

## CHAPTER V

### SUPPLEMENTARY TABLES

The Basic Transaction Tables summarize transactions involving all goods and services produced for a period of one year, based on all available data. The 2005 Input-Output tables are comprised of 520 row sectors and 407 column sectors.

The core of the Input-Output Tables, the Basic Transaction Tables are compiled in accordance with certain rules, based on 68 SNA and 93 SNA advocated by the United Nations, as well as Input-Output Table compilation theories accumulated so far. However, it is difficult to incorporate all information into Basic Transaction Tables. To meet the purposes of various input-output analyses, supplementary information is required to compensate for the limitations of the Basic Transaction Tables.

In the 2005 Input-Output Tables, the following supplementary tables are compiled for respective purposes:

#### 1 Table on Trade Margins and Table on Domestic Freights

##### (1) Concepts

These two tables show, in matrix form, distribution expenses, or trade margins and domestic freight, for transactions involving goods between each sector recorded in the Basic Transaction Table.

As Mentioned above ( § 1, Chapter II ), Basic Transaction Tables can be divided into “Input-Output Tables at producers’ prices” and “Input-Output Tables at purchasers’ prices,” based on different treatments of distribution expenses. The Input-Output Tables at producers’ price value each trade at shipments price of the manufacturer. The distribution expenses from manufacturers to user are collectively recorded at the intersection of the column sector in the intermediate and final demand sectors and the row sector in the trade and transport. The Input-Output Tables at purchasers’ price value transactions at actual purchase prices paid by the demanders; and the distribution expenses from manufacturers to users are included in respective transaction values, without distinguishing prices of goods.

It is impossible to deduce trade margins or domestic freight required for individual transactions directly from these tables. Thus, the table on trade margins and the table on domestic freights are compiled, as shown in Chart 5-1, to supplement the Basic Transaction Tables.

Tables on trade margins and tables on domestic freights function as connecting the Input-Output Tables at producers’ prices and the Input-Output Tables at purchasers’ prices. In the 2005 reports, the relevant tables are compiled, based on the medium aggregated sector classification (108 sectors), in the Data Report (2). However, the trade margins (wholesale and retail trade margins) and domestic freights (freights for seven transport modes) presented on the tables are total figures only. For the basic sector classification (520 row sectors and 407 column sectors) and the minor aggregated sector classification (190 sectors), tables on trade margins or tables on domestic freights are not compiled. However, the respective “Output tables” indicate wholesale and retail trade margins for each transaction and domestic freights by seven transport modes. The output tables perform the functions of both tables.

In output tables and input tables, trade margins and domestic freights carry the specific codes, “6” and “7,” respectively, after the column codes or row codes.

##### (2) Types and scopes of tables on trade margins and tables on domestic freights

###### i) Tables on trade margins

Tables on trade margins are compiled for wholesale margins and retail trade margins. They do not include commissions received by agencies from the import and export of goods (recorded in “special trade”) and cost trade margins, such as trade margins derived from second-hand goods (please refer to Section 1, Chapter 2). In addition, freight paid by trade sectors is excluded from trade margins that treated as domestic freight.

###### ii) Tables on domestic freights

Tables on domestic freights are compiled for domestic freight and fees derived from operating transportation activities.

Freight incurred outside the Japanese territory in international transportation and “cost transport margins” (please refer to § 1, Chapter III) are not counted as domestic freight.

Tables on domestic freights are compiled by estimating the transportation expenses incurred in each transaction by the following seven transport modes:

- [1] Railway freight transport
- [2] Road freight transport
- [3] Coastal and inland water freight transport
- [4] Port transport
- [5] Domestic air freight transport
- [6] Handling of freight transport
- [7] Warehouse

Chart 5-1 Relationships Between Basic Transaction Tables and Tables on Trade Margins and Tables on Domestic Freights

[1] Input-Output Table at Producers' Prices (Model)

		Intermediate demand					Final demand .....	Domestic production	
		A	B	C	Commerce	Transport			
Intermediate input	A		20						
	B	40	40	70	40	10	..... 100	300	
	C		110						
	Commerce		Trade margins					... ..	900
	Transport		Domestic freights					... ..	700
Gross value added	.		.						
	.		.						
	.		.						
	.		.						
	.		50						
Domestic production								300	

(Note) Input-Output Tables at purchasers' prices can be compiled by recording the trade margins and domestic freights recorded as a lump sum at the intersections of the commerce (row) and the transport (row) at each demanding sector (column) in the Basic Transaction Tables, by input goods of the relevant column sectors.

[2] Input-Output Table at Purchasers' Price (Model)

		Intermediate demand					Final demand .....	Total demand	Deduction		Domestic production
		A	B	C	Commerce	Transport			Trade margins	Domestic freight	
Intermediate input	A		30 (5+5)								
	B	55 (10+5)	55 (10+5)	90 (12+8)	70 (18+12)	15 (3+2)	..... 125 (17+8)	410	-70	-40	300
	C		165 (35+20)								
	Commerce		0					0	900	0	900
	Transport		0					0	0	700	700
Gross value added	.		.								
	.		.								
	.		.								
	.		.								
	.		50								
Domestic production											300

(Note) The figures in parentheses indicate (trade margins + domestic freight) and are included in the respective figures above. Removing them and compiling a model makes it possible to compile a “table on trade margins” and a “table on domestic freight.”

[3] Table on Trade Margins (Model)

		Intermediate demand					Final demand	Total
		A	B	C	Commerce	Transport	.....	
Intermediate input	A	5					17	70
	B	10	10	12	18	3		
	C	35						
	Commerce	-50						
	Transport	0						
Total		0						0

(Note) This is compiled by removing trade margins from the Input-Output Table at purchasers' price.

