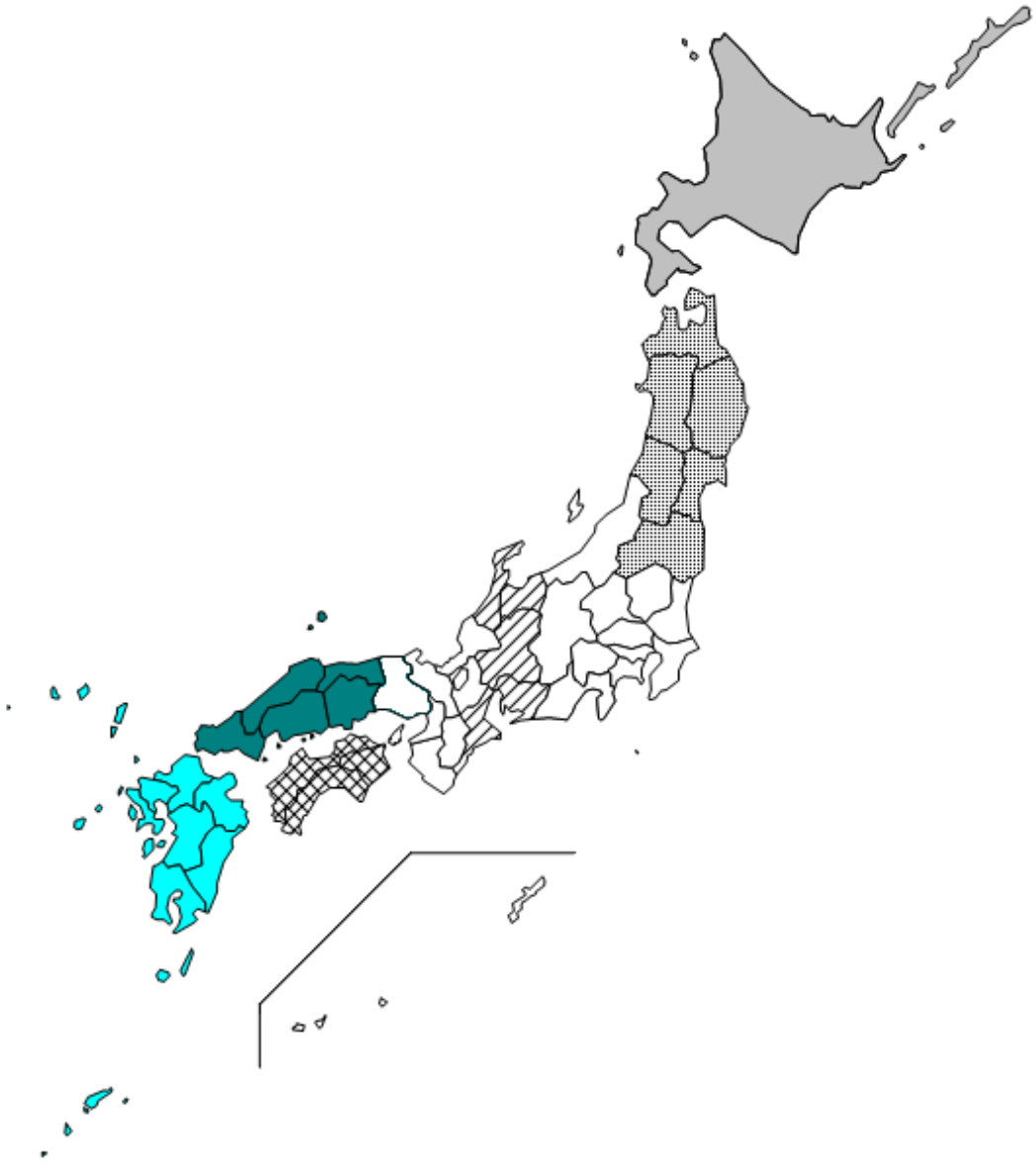
2005 Inter-Regional Input-Output Table

～A Debrief Report～



March 2010

Research and Statistics Department Economic and Industrial Policy Bureau

Ministry of Economy, Trade and Industry (METI)

Introduction

Every five years since 1960, the Ministry of Economy, Trade and Industry has carried out a joint project through its Research and Statistics Department with prefectural Bureaus of Economy, Trade and Industry, the Okinawa General Bureau of the Cabinet Office, and Okinawa Prefecture. The project divides Japan into nine regions in order to create Regional Input-Output Tables (Regional I-O Tables). In addition, the Research and Statistics Department has created and published Inter-regional Input-Output tables (Inter-regional I-O Table) linked to the Regional I-O Tables. For the 2000 Regional I-O Tables, however, creation and publication of public Inter-regional I-O Table were suspended in the interest of rationalizing work and speeding up creation and publication. (Estimated Inter-regional I-O Tables for internal use were created for 2000.)

The Inter-regional I-O Tables contain extremely rich data that enable understanding of where (in which region) the raw materials for each region's input goods and services were purchased and to which industry in which region the subsequent products were sold. The Tables thus enable extended analysis including measurement of inter-regional mutual repercussion effects.

There is much need for such I-O Table tables. Their diverse users include everyone from students to banks, think tanks, and local governments. In addition to ministerial policymaking, they are widely used in research such as various forms of repercussion effect analysis and for regional vitalization. It has therefore been decided to create public Inter-regional I-O Tables for the first time in about 10 years. They are being published as the 2005 Inter-regional I-O Table.

Contents

I. Outline of 2005 Inter-regional I-O Table

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1. What are I-O Tables?

The various industries that comprise a regional economy carry out production activities while mutually linked to industries inside and outside the region. This forms the region's unique industrial structure.

A given industry purchases (inputs) goods and services such as raw materials and fuel from other industries and processes them (inputting labor, capital, etc.) to produce new goods and services. Furthermore, they sell (output) these goods and services to other industries as raw materials. These purchase-(production)-sale relationships of goods and services link various industries together, supplying end-users with necessary goods and services.

I-O Tables record and list routine transactions (the state of production and sale) of goods and services between industries in a given region during a specific period (usually one year) in an easily understandable format. They serve to clarify the flow of goods and services in the System of National Accounts, i.e., the status of the real "flow of goods." They are called Input-Output Tables, abbreviated as "I-O Tables," because they depict the inputs and outputs of each industry. Depending on their functions and characteristics, the tables are generally used in the following two ways.

Structure of the 2005 Regional I-O Tables

		Endogenous sectors				Exogenous sectors								
	Demand sector (buyer) / Supply sector (seller)	Intermediate demand				Final demand, F						(Less)	(Less)	
		1 Agriculture, forestry and fishery	2 Mining	3 Manufacturing	Goods and services produced	Total A	Consumption expenditure outside households	Consumption	Fixed capital formation	Stock / Inventory	Exports	Outflows, U	Total B	Imports C	Inflows, N D	Regional production (gross outputs) A + B - C - D
Endogenous sectors	Intermediate input: 1 Agriculture, forestry and fishery	↓ Columns														
	2 Mining	Composition of product sale destinations (outputs)														
	3 Manufacturing	→ Rows														
	[Supplied goods and services]															
	Total E															
Exogenous sectors	Gross value added: Consumption expenditure outside households	Composition of raw materials and gross value added expenses (inputs)										G			H	
	Compensation of employees															
	Operating surplus															
	Depreciation of fixed capital											G			H	
	Indirect taxes															
	(Less) Current Subsidies															
	Total F															
	Regional production (gross inputs) E + F															

- Row production (A + B - C - D) and Column production (E + F) agree.
- Totals for gross value added and final demand minus imports / inflows agree.
- Boxes G and H express inflows / outflows of headquarters and sales offices expenses in value added sectors.

(1) Use for understanding economic structures and as reference values for economic statistics

First, I-O Tables both capture the production structure not covered by national income (transactions between industries for intermediate products are recorded in detail) and provide more detailed information on production, expenditure, and distributive income statistics.

I-O Tables describe the following in detail for each industrial sector: domestic (in-region) production of goods and services, sales by demand source (intermediate demand, consumption, investment, and exports [outflows]), and cost structure (intermediate input, labor costs, depreciation, etc.). Simply by reading the figures in the tables of these transactions, one can view or analyze the relative characteristics of the national (regional) economic structure. These include, for example, the subject year's input structure by industry, ratio of compensation of employees, product structure by final demand item, import (inflow) ratio by product, and the structure of mutual transactions between industrial sectors that structure the economy.

Furthermore, one can use the Inter-regional I-O Table to read the regional structure of the economy, regional characteristics in inter-regional comparison, trade structure, and so on.

Japan's I-O Tables are created with great accuracy every five years using every kind of statistical material. The results are used as reference values in various types of economic statistics.

For example, in the "national accounting" estimates, the I-O Tables are used as important basic statistics to revise criteria every five years. In addition, value-added by sector and intermediate demand from the I-O Tables are used and their weight is calculated in the "Tertiary Industry Activity Index" and the "Corporate Service Industries Price Index." In addition, the annual "Updated" I-O Tables are estimated based on the I-O Tables that are created every five years, with changes to their figures taken into account.

(2) Repercussion effect analysis and other I-O Table analysis

Second, using I-O Tables enables measurement that balances the final repercussions of how a given economic stimulus in turn influences other economic activities in terms of I-O Table relationships and relationships with final demand and value added. Because the I-O Tables' totals agree and are balanced vertically and horizontally, a change in a given sector will disrupt their balance. Ultimately, this will create a new balance through repercussions in other sectors. This provides an effective analytical method for issues that cannot be solved without first bearing in mind overall relationships among economic activity. Thus, they can be applied broadly to forecast analyses that simulate the economic effects of various changes (e.g., political change) or estimate the complete picture of mutually consistent future economic structures.

Various coefficients such as the input coefficients and inverse matrices that will be discussed below are calculated from the I-O Tables. Through these coefficients, ultimately one can understand how changes in final demand through increases or decreases in investment or exports (outflows) influence production or imports (inflows) of different goods and services. This methodology is widely used in the creation of various plans and forecasts regarding the economy.

As with economic forecasts, the effects brought about by specific economic measures in each industrial sector can be analyzed and evaluated using the relationships between final demand and the production level of various goods and services. This includes measurement of the repercussion effects of public financial expenditure and the economic effects of public investment.

Use of the various coefficients of the I-O Tables for repercussion analysis (production repercussion analysis and price repercussion analysis) enables measurement and analysis of the effects of future economic forecasts and policies. They are therefore used as important basic materials when setting economic policies.

2. The concept of I-O Table analysis

Looking at the iron and steel industry, the production of iron and steel involves demand for raw materials for production in the machinery industry, construction, and various other industries. Additionally, iron and steel themselves are appropriated for exports and other final demand. Looking at the products of an iron and steel user such as the machinery industry, the demand sources of the automobile industry, for example, are domestic consumption and investment and export final demand. Iron and steel that are input towards automobiles are produced to meet final demand such as consumption, investment, and export. Their very appearance is different from iron and steel that are inputs as raw materials for production in construction and other industries, indicating that they are ultimately produced to meet final demand. In every industry, not just iron and steel, production always takes place ultimately to meet final demand. When one follows this relationship from the opposite direction, starting with final demand, it is as follows.

Assume that export demand exists in a specific industry, the automobile industry for example. The automobile industry must produce only the amount needed for immediate export. In order to do so, it must purchase necessary raw materials from industries such as the iron and steel, rubber, and glass industries. Having received an order from the automobile industry, the iron and steel industry needs to produce only the amount immediately ordered by the automobile industry. In order to do so, it requires raw materials such as iron ores, coal, and electricity. Rubber, glass, and other industries are similar. Eventually, export demand for the automobile industry creates successive repercussions through various industries as demand generates demand. Ultimately, each industry becomes unable to keep up with demand by producing only the amount initially ordered.

Focusing on this point, if we know the basic units of each industry, i.e., the amount of iron and steel needed to produce automobiles, the amount of iron ore, coal, and electricity needed to produce iron and steel, and the amount of other raw materials needed to produce iron ores, coal, and electricity, we can calculate the necessary production in each industry accompanying automobile exports. Moreover, if all final demand, such as consumption, investment, and exports, are forecast, the concomitant production in each industry can be forecast as well. This is the most basic idea behind I-O Table analysis.

3. Basic assumptions of the analytical model

A number of basic assumptions are required in order to consider this. I-O Table analysis is carried out based on these assumptions. The basic assumptions are as follows.

