (MRIO Sectors 001-003, 004 (excluding Agricultural Services))

Property-type income, total for all farms, by state, was taken from U.S. Department of Agriculture, Economics and Statistics Service, Economic Indicators of the Farm Sector: State Income and Balance Sheet Statistics, 1979, March 1981 (Source 02111); Table 2, pp. 33-57, "Farm Production Transactions by State." PTI was computed as capital consumption plus interest plus returns to operators less government payments, from data in the table. The resulting farm PTI by state were scaled to GPO U.S. total farm PTI. Farm PTI includes the inventory valuation adjustment.

National control totals for PTI in the MRIO farm sectors were developed by allocating the components of GPO PTI (profits, capital consumption, interest, and government subsidies). The allocations were based on output by MRIO farm sector and on ratios of farm debt, value of assets, and value of products sold less production expenses to value of products sold, for the SIC farm industries most closely corresponding to the MRIO farm sectors, from U.S. Department of Commerce, Bureau of the Census 1974 Census of Agriculture (Source 03109) Volume 1, part 51, Chapter 1, Table 32, pp. 1-76 to 1-91, "Summary by Standard Industrial Classification of Farms: 1974."

Mining (MRIO Sectors 007-013)

Total value added by four-digit SIC industry by state was available from the 1977 Census of Mineral Industries (Source 03106), Vols. MIC 77-A-1 through -A-9, (Geographic Area Series) Table 2a, "State Statistics for Mineral Establishments by Industry." Suppressed values were estimated as the U.S. average ratio of value added to employment for the four-digit SIC industry times state employment in the industry. For MRIO sectors containing parts of four-digit SIC industries, the SIC industry value added was allocated to MRIO sectors proportionally to SIC industry output in each MRIO sector.

Value added in the Economic Censuses is computed as value of production less cost of materials consumed.<sup>1</sup> Since Census does not collect data on most purchased services, Census-definition value added includes the cost of purchased services.

Value added by MRIO sector was computed by deducting estimates of purchased services from MRIO sector Census-definition value added. Ratios were computed of value added to (value added plus services purchased from BEA I-O Sectors 66, 67, 68.0300, 69-79) in the 1972 BEA I-O Use of Commodities by Industry table (U.S. Department of Commerce, Bureau of Economic Analysis, Detailed Input-Output Structure of the U.S. Economy: 1972, (Source 03504, Volume 1, Table 1)), for BEA I-O Sectors 5 through 10. Value added adjusted for removal of purchased services was then computed for each MRIO state-level mining sector as Census-definition value added times the U.S. average ratio of value added to (value added plus purchased services) for the most closely corresponding BEA I-O sector.

Census-definition value added implicitly includes inventory change at book value, and no inventory valuation adjustment was performed on the MRIO sector value added estimates derived from the Economic Censuses (i.e., the mining, construction, and manufacturing sectors).

<sup>1</sup>Computationally, in the Census of Mineral Industries, value added is value of shipments plus capital expenditures less cost of supplies less purchased machinery.

#### Construction (MRIO Sectors 014-019)

In the construction sectors, U.S. total value added by MRIO sector and total value added for all construction sectors by state were estimated from 1977 Census of Construction Industries (Source 03104) value added data (state value added from Vol. CC 77-A-10, Table 4 "General Statistics for Establishments with Payroll by State: 1977, 1972, 1967," pp. 52-57; and U.S. total value added by two-digit SIC from Vol. CC 77-I-28, Table 4, "Detailed Statistics for Establishments with Payroll: 1977"), the distribution of gross receipts by MRIO construction sector by two-digit SIC industry from Task 1, and BEA I-O ratios of value added to (value added plus purchased services) in construction. U.S. total value added for each two-digit SIC industry was computed as Census value added for establishments with payroll, less rental payments and purchased repair and communications services reported by Census, less estimated value added in non-construction activities not deducted in the Census value added computation, plus estimated value added for establishments without payroll, less other purchased services estimated from the BEA 1972 I-O table by the method described under the section on mining PTI above. Purchased services for which Census does not collect data in construction correspond to BEA I-O Sectors 67, 68.0300, 70, 71.0100, 72.0100, 72.0300, 74, and 76-79.

Value added by two-digit SIC industry was allocated to MRIO construction sectors proportionally to the gross receipts of each two-digit SIC industry in each MRIO construction sector, at the U.S. level. Value added in MRIO 014 was then scaled to allow for an additional \$6,460 million of output in the sector not reported in the Census, but included in the MRIO 014 output estimate.

Finally, census-definition value added in construction by state was scaled to sum to the total of the U.S. MRIO sector value added estimates.

#### Manufacturing (MRIO Sectors 020-084)

The method for developing estimates of value added by state by sector in manufacturing was identical to that described for mining above, with two exceptions. First, the computations in manufacturing were carried through entirely at the four-digit SIC industry level before aggregating to MRIO sectors. Second, it was necessary first to add excise taxes not included in Census value of shipments to Census-definition value

added, before multiplying by the BEA I-O ratio of value added to (value added plus purchased services). Excise taxes were then deducted from producing sector value added.

All Other Sectors (MRIO Sectors 004 (agricultural services part), 005, 006, 085-119)

For this group of sectors, U.S. total PTI (less the inventory valuation adjustments) for GPO industries were the only PTI data employed. PTI for each GPO industry that corresponds to parts of more than one MRIO sector in the group was allocated proportionally to the output of those MRIO sectors or subsectors comprising the GPO industry, at the U.S. level.

APPENDIX A: DEFINITIONS OF VALUE ADDED COMPONENTS IN THE NATIONAL  
INCOME AND PRODUCT ACCOUNTS<sup>1</sup>

[ . . . ]

The definitions are presented in the framework of the five-account summary of the national income and product accounts (NIPA's) shown in table A. Entries in a given account have counterentries in another. The parenthetical numbers that follow entries identify these counterentries by account and line number.

[ . . . ]

*NIP account: charges against gross national product*

*Charges against GNP* is the costs incurred and the profits earned in the production of GNP. Accordingly, it equals GNP, except for the statistical discrepancy. In the NIPA's, these charges are arranged in two groups. The first of these—compensation of employees, proprietors' income, rental income of persons, corporate profits, and net interest—are factor charges, because they represent the incomes of the factors of production (labor and property). The total of factor incomes is called the national income. The second group consists of nonfactor charges. Addition of business transfers, indirect business taxes, and current surplus of government enterprises less subsidies—which are included in this group—to national income equals charges against net national product (and net national product). Addition of capital consumption allowances—the remaining item in the nonfactor cost group—to charges against net national product equals, in principle, charges against GNP (and GNP). In practice, a statistical discrepancy is also entered to secure balance between GNP and the factor and nonfactor charges against it.

<sup>1</sup>Reproduced from U.S. Department of Commerce, Bureau of Economic Analysis, *The National Income and Product Accounts of the United States, 1929-74. Statistical Tables, a Supplement to the Survey of Current Business*, Washington, DC, U.S. Government Printing Office, 1977; pp. vii-ix.