[4] Table on Domestic Freights (Model)

		Intermediate demand					Final demand	Total
		A	B	C	Commerce	Transport	.....	
Intermediate input	A	5					8	40
	B	5	5	8	12	2		
	C	20						
	Commerce	0						
	Transport	-30						
Total		0						0

(Note) This is compiled by taking out domestic freight from the Input-Output Table at purchasers' price.

(3) Compilation method of table on trade margins

Tables on trade margins are compiled in the following manner.

i) Removing the total trade margins by wholesale and retail trade

Calculate trade sales and margins from the “Census of Commerce” and estimate the gross margins by wholesale and retail by multiplying the trade sales by the margin rates. The total figures are domestic production at wholesale and retail sectors.

ii) Estimating trade margins by row sector

Using the same data as above, estimate the trade margins by commodities by type of industrial section in itemized sectors and the trade margins by row sector.

iii) Estimating the transaction value subject to trade margins

For individual transactions, estimate the ratios of transactions not covered by trade margins and of transactions whose margin ratios differ.

The factors generating or not generating trade margins or generating the difference of margin ratios in different transactions can include the following:

- [1] Consumption in one's own factory
- [2] Consumption in other factories of one's own company
- [3] Direct sales to other companies (without intermediary wholesale or retail trade; as for wholesale trade, direct sales without intermediary retail trade)
- [4] Whether there is a ratio of discount margins
- [5] Whether there is a kickback

- [6] Differences between distribution systems
  - [7] Whether there is multistage distribution (such as first, second, and third wholesale)
  - [8] Differences due to large- and small-sized transactions
- iv) Estimating trade margins by each transaction
- Wholesale and retail trade margins are estimated by each transaction based on the results of ii) and iii).

(4) Compilation method of table on domestic freights

Overviews of the method of compiling the tables on domestic freight are as follows.

- i) Estimating domestic production in the transport sector
- “Freight” as domestic production in transport sectors, including cost transport margins, is estimated for seven transport modes.

Aggregate domestic production in the transport sector (CT) [1] for the seven transport modes.

			CT
Transport			①
CT			

- ii) Estimating freight by row sector (transport commodities)

First, classify the freight established by the seven transport modes broadly for the respective transport commodity groups, then gradually divide into smaller commodity groups. Finally, estimate freight by row sector (transport commodities).

Next, estimate the freight by row sector (F) [2]. The total of [2] is equal to [1].

		CT	F
Transport		①	②
			②

- iii) Separation of cost transport margins

From the freight established for the respective row sectors, separate the cost transport margins by row sector (commodities) estimated. Estimate the freight by row sector to be covered by the freight.

		CT	F	Domestic freight
			F'	
Transport		①	F <i>i</i> '	③
			F <i>i</i> '	③

- iv) Estimating the transaction value subject to freight

Not all transactions involving goods require freight, nor is the ratio of freight in all transactions constant. In consideration of these facts, makes it judgment which part of each transaction value, by each good and its output sector (column sector), is subject to freight and, contrary, which part is not subject to freight. At the same time, the “Table of the Ratio Not Subject to Freight” by each transaction is compiled in view of the ratio of freight in the transactions subject to freight.

The following factors presumably caused the differences in the ratio not subject to freight:

- Whether the portion was consumed in one's own factory and its ratio
- The ratio of the self-transport portion
- Whether pipeline transport is involved
- Difference in the distance of transport
- Whether discount freight is applied

Next, the "transaction value subject to freight in each transaction" is computed by multiplying each transaction value by [1 - the ratio not subject to freight]. Then, this is totaled by row sector, and the "transaction value subject to freight by row sector" is estimated.

v) Computation of freight by each transaction

The ratio of freight by row sector to the transaction value subject to freight by row sector is defined as the "ratio of freight by row sector." "Freight by each transaction" is computed by multiplying the "ratio of freight by row sector" by the transaction value subject to freight by each transaction obtained in iv).

$$F'_{ij} = X'_{ij} \cdot \frac{F'_i}{X'_i}$$

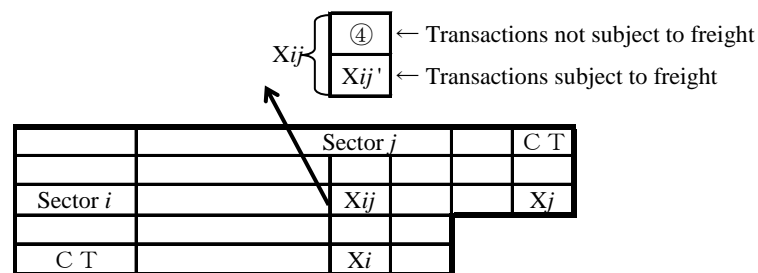
Notes:

$F'_{ij}$ : Freight by each transaction excluding cost transport margins

$X'_{ij}$ : Transaction value subject to freight by each transaction excluding cost transport margins

$F'_i$ : Freight by row sector excluding cost transport margins

$X'_i$ : Transaction value subject to freight by row sector excluding cost transport margins



$$\frac{\textcircled{4}}{X_{ij}} = n_{ij} = \text{Freight non-coverage ratios}$$

$$\sum_j X'_{ij} = X'_i = \text{Transaction to be covered by freight in Sector } i$$

$$\frac{F'_i}{X'_i} = \text{Freight ratio in Sector } i$$

## 2 Table on Imports

### (1) Concepts

There are two methods of treating imports: the "competitive import type" method, which makes no distinction between imported goods and domestic goods, and the "non-competitive import type" method, which distinguishes between imported goods and domestic goods.