(1) All "production" takes place to meet "final demand."
(2) It is assumed that no "constraints" on production (e.g., equipment capacity) exist.
(3) Each product has a one-to-one relationship with each industrial sector. One product is supplied from only one industrial sector. Thus, it is assumed that a product never has a one-to-many (limiting assumption) or many-to-one (non-existence of coproduction) relationship with industrial activities. Additionally, it is assumed that there is an "input structure" peculiar to the production of each product and that it remains "specific" without short-term change.
(4) The input volume utilized by each sector is assumed to be proportional to the sector's production level. A "linear proportional relationship" in which a doubling of production level means a doubling of raw material input volume is assumed." ("Economies of scale are assumed not to exist.")
(5) Production repercussions are assumed to proceed to the end without interruption at intermediate stages. (Increases in additional demand are always met through increased production, without interrupting repercussions through inventory drawdown, etc.)
(6) The sum of the effects of each sector individually carrying out production activities is assumed to be equivalent to the total effect of those sectors performing the production activities simultaneously. ("Additivity among activities" is assumed, i.e., there are no external economies or external diseconomies [e.g., pollution].)

4. What are Inter-regional I-O Table? Measurement of inter-regional production repercussion effects is possible

Regional I-O Tables can be broadly divided into two types, Regional I-O Tables and Inter-regional I-O Table.
Regional I-O Tables describe transactions in goods and services in a specific region during a given period. Analysis using these tables is limited to transaction relationships in a specific region.

Image of Intra-regional Tables

Demand side / Supply side		Intermediate demand			In-region final demand		Exports	Outflows			Imports	Inflows			Production amount
		A	B	C	Consumption	Investment		(i) Region	(ii) Region	(iii) Region		(i) Region	(ii) Region	(iii) Region	
Intermediate input	Sector A														
	Sector B														
	Sector C														
Gross value added															
Production amount															

In contrast, Inter-regional I-O Tables cover multiple regions at the same time, describing transaction relationships of goods and services not only inside region but between them as well. In Regional I-O Tables, goods and services supplied to outside regions in Japan are shown only as "outflow" totals for each good and service. Inter-regional I-O Tables show "how much was consumed by which region's which industry or final demand" for goods and services produced in each region.

Image of the Inter-regional Tables

Demand side / Supply side		Intermediate demand									In-region final demand			Exports			Imports			Production amount
		(i) Region			(ii) Region			(iii) Region			(i)	(ii)	(iii)	(i)	(ii)	(iii)	(i)	(ii)	(iii)	
					A															
Intermediate input	(i) Region																			
	(ii) Region																			
	(iii) Region																			
Gross value added																				
Production amount					X															

Notes: Looked at vertically, I-O Tables display the cost structure (input) required to carry out bottom-row production; looked at horizontally, they display the sales channel structure (output) of the goods and services produced.
In Inter-regional I-O Tables, when the production and demand regions are different for the cost structure and sales channel structure, they are displayed as if they were different goods and services.
For example, looking vertically at Sector A of Region 2, Sector A purchased various raw materials from industries in different regions and carried out X amount of production. The ▭ area is the amount purchased (inflow) from industries in Region 1.
Final demand is similar. The Region 2 ▭ area indicates the goods and services supplied (inflow) by Region 1 to meet final demand in Region 2.
Squares where the top and the side region are the same represent the in-region supply of in-region products. Note that this area also includes imports consumed within the region.
The ▱ area indicates that no figures are calculated.

Creation of these Inter-regional I-O Tables not only clarifies inter-regional trade structures by industry, they enable analysis of various inter-regional repercussion effects through inter-regional interdependent relationships. This analysis is not possible with Regional I-O Tables. For example, if capital investment is carried out in a given region (e.g., Hokkaido), analysis with Regional I-O Tables could measure in-prefecture production repercussion effects only for money needed for capital investment that was procured from inside Hokkaido (in-prefecture production). If most of the goods needed for the capital investment were inflows from outside the prefecture, then they would not bring about large production repercussions inside the prefecture. However, in the region that produced the investment goods that flowed into Hokkaido (e.g., Kanto), raw materials were needed for their production. If most of those raw materials were purchased from other regions, including Hokkaido, then of course this generated new raw material outflow demand from Hokkaido and other regions to Kanto.

Thus, even if investment goods related to investment demand in Hokkaido were not procured there, Hokkaido of course induces production in other regions. This in turn induces production in Hokkaido through a series of repercussions. Analysis that weaves in this kind of inter-regional repercussion only became possible with the creation of Inter-regional I-O Table.

5. Outline of the process for creating the 2005 Inter-regional I-O Table (details will follow below)

The Regional I-O Tables (inter-regional competitive inflow and import type table: basic sectors) were created through the following process of rearrangement and consolidation.

(1) Column sectors were consolidated into 53 sectors, with region inflows for each row sector (basic sectors) divided by "intermediate demand + regional final demand − increase in product stocks − increase in semi-finished goods and work in progress" to find inter-regional trade coefficients.

(2) Intermediate demand and regional final demand (excluding increase in product stocks and increase in semi-finished goods and work in progress) are multiplied by inter-regional trade coefficients, divided into regions, and rearranged in a non-competitive type.
Increase in product stocks, increase in semi-finished goods and work in progress, and exports were excluded from regional division because they are considered not covered by other-region products.

(3) Row sectors were consolidated into 53 sectors.
This created 53 row sectors × 53 column sectors, so they were adjusted for CT and inflow/outflow balance and matched with the Regional I-O Tables (53 sectors).

(4) Twenty nine sectors and eleven sectors were consolidated for analysis calculation. In addition, three sector tables were consolidated as "models."

6. Characteristics of Inter-regional I-O Table

The 2005 Inter-regional I-O Table were created using essentially the same process as the 1995 Inter-regional I-O Table. The major difference is that in the final balancing work, mechanical error adjustment was heavily used, with human work reduced to the greatest extent possible. This means that there is a potential for bias in allocation when the tables are viewed in detail.

7. Notes regarding this analysis

(i) The values for 2000 appearing in the overview were calculated by individuals, but because they are highly reliable, they are used with a simple 2005 conversion.

(ii) Because the 1995 and 2000 values used for analysis are nominal prices, and some definitions and concepts are different, caution is necessary when making comparisons.

(iii) Totals and breakdowns may not match due to rounding.

(iv) For imports, ratio of import to the total demand (11 sectors) is calculated from competitive import type Regional I-O Tables.

II. Overview of 2005 Inter-regional I-O Table

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1. 2005 regional economies

(1) Changes in production by region

Regional production (gross outputs) for Japanese industry in 2005 was 948.1934 trillion yen, a 1.2 percent increase compared with 2000 (nominal value; same applies hereinafter).

Looking at production growth rates by region, there were increases in Chugoku (up 8.5 percent compared with 2000), Chubu (up 7.8 percent), Kanto (up 1.2 percent), and Kyushu (up 0.8 percent). There were decreases in Tohoku (down 4.3 percent), Kinki (down 2.9 percent), Okinawa (down 2.8 percent), Hokkaido (down 2.3 percent), and Shikoku (down 0.4 percent).

Status of production by region

(Value units: ¥100 million, growth rate / composition ratio: %)

Year / Region	1995	2000	2005	Growth rate (%)		Composition ratio (%)			Difference in composition ratio	
				2000 / 1995	2005 / 2000	1995	2000	2005	2000-1995	2005–2000
Region total	9,282,688	9,372,233	9,481,934	1.0	1.2	100.0	100.0	100.0	-	-
Hokkaido	348,166	347,190	339,246	- 0.3	- 2.3	3.8	3.7	3.6	0.0	-0.1
Tohoku	598,478	598,466	572,675	0.0	- 4.3	6.4	6.4	6.0	-0.1	-0.3
Kanto	3,914,398	4,038,910	4,086,442	3.2	1.2	42.2	43.1	43.1	0.9	0.0
Chubu	1,145,778	1,145,334	1,235,014	0.0	7.8	12.3	12.2	13.0	-0.1	0.8
Kinki	1,602,811	1,568,640	1,522,685	- 2.1	- 2.9	17.3	16.7	16.1	-0.5	-0.7
Chugoku	576,691	569,827	618,336	- 1.2	8.5	6.2	6.1	6.5	-0.1	0.4
Shikoku	264,569	257,616	256,647	- 2.6	- 0.4	2.9	2.7	2.7	-0.1	0.0
Kyushu	777,697	786,915	793,220	1.2	0.8	8.4	8.4	8.4	0.0	0.0
Okinawa	54,100	59,336	57,669	9.7	- 2.8	0.6	0.6	0.6	0.1	0.0

Note 1: Sector classifications fro the 11 sectors were as follows (in tables below as well).

Agriculture, forestry and fishery	:	Agriculture, forestry and fishery
Mining	:	Metallic ores, non-metallic ores, and coal mining , crude petroleum and natural gas
Beverages and Foods	:	Foods, beverage, feeds, and tobacco
Metal products	:	Iron or steel products, non-ferrous metals products, and metal products
Machinery	:	General machinery, electrical machinery, Transportation equipment, precision instruments
Miscellaneous manufacturing products	:	Textile products, timber, wooden products and furniture, pulp, paper, paperboard, and building paper, chemical products, petroleum and coal products, plastic products, ceramic, stone and clay products, and miscellaneous manufacturing products
Construction	:	Building construction and repair of construction, public construction, and other civil engineering and construction
Public utilities	:	Electricity, gas and heat supply, water supply and waste disposal business
Commerce and transport	:	Commerce and transport
Finance and insurance and real estate	:	Finance and insurance and real estate
Information and communications services	:	Information and communications, Public administration and education and research, medical service, health, social security and nursing care, business services, personal services, and others

In order to ensure continuity with past data, the information and communications and service industries were combined for time series comparison. The same applies hereinafter.

Note 2: Jurisdictions of the Bureaus of Economy, Trade and Industry are as follows.

Region	Target regions (prefectures included)
Hokkaido	Hokkaido
Tohoku	Aomori, Iwate, Miyagi, Akita, Yamagata, Fukushima
Kanto	Ibaraki, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa, Niigata, Yamanashi, Nagano, Shizuoka
Chubu	Toyama, Ishikawa, Gifu, Aichi, Mie
Kinki	Fukui, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama
Chugoku	Tottori, Shimane, Okayama, Hiroshima, Yamaguchi
Shikoku	Tokushima, Kagawa, Ehime, Kochi
Kyushu	Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima
Okinawa	Okinawa

Looking at production by industry and region, metal products and commerce and transport showed an increase in every region compared with 2000. Mining, construction, and beverages and foods showed a decrease in every region. Agriculture, forestry, and fisheries decreased in every region but Hokkaido.

Status of production by region and industry

(Unit: %)

Industry / Region	Growth rate (2005 / 2000)													
	All industries													
		Agriculture, forestry and fishery	Industrial Production						Construction and service industries					
				Mining	Beverages and Foods	Metal products	Machinery	Miscellaneous manufacturing products		Construction	Public utilities	Commerce and transport	Finance and insurance and real estate	Information and communications services
Region total	1.2	- 8.5	- 0.3	- 26.9	- 7.8	23.2	1.2	- 7.5	2.1	- 18.2	0.0	8.9	3.6	4.2
Hokkaido	- 2.3	4.8	- 6.9	- 34.6	- 10.1	34.9	- 25.7	- 5.3	- 1.6	- 24.8	- 3.0	6.7	2.0	1.2
Tohoku	- 4.3	- 11.4	- 7.0	- 34.0	- 20.1	17.9	- 3.6	- 8.6	- 2.7	- 26.7	- 3.2	4.1	- 1.3	2.9
Kanto	1.2	- 8.5	- 5.4	- 11.2	- 2.4	17.5	- 7.5	- 10.6	4.3	- 13.3	1.7	11.1	2.7	6.1
Chubu	7.8	- 10.7	10.9	- 27.9	- 5.5	24.9	18.5	- 4.2	5.4	- 15.4	13.6	3.8	22.1	6.9
Kinki	- 2.9	- 14.5	- 4.7	- 30.4	- 4.0	19.3	- 6.0	- 13.5	- 2.0	- 20.8	- 9.6	8.1	- 2.2	- 0.8
Chugoku	8.5	- 10.7	16.7	- 33.9	- 19.7	37.6	23.5	10.3	3.2	- 21.4	2.7	9.9	11.1	5.0
Shikoku	- 0.4	- 17.4	- 2.7	- 39.3	- 24.6	26.6	- 3.0	0.2	1.7	- 13.7	0.4	4.1	7.8	3.2
Kyushu	0.8	- 9.2	2.7	- 33.5	- 8.2	31.8	6.7	- 6.9	0.6	- 25.1	- 0.6	9.3	3.2	3.4
Okinawa	- 2.8	- 2.7	- 23.1	- 0.6	- 18.6	17.6	- 25.5	- 32.5	0.2	- 23.9	1.8	18.3	- 0.9	2.5

(2) Regional analysis of production

Each region's industrial structure can be examined based on 2005 production using the location quotient and industrial concentration quotient.