The aggregates that have been enumerated so far differ from each other because of distinctions that are made between market value and factor cost concepts, and gross and net concepts. GNP as derived above is a gross market value measure; national income is a net factor cost measure; and net national product is a net market value measure. In principle, four measures of production can be derived from these two distinctions. In the United States, the following three have been found most useful: GNP, which has already been defined, and net national product and national income, which are defined below.

*Net national product* is the net market value of the goods and services produced by labor and property supplied by residents of the United States. Net national product equals GNP less capital consumption allowances, which are deducted from gross private domestic fixed investment to express it on a net basis.

*National income* is the incomes that originate in the production of goods and services attributable to labor and property supplied by residents of the United States. Thus, it measures the factor costs of goods and services produced. Incomes are recorded in the forms in which they accrue to residents, and are measured before deduction of taxes on those incomes. They consist of the compensation of employees, proprietors' income, rental income of persons, corporate profits, and net interest.

*Compensation of employees* is the income accruing to employees as remuneration for their work. It is the sum of wages and salaries and supplements to wages and salaries.

*Wages and salaries* consists of the monetary remuneration of employees, including the compensation of corporate officers; commissions, tips, and bonuses; and receipts in kind that represent income to the recipients. It consists of *disbursements* (1-3) and *wage accruals less disbursements* (1-4). Disbursements is wages and salaries as just defined except that retroactive wages are counted when paid rather than when earned.

*Supplements to wages and salaries* consists of employer contributions for social insurance and of other labor income. *Employer contributions for social insurance* (1-6) includes employer payments under the following programs: Federal old-age, survivors, disability, and hospital insurance; State unemployment insurance; railroad retirement and unemployment insurance; government retirement; and publicly administered workman's compensation. *Other labor income* (1-7) includes employer contributions to private pension and welfare funds, and directors' fees.

*Proprietors' income with inventory valuation and capital consumption adjustments* (1-8) is the monetary income and income in kind of sole proprietorships and partnerships, including the independent professions, and of producers' cooperatives. Interest and dividend income received by proprietors, and rental incomes received by persons who are not primarily engaged in the real estate business are excluded. The inventory valuation adjustment is described under corporate profits and the capital consumption adjustment under capital consumption allowances.

*Rental income of persons with capital consumption adjustment (1-9)* is the monetary income of persons from the rental of real property, except the income of persons primarily engaged in the real estate business; the imputed net rental income of owner-occupants of non farm dwellings, and the royalties received by persons from patents copyrights, and rights to natural resources. The capital consumption adjustment is described under capital consumption allowances.

*Corporate profits with inventory valuation and capital consumption adjustments* is the income of corporations organized for profit and of mutual financial institutions that accrues to residents, measured before profits taxes, before deduction of depletion charges, after exclusion of capital gains and losses, and net of dividends received from domestic corporations. In addition to profits earned in domestic operations, corporate profits includes net receipts of dividends and branch profits from abroad. In other major respects, profits are defined in accordance with Federal income tax regulations. The capital consumption adjustment is described under capital consumption allowances.

*Profits before tax* is corporate profits without inventory valuation and capital consumption adjustments.

*Profits tax liability (1-12)* is Federal, State, and local taxes on corporate income.

*Profits after tax* is profits before tax less profits tax liability. *Dividends (1-14)* is cash dividends paid by corporations organized for profit to stockholders who are U.S. persons. *Undistributed profits (1-15)* is corporate profits before tax less corporate profits tax liability and less dividends. It equals the change in corporate net worth stemming from current operations. It may also be viewed as the sum of purchases of fixed assets, the change in the book value of corporate inventories, and the net acquisition of financial assets, less the sum of capital consumption allowances, net borrowing, and net stock issues.

*Inventory valuation adjustment (1-16)* is the change in the business inventories component of GNP (CBI), which is measured as the change in the physical volume of inventories valued in prices of the current period, less the change in the value of inventories reported by business (book value). The IVA is required because, according to the inventory accounting methods used by business, the change in book values generally differs from the CBI. Measurement of inventory change as physical volume change valued in prices of the current period conforms its treatment to that of all other components of GNP. An alternative definition of the IVA as the excess of the replacement cost of inventories used up over their historical acquisition cost is often helpful. That this definition is equivalent to the definition stated above follows from the fact that, according to all methods of inventory valuation used by business, inventory purchases in an accounting period are reflected in book values in the prices of that accounting period. To make the measurement of charges against GNP consistent with GNP, the IVA must be applied to reported corporate profits and proprietors' income, because these are based on the same accounting methods that underlie the book value of inventories.

*Net interest (1-18)* is interest paid by domestic business less interest received by it, plus net interest received from abroad. In addition to monetary interest flows, net interest includes flows of interest in kind (imputed interest). The latter have their counterparts in similar service charges. The portion of the imputed interest flows that is allocated to consumers and government is a component of net interest and the associated service charges are included in PCE and government purchases.

*Business transfer payments (1-20)* includes corporate gifts to non-profit institutions and bad debts incurred by consumers. Most of PCE is stated before deduction of consumer bad debts; corporate profits and proprietors' income are stated after allowance for bad debts. Accordingly bad debts have to be entered explicitly among the charges against GNP. They are entered as a component of businesses transfer payments because, like gifts, they fit into the general category of transfer payments, which are defined as payments to persons for which the latter do not perform current services.

*Indirect business tax and nontax liability (1-21)* consists of tax liabilities (except employer contributions for social insurance) that are chargeable to business expense in the calculation of profit-type incomes, and of certain other business liabilities to general government that it is convenient to treat like taxes. Indirect business taxes includes sales, excise, and property taxes. Taxes on corporate income are excluded because such taxes cannot be calculated until profits are known, and in that sense, are not a business expense. Nontaxes includes regulatory and inspection fees, special assessments, fines and penalties, rents, and royalties, and donations. Nontaxes generally excludes business purchases from government of goods and services that are similar to business purchases of intermediate products from other businesses. Government receipts from the sale of such products are netted against government purchases so that they do not appear in GNP and other measures of production.

*Subsidies less current surplus of government enterprises (1-22).* *Subsidies* is the monetary grants paid by government to business, including government enterprises at another level of government. The *current surplus of government enterprises* is their sales receipts less their current outlays. In the calculation of their current surplus, no deduction is made for depreciation charges and net interest paid. Subsidies and current surplus are often combined because government enterprises may incur deficits by selling goods to businesses at lower than market prices in lieu of giving them subsidies. This is also the major reason for not counting the current surplus of government enterprises as a profit-type income and, accordingly, as part of factor charges.

*Statistical discrepancy (1-23)* is GNP less charges against GNP other than the statistical discrepancy. It arises because GNP and charges against GNP are estimated independently by a methodology that is subject to error.

*Capital consumption allowances with capital consumption adjustment (1-25).* *Capital consumption allowances* consists of depreciation charges and accidental damage to fixed business capital. For nonfarm business, they are as reported on Federal income tax returns. For farms, nonprofit institutions, and owner-occupied houses, depreciation charges are not based on income tax returns, but instead are NIP calculations. *Capital consumption adjustment (1-17)* is the tax return-based capital consumption allowances less capital consumption allowances that are based on estimates of economic service lives, straight-line depreciation, and replacement cost.