The competitive import type table shows the breakdown of imports by commodity by goods and services in the column vector only. The totals of domestic and imported goods are append in each individual transaction amounts. Therefore, the transaction value of either imported or domestic goods only cannot be determined from the Basic Transaction Table.

The table on imports is compiled by extracting only the transaction amounts of imports from the Basic Transaction Table (Chart 5-2). This makes it possible grasp what types of imports, and how much, are consumed by which sectors.

Within the import transaction amounts disclosed in the Basic Transaction Tables (basic sector classification), ordinary trade, special trade, direct purchases, customs duties, as well as import commodity taxes are exogenously indicated in the form of respective row vectors. In the table on imports, imports aggregated in totals for respective transactions are recorded and indicated, in their entirety, in matrix form.

Chart 5-2 Relationship Between Basic Transaction Table and Table on Imports

[1] Input-Output Tables at Producers' Price (Model)

	A	B	C	D	Consumption	Fixed capital formation, etc.	Exports	Import deduction	Domestic production
A	...	60 (10)	...	...	...	...	...	...	...
B	20 (5)	10 (0)	50 (15)	10 (0)	20 (10)	15 (5)	10 (0)	-35 (-35)	100
C	...	10 (5)	...	...	...	...	...	...	...
D	...	5 (0)	...	...	...	...	...	...	...
Gross value added	...	...	...	...	...	...	...	...	...
Domestic production	...	100	...	...	...	...	...	...	...

(Note) Figures in parentheses indicate transaction amounts for imported goods and are included in the above figures.

[2] Table on Import (Model)

	A	B	C	D	Consumption	Fixed capital formation, etc.	Exports	Total
A	...	10	...	...	...	...	...	...
B	5	0	15	0	10	5	0	35
C	...	5	...	...	...	...	...	...
D	...	0	...	...	...	...	...	...
	...	15	...	...	...	...	...	...

(2) Compilation method

In compilation of the table on imports, the demand figures for each column sector are estimated for "ordinary trade," "special trade," "direct purchases," "customs duties," and "import commodity taxes" in the respective row sectors. Estimates are made as follows:

i) Ordinary trade

Imports by row sector in the Basic Transaction Tables (row vector) are first calculated by reclassifying the Foreign Trade Statistics to the Input-Output Table sectors. For these imports, demand figures for respective row sectors are then estimated, based on the product characteristics of the individual imported goods belonging to each row sector (Note: 9-digit items of the HS classifications) and the preliminary import tables.

ii) Special trade

Demand sectors are determined in accordance with the product characteristics of the goods and services to distribute import figures by row sector.

As for row sectors for which demand sectors cannot be determined, distributions are made using the import ratios of the row sectors (imports/domestic final demand).

iii) Direct purchases

Total amounts are recorded in household consumption expenditure sectors, based on the concepts, definitions and scopes.

iv) Custom duties

Individual import items (9-digit items of HS classification) have been examined to determine whether customs duties are applied; if so, they are estimated accordingly.

As for imported items for which application of the customs duties cannot be determined, duties are distributed in accordance with the ratios of demanders to the imports by row sector concerning ordinary trade.

v) Import commodity taxes

Determine the demand sectors for import items to be taxed. Taxes are distributed in accordance with the transaction ratios of the relevant sectors. Consumption taxes on imported items are distributed in accordance with the ratios of demand sectors to ordinary trade to which is added customs duties and import commodity taxes.

Import tables based on the basic sector classification (517 row sectors, 405 column sectors) and minor aggregated sector classification (188 sectors) are not compiled. However, the functions of import tables are secured by indicating import breakdowns for individual transactions in the “output tables” and in the “input tables.”

(Note) Used in the import item list of the Monthly Trade Statistics (Ministry of Finance), these are 9-digit codes regulated in accordance with the HS (Harmonized Commodity Description and Coding System: a unified system of product names and classifications) Treaty.

### 3 Table on Scrap and By-Products

(1) Concepts of Table on Scraps and By-products

“Scraps” and “by-products” may be treated in compiling the basic transaction tables by several different methods. The method applied in Japan is the “minus input method” (Stone method; refer to § 1, CHAPTER II). In the table of conventional basic transaction tables based on the minus input method, the output of scraps and by-products is recorded as a negative value at the intersection of the output sector (column) and the competing sector (row), while the input is recorded as a positive value at the intersection of the competing sector (row) and demand sector (column), and production is offset to be zero (Chart 4-3 [1]).

Due to the “Reuse and recycling” sector newly established in the 2000 Input-Output Tables, all scraps and by-products generated (negative) are output in the basic transaction tables to the sector, and through that sector, output (positive) to each input sector, while generally maintaining the minus input method. Imports/exports of scraps and by-products are recorded as a lump sum in the “Reuse and recycling” sector to stabilize the import coefficient and ensure analytical consistency. (Chart 7-3 [1]). However, in this table, all scraps and by-products are output from the single sector of “Reuse and recycling,” making it impossible to determine specific goods and input values.

In the 2005 Input-Output Tables, the value of scraps and by-products are not input into the “Reuse and recycling” sector, and only related expenses are counted. As with the 1995 Input-Output Tables and prior tables, the negative input method was used for output and input of scraps and by-products. As a result, the output sector, output amount, input sector and input amount of “scraps and by-products” by type of scrap or by-product, and the expenditures related to each are recorded respectively in the Basic Transaction Tables (Chart 7-2 [2]).