Looking at location quotient, Okinawa is the region most skewed towards specific industries, followed by Hokkaido, Chubu, and Chugoku. The region with the lowest quotient is Kinki, followed by Kanto and Kyushu. Compared with 1995 and 2000, the location quotients for Chubu and Chugoku increased, with their industrial structures becoming dominated by specific industries.

Status of location quotient by region

Region / Year	Location quotient by region			Increase-decrease in percentage points	
	1995	2000	2005	(2000–1995)	(2005–2000)
Hokkaido	0.1861	0.1710	0.1720	- 0.0151	0.0009
Tohoku	0.0981	0.0901	0.0734	- 0.0081	- 0.0166
Kanto	0.0433	0.0392	0.0468	- 0.0041	0.0076
Chubu	0.1268	0.1457	0.1645	0.0189	0.0188
Kinki	0.0416	0.0379	0.0394	- 0.0037	0.0015
Chugoku	0.0842	0.0909	0.1260	0.0067	0.0351
Shikoku	0.1036	0.0888	0.0911	- 0.0149	0.0023
Kyushu	0.0983	0.0781	0.0665	- 0.0202	- 0.0116
Okinawa	0.2829	0.2680	0.2242	- 0.0149	- 0.0438

Looking at the industrial concentration quotient, the industries concentrated in specific regions were agriculture, forestry, and fishery, mining, metal products, and machinery. Industries most evenly distributed in each region were construction, commerce and transport, information and communications/service industries, and finance, insurance, and real estate.
Compared with their industrial concentration quotients in 2000, machinery, commerce and transport, and agriculture, forestry, and fishery increased, becoming more concentrated. On the other hand, quotients declined for mining, beverages and foods, and construction, as they tended to become less concentrated.

Status of industrial concentration quotient by region

Industry \ Year	Industrial concentration quotient			Increase-decrease in percentage points	
	1995	2000	2005	(2000–1995)	(2005–2000)
Agriculture, forestry and fishery	0.3324	0.3292	0.3427	- 0.0032	0.0135
Mining	0.2625	0.2526	0.2037	- 0.0099	- 0.0490
Beverages and Foods	0.1038	0.1066	0.0897	0.0027	- 0.0169
Metal products	0.1391	0.1512	0.1557	0.0121	0.0045
Machinery	0.1186	0.1013	0.1311	- 0.0173	0.0298
Miscellaneous manufacturing products	0.0771	0.0777	0.0864	0.0007	0.0087
Construction	0.0613	0.0515	0.0374	- 0.0098	- 0.0141
Public utilities	0.0828	0.0822	0.0689	- 0.0007	- 0.0133
Commerce and transport	0.0236	0.0263	0.0431	0.0027	0.0168
Finance and insurance and real estate	0.0825	0.0617	0.0550	- 0.0208	- 0.0066
Information and communications services	0.0375	0.0467	0.0545	0.0091	0.0079

(3) Input structure

Domestic production accounted for by intermediate input (equivalent to intermediate demand) was 456.1856 trillion yen, a 6.1 percent increase compared with 2000. This exceeded the growth rate for domestic production (up 1.2 percent compared with 2000).
Looking at growth in intermediate input by region, although Tohoku decreased slightly (down 0.1 percent from 2000), all other regions showed increases.

Status of intermediate input by region

(Value units: ¥100 million, growth rate / composition ratio: %)

Region \ Year	1995	2000	2005	Growth rate (%)		Composition ratio (%)			Difference in composition ratio	
				2000 / 1995	2005 / 2000	1995	2000	2005	2000-1995	2005–2000
Region total	4,225,553	4,297,725	4,561,856	1.7	6.1	100.0	100.0	100.0	-	-
Hokkaido	147,318	147,779	148,404	0.3	0.4	3.5	3.4	3.3	0.0	-0.2
Tohoku	258,168	263,214	262,824	2.0	- 0.1	6.1	6.1	5.8	0.0	-0.4
Kanto	1,776,200	1,845,911	1,935,509	3.9	4.9	42.0	43.0	42.4	0.9	-0.5
Chubu	564,253	578,351	662,699	2.5	14.6	13.4	13.5	14.5	0.1	1.1
Kinki	719,596	702,231	712,378	- 2.4	1.4	17.0	16.3	15.6	-0.7	-0.7
Chugoku	278,958	278,738	327,568	- 0.1	17.5	6.6	6.5	7.2	-0.1	0.7
Shikoku	118,974	114,593	120,524	- 3.7	5.2	2.8	2.7	2.6	-0.1	0.0
Kyushu	340,288	342,172	366,759	0.6	7.2	8.1	8.0	8.0	-0.1	0.1
Okinawa	21,798	24,736	25,192	13.5	1.8	0.5	0.6	0.6	0.1	0.0

The ratio of intermediate input to the value of total domestic production (intermediate input/production) was 48.1 percent, an increase of 2.3 percentage points compared with 2000 (45.9 percent).

Status of ratio of intermediate input to the value of total domestic production by region

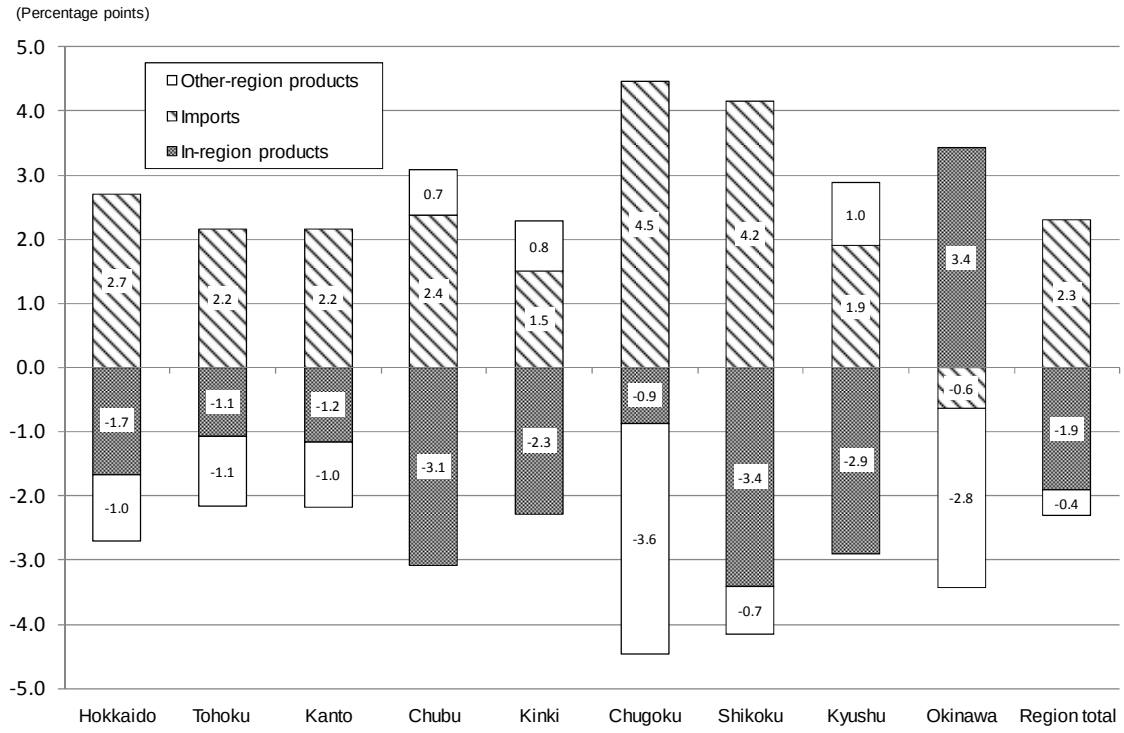
(%)

Region \ Year	1995	2000	2005	Growth rate (%)		Difference in percentage points	
				2000 / 1995	2005 / 2000	2000-1995	2005–2000
Region total	45.5%	45.9%	48.1%	0.7	4.9	0.3	2.3
Hokkaido	42.3%	42.6%	43.7%	0.6	2.8	0.3	1.2
Tohoku	43.1%	44.0%	45.9%	2.0	4.3	0.8	1.9
Kanto	45.4%	45.7%	47.4%	0.7	3.6	0.3	1.7
Chubu	49.2%	50.5%	53.7%	2.5	6.3	1.2	3.2
Kinki	44.9%	44.8%	46.8%	- 0.3	4.5	-0.1	2.0
Chugoku	48.4%	48.9%	53.0%	1.1	8.3	0.5	4.1
Shikoku	45.0%	44.5%	47.0%	- 1.1	5.6	-0.5	2.5
Kyushu	43.8%	43.5%	46.2%	- 0.6	6.3	-0.3	2.8
Okinawa	40.3%	41.7%	43.7%	3.5	4.8	1.4	2.0

As for the ratio of intermediate input to the value of total domestic production by region, compared to 2000 it increased in every region. Chugoku and Chubu, which are heavily weighted towards industrial production, had the largest increases.
By industry, in industrial production, the ratio for "Metal products" increased in every region, while "Mining" increased in every region but Okinawa. In construction and service industries, "Information and communications/service industries" increased in all regions, while "Commerce and transport" increased in all regions except Hokkaido.

Looking at the input source ratio of intermediate input goods, it was 66.1 percent in-region products, 25.7 percent other-region products, and 8.2 percent imports. Compared with 2000, the share of inputs accounted for by imported products rose in every region but Okinawa, while the share of in-region products declined.

Status of input source ratio of intermediate input goods by region (2005–2000)



(4) Gross value added

Gross value added was 491.5224 trillion yen, a decrease of 3.1 percent compared with 2000.
By region, Chubu increased by 0.8 percent compared to 2000, to 57.1218 trillion yen, but all other regions, including Tohoku (down 7.6 percent compared to 2000), Kinki (down 6.6 percent), and Okinawa (down 6.1 percent), decreased.

Status of gross value added by region

(Value units: ¥100 million, growth rate / composition ratio: %)

Region \ Year	1995	2000	2005	Growth rate (%)		Composition ratio (%)			Difference in composition ratio	
				2000 / 1995	2005 / 2000	1995	2000	2005	2000-1995	2005–2000
Region total	5,052,460	5,072,680	4,915,224	0.4	- 3.1	100.0	100.0	100.0	-	-
Hokkaido	200,771	199,340	190,626	- 0.7	- 4.4	4.0	3.9	3.9	0.0	-0.1
Tohoku	340,058	335,119	309,518	- 1.5	- 7.6	6.7	6.6	6.3	-0.1	-0.3
Kanto	2,136,444	2,192,210	2,149,398	2.6	- 2.0	42.3	43.2	43.7	0.9	0.5
Chubu	580,538	566,767	571,218	- 2.4	0.8	11.5	11.2	11.6	-0.3	0.4
Kinki	882,138	866,118	809,336	- 1.8	- 6.6	17.5	17.1	16.5	-0.4	-0.6
Chugoku	297,450	290,988	290,561	- 2.2	- 0.1	5.9	5.7	5.9	-0.2	0.2
Shikoku	145,569	142,971	135,971	- 1.8	- 4.9	2.9	2.8	2.8	-0.1	-0.1
Kyushu	437,199	444,580	426,138	1.7	- 4.1	8.7	8.8	8.7	0.1	-0.1
Okinawa	32,293	34,587	32,460	7.1	- 6.1	0.6	0.7	0.7	0.0	0.0

The gross value added ratio (gross value added / production) was 51.8 percent, a decrease of 2.3 percentage points from 2000 (54.1 percent).
By region, although Okinawa and Hokkaido are highest, every region declined compared to 2000. The decrease was especially large in Chugoku and Chubu, where the ratio of intermediate input to the value of total domestic production increased.

Status of gross value added ratio by region

(%)

Region \ Year	1995	2000	2005	Growth rate		Difference in composition ratio	
				2000 / 1995	2005 / 2000	2000-1995	2005–2000
Region total	54.4%	54.1%	51.8%	- 0.6	- 4.2	-0.3	-2.3
Hokkaido	57.7%	57.4%	56.2%	- 0.4	- 2.1	-0.2	-1.2
Tohoku	56.8%	56.0%	54.0%	- 1.5	- 3.5	-0.8	-1.9
Kanto	54.6%	54.3%	52.6%	- 0.6	- 3.1	-0.3	-1.7
Chubu	50.7%	49.5%	46.3%	- 2.3	- 6.5	-1.2	-3.2
Kinki	55.0%	55.2%	53.2%	0.3	- 3.7	0.2	-2.1
Chugoku	51.6%	51.1%	47.0%	- 1.0	- 8.0	-0.5	-4.1
Shikoku	55.0%	55.5%	53.0%	0.9	- 4.5	0.5	-2.5
Kyushu	56.2%	56.5%	53.7%	0.5	- 4.9	0.3	-2.8
Okinawa	59.7%	58.3%	56.3%	- 2.3	- 3.4	-1.4	-2.0

(5) Final demand

(i) Consumption was 374.5269 trillion yen, an increase of 0.2 percent compared with 2000.
Looking by region, Chubu increased by 8.7 percent compared with 2000, Chugoku increased by 1.9 percent, and Kanto increased by 1.6 percent, but all other regions, including Kinki (down 4.6 percent from 2000), Tohoku (down 4.1 percent), and Kyushu (down 2.2 percent) decreased.