Table A<sup>a</sup>.

1.—National Income and Product Account  
[Billions of dollars]

Line		Line	
1	Compensation of employees.....	26	Personal consumption expenditures (2-3).....
2	Wages and salaries.....	27	Durable goods.....
3	Disbursements (2-7).....	28	Nondurable goods.....
4	Wage accruals less disbursements (3-11)+(5-4).....	29	Services.....
5	Supplements to wages and salaries.....	30	Gross private domestic investment (5-1).....
6	Employer contributions for social insurance (3-10).....	31	Fixed investment.....
7	Other labor income (2-8).....	32	Nonresidential.....
8	Proprietors' income with inventory valuation and capital consumption adjustments (2-9).....	33	Structures.....
9	Rental income of persons with capital consumption adjustment (2-10).....	34	Producers' durable equipment.....
10	Corporate profits with inventory valuation and capital consumption adjustments.....	35	Residential.....
11	Profits before tax.....	36	Change in business inventories.....
12	Profits tax liability (3-10).....	37	Net exports of goods and services.....
13	Profits after tax.....	38	Exports (4-1).....
14	Dividends (2-11).....	39	Imports (4-3).....
15	Undistributed profits (5-8).....	40	Government purchases of goods and services (3-1).....
16	Inventory valuation adjustment (5-7).....	41	Federal.....
17	Capital consumption adjustment (5-8).....	42	National defense.....
18	Net interest (2-13).....	43	Nondefense.....
19	NATIONAL INCOME.....	44	State and local.....
20	Business transfer payments (2-10).....		
21	Indirect business tax and owner liability (3-17).....		
22	Less: Subsidies less current surplus of government enterprises (3-10).....		
23	Statistical discrepancy (5-12).....		
24	CHARGES AGAINST NET NATIONAL PRODUCT.....		
25	Capital consumption allowances with capital consumption adjustment (5-9).....		
	CHARGES AGAINST GROSS NATIONAL PRODUCT.....		
			GROSS NATIONAL PRODUCT.....

A-5

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<sup>a</sup>This table is intended for illustration purposes only. The values are for 1974 NIP, and do not reflect the latest revisions to the NIP.

APPENDIX B  
ALLOCATION AND SCALING PROCEDURES

The following notation will be used in this appendix.

The matrix

$$B = \begin{bmatrix} b_{11} & \dots & b_{1m} \\ \vdots & & \vdots \\ \vdots & & \vdots \\ b_{n1} & \dots & b_{nm} \end{bmatrix}$$

is a matrix of values associated with  $m$  industry sectors in  $n$  states (for example, payroll by MRIO manufacturing sector by state).

$$R = \begin{bmatrix} r_1 \\ \vdots \\ r_n \end{bmatrix} = \begin{bmatrix} \sum_{j=1}^m b_{1j} \\ \vdots \\ \sum_{j=1}^m b_{nj} \end{bmatrix}$$

is the vector of row totals of  $B$ , and

$$C = \begin{bmatrix} c_1 & \dots & c_m \end{bmatrix} = \begin{bmatrix} \sum_{i=1}^n b_{i1} & \dots & \sum_{i=1}^n b_{im} \end{bmatrix}$$

is the vector of column totals of  $B$ .

The vector

$$R' = \begin{bmatrix} r_1' \\ \vdots \\ r_n' \end{bmatrix}$$

is another vector of attributes of all sectors in each of the  $n$  states (for example, required supplements, total for all manufacturing sectors, by state); and

$$C' = \begin{bmatrix} c_1' & \dots & c_m' \end{bmatrix}$$

is a vector of attributes of each of the  $m$  sectors for all states (for example, required supplements, U.S. total by MRIO manufacturing sector.)

Then, in the text, the phrase --R' was allocated proportionally to B -- means that a new matrix A with elements

$$a_{ij} = b_{ij} \frac{r_i'}{r_i}$$

was computed.

The phrase -- B was scaled to R' -- is defined identically. The phrases -- C' was allocated proportionally to B -- and -- B was scaled to C' -- have analogous definitions.

The description in the text -- R' and C' were allocated by iterative scaling on B -- means: B was scaled to R', yielding matrix A<sub>1</sub>; and A<sub>1</sub> was scaled to C', yielding A<sub>2</sub>. Then A<sub>2</sub> was scaled to R', yielding A<sub>3</sub>; and A<sub>3</sub> was scaled to C', yielding A<sub>4</sub>; and so forth. This procedure is repeated until A<sub>k</sub>'s rows sum to R' and its columns sum to C' simultaneously to within some specified tolerance. The procedure will not converge if some b<sub>kl</sub> is the only non-zero element in row k and column l of B; or an entire row or column of B is zero and the corresponding element of R' or C' is non-zero; and in several other less probable circumstances.

The iterative scaling procedure is an informal method of producing a plausible allocation of a quantity when both row and column totals are known, and a state by sector matrix of some related quantity is available. The resulting allocation sums to the known totals, and reflects the structure of the original, related matrix.

APPENDIX C  
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April, 1982

Concordance of MRIO, BEA I-O and SIC Codes

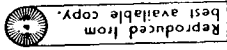
APPENDIX D

MRIO Code	Sector Name	1977 BEA I-O Code	Sector Name	1977 SIC
001	Dairy farm products	10100	Dairy farm products -----	0241, pt. 0191, pt. 0259, pt. 0291
002	Livestock and poultry	10200	Poultry and eggs -----	025 (excl. pt. 0259), pt. 0191, pt. 0219, pt. 0291
003	Cotton, grain and tobacco	10301	Heat animals -----	021 (excl. pt. 0219), pt. 0191, pt. 0259, pt. 0291
		10302	Miscellaneous livestock =	027, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		20100	Cotton -----	0131, pt. 0191, pt. 0219, pt. 0259, pt. 0291
004	Fruits, nuts, vegetables, and misc. crops and services	20201	Food grains -----	pt. 011, pt. 0139, pt. 0219, pt. 0259, pt. 0291
		20202	Feed grains -----	pt. 011, pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		20203	Grass seeds -----	0132, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		20300	Tobacco -----	0132, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		20401	Fruits -----	pt. 017, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		20402	Tree nuts -----	0173, pt. 0179, pt. 0191, pt. 0219, pt. 0259, pt. 0291

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Agriculture, forestry and fisheries

(cont'd)



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Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	I-O Code	Sector Name	SIC
004	Agriculture, cont'd Fruits, nuts, vegetables, and misc. crops and services	1977 BEA		1977
005	Forestry products		20501 Vegetables ----- 20502 Sugar crops ----- 20503 Miscellaneous crops ----- 20600 Oil bearing crops ----- 20701 Forest products -----	0134, 0161, pt. 0119, pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291 0133, pt. 0191, pt. 0219, pt. 0259, pt. 0291 pt. 0119, pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291 0116, pt. 0119, pt. 013, pt. 0173, pt. 0219, pt. 0259, pt. 0291 pt. 018, pt. 0191, pt. 0219, pt. 0259, pt. 0291
006	Commercial fishing and trapping			88 88
007	Iron and ferroalloy ores		50000 Iron and ferroalloy ores 60100 Copper ore mining ----- 60200 Nonferrous metal ores Mining, except copper	101, 106 102
008	Nonferrous ores			103-B, pt. 108, 109
009	Coal		70000 Coal mining -----	1111, pt. 1112, 1211, pt. 1213