The “Table on Scraps and By-products” thus clarifies the generation and input status of scraps and by-products by compiling the generated and input values of scraps and by-products, as compiled in Chart 5-3 [4].

Chart 5-3 Relationship Between Transaction Table and Table on Scrap and By-Products

[1] Input-Output Tables at Producers' Price (Model) (conventional)

	A	B	C	D	Reuse and Recycling	Final demands	Imports	Domestic production
A		65	5	...	5 (5)	25 ( $\Delta 5$ )		100 (0)
B	45	20	$\Delta 10$ ( $\Delta 30$ )	50	35 (35)	60 ( $\Delta 5$ )		200 (0)
C	...	40	...	...	10 (0)	...		...
D	18 ( $\Delta 5$ )	30	...	...	5 (5)	...		...
Reuse and Recycling	18 (15)	18 (15)	...	34 (20)	...	...	$\Delta 5$ ( $\Delta 5$ )	65 (45)
Total value added	19	27	...	...	10			
Domestic production	100	200	...	...	65			

(Note) The figures in parentheses are generated values (double-counted). Positive values represent the input value before adding processing costs. In addition, the establishment of the "reuse and recycling" sector increases domestic production (total).

[2] Input-Output Tables at Producers' Price (Model) (2005 table)

	A	B	C	D	Reuse and Recycling	Final demands	Imports	Domestic production
A		70 (5)	5		0	25 ( $\Delta 5$ )		100 (0)
B	60 (15)	20	$\Delta 10$ ( $\Delta 30$ )	70 (20)	0	60 ( $\Delta 5$ )		200 (0)
C	...	40	...	...	10	...		...
D	18 ( $\Delta 5$ )	40 (10)	...	...	0	...	$\Delta 5$ ( $\Delta 5$ )	...
Reuse and Recycling	3	3	...	14	...	...		20
Total value added	19	27	...	...	10			
Domestic production	100	200	...	...	20			

Output scraps and by-products are directly input into sectors without going through "Reuse and recycling" Only collection and processing are recorded in "Reuse and recycling."

[3] Table on scraps and by-products (template)(The 2005 Table)

Competing sector	Output Sector	Output	Input Sector	Input
A	Final demands	$\Delta 5$	B	5
B	C	$\Delta 30$	A	15
	Final demands	$\Delta 5$	D	20
	Total	$\Delta 35$	Total	35
C	...	...	...	...
D	A	$\Delta 5$	B	10
	Import	$\Delta 5$		
	Total	$\Delta 10$	Total	10

In the 2005 Input-Output Tables, scraps and by-products do not bypass "Reuse and recycling" and thus, "Recyclable input" was omitted.



## (2) How to Compile the Table on Scraps and By-Products

Scraps and by-products can be distinguished from other transactions by appending the following special codes to sector codes when compiling the basic transaction tables.

Special code	Special classification
2	Scrap input
3	Scrap output
4	By-product input
5	By-product output

Actually, estimates involving to which column sectors output or input what types of scraps and by-products are generated as follows.

- [1] Consumption of scraps and by-products is converted to a monetary value from various current surveys of industrial production. The generated monetary values can be estimated through correspondence to the specific column sectors from the production technology structure.
- [2] Of all scraps, for scrap iron and non-ferrous metal scraps, consumption by each column sector can be estimated from the Statistical Yearbook of Iron and Steel, etc. Due to the scarcity of relevant data, generated monetary values can be estimated for each sector from input value of iron, etc., at each industrial sector.
- [3] For used paper, consumption values are estimated consumption values derived from waste paper supply/demand statistics, etc.

## 4 Table on Value and Quantity

### (1) Concepts

This table indicates the transacted quantities of major goods listed in the Basic Transaction Tables.

Ideally, in input-output analyses, Basic Transaction Tables would be based on the quantity of transactions between sectors to ensure the stability of input coefficients. Actually, given the various input materials in the column sectors, it is impossible to measure their size in a single numerical unit. The Basic Transaction Tables are thus based on monetary value. The tables on values and quantities are compiled to present quantitative data concerning the Basic Transaction Tables, although to limited extent.

Compiling tables on values and quantities of selected goods are compiled to provide physical data related to the Basic Transaction Tables, and make it possible to conduct physical analyses of the prospects of supply and demand in energy and other subjects.

### (2) Limitations of the table on value and quantity of selected goods

Tables on value and quantity are tables that express the transactions that are possible from among the individual transactions listed in the Basic Transaction Tables.

At this time, it is impossible to compile tables on values and quantities for all sectors for the following reasons:

[1] To compile a table on value and quantity, the transaction amount of each commodity must be identified with "quantity multiplied by unit price." However, service sectors in the Input-Output Tables (for which measurements of quantitative units are extremely difficult) account for more than 50% of all sectors.

[2] In the goods sectors, there are cases in which multiple commodities are included in the same sector, making it impossible to calculate the amounts by row sector units.

[3] In sectors represented as "Other ..." and those related to processing and assembling, various commodities with different unit prices and units may be combined. In these sectors, quantity-based indication by row sector is almost meaningless.

[4] The availability of quantity-related information by output destination is significantly reduced.

### (3) Compilation method

i) The sectors for which the table on value and quantity of selected goods is compiled are producers of major materials, primarily basic materials, among the row sectors in the Basic Transaction Tables. Those with significant differences in price levels of detailed items comprising the row sectors and those for which multiple quantitative units are used to estimate detailed items are generally excluded.

ii) The table on value and quantity of selected goods is basically compiled by estimating transaction units for individual output destinations and using these units to calculate transaction quantities by output

destination (monetary transaction amounts/transaction unit prices). The following was done for the 2000 Input-Output Tables (Chart 4-4).