Status of consumption by region

(Value units: ¥100 million, growth rate / composition ratio: %)

Year / Region	1995	2000	2005	Growth rate (%)		Composition ratio (%)			Difference in composition ratio	
				2000 / 1995	2005 / 2000	1995	2000	2005	2000-1995	2005–2000
Region total	3,604,018	3,736,762	3,745,269	3.7	0.2	100.0	100.0	100.0	-	-
Hokkaido	171,181	176,876	175,167	3.3	- 1.0	4.7	4.7	4.7	0.0	-0.1
Tohoku	256,648	261,211	250,602	1.8	- 4.1	7.1	7.0	6.7	-0.1	-0.3
Kanto	1,481,578	1,531,674	1,556,074	3.4	1.6	41.1	41.0	41.5	-0.1	0.6
Chubu	359,088	364,857	396,492	1.6	8.7	10.0	9.8	10.6	-0.2	0.8
Kinki	630,009	655,538	625,408	4.1	- 4.6	17.5	17.5	16.7	0.1	-0.8
Chugoku	204,334	218,061	222,264	6.7	1.9	5.7	5.8	5.9	0.2	0.1
Shikoku	114,079	117,797	117,393	3.3	- 0.3	3.2	3.2	3.1	0.0	0.0
Kyushu	357,279	377,976	369,524	5.8	- 2.2	9.9	10.1	9.9	0.2	-0.2
Okinawa	29,821	32,772	32,344	9.9	- 1.3	0.8	0.9	0.9	0.0	0.0

(ii) Investment was 116.2151 trillion yen, a decrease of 10.9 percent from 2000.
Looking by region, investment decreased in all regions, including Okinawa (25.7 percent compared with 2000 down), Tohoku (down 20.4 percent), Hokkaido (down 18.0 percent), Kinki (down 14.8 percent), and Kyushu (down 13.3 percent).

Status of investment by region

(Value units: ¥100 million, growth rate / composition ratio: %)

Year / Region	1995	2000	2005	Growth rate (%)		Composition ratio (%)			Difference in composition ratio	
				2000 / 1995	2005 / 2000	1995	2000	2005	2000-1995	2005–2000
Region total	1,421,082	1,304,491	1,162,151	- 8.2	- 10.9	100.0	100.0	100.0	-	-
Hokkaido	64,440	60,987	50,020	- 5.4	- 18.0	4.5	4.7	4.3	0.1	-0.4
Tohoku	105,191	102,975	81,993	- 2.1	- 20.4	7.4	7.9	7.1	0.5	-0.8
Kanto	591,291	536,401	502,529	- 9.3	- 6.3	41.6	41.1	43.2	-0.5	2.1
Chubu	157,284	151,475	137,802	- 3.7	- 9.0	11.1	11.6	11.9	0.5	0.2
Kinki	243,018	200,480	170,834	- 17.5	- 14.8	17.1	15.4	14.7	-1.7	-0.7
Chugoku	82,406	77,536	68,415	- 5.9	- 11.8	5.8	5.9	5.9	0.1	-0.1
Shikoku	43,253	39,791	35,171	- 8.0	- 11.6	3.0	3.1	3.0	0.0	0.0
Kyushu	122,799	122,823	106,449	0.0	- 13.3	8.6	9.4	9.2	0.8	-0.3
Okinawa	11,401	12,022	8,938	5.4	- 25.7	0.8	0.9	0.8	0.1	-0.2

(iii) Exports were 73.5971 trillion yen, an increase of 28.0 percent compared with 2000.
Every region showed an increase, led by Chugoku (up 52.8 percent compared with 2000), Kyushu (up 51.9 percent), Chubu (up 38.8 percent), Hokkaido (up 27.7 percent), and Tohoku (up 22.7 percent).

Status of exports by region

(Value units: ¥100 million, growth rate / composition ratio: %)

Year / Region	1995	2000	2005	Growth rate (%)		Composition ratio (%)			Difference in composition ratio	
				2000 / 1995	2005 / 2000	1995	2000	2005	2000-1995	2005–2000
Region total	467,957	574,867	735,971	22.8	28.0	100.0	100.0	100.0	-	-
Hokkaido	2,547	2,927	3,737	14.9	27.7	0.5	0.5	0.5	0.0	0.0
Tohoku	16,056	27,088	33,245	68.7	22.7	3.4	4.7	4.5	1.3	-0.2
Kanto	206,369	236,138	282,116	14.4	19.5	44.1	41.1	38.3	-3.0	-2.7
Chubu	89,892	109,097	151,460	21.4	38.8	19.2	19.0	20.6	-0.2	1.6
Kinki	75,698	96,087	114,629	26.9	19.3	16.2	16.7	15.6	0.5	-1.1
Chugoku	32,404	39,313	60,074	21.3	52.8	6.9	6.8	8.2	-0.1	1.3
Shikoku	12,059	15,991	18,079	32.6	13.1	2.6	2.8	2.5	0.2	-0.3
Kyushu	30,916	46,997	71,366	52.0	51.9	6.6	8.2	9.7	1.6	1.5
Okinawa	2,015	1,229	1,264	- 39.0	2.9	0.4	0.2	0.2	-0.2	0.0

(6) Imports

Imports were 72.3313 trillion yen, an increase of 33.5 percent over 2000.

By region, imports were up in each region, led by Chugoku (up 61.7 percent compared with 2000), Chubu (up 52.1 percent), Shikoku (up 41.1 percent), Kyushu (up 39.7 percent), and Hokkaido (up 38.2 percent).

Status of imports by region

(Value units: ¥100 million, growth rate / composition ratio: %)

Year / Region	1995	2000	2005	Growth rate (%)		Composition ratio (%)			Difference in composition ratio	
				2000 / 1995	2005 / 2000	1995	2000	2005	2000-1995	2005–2000
Region total	435,921	541,612	723,313	24.2	33.5	100.0	100.0	100.0	-	-
Hokkaido	14,706	17,894	24,734	21.7	38.2	3.4	3.3	3.4	-0.1	0.1
Tohoku	25,987	32,214	39,981	24.0	24.1	6.0	5.9	5.5	0.0	-0.4
Kanto	187,285	239,135	309,477	27.7	29.4	43.0	44.2	42.8	1.2	-1.4
Chubu	50,796	63,494	96,560	25.0	52.1	11.7	11.7	13.3	0.1	1.6
Kinki	75,967	92,322	110,261	21.5	19.4	17.4	17.0	15.2	-0.4	-1.8
Chugoku	29,895	37,175	60,118	24.4	61.7	6.9	6.9	8.3	0.0	1.4
Shikoku	14,354	16,808	23,711	17.1	41.1	3.3	3.1	3.3	-0.2	0.2
Kyushu	33,872	39,568	55,275	16.8	39.7	7.8	7.3	7.6	-0.5	0.3
Okinawa	3,059	3,002	3,197	- 1.9	6.5	0.7	0.6	0.4	-0.1	-0.1

(7) Trade structure

Transactions between countries are called "imports/exports," and transactions between regions are called "inflows/outflows."

Inflows/outflows were 200.5997 trillion yen, a decrease of 0.7 percent compared with 2000.

Looking at outflows by region, although Chubu (up 7.2 percent compared with 2000), Chugoku (up 5.7 percent), and Hokkaido (up 4.6 percent) showed increases, Okinawa (down 10.5 percent), Kanto (down 4.6 percent), Kinki (down 2.6 percent), Tohoku (down 2.0 percent), Kyushu (down 1.3 percent), and Shikoku (down 0.1 percent) showed decreases.

Status of outflows by region

(Value units: ¥100 million, growth rate / composition ratio: %)

Year / Region	1995	2000	2005	Growth rate (%)		Composition ratio (%)			Difference in composition ratio	
				2000 / 1995	2005 / 2000	1995	2000	2005	2000-1995	2005–2000
Region total	1,966,977	2,019,177	2,005,997	2.7	- 0.7	100.0	100.0	100.0	-	-
Hokkaido	62,468	66,187	69,252	6.0	4.6	3.2	3.3	3.5	0.1	0.2
Tohoku	160,965	159,164	155,994	- 1.1	- 2.0	8.2	7.9	7.8	-0.3	-0.1
Kanto	641,390	714,172	681,270	11.3	- 4.6	32.6	35.4	34.0	2.8	-1.4
Chubu	323,281	316,763	339,496	- 2.0	7.2	16.4	15.7	16.9	-0.7	1.2
Kinki	370,284	373,802	364,235	1.0	- 2.6	18.8	18.5	18.2	-0.3	-0.4
Chugoku	172,684	164,516	173,945	- 4.7	5.7	8.8	8.1	8.7	-0.6	0.5
Shikoku	77,161	74,311	74,265	- 3.7	- 0.1	3.9	3.7	3.7	-0.2	0.0
Kyushu	152,468	142,270	140,383	- 6.7	- 1.3	7.8	7.0	7.0	-0.7	0.0
Okinawa	6,276	7,993	7,157	27.3	- 10.5	0.3	0.4	0.4	0.1	0.0

As for inflows by region, they increased in Chubu (up 14.3 percent compared with 2000), Chugoku (up 1.5 percent), and Kyushu (up 0.1 percent), but decreased in Okinawa (down 14.5 percent), Hokkaido (down 7.9 percent), Tohoku (down 6.0 percent), Kanto (down 4.2 percent), Kinki, and Shikoku (both down 3.4 percent).

Status of inflows by region

(Value units: ¥100 million, growth rate / composition ratio: %)

Year / Region	1995	2000	2005	Growth rate (%)		Composition ratio (%)			Difference in composition ratio	
				2000 / 1995	2005 / 2000	1995	2000	2005	2000-1995	2005–2000
Region total	1,966,977	2,019,177	2,005,997	2.7	- 0.7	100.0	100.0	100.0	-	-
Hokkaido	85,081	89,672	82,600	5.4	- 7.9	4.3	4.4	4.1	0.1	-0.3
Tohoku	172,562	182,972	172,003	6.0	- 6.0	8.8	9.1	8.6	0.3	-0.5
Kanto	595,146	586,252	561,578	- 1.5	- 4.2	30.3	29.0	28.0	-1.2	-1.0
Chubu	297,224	311,714	356,374	4.9	14.3	15.1	15.4	17.8	0.3	2.3
Kinki	359,827	367,175	354,537	2.0	- 3.4	18.3	18.2	17.7	-0.1	-0.5
Chugoku	164,201	171,163	173,813	4.2	1.5	8.3	8.5	8.7	0.1	0.2
Shikoku	86,601	88,060	85,075	1.7	- 3.4	4.4	4.4	4.2	0.0	-0.1
Kyushu	192,182	205,756	205,986	7.1	0.1	9.8	10.2	10.3	0.4	0.1
Okinawa	14,153	16,414	14,030	16.0	- 14.5	0.7	0.8	0.7	0.1	-0.1

Looking at the inter-regional balance of payments (outflows − inflows) by region, three regions, Kanto (outflow surplus of 11.9691 trillion yen), Kinki (969.7 billion yen), and Chugoku (13.2 billion yen), had outflow surpluses. Regions with an inflow surplus included Kyushu (inflow surplus of 6.5603 yen), Chubu (1.6878 yen), and Tohoku (1.6009 yen).

Status of inter-regional balance of payments (outflows − inflows) by region

(Value unit: ¥100 million)

Year / Region	1995	2000	2005
Hokkaido	-22,613	-23,485	-13,348
Tohoku	-11,598	-23,809	-16,009
Kanto	46,244	127,920	119,691
Chubu	26,057	5,049	-16,878
Kinki	10,457	6,627	9,697
Chugoku	8,484	-6,647	132
Shikoku	-9,441	-13,749	-10,810
Kyushu	-39,714	-63,485	-65,603
Okinawa	-7,877	-8,421	-6,873

(8) Production inducement

Each region's production activities (activities of endogenous sectors) are carried out to meet final demand. Domestic products induced by individual final demand items ("induced domestic products") can be measured with an equilibrium output model.