(cont'd)

MRIO Code	Sector Name	1977 BSA I-O Code	Sector Name	1977 BIC
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010	Crude petroleum			pt. 131, pt. 132, pt. 138
011	Natural gas and liquids			pt. 131, pt. 132, pt. 138
012	Stone, clay, sand and gravel	90001	Dimension, crushed and broken stone mining and quarrying	141-2
		90002	Sand and gravel mining	144
		90003	Clay, ceramic, and refractory minerals	145
		90004	Nonmetallic mineral services and miscellaneous minerals mining	pt. 148, 149
013	Chemical and fertilizer minerals	10000	Chemical and fertilizer and quarrying	147
<b>Construction</b>				
014	Residential building construction	110101	New residential 1-unit structures, nonfarm	pt. 15, pt. 17
		110102	New residential 2-4 unit structures, nonfarm	pt. 15-17
		110103	New residential garden apartments	pt. 15-17
		110104	New residential high-rise apartments	pt. 15-17
		110105	New residential additions and alterations, nonfarm	pt. 15-17

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Concordance of MRIO, BSA I-O and SIC Codes

(cont'd)  
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MRO Code	Sector Name	1977 BEA I-O Code	Sector Name	1977 SIC
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Construction cont'd

013 Nonresidential building construction

- 110106 New hotels and motels ----- pc. 15-17
- 110107 New dormitories and other group housing ----- pc. 15-17
- 110201 New industrial buildings ----- pc. 15-17
- 110202 New office buildings ----- pc. 15-17
- 110203 New warehouses ----- pc. 15-17
- 110204 New garages and service stations ----- pc. 15-17
- 110205 New stores and restaurants ----- pc. 15-17
- 110206 New religious buildings ----- pc. 15-17
- 110207 New educational buildings ----- pc. 15-17
- 110231 New hospitals ----- pc. 15-17
- 110232 New residential institutions and other health facilities ----- pc. 15-17
- 110241 New amusement and recreation buildings ----- pc. 15-17
- 110250 Other nonfarm buildings ----- pc. 15-17
- 110301 New telephone and telegraph facilities ----- pc. 16-17
- 110302 New railroads ----- pc. 16-17
- 110303 New electric utility facilities ----- pc. 16-17
- 110304 New gas utility facilities ----- pc. 16-17
- 110305 New petroleum pipelines ----- pc. 16-17
- 110306 New water supply facilities ----- pc. 16-17
- 110307 New sewer system facilities ----- pc. 16-17
- 110308 New local transit facilities ----- pc. 16-17

018 Public utility construction

(cont'd)

Concordance of MRO, BEA I-O and SIC Codes

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Concordance of MRIO, BSA I-O and SIC Codes

MRIO Code	Sector Name	1977 BSA I-O Code	Sector Name	1977 SIC
	Construction cont'd			
017	Highways and Streets	110400	New highways and streets	pc. 16-17
018	Other Construction	110501	New farm housing units and additions and alterations	pc. 15, pc. 17
		110502	New farm service facilities	pc. 15, pc. 17
		110601	New petroleum and natural gas well	pc. 15, pc. 17
		110602	New petroleum, natural gas, and solid mineral exploration	pc. 130
		110603	New access structures for solid mineral development	pc. 100, pc. 1112, pc. 1213, pc. 138, pc. 148
		110701	New military facilities	pc. 15-17
		110702	New dams and reservoirs	pc. 15-17
		110703	Other new conservation and development facilities	pc. 15-17
		110704	Other new nonbuilding facilities	pc. 15-17
019	Maintenance construction	120100	Maintenance and repair, residential	pc. 15, pc. 17
		120201	Maintenance and repair of other nonfarm buildings	pc. 15-17
		120202	Maintenance and repair of farm residential buildings	pc. 15, pc. 17

(cont'd)

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Concordance of MRIO, BSA I-O and SIC Codes

MRIO Code	Sector Name	1977 BSA I-O Code	Sector Name	1977 SIC
819	Construction cont'd			
	Maintenance construction			
120203	Maintenance and repair of farm service facilities	120204	Maintenance and repair facilities	pc. 15, pc. 17
120205	Maintenance and repair of telegraph facilities	120205	Maintenance and repair of telegraph facilities	pc. 16-17
120206	Maintenance and repair of electric utility facilities	120206	Maintenance and repair of electric utility facilities	pc. 16-17
120207	Maintenance and repair of gas utility facilities	120207	Maintenance and repair of gas utility facilities	pc. 16-17
120208	Maintenance and repair of petroleum pipelines	120208	Maintenance and repair of petroleum pipelines	pc. 16-17
120209	Maintenance and repair of water supply facilities	120209	Maintenance and repair of water supply facilities	pc. 16-17
120210	Maintenance and repair of sewer facilities	120210	Maintenance and repair of sewer facilities	pc. 16-17
120211	Maintenance and repair of local transit facilities	120211	Maintenance and repair of local transit facilities	pc. 16-17
120212	Maintenance and repair of military facilities	120212	Maintenance and repair of military facilities	pc. 16-17
120213	Maintenance and repair of conservation and development facilities	120213	Maintenance and repair of conservation and development facilities	pc. 15-17
120214	Maintenance and repair of highways and streets	120214	Maintenance and repair of highways and streets	pc. 15-17
			(cont'd)	

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Concordance of MRIO, BFA I-O and SIC Codes

MRIO Code	Sector Name	1977 BFA I-O Code	Sector Name	1977 SIC
819	Maintenance construction	120215	Maintenance and repair of petroleum and natural gas wells	pc. 130
		120216	Maintenance and repair of other nonbuilding facilities	pc. 15-17
	Manufacturing	130200	Ammunition, except for small arms, n.e.c.	3483
		130300	Tanks and tank components	3795
		130500	Small arms	3484
		130600	Small arms ammunition	3482
		130700	Other ordnance and accessories	3489
821	Meat products	140101	Meat packing plants	2011
		140102	Sausages and other prepared meats	2013
		140103	Poultry dressing plants	2016
		140104	Poultry and egg processing	2017
822	Dairy products	140200	Creamery butter	2021
		140300	Cheese, natural and processed	2022
		140400	Condensed and evaporated milk	2023
		140500	Ice cream and frozen desserts	2024
		140600	Fluid milk	2026

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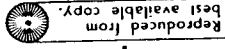
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MRIO Code	Sector Name	1977 BSA I-O Code	Sector Name	SIC
	Manufacturing cont'd			
023	Canned and frozen foods	140700	Canned and cured sea foods	2091
		140800	Canned specialties	2032
		140900	Canned fruits and vegetables	2033
		141000	Dehydrated food products	2034
		141100	Pickles, sauces, and salad dressings	2035
		141200	Fresh or frozen packaged fish	2092
		141301	Frozen fruits, fruit juices and	2037
		141302	Frozen specialties	2038
		141401	Flour and other grain mill products	2041
		141402	Cereal breakfast foods	2043
		141403	Blended and prepared flour	2045
		141503	Dog, cat, and other pet food	2047
		141502	Prepared feeds, n.e.c.	2048
		141600	Rice milling	2044
		141700	Wet corn milling	2046
025	Bakery products	141801	Bread, cake, and related products	2051
		141802	Cookies and crackers	2052
		141900	Sugar	2051-3
		142001	Confectionery products	2065
		142002	Chocolate and cocoa products	2066
		142003	Chewing gum	2067
			(cont'd)	