- [1] Imported goods and domestic goods are separated and the transaction quantities by output destinations estimated.
  - [2] The table on value and quantity of selected goods is ideally compiled by estimating transaction units for individual output destinations and using these units to calculate transaction quantities by output destination (monetary transaction amounts/transaction unit prices). The following was done for the 2005 Input-Output Tables (Chart 5-4)
  - [3] For domestic production, the quantities of ordinary trades among exported goods are taken from the Foreign Trade Statistics. The amounts of special trades and direct purchases are derived from the average unit prices of the ordinary trades to estimate quantities, as in the case of estimates of import quantities. The domestic supply quantities for row section of the domestic production are estimated by deducting export quantities from the domestic production quantities by row acquired from Domestic Production Table by Sector and Commodity. Next, the domestic product quantities are distributed to each column sector, in accordance with the domestic production input information of the output table.
  - [4] The table on value and quantity of selected goods is compiled by adding [2] and [3] above.  
(Thus, differences in unit prices of imported goods and domestic products are reflected on the table on value and quantity of selected goods, but differences in unit prices due to different demand sources of individual products are not reflected.)
- iv) Thus, the limitations of the table on value and quantity must be kept in mind, since quantitative estimates are limited to specified sectors and estimation methods tend to be mechanical.

Chart 5-4 Relationship Between Transaction Table and Table on Value and Quantity

[1] Input-Output Tables at Producers' Price (Model)

	A	B	C	D	Consumption	Fixed capital formation, etc.	Exports	Domestic production
A	...	...	...	...	...	...	...	...
B	600 (40×15)	150 (10×15)	500 (25×20)	250 (10×25)	120 (4×30)	180 (9×20)	100 (5×20)	1900
C	...	...	...	...	...	...	...	...
D	...	...	...	...	...	...	...	...
Gross value added	...	...	...	...	...	...	...	...
Domestic production	...	1900	...	...	...	...	...	...

(Note) Figures in parentheses are quantity multiplied by unit price. The table on value and quantity of selected goods extracts and lists these parts.

[2] Table on Value and Quantity (Model)

		A	B	C	D	Consumption	Fixed capital formation, etc.	Exports	Domestic production	
Sectors for major goods	A {	Quantity (unit price)	...	...	...	...	...	...	...	
		Monetary value (million yen)	...	...	...	...	...	...	...	
	B {	Quantity (unit price)	40	10	25	10	4	9	5	103
		Monetary value (million yen)	600	150	500	250	120	180	100	1900
	C {	Quantity (unit price)	...	...	...	...	...	...	...	...
		Monetary value (million yen)	...	...	...	...	...	...	...	...
		∴								

## **5 Table on Employees Engaged in Production Activities (by Occupation)**

### **(1) Concepts**

The “Table on employees engaged in production activities” shows the amount of labor input in terms of the average number of people by each sector for production activities during one year by employment status, such as the number of employees (full-time, part-time, and day workers), number of paid executives, number of self-employed workers, and number of family workers. As in the Basic Transaction Table, the sector classifications of this table are based on activities.

The incomes of employees and paid executives correspond to the “compensation of employees” in the Basic Transaction Table, while those of self-employed workers and family workers are included in the “operating surplus.”

From the table on persons engaged in production activities, the labor input coefficients and labor inducement coefficients corresponding to the input coefficients and production inducement coefficients, among others, are calculated. Labor input coefficients indicate the labor directly required for unit production, generally corresponding to the inverse of labor productivity. Labor inducement coefficients indicate how much labor is required for each sector to produce goods and services directly and indirectly induced by the increase of one unit of final demand.

These coefficients are used to identify the repercussion processes of changes in final demand on employment demand and entire employment demand figures, which enable analyses of labor force flow and employment structures, analyses of the effects of economic fluctuations on employment and employment demand prospects outlook, etc.

### **(2) Compilation method**

In compiling the table on persons engaged in production activities, firstly, the number of employees is estimated based on industrial classifications (does not necessarily match the activity) using the Population Census, Employment Status Survey, Establishment and Enterprise Census, and Labour Force Survey.

Then, a correspondence table consisting of industrial classifications and sector classifications is compiled, and the number of employees by industry is converted to the number of industries by column sector of the Basic Transaction Table. When doing so, the attempts are made to bring the industrial classifications as close as possible to activity concepts, by taking occupational structure and management structure into consideration.

In the end, if there is data from which activities can be further accurately comprehended, figures are replaced by values that are estimated based on such other data where necessary. In addition, consistency with employer income and wage per capita is also verified and revised.

## **6 Employment Matrix (Table on Employees Engaged in Production Activities [by Occupation])**

### **(1) Concepts**

The employment matrix gives a breakdown into occupational categories of paid executives and employees by production activity sectors, obtained from the above table on persons engaged in production activities. The employment matrix can indicate the number of employees by occupation and in terms of production activities. In addition, calculating occupational inducement coefficients makes it possible to analyze how many of what types of employees is required due to changing economic structures or other factors.

### **(2) Compilation method**

To compile the employment matrix, the occupational component ratios by industries are compiled for paid executives and employees from the Population Census data.