In the case of Inter-regional I-O Table, "induced domestic products" can measure which region's demand induced (or was induced by) which region's production activities. They can be expressed in a table as shown below. (The table below consolidates sectors in rows and final demand in columns, expressing them as region × region.)

The figures aggregated in rows (the highlighted area on the right) indicate each region's induced domestic products.

Status of induced domestic products by region (2005)

(¥100 million)

	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	**Region total**
Hokkaido	242,103	10,740	46,890	12,806	14,254	4,353	1,758	5,911	430	**339,246**
Tohoku	10,935	367,679	120,777	22,723	23,993	8,499	4,187	13,017	864	**572,675**
Kanto	67,907	143,173	3,123,171	239,396	221,728	94,001	45,903	140,856	10,306	**4,086,442**
Chubu	16,734	29,410	221,179	757,766	108,272	33,234	15,257	50,020	3,143	**1,235,014**
Kinki	18,698	29,185	205,330	104,651	1,021,329	51,596	27,678	60,475	3,743	**1,522,685**
Chugoku	7,234	11,177	84,276	34,552	53,381	369,963	14,796	41,250	1,707	**618,336**
Shikoku	2,314	4,391	30,972	12,256	20,994	11,597	162,775	10,827	521	**256,647**
Kyushu	5,064	9,604	71,464	28,006	40,515	26,556	8,691	599,826	3,494	**793,220**
Okinawa	194	319	4,532	1,252	1,649	406	183	1,447	47,688	**57,669**
Region total	371,183	605,679	3,908,590	1,213,409	1,506,115	600,204	281,229	923,629	71,896	**9,481,934**

In general, when the above table is read vertically, the production inducement coefficient can be measured; when it is read horizontally, production inducement distribution ratio can be measured. Vertical or horizontal tabulation enables measurement of "which region's demand induced which region's production activities (vertical), or which region's demand was induced by which region's production activities (horizontal)." Furthermore, the "production repercussion balance of payments" can also be measured.

Looking at "production repercussion balance of payments," Kanto was highest at 17.7852 trillion yen, followed by Chubu (2.1605 trillion yen), Chugoku (1.8132 trillion yen), and Kinki (1.6571 trillion yen). Regions with small production repercussion balance of payments were, in ascending order, Kyushu, Tohoku, Hokkaido, Shikoku, and Okinawa.

Status of production repercussion balance of payments by region (2005)

(¥100 million)

	A+C	A	B	C	C-B	Reference
	Induced domestic products	Same-region inducement from same-region demand	Other-region inducement from same-region demand	Same-region inducement through other-region demand	Production repercussion balance of payments	Inter-regional balance of payments
Hokkaido	339,246	242,103	129,080	97,143	-31,938	-13,348
Tohoku	572,675	367,679	238,000	204,996	-33,004	-16,009
Kanto	4,086,442	3,123,171	785,420	963,271	177,852	119,691
Chubu	1,235,014	757,766	455,643	477,249	21,605	-16,878
Kinki	1,522,685	1,021,329	484,786	501,356	16,571	9,697
Chugoku	618,336	369,963	230,241	248,373	18,132	132
Shikoku	256,647	162,775	118,454	93,872	-24,582	-10,810
Kyushu	793,220	599,826	323,802	193,394	-130,409	-65,603
Okinawa	57,669	47,688	24,208	9,981	-14,227	-6,873
Region total	9,481,934	6,692,298	2,789,635	2,789,635	0	0

III. Characteristics of 2005 regional economies as seen in the I-O Tables

III. Characteristics of 2005 regional economies as seen in the I-O Tables

1. Comparison of production structure by region

(1) Comparison of production structure by industry and region

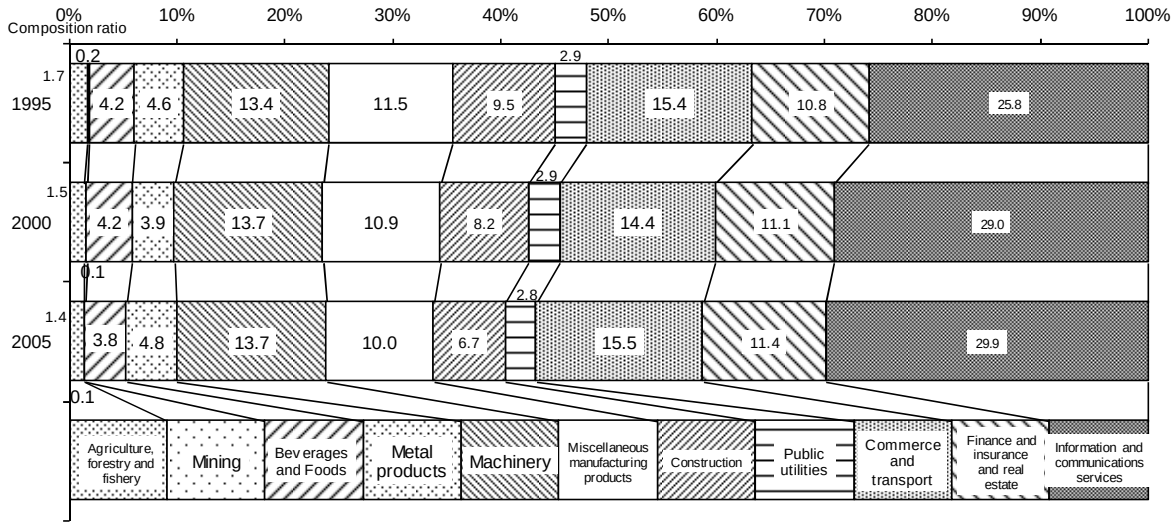
Using the 2005 Inter-regional I-O Table to compare production structure by industry (11 sectors) and by region (nine regions), the following characteristics were found.

Japan's 2005 regional production (gross outputs) totaled by region was 948.1934 trillion yen (Table 1-1).

(i) Composition ratio

Looking at 2005 regional totals for the industrial structure of production, five sectors each accounted for at least 10 percent (Figure 1-1). Information and communications/service industries (composition ratio: 29.9 percent) accounted for the largest share, followed by commerce and transport (15.5 percent), machinery (13.7 percent), finance, insurance, and real estate (11.4 percent), and miscellaneous manufacturing products (10.0 percent).

Figure 1-1: Composition ratio of production by industry



Compared with the 2000 composition ratio, four sectors, commerce and transport (up 1.1 percentage points), information and communications/service industries (up 0.9 percentage points), metal products (up 0.9 percentage points), and finance, insurance, and real estate (up 0.3 percentage points), expanded their shares (Table 1-1). In contrast, the shares of four sectors, construction (down 1.6 percentage points), miscellaneous manufacturing products (down 0.9 percentage points), beverages and foods (down 0.4 percentage points), and agriculture, forestry, and fishery (down 0.1 percentage points), decreased.

Table 1-1: Composition ratio of production by industry

(Units: ¥100 million, %)

Sector name \ Year	Region total							
	Regional production (gross outputs)			Composition ratio			Difference in composition ratio	
	1995	2000	2005	1995	2000	2005	2000-7	2005-12
All industries	9,282,688	9,372,233	9,481,934	100.0	100.0	100.0	0.0	0.0
Agriculture, forestry and fishery	158,178	143,697	131,546	1.7	1.5	1.4	-0.2	-0.1
Industrial Production	3,145,655	3,080,009	3,070,514	33.9	32.9	32.4	-1.0	-0.5
Mining	16,595	13,787	10,084	0.2	0.1	0.1	0.0	0.0
Beverages and Foods	389,319	389,829	359,367	4.2	4.2	3.8	0.0	-0.4
Metal products	424,533	369,946	455,711	4.6	3.9	4.8	-0.6	0.9
Machinery	1,245,270	1,285,959	1,301,730	13.4	13.7	13.7	0.3	0.0
Miscellaneous manufacturing products	1,069,938	1,020,489	943,622	11.5	10.9	10.0	-0.6	-0.9
Construction and service industries	5,978,856	6,148,527	6,279,874	64.4	65.6	66.2	1.2	0.6
Construction	881,493	773,105	632,373	9.5	8.2	6.7	-1.2	-1.6
Public utilities	264,635	267,988	267,893	2.9	2.9	2.8	0.0	0.0
Commerce and transport	1,432,190	1,350,967	1,470,544	15.4	14.4	15.5	-1.0	1.1
Finance and insurance and real estate	1,005,198	1,040,021	1,077,927	10.8	11.1	11.4	0.3	0.3
Information and communications services	2,395,340	2,716,446	2,831,137	25.8	29.0	29.9	3.2	0.9

Looking at the composition of production in 2005 by region, Kanto had the highest composition ratio (43.1 percent), followed by Kinki (16.1 percent) and Chubu (13.0 percent). Those three regions accounted for more than 70 percent of the composition ratio (Figure 1-2).
Compared with 2000, Chubu (up 0.8 percentage points) and Chugoku (up 0.4 percentage points) expanded their shares, while Kinki (down 0.7 percentage points), Tohoku (down 0.3 percentage points), and Hokkaido (0.1 percentage points) contracted (Table 1-2). Additionally, in 2005 Chugoku, where production grew extensively, surpassed Tohoku in composition ratio.

Figure 1-2: Composition ratio of production by region

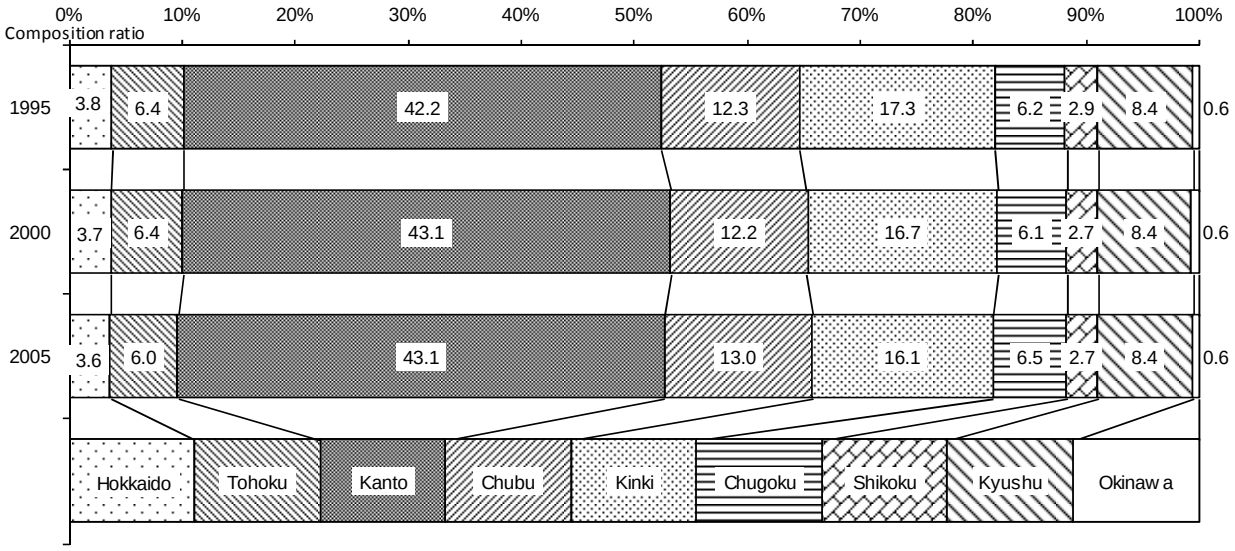


Table 1-2: Composition ratio of production by region

(Unit: %)