Concordance of MRIO, BVA I-O and SIC Codes

MRIO Code	Sector Name	Manufacturing cont'd	1977 BVA I-O Code	Sector Name	SIC
027	Beverages, extracts, and sirups		142101	Malt beverages	2082
			142102	Malt	2083
			142103	Wines, brandy, and brandy spirits	2084
			142104	Distilled liquor, except brandy	2085
			142200	Bottled and canned soft drinks	2086
			142300	Flavoring extracts and sirups, n.e.c.	2087
028	Other food products		142400	Cottonseed oil mills	2074
			142500	Soybean oil mills	2075
			142600	Vegetable oil mills, n.e.c.	2076
			142700	Animal and marine fats and oils	2077
			142800	Roasted coffee	2095
			142900	Shortening and cooking oils	2079
			143000	Manufactured ice	2097
			143100	Macaroni and spaghetti	2098
			143200	Food preparations, n.e.c.	2099
029	Tobacco products		150101	Cigarettes	211
			150102	Cigars	212
			150103	Chewing and smoking tobacco	213
			150200	Tobacco stemming and redrying	214
030	Fabric, yarn and thread mills		160100	Broadwoven fabric mills and fabric finishing plants	221-9, 2261-2
			160200	Narrow fabric mills	224

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(cont'd)

MRIO Code	Sector Name	1977 BEA I-O Code	Sector Name	SIC
030	Fabric, yarn and thread mills	160300	Yarn mills and finishing of textiles, n.e.c.	2269, 2281-30, 2284
031	Floor coverings and mbr. textile products	170100	Floor coverings	227
		170200	Felt goods, n.e.c.	2291
		170300	Lace goods	2292
		170400	Padding and uphol- stery filling	2293
		170500	Processed textile waste	2294
		170600	Coated fabrics, not rubberized	2295
		170700	Tire cord and fabric	2296
		170900	Cordage and twine	2298
		171001	Nonwoven fabrics	2297
		171002	Textile goods, n.e.c.	2299
032	Hosiery and knit goods	180101	Women's hosiery, except socks	2251
		180102	Hosiery, n.e.c.	2252
		180300	Knit fabric mills	2257-0
033	Apparel	180400	Apparel made from purchased materials	231-00, 39396
		180201	Knit outerwear mills	2253
		180202	Knit underwear mills	2254
034	Other fabricated textile products	100203	Knitting mills, n.e.c.	2259
		190100	Curtains and draperies	2391
		190200	Housefurnishings, n.e.c.	2392
		190301	Textile bags	2393
		190302	Canvas and related products	2394

(cont'd)

Revised

Revised

Revised

MRIQ Code	Sector Name	I-O Code	Sector Name	SIC
1977	1977 BEA			1977
	Manufacturing, cont'd			
834	Other fabricated textile products	190303	Plating and stitching -	2395
		190304	Automotive and apparel	2396
		190305	Schiffli machine	2397
		190306	Fabricated textile	2399
		200100	Logging camps and logging	2411
		200200	Sawmills and planing	2421
		200300	Hardwood dimension and	2426
		200400	Special product sawmills,	2429
		200501	Millwork	2431
		200502	Wood kitchen cabinets	2434
		200600	Veneer and plywood	2435-6
		200701	Structural wood members,	2439
		200800	Wood preserving	2491
		200901	Wood pallets and skids	2448
		200902	Particleboard	2492e
		200903	Wood products, n.e.c.	2499
		210000	Wood containers	2441, 2449
837	Pre-fabricated buildings	200702	Prefabricated wood	2452
	and mobile homes	610602	Mobile homes	2451
838	Household furniture	220101	Wood household furniture	2511
		220102	Household furniture,	2519
		220103	Wood TV and radio	2517
			cabinets	
			(cont'd)	

Concordance of MRIQ, BEA I-O and SIC Codes

Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	1977 BEA I-O Code	Sector Name	1977 SIC
	<u>Manufacturing cont'd</u>			
038	Household furniture	220200	Upholstered household furniture -----	2512
		220300	Metal household furniture -----	2514
		220400	Mattresses and bedsprings	2515
039	Other furniture and fixtures	230100	Wood office furniture ----	2521
		230200	Metal office furniture ----	2522
		230300	Public building furniture -	2531*
		230400	Wood partitions and fixtures -----	2541*
		230500	Metal partitions and fixtures -----	2542
		230600	Drapery hardware and blinds and shades ----	2591
		230700	Furniture and fixtures, n.e.c. -----	2599
040	Paper and allied products	240100	Pulp mills -----	261*
		240200	Paper mills, except building paper -----	262
		240300	Paperboard mills -----	263
		240400	Envelopes -----	2642
		240500	Sanitary paper products-	2647
		240602	Building paper and board mills -----	266*
		240701	Paper coating and glazing -----	2641
		240702	Bags, except textile ---	2643
		240703	Die-cut paper and board -----	2645
		240704	Pressed and molded pulp goods -----	2646
		240705	Stationery products ----	2648
		240706	Converted paper products, n.e.c. ----	2649*
041	Paperboard containers and boxes	250000	Paperboard containers and boxes -----	265

(cont'd)



MRIO Code	Sector Name	I-O Code	Sector Name	SIC
	Manufacturing cont'd	1977 BVA		1977
043	Newspapers, periodicals and other printing and publishing	260100	Newspapers -----	271
		260200	Periodicals -----	272
		260301	Book publishing -----	2731
		260302	Book printing -----	2732
		260400	Miscellaneous -----	2740
		260501	Commercial printing -----	2740
		260502	Lithographic plate-making and services --	2751-2, 2754
		260601	Manifold business forms-	276
		260602	Blankbooks and loose-leaf binders -----	2782
		260700	Greeting card publishing	277
		260801	Engraving and plate printing -----	2753
		260802	Bookbinding and related work -----	2789
		260803	Typesetting -----	2791
		260804	Photogravure -----	2793
		260805	Electrotyping and stereotyping -----	2794
043	Industrial chemicals	270100	Industrial (inorganic and organic) chemicals -----	2810 (excl. 28195), 2865, 2869
044	Agricultural chemicals	270201	Nitrogenous and phosphate fertilizers -----	2873-4
		270202	Fertilizers, mining only -----	2875
		270300	Agricultural chemicals, n.e.c. -----	2879
045	Other chemical products	270401	Gum and wood chemicals	2861
		270402	Adhesives and sealants	2891
		270403	Explosives -----	2892

Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	I-O Code	Sector Name	SIC
	Manufacturing, cont'd	1977 BEA		1977
843	Other chemical products	270404 Printing ink ----- 270405 Carbon black ----- 270406 Chemical preparations, n.e.c. -----	2893 2895 2899	
840	Plastics and synthetics	280100 Plastics materials and resins ----- 280200 Synthetic rubber ----- 280300 Cellulosic man-made fibers ----- 280400 Organic fibers, non-cellulosic -----	2821 2822 2823 2824 2825 2826 2827 2828	
847	Drugs	290100 Drugs -----	2830	
848	Cosmetics and cleaning products	290201 Soap and other detergents- 290202 Polishes and sanitation goods ----- 290203 Surface active agents -----	2841 2842 2843 2844	
849	Paint and allied products	300000 Paints and allied products -----	285	
850	Petroleum refining and allied products	310101 Petroleum refining ----- 310102 Lubricating oils and greases ----- 310103 Products of petroleum and coal, n.e.c. ----- 310200 Paving mixtures and blocks ----- 310300 Asphalt felts and coatings -----	2992 2992 2999 2951 2952	
851	Rubber and misc. plastics	320100 Tires and inner tubes - 320200 Rubber and plastics footwear -----	301 302	

(cont'd)

MRIQ Code	Sector Name	Manufacturing, cont'd	1977 BEA	1977 SIC
091	Rubber and miscellaneous plastics	320301 Reclaimed rubber ----- 320302 Fabricated rubber ----- 320400 Miscellaneous plastics 320500 Rubber and plastics products ----- 304 hose and belting -----	303 306 307 304	
092	Leather and leather products	330001 Leather tanning and finishing ----- 340100 Boot and shoe cut stock and findings ----- 340201 Shoes, except rubber -- 340202 House slippers ----- 340301 Leather gloves and mittens ----- 340302 Luggage ----- 340303 Women's handbags and purses ----- 340304 Personal leather goods-- 340305 Leather goods, n.e.c. =	311 313 314-9 3142 315 316 317 3171 3172 319	
093	Glass and glass products	350100 Glass and glass pro- ducts, except containers ----- 350200 Glass containers -----	321, 3229, 323 3221	
094	Stone and clay products	360100 Cements, hydraulic ----- 360200 Brick and structural clay tile ----- 360300 Ceramic wall and floor tile ----- 360400 Clay refractories ----- 360500 Structural clay products, n.e.c. -----	324 3251 3253 3255 3259	

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Concordance of MRIQ, BEA I-O and SIC Codes

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Concordance of MRIO, BEA I-O and SIC Codes

1977	SIC	1977 BEA	I-O Code	Sector Name	MRIO	Sector Name	Code
				360600 Vitreous plumbing fixtures	054	Stone and clay products	
	3261			360701 Vitreous china food utensils			
	3262			360702 Fine earthenware food utensils			
	3263			360800 Porcelain electrical supplies			
	3264			360900 Pottery products, n.e.c.			
	3269			360100 Concrete block and brick			
	3271			361100 Concrete products, n.e.c.			
	3272			361200 Ready-mixed concrete			
	3273			361300 Lime			
	3274			361400 Gypsum products			
	3275			361500 Cutstone and stone products			
	3278			361600 Abrasive products			
	3291			361700 Asbestos products			
	3292			361800 Gaskets, packing and sealing devices			
	3293			361900 Minerals, ground or treated			
	3295			362000 Mineral wool			
	3296			362100 Nonclay refractories			
	3297			362200 Nonmetallic mineral products, n.e.c.			
	3299			370101 Blast furnaces and steel mills	055	Iron and steel mills and forging	
	3312			370102 Electrometallurgical products			
	3313			370104 Cold finishing of steel shapes			
	3316			370105 Steel pipe and tubes			
	3317						

Revised

(cont'd)

Concordance of MRO, BIA I-O and SIC Codes

MRO Code	Sector Name	I-O Code	Sector Name	SIC
1977 BIA				1977
055	Iron and steel mills and forging	37030	Iron and steel forgings	3462
		370401	Metal heat treating	3398
		370402	Primary metal products, n.e.c.	3399
056	Iron and steel foundries	37020	Iron and steel foundries	332
037	Primary nonferrous metals and products	380100	Primary copper	3331
		380200	Primary lead	3332
		380300	Primary zinc	3333
		380400	Primary aluminum	3334, 20195
		380500	Primary nonferrous metals, n.e.c.	3339
		380600	Secondary nonferrous metals	334
		380700	Copper rolling and drawing	3351
		380800	Aluminum rolling and drawing	3353-8
		380900	Nonferrous rolling and drawing, n.e.c.	3356
		381000	Nonferrous wire drawing, n.e.c.	3357
		381100	Aluminum castings	3361
		381200	Brass, bronze, and copper castings	3362
		381300	Nonferrous castings	3369
		381400	Nonferrous forgings	3463
058	Metal containers and misc. metal products	370103	Steel wire and related products	3375
		390100	Metal cans	3411
		390200	Metal barrels, drums, and pallets	3412

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Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	I-O Code	Sector Name	SIC
058	Metal containers and misc. metal products	420100	Cutlery	3421
		420201	Hand and edge tools, n.e.c.	3423
		420202	Hand saws and saw blades - n.e.c.	3425
		420300	Hardware, n.e.c.	3429
		420401	Plating and polishing	3471
		420402	Metal coating and allied services	3479
		420500	Miscellaneous fabricated wire products	3495-6
		420700	Steel springs, except wire	3493
		420800	Pipe, valves, and pipe fittings	3498, 3499
		421000	Metal foil and leaf	3497
		421100	Fabricated metal products, n.e.c.	3499
059	Structural metal products	400100	Metal sanitary ware	3431
		400200	Plumbing fixture fittings and trim	3432
		400300	Heating equipment, except electric	3433
		400400	Fabricated structural metal	3441
		400500	Metal doors, sash, and trim	3442
		400600	Fabricated plate work (boiler shops)	3443
		400700	Sheet metal work	3444
		400800	Architectural metal work	3446
		400901	Prefabricated metal buildings	3448
		400902	Miscellaneous metal work	3449

Manufacturing, cont'd

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Concordance of MRO, BEA I-O and SIC Codes

MRO Code	Sector Name	I-O Code	Sector Name	SIC
1977 BEA				1971
	Manufacturing, cont'd			
000	Screw machine products and metal stampings	410100	Screw machine products and bolts, nuts, rivets and washers	345
			Automotive stampings	3465
			Crowns and closures	3466
			Metal stampings, n.e.c.	3469*
001	Engines and turbines	430100	Turbines and turbine generator sets	3511
			Internal combustion engines, n.e.c.	3519
002	Farm and lawn equipment	440001	Farm machinery and equipment	3523*
			Lawn and garden equipment	3524
003	Construction and mining equipment	450100	Construction machinery and equipment	3531*
			Mining machinery, except oil field	3532
			Oil field machinery	3533
004	Materials handling equipment	460100	Elevators and moving stairways	3534
			Conveyors and conveying equipment	3535
			Hoists, cranes, and monorails	3536*
			Industrial trucks and tractors	3537*
005	Metalworking equipment	470100	Machine tools, metal cutting types	3541
			Machine tools, metal forming types	3542

(cont'd)