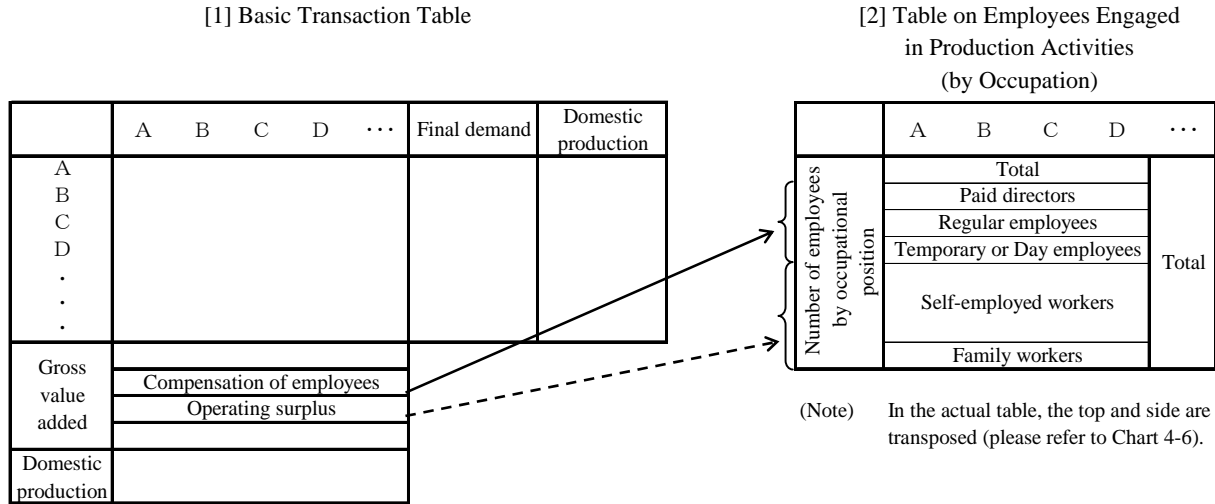
Next, by using the correspondence between “sectors” of the Input-Output Tables and “industries” of the Population Census, obtained during the employment table compilation process, the occupational component ratios by industries are transformed in accordance with the sector concepts of the medium aggregated sectors (108 sectors) of the Input-Output Tables (105 sectors in actuality, as “House rent (imputed rent),” “self-transport,” and “office supplies” are excluded).

When making converting these ratios mechanically, there are instances where there is no consistency between the activity and occupation. Thus, by taking the definition of sectors into consideration, a process of eliminating occupations that should be categorized under other sectors and adding occupations that have been omitted is carried out.

Next adjustments are made so that the figures match with the range of the number of employees by sector estimated in the employment matrix.

Finally, consistency between the numbers of employees by occupation estimated by considering the number of those with public qualifications and the status of main and subsidiary businesses and the numbers of employees by occupation in respective sectors obtained above should be flowed up and reconciled.

Chart 5-5 Relationship Between Basic Transaction Table and Table on Persons Engaged in Production Activities (by Employment Status)



(Note) Since the incomes of self-employed workers occupy only part of the operating surpluses, and since family workers are in principle unpaid, these numbers are estimated, regardless of the gross value added.

Chart 4-6 Relationship Between Table on Employees Engaged in Production Activities (by Occupation) and Employment Matrix (Table on Employees Engaged in Production Activities [by Occupation])

[1] Table on Employees Engaged in Production Activities

Production activity sector	Table on Employees Engaged in Production Activities						Per capita compensation of paid directors and employees	Per capita wages of regular employees
	Total	Self-employed workers	Family workers	Paid directors and employees	Employees	Regular employees		
A								
B								
C								
D								
·								
·								
Total								

(Note) Paid executives and employees for production activity sectors are classified by occupation to produce the "employment matrix."

[2] Employment Matrix

		Occupation
		Scientific researcher Engineer Medical service provider .....
Production activity sector	A	
	B	
	C	
	D	
	.	
Total		

(Note) The “occupation” is classified into 288 types, including “Unable to classify.”  
 Production activity sectors are comprised of 108 sectors of medium aggregated sector classifications (since “house rent (imputed rent)”, “self-transport” and “office supplies” are excluded, the actual number is 105).

**7 Fixed Capital Matrix (Table on Fixed Capital Formation)**

(1) Concepts

The “gross domestic fixed capital formation” basically covers the transaction values of reproducible capital assets with purchaser unit price of 100,000 yen or more and utility duration of one year or longer, including buildings, machinery, and equipment, as well as growth and increase of productive capital services provided by livestock and fruit trees. (please refer to Section 2, Chapter 7).

From the 1995 Input-Output Tables, intangible fixed assets have also been included under capital formation to cover the software industry. Similarly, mineral exploration is included under “other business services.”

In the Basic Transaction Table, fixed capital formation is treated as “total domestic fixed capital formation (public)” and “total domestic fixed capital formation (private)” merely to record the total capital goods in the column vectors. It is thus impossible to identify how much capital formation has occurred in which sector.

The table on fixed capital formation (fixed capital matrix) supplements the Basic Transaction Tables. As indicated in Chart 4-7, the fixed capital matrix can indicate which and how much capital goods and have been purchased (“capital formation”) by which column sectors (“capital formation sectors”) for different investment entities (public or private). This data then makes it possible to conduct dynamic input-output analyses that treat capital formation values at column sectors as endogenous variables, and cost analyses including capital formation, etc.

The capital formation sectors at the top of the fixed capital matrix in Chart 4-7 are based in principle on the medium aggregated sector classifications (104 sectors).