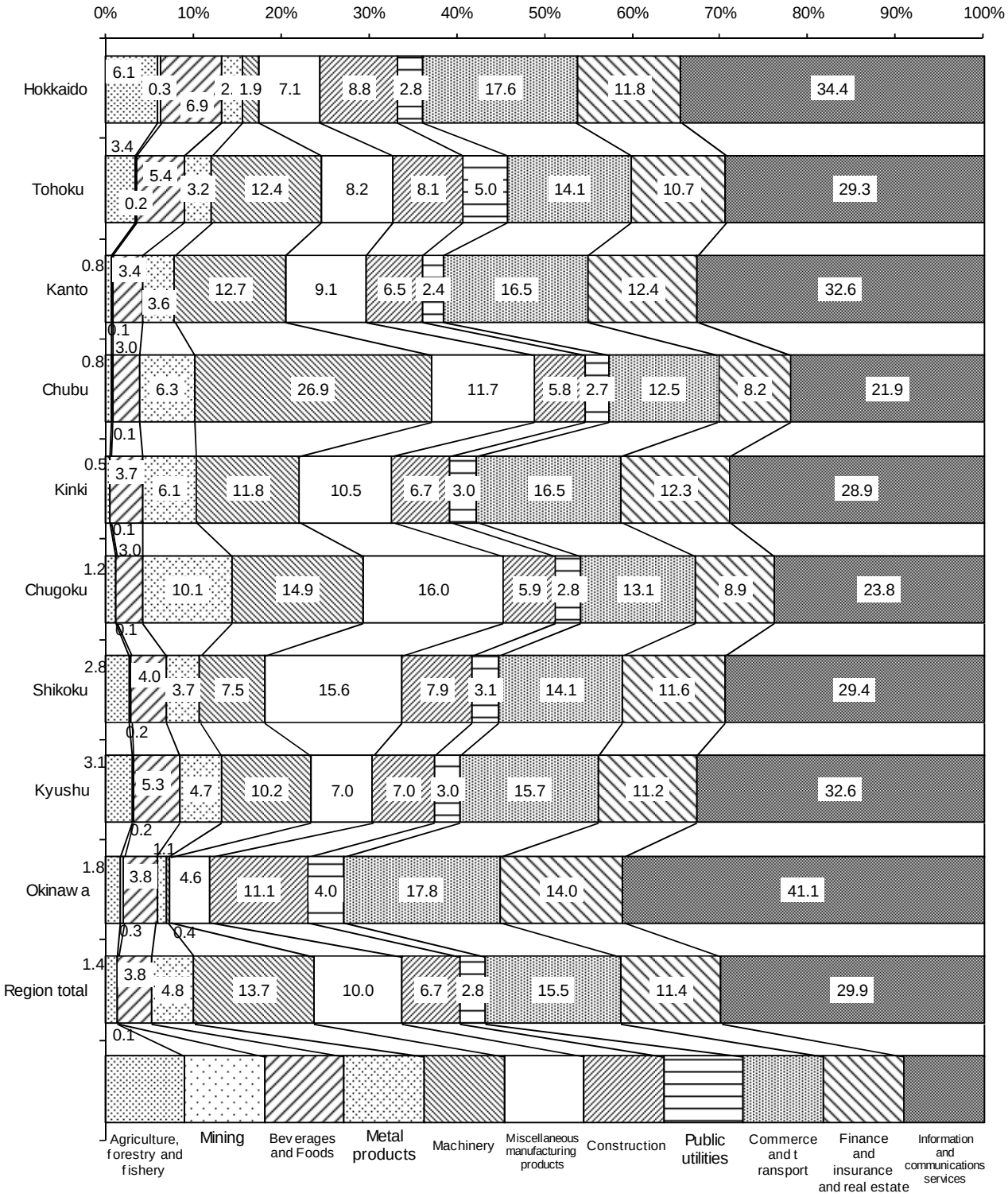
Region \ Year	Composition ratio of production (vs. national)				
	Vs. regional total			Difference in composition ratio	
	1995	2000	2005	2000-1995	2005-2000
Hokkaido	3.8	3.7	3.6	- 0.0	- 0.1
Tohoku	6.4	6.4	6.0	- 0.1	- 0.3
Kanto	42.2	43.1	43.1	0.9	0.0
Chubu	12.3	12.2	13.0	- 0.1	0.8
Kinki	17.3	16.7	16.1	- 0.5	- 0.7
Chugoku	6.2	6.1	6.5	- 0.1	0.4
Shikoku	2.9	2.7	2.7	- 0.1	- 0.0
Kyushu	8.4	8.4	8.4	0.0	- 0.0
Okinawa	0.6	0.6	0.6	0.1	- 0.0

Note 1: Sector classifications fro the 11 sectors were as follows (in tables below as well).

Agriculture, forestry and fishery	:	Agriculture, forestry and fishery
Mining	:	Metallic ores, non-metallic ores, and coal mining , crude petroleum and natural gas
Beverages and Foods	:	Foods, beverage, feeds, and tobacco
Metal products	:	Iron or steel products, non-ferrous metals products, and metal products
Machinery	:	General machinery, electrical machinery, Transportation equipment, precision instruments
Miscellaneous manufacturing products	:	Textile products, timber, wooden products and furniture, pulp, paper, paperboard, and building paper, chemical products, petroleum and coal products, plastic products, ceramic, stone and clay products, and miscellaneous manufacturing products
Construction	:	Building construction and repair of construction, public construction, and other civil engineering and construction
Public utilities	:	Electricity, gas and heat supply, water supply and waste disposal business
Commerce and transport	:	Commerce and transport
Finance and insurance and real estate	:	Finance and insurance and real estate
Information and communications services	:	Information and communications, Public administration and education and research, medical service, health, social security and nursing care, business services, personal services, and others

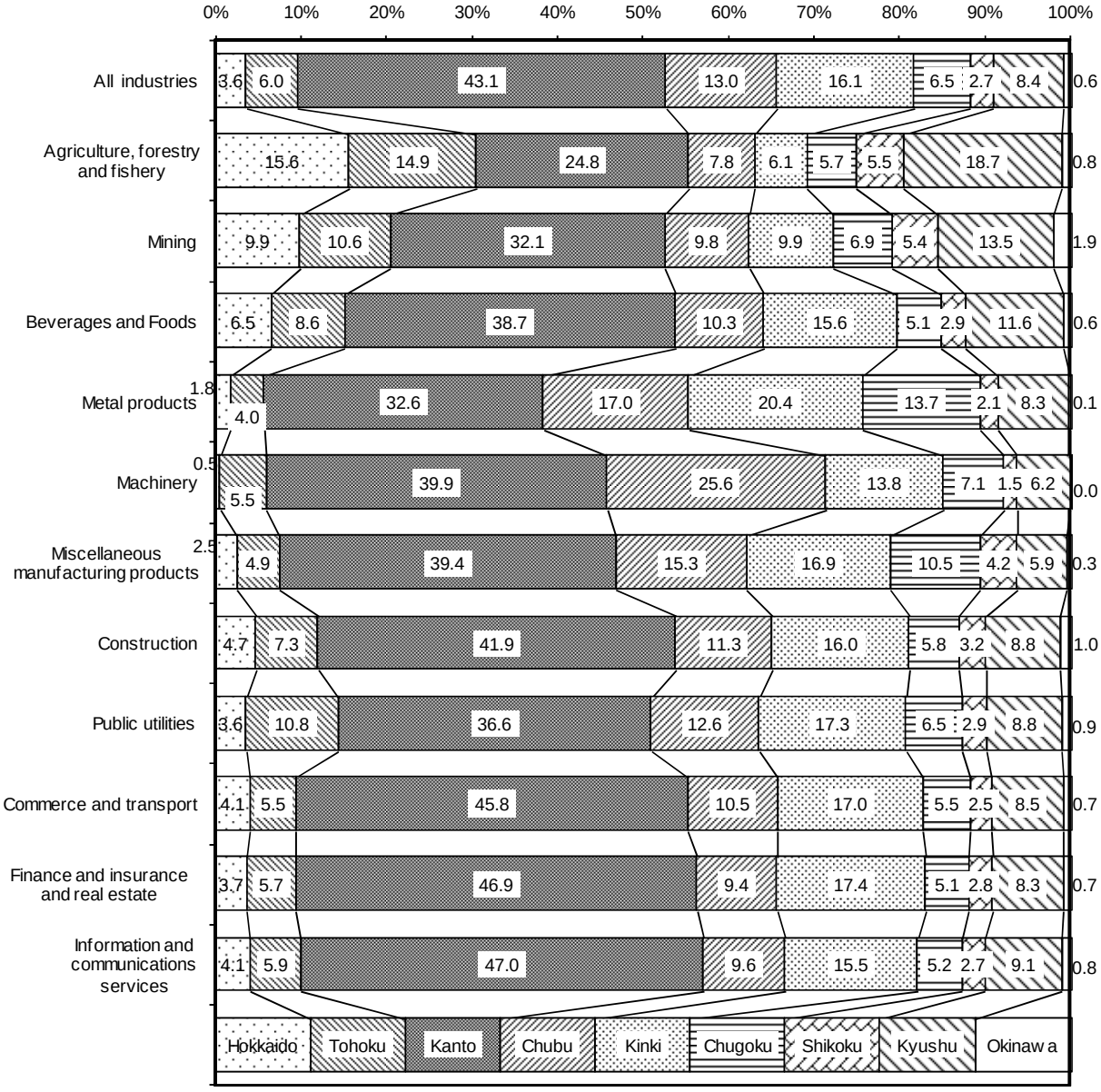
Looking at industrial structure by region, machinery had the highest composition ratio in Chubu only, at 26.9 percent. In all the other regions, information and communications/service industries had the highest composition ratio. The composition ratio for information and communications/service industries was above 30 percent in Okinawa (41.1 percent), Hokkaido (34.4 percent), Kanto (32.6 percent), and Kyushu (32.6 percent). (See Figure 1-3.) In most regions, commerce and transport held second place in composition ratio. In Chugoku (16.0 percent) and Shikoku (15.6 percent), miscellaneous manufacturing products held second place.

Figure 1-3: Composition ratio of production by region and industry



Looking at regional structure by industry, Kanto had the highest composition ratio in every sector (Figure 1-4). Kanto had composition ratios above 40 percent in information and communications/service industries (47.0 percent), finance, insurance, and real estate (46.9 percent), commerce and transport (45.8 percent), and construction (41.9 percent).
Kinki had the second highest composition ratio in every sector except for Kyushu in agriculture, forestry, and fishery (18.7 percent) and mining (13.5 percent) and Chubu in machinery (25.6 percent).

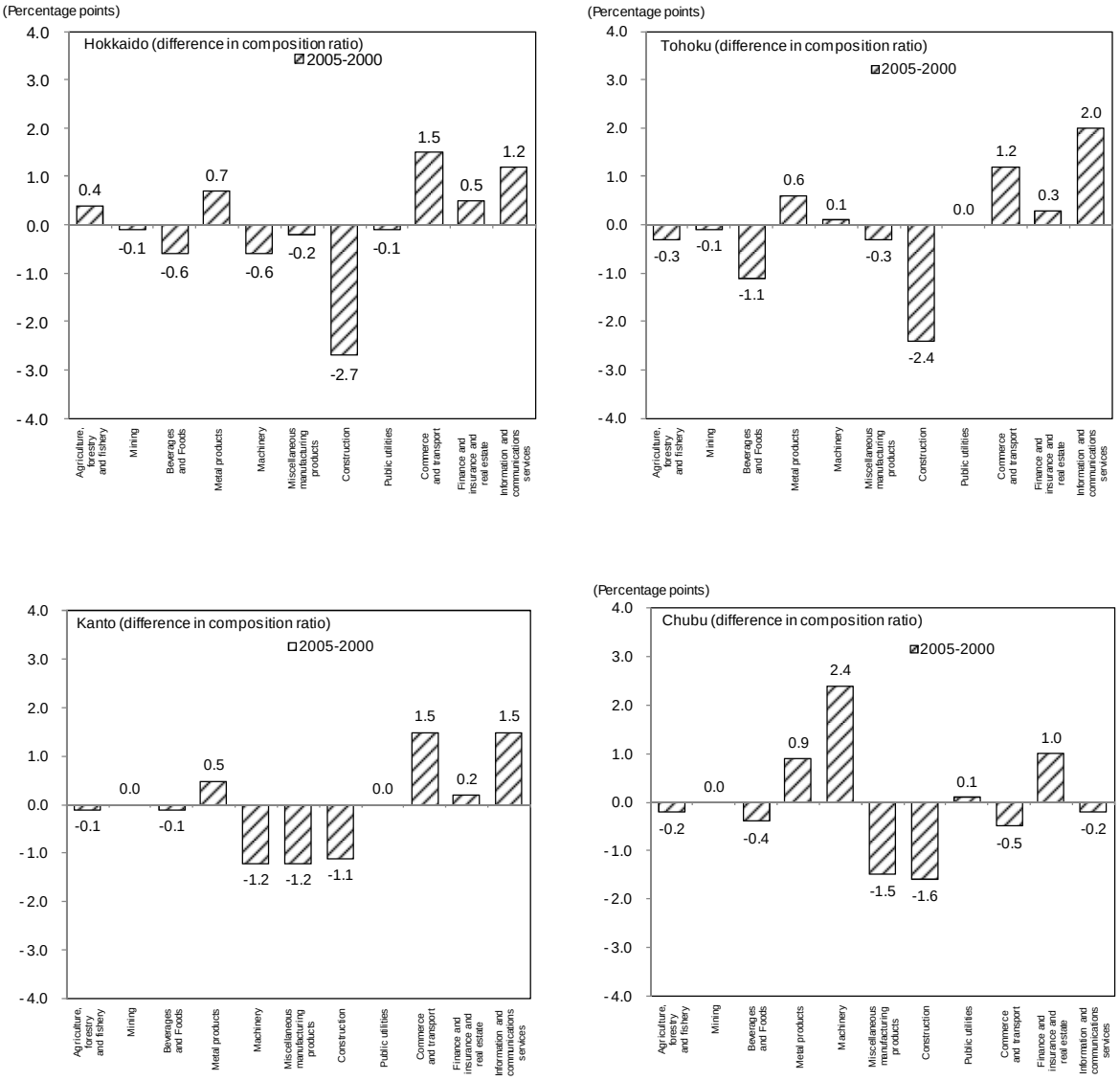
Figure 1-4: Composition ratio of production by industry and region