MRIQ Code	Sector Name	I-O Code	Sector Name	SIC
063	Manufacturing, cont'd	1977 BEA		1977
063	Metalworking equipment	470300	Special dies and tools	3544-50
		47401	Power driven hand tools-	3546
		47402	Rolling mill machinery -	3547
		47403	Metalworking machinery,	3549
			n.e.c. -----	
064	Special industry machinery and equipment	480100	Food products machinery -	3551
		480200	Textile machinery -----	3552
		480300	Woodworking machinery ---	3553
		480400	Paper industries	3554
		480500	Printing trades	3555
		480600	Special industry	3559
			machinery, n.e.c. -----	
067	General industrial and other non-electrical machinery and equipment	490100	Pumps and compressors ---	3561, 3563
		490200	Ball and roller bearings-	3562
		490300	Blowers and fans -----	3564
		490400	Industrial patterns -----	3565
		490500	Power transmission	3566, 3568
		490600	Industrial furnaces and	
			equipment -----	
		490700	General industrial	3567
			machinery, n.e.c. -----	
		500001	Carburizers, pistons,	3569
			rings, valves -----	
		500002	Machinery, except	3592
			electrical, n.e.c. ---	3599
068	Office and computing equipment	510101	Electronic computing	3573
			equipment -----	
		510102	Calculating and accounting	3574
			machines -----	

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CONFERENCE OF CHIEFS OF BUREAUS OF ECONOMIC ANALYSIS



Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	1977 BEA		1977
		I-O Code	Sector Name	SIC
	<u>Manufacturing, cont'd</u>			
068	Office and computing equipment	510200	Typewriters -----	3572
		510300	Scales and balances ---	3576
		510400	Office machines, n.e.c.	3579
069	Service industry machinery and equipment	520100	Automatic merchandising machines -----	3581
		520200	Commercial laundry equipment -----	3582
		520300	Refrigeration and heating equipment -----	3585
		520400	Measuring and dispensing pumps -----	3586
		520500	Service industry machines, n.e.c. ---	3589*
070	Electric transmission and electrical industrial equipment	530100	Instruments to measure electricity -	3625
		530200	Transformers -----	3612
		530300	Switchgear and switchboard apparatus -----	3613
		530400	Motors and generators -	3621
		530500	Industrial controls ---	3622
		530600	Welding apparatus, electric -----	3623
		530700	Carbon and graphite products -----	3624
		530800	Electrical industrial apparatus, n.e.c. ---	3629
071	Household appliances	540100	Household cooking equipment -----	3631*
		540200	Household refrigerators and freezers ---	3632
		540300	Household laundry equipment -----	3633

(cont'd)

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Concordance of MRIO, BRA I-O and SIC Codes

MRIO Code	Sector Name	I-O Code	Sector Name	SIC
071	Household appliances	540400	Electric housewares and fans	3634a
		540500	Household vacuum cleaners	3635
		540600	Sewing machines	3636
		540700	Household appliances, n.e.c.	3639
072	Electric lighting and wiring equipment	550100	Electric lamps	3641
		550200	Lighting fixtures and equipment	3645-8
		550300	Wiring devices	3643-4
073	Receiving sets, records and tapes	560100	Radio and TV receiving sets	3651
		560200	Phonograph records and tapes	3652
074	Communications equipment	560300	Telephone and telegraph apparatus	3661
		560400	Radio and TV communication equipment	3662
075	Electronic components	570100	Electron tubes	3671-3
		570200	Semiconductors and related devices	3674
		570300	Electronic components, n.e.c.	3675-9
076	Other electrical equipment	580100	Storage batteries	3691
		580200	Primary batteries, dry and wet	3692
		580300	X-ray apparatus and tubes	3693
		580400	Engine electrical equipment	3694
		580500	Electrical equipment and supplies, n.e.c.	3699a

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Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	I-O Code	Sector Name	SIC
1977	1977 BEA			1977
	Manufacturing, Cont'd			
077	Motor vehicles and parts	590100	Truck and bus bodies -----	3713*
		590200	Truck trailers -----	3715
		590301	Motor vehicles and car	3711
		590302	Motor vehicle parts and	3714
			accessories -----	
078	Aircraft and parts			3721, 3720
079	Missiles, spacecraft and parts			3761, 3760
080	Aircraft, missile and spacecraft			3724, 3764
	propulsion units			
081	Other transportation equipment	610100	Ship building and	3731
			repairing -----	
		610200	Boat building and	3732
			repairing -----	
		610300	Railroad equipment -----	374
		610500	Motorcycles, bicycles,	375
			and parts -----	
		610601	Travel trailers and	3792*
			campers -----	
		610603	Motor homes (made from	3716
			purchased materials)-	
		610700	Transportation equip-	3799
			ment, n.e.c. -----	
		620100	Engineering and	
			scientific	
			instruments -----	
		620200	Mechanical measuring	3811
			devices -----	
082	Scientific and photographic equipment, watches and clocks			3823-4, 3829

Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	1977 BEA I-O Code	Sector Name	1977 SIC
	<u>Manufacturing, Cont'd</u>			
002	Scientific and photographic equipment, watches and clocks	620300	Environmental controls-	3822
		620700	Watches, clocks, and parts -----	387
		630300	Photographic equipment and supplies -----	386
003	Medical, Dental and Optical equipment	620400	Surgical and medical instruments -----	3841
		620500	Surgical appliances and supplies -----	3842
		620600	Dental equipment and supplies -----	3843
		630100	Optical instruments and lenses -----	383
		630200	Ophthalmic goods -----	385
004	Other manufactured products	640101	Jewelry, precious metal -----	3911
		640102	Jewelers' materials and lapidary work ---	3915
		640104	Silverware and plated ware -----	3914
		640105	Costume jewelry -----	3961
		640200	Musical instruments ---	393
		640301	Games, toys, and children's vehicles -	3944
		640302	Dolls -----	3942
		640400	Sporting and athletic goods, n.e.c. -----	3949
		640501	Pens and mechanical pencils -----	3951
		640502	Lead pencils and art goods -----	3952
		640503	Marking devices -----	3953
		640504	Carbon paper and inked ribbons -----	3955
			(cont'd)	

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Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	1977 BEA		1977 SIC
		I-O Code	Sector Name	
	<u>Manufacturing, Cont'd</u>			
084	Other manufactured products	640600	Artificial trees and flowers -----	3962
		640701	Buttons -----	3963
		640702	Needles, pins, and fasteners -----	3964
		640800	Brooms and brushes -----	3991
		640900	Hard surface floor coverings -----	3996
		641000	Burial caskets and vaults-----	3995
		641100	Signs and advertising displays -----	3993
		641200	Manufacturing industries, n.e.c. -----	3999 (excl. 39996)
	<u>Transportation</u>			
085	Railroads	650100	Railroads and related services -----	40 <sup>a</sup> , 474, pt. 4789
086	Local passenger transportation and inter-city bus	650200	Local and suburban transit and interurban highways passenger transportation-----	41
		790100	Local government passenger transit ---	pt. 41
087	Motor freight	650300	Motor freight transportation and warehousing -	42 <sup>a</sup> , pt. 4789
088	Water transportation	650400	Water transportation -----	44
089	Air transportation	650500	Air transportation -----	45
090	Pipelines, except natural gas	650600	Pipe lines, except natural gas -----	46
091	Transportation services	650701	Freight forwarders and other transportation services -----	471, 4723, pt. 478
		650702	Arrangement of passenger transportation -----	4722