Fixed capital formation includes general social capital, which cannot be treated as capital for production activities at specific sectors such as housing, roads, and parks. Such capital is defined as “Other” under the medium aggregated sector classification. The classifications and scopes are as indicated in Table 4-1. Furthermore, in the fixed capital formation, the cost trade margins generation of scrap and by-products are excluded from the scope of the fixed capital matrix.

(2) Compilation method

Compilation of the fixed capital matrix for both public and private sector capitals begins with estimates of breakdowns by output destination for respective capital goods (capital formation sectors) based on data such as the Survey of Capital Goods Demand Structure, Census of Manufacturers, Survey of Building Construction Started, and domestic production in detailed items, etc. Necessary adjustments are then made, based on specific information from the input sectors.

All capital goods concerning the goods rental and leasing sectors are estimated by the Ownership approach.

Chart 4-7 Relationship Between the Basic Transaction Table and Fixed Capital Matrix

[1] Basic Transaction Table

	A	B	C	D	...	Consumption	Domestic total fixed capital formation (public)	Domestic total fixed capital formation (private)	Exports	Domestic production
A	...	...	...	...	...		200			
B	...	...	...	...	...		500			
C										
D										
·										
·										
Gross value added										
Domestic production										

(Note) The fixed capital formation recorded in the final demand in a lump sum is distributed to output destinations to formulate the “fixed capital matrix.”

[2] Fixed Capital Matrix

Capital formation sector Sector of capital goods	Total	Capital formation sector				Other		
		Agriculture	Steel	Construction	...	Road	Housing	...
A	200			50		100	50	
B	500	50	200	100		150		
C								
D								
·								
·								
Total								

(Note) Three types of tables are compiled: public, private, and public + private.

Table 4-1 Detailed Classification and Scope in “Other”

Classification	Scope
Road	Road businesses (including maintenance, repair, restoration after disaster operations, etc. (the same applying to the following)) and street business. However, toll road businesses are classified under “transportation services (providing road transportation facilities).”
Housing	Owner-occupied units, built-for-sale units (public, public corporation, and private) (sold public and public-corporation units are “private,” but unsold ones are “public”). Rental units and company housing units are included in the “real estate (rental housing rents).”
Environment and hygiene	City parks (including maintenance, repair, restoration after disaster operations, etc. (the same applying to the following)), natural parks, public parks, drainage. Water-supply facilities and waste disposal facilities are classified under “water supply and waste management services.”
Land conservation	Soil conservation (soil conservation accounts in the special account for national forestry) (including maintenance, repair, restoration after disaster operations, etc. (the same applying to the following)) and water control (special account for water control), coastal preservation business, forest reserves, mine pollution recovery business
Land development	Residential land development, industrial land development, reclamation

## 8 Table on Commodity Output by Industry (Make table)

### (1) Concepts

Respective sector classifications comprising endogenous sectors of the Input-Output Tables (Basic Transaction Table) are based on activities of the “production activity units” producing goods and services and established in accordance with a concept similar to commodity classification (Commodity-by-Commodity).

For instance, in the case of an enterprise producing multiple types of goods and services, this means that while classifications are determined by types of goods and services produced by the enterprise based on enterprises in ordinary statistics, production activities within a single enterprise for the purpose of the Input-Output Tables (Basic Transaction Table) are categorized into different sectors in accordance with types of goods and services (Chart 5-8).

The table on commodity output by industry (hereafter referred to as “Make Table”) indicates the amount of goods and services produced by each industry (establishments), including scrap and by-products. The table is structured in a matrix (industry-by-commodity), with the industry on the side and commodity on the top.

The side of the table indicates the industrial classifications with each establishment as a unit. The top indicates the commodity classifications in accordance with the types of goods and services.

### (2) Compilation method

To compile the V table, the amounts of shipment by establishment and item captured in the Census of Manufacturers must first be reclassified and aggregated to produce the necessary figures. Product (service) output by industry should be obtained based on enterprise incomes by industry and product in the results of the reclassification of the Survey on Service Industries, to permit reclassification so that sector classifications are the same as in the V table of the manufacturing sectors, and obtain the relevant figures.

For the other sectors, estimates should be made by utilizing as much relevant statistical data as possible.

Figures are then determined by making the various necessary adjustments.

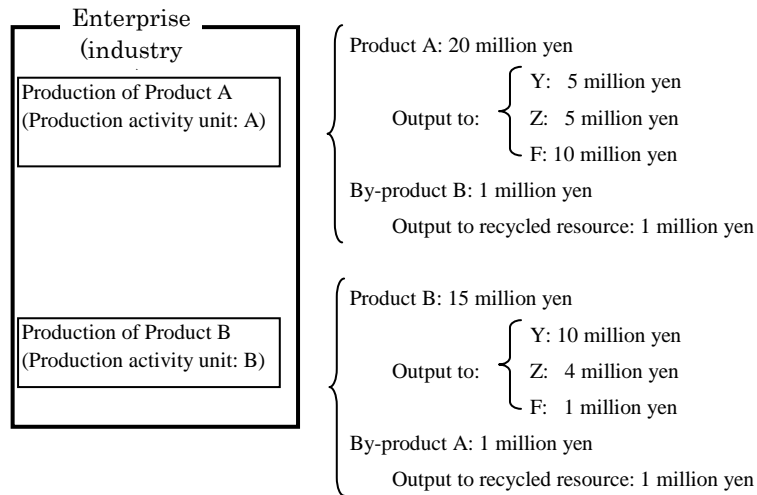
In the Basic Transaction Table, the value of scraps and by-products, for which the negative input method is used, is generally not recorded to domestic production. However, V tables are compiled by including such values.