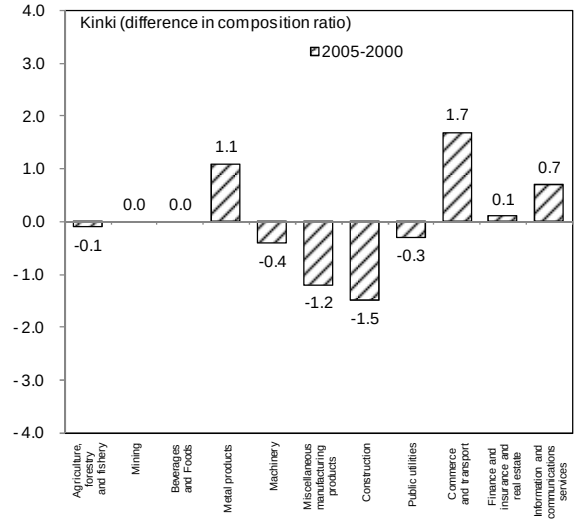
Looking at changes in composition ratio by region and industry from 2000 to 2005 (Figure 1-5), in Hokkaido, the composition ratios of construction, machinery, and beverages and foods shrank, while those of commerce and transport, information and communications/service industries, and metal products grew.
In Tohoku, the composition ratios for construction, beverages and foods, agriculture, forestry, and fishery, and miscellaneous manufacturing products contracted, while those of information and communications/service industries, commerce and transport, and metal products expanded.
In Kanto, the composition ratios of information and communications/service industries, commerce and transport, and metal products rose, while those of machinery, miscellaneous manufacturing products, and construction fell.

In Chubu, the composition ratios of machinery, finance, insurance, and real estate, and metal products increased, while those of construction, miscellaneous manufacturing products, and commerce and transport decreased.
In Kinki, the composition ratios of construction, miscellaneous manufacturing products, and machinery shrank, while those of commerce and transport, metal products, and information and communications/service industries grew.
In Chugoku, the composition ratios of metal products, machinery, miscellaneous manufacturing products, and finance, insurance, and real estate expanded, while those of construction, beverages and foods, and information and communications/service industries contracted.
In Shikoku, the composition ratios of beverages and foods, construction, and agriculture, forestry, and fishery decreased, while those of information and communications/service industries, finance, insurance, and real estate, and metal products increased.
In Kyushu, the composition ratios of commerce and transport, metal products, and information and communications/service industries rose, while those of construction, miscellaneous manufacturing products, and beverages and foods fell.
In Okinawa, the composition ratios of construction, miscellaneous manufacturing products, and beverages and foods shrank, while those of commerce and transport, information and communications/service industries, and finance, insurance, and real estate grew.

Figure 1-5: Differences in the composition ratios of production by region and industry (2005 − 2000)



(Percentage points)



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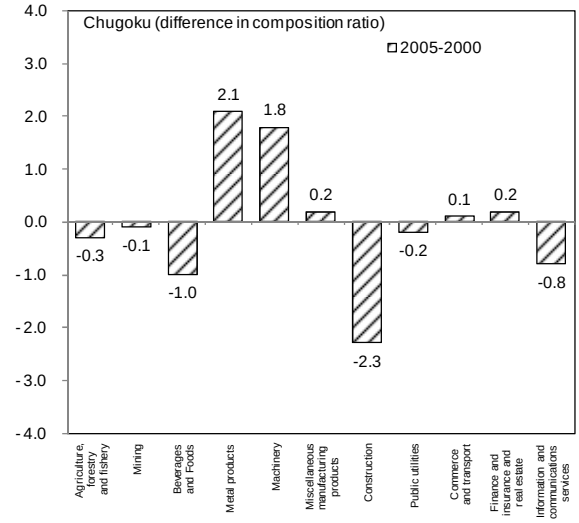

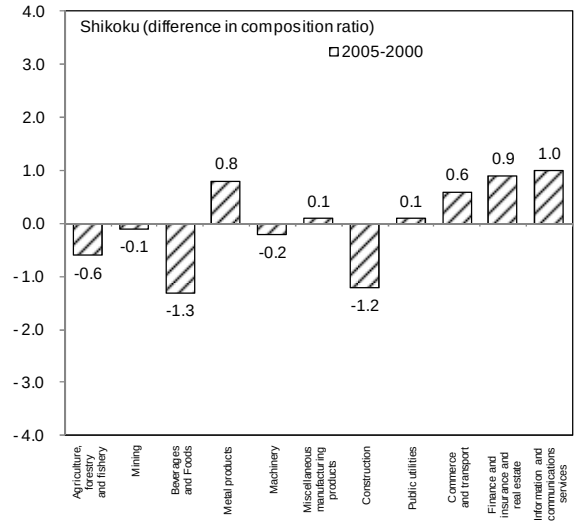

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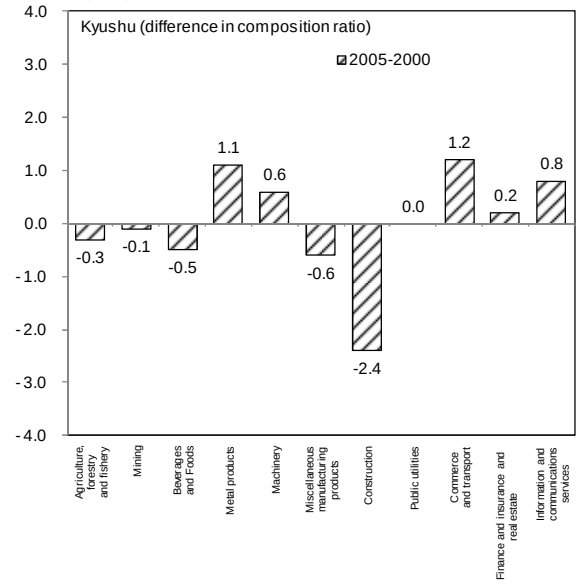

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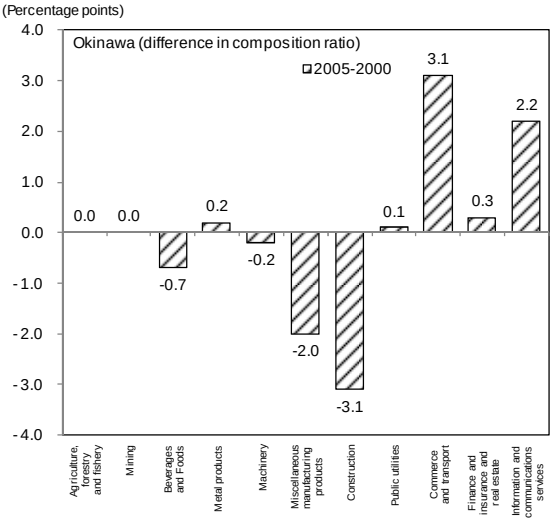


(ii) Increase-decrease rate

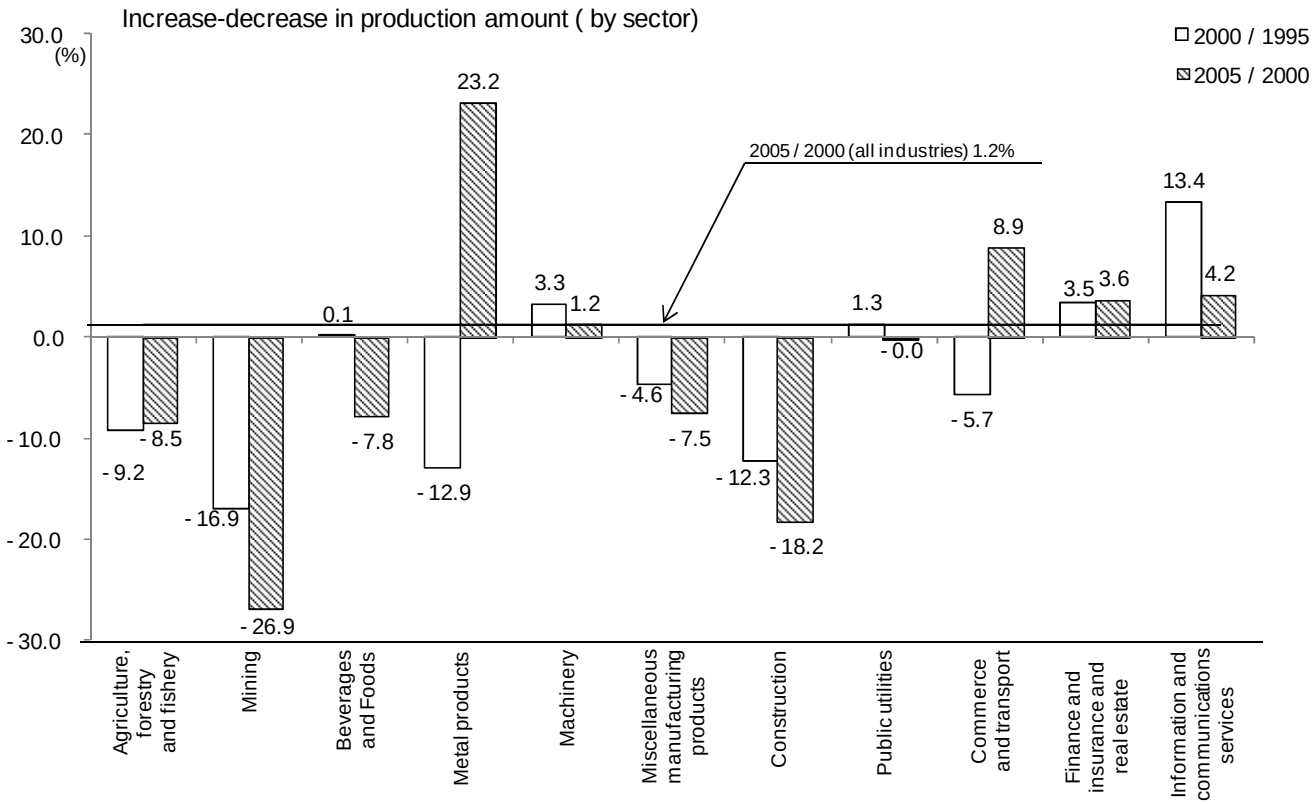
The 2005 all-region total for regional production (gross outputs) increased by 1.2 percent compared with 2000.

Although agriculture, forestry, and fishery shrank 8.5 percent to 13.1546 trillion yen and industrial production decreased 0.3 percent to 307.0514 trillion yen, construction and service industries grew 2.1 percent to 627.9874 trillion yen.

By industry, agriculture, forestry, and fishery and industrial production continued their falling trends from 2000, while construction and service industries continued its rising trend. The trend of rising production in service industries-related sectors remained unchanged.