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Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	1977 BEA I-O Code	Sector Name	1977 SIC
<u>Communications</u>				
092	Communications, except radio and TV	660000	Communications, except radio and TV -----	48 (excl. 483)
093	Radio and TV broadcasting	670000	Radio and TV broadcasting -----	483
<u>Electric, gas, and sanitary services</u>				
094	Electric utilities (private and public)	680100	Electric services (utilities) -----	pt. 491, pt. 493
		780200	Federal electric utilities -----	pt. 491
		790200	State and local electric utilities	pt. 491
095	Gas transmission and distribution (private and public)	680200	Gas production and distribution (utilities) -----	492*, pt. 493
			(Includes pt. 790300 Other state and local government enterprises)	
096	Water and sanitary services (private and public)	680301	Water supply and sewerage systems -----	494, 4952
		680302	Sanitary services, steam supply, and irrigation systems ---	495 (excl. 4952), 496-7, pt. 493
			(Includes pt. 790300 Other state and local government enterprises)	
<u>Trade and services</u>				
097	Wholesale trade	690100	Wholesale trade -----	50*, 51* (excl. manufactures' sales offices)

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Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	I-O Code	Sector Name	1977 SIC	
<u>Trade and services, cont'd</u>					
098	Eating and drinking places	740000	Eating and drinking places -----	58, pt. 70	
099	General merchandise and apparel stores	}		53, 54	
100	Food, drug and liquor stores (includes state and local government liquor stores)			690200 Retail trade (MRIO code 100 also includes liquor stores, pt. BEA code 790300, Other state and local government enterprises)	54, 591, 592
101	Automotive dealers and gasoline service stations			55	
102	Other retail stores			52, 57, 593-599, 7398	
103	Banking, credit agencies and investment brokers	700100 Banking ----- 700200 Credit agencies ----- 700300 Security and commodity brokers -----	60 61* (excl. pt. 613), 67* 62		

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Concordance of MRIO, BRA I-O and SIC Codes

MRIO Code	Sector Name	1977 BRA I-O Code	Sector Name	1977 SIC
104	Insurance	700400	Insurance carriers -----	630
		700500	Insurance agents, bro- kers, and services ---	640
105	Real estate and rental	710100	Owner-occupied dwellings -----	not applicable
		710200	Real estate -----	65-69, pt. 1531
106	Hotels and lodging places	720100	Hotels and lodging places -----	704 (excl. dining)
107	Personal and repair services, except auto	720201	Laundry, cleaning, garment services and shoe repair -----	721, 725
		720202	Funeral service and crematories -----	728
		720203	Portrait, photographic studios, and miscel- laneous personal services -----	722, 7290
		720204	Electrical repair shops - Match, clock, jewelry	762
		720300	Beauty and barber shops - and furniture repair -	763-4 723-40
108	Misc. services and advertising	730101	Miscellaneous repair shops -----	769
		730102	Services to dwellings and other buildings --	734

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Concordance of MRO, BSA I-O and SIC Codes

MRO Code	Sector Name	1977 BSA I-O Code	Sector Name	SIC
108	Misc. services and advertising	730103	Personnel supply services -----	736
		730104	Computer and data processing services -----	737
		730105	Management and consulting services, testing and research labs -----	7391-2, 7397
		730106	Protective services -----	7393
		730107	Equipment rental and leasing -----	7394
		730108	Photofinishing labs, photocopy, and commercial photography -----	7395-3, 7395
		730109	Other business services -----	732, 7331, 7339, 735, 7399
		730200	Advertising -----	731
109	Misc. professional services	730301	Legal services -----	811
		730302	Engineering, architectural, and surveying services -----	811
		730303	Accounting, auditing and bookkeeping, and miscellaneous services -----	8911
			miscellaneous services, n.e.c. -----	8930, 899
110	Auto rental, repair and maintenance	750001	Automotive rental and leasing, without drivers -----	751
		750002	Automotive repair shops and services -----	753, 7549
		750003	Automobile parking and car washes -----	752, 7542

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Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	1977 BEA I-O Code	Sector Name	1977 SIC
<u>Trade and Services cont'd</u>				
111	Amusements	760100	Motion pictures -----	78
		760201	Theatrical producers (except motion pictures), bands, and entertainers ----	792
		760202	Bowling alleys, billiard and pool establishments -----	793
		760203	Commercial sports except racing -----	7941
		760204	Racing (including track operation) ----	7948*
		760205	Membership sports and recreation clubs ----	7997
		760206	Other amusement and recreation services -	791, 799* (excl. 7997)
112	Doctors and dentists, inc. outpatient care facilities			801-3, 808, 8041
113	Hospitals and nursing	770200	Hospitals -----	806
		770301	Nursing and personal care facilities -----	805
114	Other medical and health services			074, 804 except 8041, 807, 80
115	Educational services	770401	Elementary and secondary schools -----	821
		770402	Colleges, universities, and professional schools -----	822
		770403	Libraries, correspondence and vocational schools, and educational services, n.e.c. -----	823-9

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Concordance of MRIO, BEA I-O and SIC Codes

MRIO Code	Sector Name	I-O Code	Sector Name	SIC
		1977 BEA		1977
	<u>Trade and Services cont'd</u>			
116	Nonprofit organizations	770501	Business associations and professional membership organizations -----	861-2
		770502	Labor organizations and civic, social, and fraternal associations -	863-4
		770503	Religious organizations --	866
		770504	Other membership organizations -----	84, 865, 869, 892Z
117	Other social services	770600	Job training and related services -----	8331
		770700	Child day care services --	8351
		770800	Residential care -----	8361
		770900	Social services, n.e.c. --	8321, 8399
	<u>Government enterprises</u>			
118	Federal government enterprises, except utilities and local transit	780100	U.S. Postal Service -----	4311
		780300	Commodity Credit Corporation -----	pc, 613
		780400	Other Federal Government enterprises ---	several
119	State and local government enterprises, except utilities and local transit	790300	Other State and local government enterprises -----	several
	<u>Special Industries</u>			
120	Directly allocated imports	800000	Noncomparable imports	
121	Scrap	810001	Scrap -----	

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Concordance of MRIO, BEA I-O and SIC Codes

		1977 BEA	
MRIO Code	Sector Name	I-O Code	Sector Name
<u>Special industries cont'd</u>			
122	Government industry	820000	Government industry ---
123	Household industry	840000	Household industry ----
Added [124	Rest of World		
<u>Final Demand</u>			
150	Personal consumption expenditures		
151	Gross private fixed capital formation		
152	Net inventory change		
153	Gross exports		
154	Federal gov't capital expenditures, (except defense)		
155	State and local gov't capital expenditures		
156	Federal defense expenditures (current and capital)		
157	Federal gov't current expenditures (except defense)		
158	State and local gov't current expenditures		
159	Foreign imports		

\* Indicates those industries in which there was a change in composition between the 1972 and 1977 SIC's.

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