As a result, the total by commodity (output by commodity = each row total in the V table) matches the total of “domestic production + the value of scraps and by-products (endogenous sectors)” (the value of scraps and by-products in the final demand sector are not recorded since they do not fall under the concept of the V table) (Chart 5-9).

The industries on the side of the table are set in principle in accordance with medium aggregated sector classifications (108 sectors), but partly in accordance with the minor aggregated sector classifications due to the requirements of analyses and tabulations. Industries are categorized into [1] Industry; [2] Producers of government service activity; and [3] Producers of private non-profit service for households.

The commodities at the top of the table (goods and services) are set to match on a one-to-one basis with the industries on the side. Thus, Make table is a square matrix.

Chart 5-8 Enterprises and Production Activity Units



(Explanation)

In terms of industrial classification, this establishment is regarded to belong under “Industry A” due to a major product for which production amounts to 46 million yen. However, it is regarded as “Commodity A” and “Commodity B” in the sector classification of the Input-Output Tables, with production at A amounting to 20 million and production at B reaching 15 million yen. By-product is not recorded as a domestic production, since the Basic Transaction Table is in principle compiled by the negative input method.

Chart 5-9 Relationship Between Basic Transaction Table and the Table on Commodity Output by Industry (Make Table)

[1] Basic Transaction Table

		Intermediate demand				Final demand	Domestic production	
		A	B	Reuse and recycling	Y	Z		F
Intermediate input	A	0	△10	10	5	5	10	50
	B	△0	...	1	4	4	1	15
	Reuse and recycling	0	15	0	0	4	6	25
	Y	5	...	2	...	...	...	...
	Z	10	...	...	...	...	...	...
Gross value added		...	...	...	...	...		
		6	10	12	...	...		
		...	...	...	...	...		
		...	...	...	...	...		
Domestic production		50	10	...	...	...		

[2] Table on Commodity Output by Industry (Make table)

		Product (goods and services)				Domestic production	
		A	B	Reuse and recycling	Y		Z
Industry	A	30	16	0	...	...	46
	B	...	...	0	...	...	...
	Reuse and recycling	...	...	14	...	...	14
	Y	...	...	0	...	...	...
	Z	...	...	0	...	...	...
Total		30	16	14	...	...	...
Scrap and by-products		10	1	0	...	...	...
Domestic production		20	15	25	...	...	...



## 9 Table on Self-Transports

### (1) Concepts

The table on self-transports indicates the detailed goods and services input for activities related to “Self-transport by private cars (passengers)” and “Self-transport by private cars (freight),” which are dummy sectors (refer to § 1, Chapter II) representing self-activities, under the column sector of the Basic Transaction Table.

In Basic Transaction Table, expenses for fuel, non-life insurance, and auto repairs, etc., input by each column sector to conduct self-transport activities are not recorded directly at the intersection of the respective column sectors and the rows of the goods and services. Instead, the expenses required for self-transport activities for passenger and freight services are aggregated and the “Self-transport by private cars (passengers)” and “Self-transport by private cars (freight)” are regarded as input in a lump sum. It is thus impossible to identify the breakdown of the expenses required for the self-transport activities in each column sector.

The table on self-transports is compiled as a supplementary table to fill the gap, revealing the input structure of goods and services required for self-transport activities at each column sector and the status of the output of goods and services required for self-transport activities to each column sector.

“Self-Transport” sector is dummy sector, and doesn’t record value added.

### (2) Compilation method

The table on self-transports is compiled in parallel with the compilation of the Basic Transaction Table, as follows.

- i) Each column sector distributes the expenses required for self-transport proportionately from the goods and services input to date, accumulates these figures, and estimates the inputs for “Self-transport by private cars (passengers)” and “Self-transport by private cars (freight).”
- ii) In parallel with i), inputs of goods and services are estimated from various data for private automobiles in both sectors of “Self-transport by private cars (passengers)” and “Self-transport by private cars (freight).” The output of each column is also estimated (refer to Chapter VI). Input and output to the private automobile sector are established by making the necessary adjustments with the relevant sectors.
- iii) With the input of the self-transport sector obtained in ii) above and the output of the self-transport sector to each column as CT (Control Totals), the table on self-transport of the preceding table and various data on the subsequent changes of the self-transport activities at each industry are used to distribute the input of the column sectors, which are then adjusted with the output sectors (including readjustments for cases in which the figures of ii) need to be changed at this stage) to complete the table on self-transport.

The Basic Transaction Table has been compiled in two formats: one indicating the self-transport sectors at columns and rows, and one not setting self-transport sectors, with each sector directly inputting goods and services related to self-transport. The two formats are offered to meet varying needs.

Chart 5-10 Relationship Between Basic Transaction Table and Table on Self-Transports

[1] Basic Transaction Table

	A	B	C	D	Self-transport	E	Final demand	Domestic production
A			(5)		20			
B		Disaggregated	(20)	40	80			
C			(5)		30			
D			(0)		10			
Self-transport	20		40	30	50	(0)	10	.....
E			(0)		10			
Gross value added					.	.		
					0			
Domestic production					150			

(Note) Expenses concerning self-transport aggregated and recorded in the self-transport sectors in the rows of the Basic Transaction Table are disaggregated into each row sector to produce the table on self-transports.

[2] Table on Self-Transports

	A	B	C	D	E	Total
A	...	...	5	...	...	20
B	...	...	20	...	...	80
C	4	8	5	10	3	30
D	...	...	0	...	...	10
E	...	...	0	...	...	10
Total	20	40	30	50	10	150