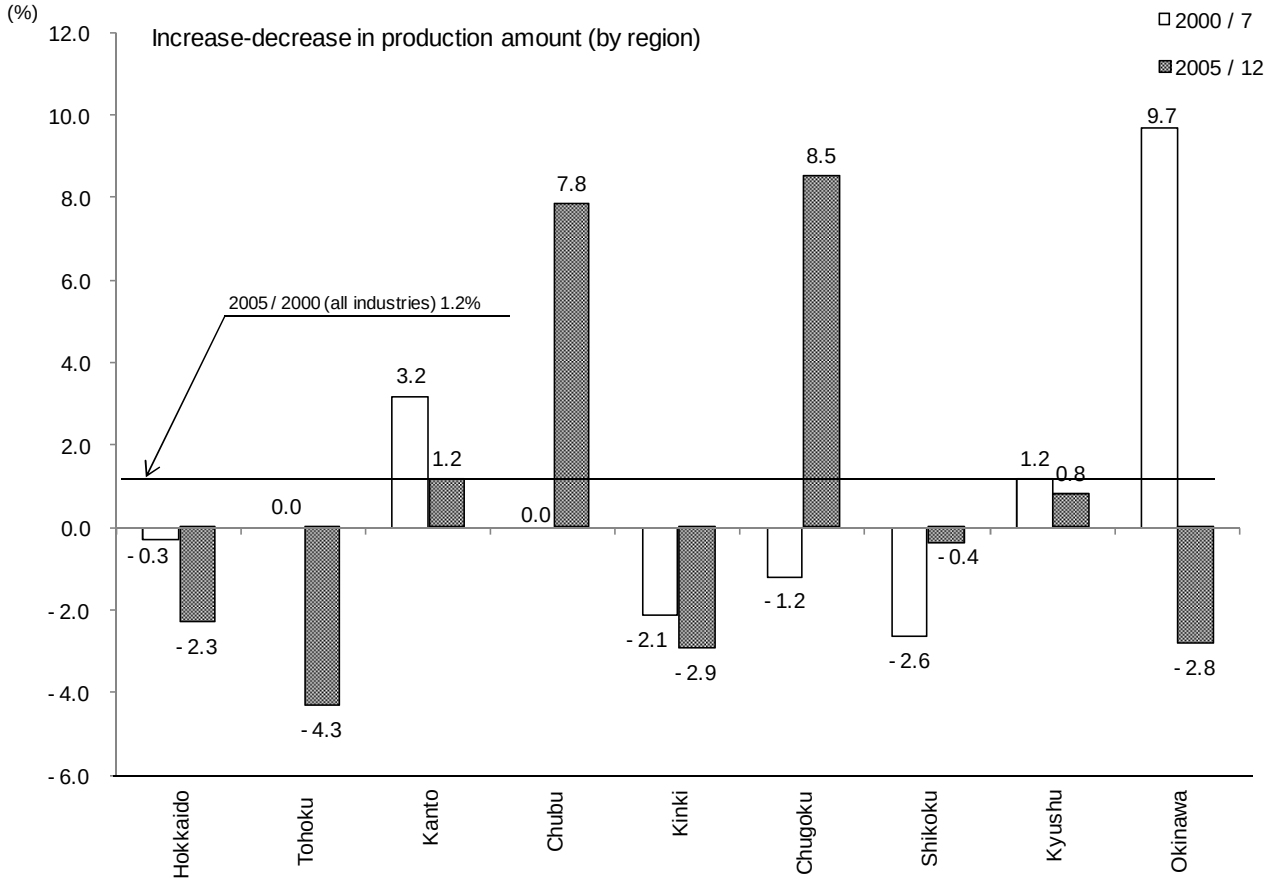
Dividing production into 11 sectors, metal products climbed sharply compared with 2000, rising by 23.2 percent (Figure 1-6). The next fastest growing sector was commerce and transport at 8.9 percent, followed by information and communications/service industries at 4.2 percent, finance, insurance, and real estate at 3.6 percent, and machinery at 1.2 percent. Sectors that decreased were mining, which fell by 26.9 percent, construction, down 18.2 percent, agriculture, forestry, and fishery, down 8.5 percent, beverages and foods, down 7.8 percent, and miscellaneous manufacturing products, down 7.5 percent. Public utilities were unchanged.

Figure 1-6: Increase or decrease in production by industry



By region, Chugoku increased by 8.5 percent compared with 2000, while Chubu rose by 7.8 percent, Kanto by 1.2 percent, and Kyushu by 0.8 percent (Figure 1-7). In contrast, Tohoku decreased by 4.3 percent, Kinki by 2.9 percent, Okinawa by 2.8 percent, Hokkaido by 2.3 percent, and Shikoku by 0.4 percent.

Figure 1-7: Increase or decrease in production by region



By region and industry, production rose in metal products and commerce and transport in every region (Table 1-3). On the other hand, production in every region fell in mining, construction, and beverages and foods.

By industry and region, agriculture, forestry, and fishery increased in Hokkaido (up 4.8 percent compared with 2000), but fell in every other region. Shikoku (down 17.4 percent), Kinki (down 14.5 percent), Tohoku (down 11.4 percent), Chubu, and Chugoku (both down 10.7 percent) saw double-digit decreases.

In mining, six regions had decreases of at least 30 percent compared with 2000: Shikoku (down 39.3 percent), Hokkaido (down 34.6 percent), Tohoku (down 34.0 percent), Chugoku (down 33.9 percent), Kyushu (down 33.5 percent), and Kinki (down 30.4 percent).

In beverages and foods, Shikoku (down 24.6 percent compared with 2000), Tohoku (down 20.1 percent), Chugoku (down 19.7 percent), Okinawa (down 18.6 percent), and Hokkaido (down 10.1 percent) had double-digit decreases.

In metal products, Chugoku (up 37.6 percent), Hokkaido (up 34.9 percent), Kyushu (up 31.8 percent) had increases of at least 30 percent compared with 2000.

In machinery, Chugoku (up 23.5 percent compared with 2000), Chubu (up 18.5 percent), and Kyushu (up 6.7 percent) increased, while Hokkaido (down 25.7 percent) and Okinawa (down 25.5 percent) decreased.

In miscellaneous manufacturing products, Okinawa (down 32.5 percent), Kinki (down 13.5 percent), and Kanto (down 10.6 percent) showed decreases compared with 2000. Showing increases were Chugoku (up 10.3 percent) and Shikoku (up 0.2 percent).

In construction, Tohoku (down 26.7 percent), Kyushu (down 25.1 percent), Hokkaido (down 24.8 percent), and every other region posted a double-digit decrease compared with 2000.

In public utilities, Kinki (down 9.6 percent), Tohoku (down 3.2 percent), Hokkaido (down 3.0 percent) decreased compared with 2000. In contrast, Chubu (up 13.6 percent), Chugoku (up 2.7 percent), and Okinawa (up 1.8 percent) increased.

In commerce and transport, Okinawa (up 18.3 percent) and Kanto (up 11.1 percent) had double-digit increases compared with 2000.

In finance, insurance, and real estate, Chubu (up 22.1 percent), Chugoku (up 11.1 percent), and Shikoku (up 7.8 percent) rose compared with 2000. On the other hand, Kinki (down 2.2 percent), Tohoku (down 1.3 percent), and Okinawa (down 0.9 percent) fell compared with 2000.

In information and communications/service industries, although Kinki (down 0.8 percent compared with 2000) decreased compared with 2000, the other regions, led by Chubu (up 6.9 percent), Kanto (up 6.1 percent), and Chugoku (up 5.0 percent), increased.

Table 1-3: Increase or decrease in production by region and industry

(Unit: %)

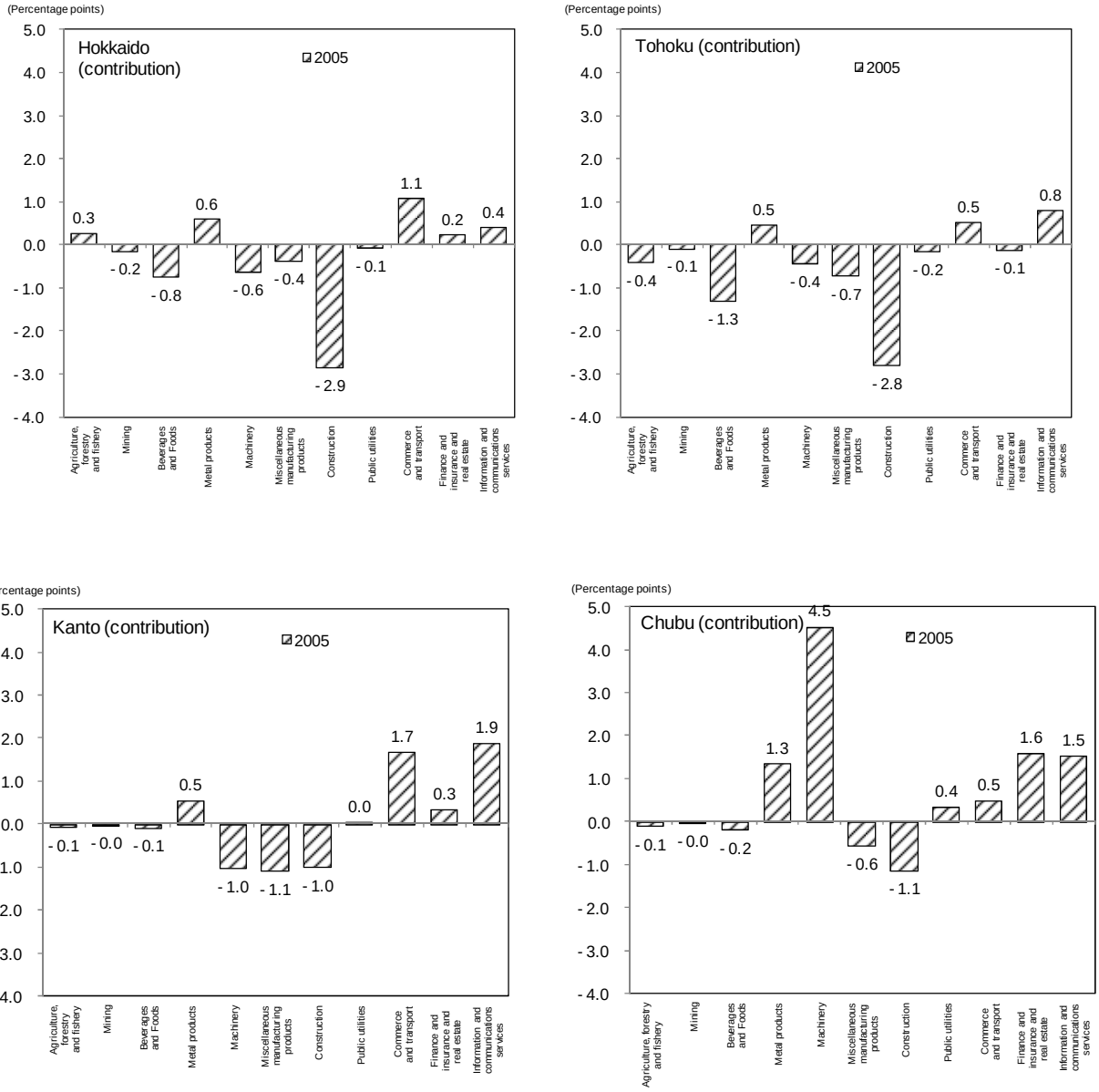
Industry / Region	Growth rate (2005 / 2000)													
	All industries													
		Agriculture, forestry and fishery	Industrial Production						Construction and service industries					
				Mining	Beverages and Foods	Metal products	Machinery	Miscellaneous manufacturing products		Construction	Public utilities	Commerce and transport	Finance and insurance and real estate	Information and communications services
Region total	1.2	- 8.5	- 0.3	- 26.9	- 7.8	23.2	1.2	- 7.5	2.1	- 18.2	0.0	8.9	3.6	4.2
Hokkaido	- 2.3	4.8	- 6.9	- 34.6	- 10.1	34.9	- 25.7	- 5.3	- 1.6	- 24.8	- 3.0	6.7	2.0	1.2
Tohoku	- 4.3	- 11.4	- 7.0	- 34.0	- 20.1	17.9	- 3.6	- 8.6	- 2.7	- 26.7	- 3.2	4.1	- 1.3	2.9
Kanto	1.2	- 8.5	- 5.4	- 11.2	- 2.4	17.5	- 7.5	- 10.6	4.3	- 13.3	1.7	11.1	2.7	6.1
Chubu	7.8	- 10.7	10.9	- 27.9	- 5.5	24.9	18.5	- 4.2	5.4	- 15.4	13.6	3.8	22.1	6.9
Kinki	- 2.9	- 14.5	- 4.7	- 30.4	- 4.0	19.3	- 6.0	- 13.5	- 2.0	- 20.8	- 9.6	8.1	- 2.2	- 0.8
Chugoku	8.5	- 10.7	16.7	- 33.9	- 19.7	37.6	23.5	10.3	3.2	- 21.4	2.7	9.9	11.1	5.0
Shikoku	- 0.4	- 17.4	- 2.7	- 39.3	- 24.6	26.6	- 3.0	0.2	1.7	- 13.7	0.4	4.1	7.8	3.2
Kyushu	0.8	- 9.2	2.7	- 33.5	- 8.2	31.8	6.7	- 6.9	0.6	- 25.1	- 0.6	9.3	3.2	3.4
Okinawa	- 2.8	- 2.7	- 23.1	- 0.6	- 18.6	17.6	- 25.5	- 32.5	0.2	- 23.9	1.8	18.3	- 0.9	2.5

Looking at the contribution of the 11 sectors to the rate of production growth from 2000 to 2005, the largest contribution was made by commerce and transport (contributing 1.3 percentage points). Following next were information and communications/service industries (contributing 1.2 percentage points), metal products (0.9 percentage points), and finance, insurance, and real estate (0.4 percentage points). (See Figure 1-8.) Contributing decreases were construction (minus 1.5 percentage points), miscellaneous manufacturing products (minus 0.8 percentage points), and beverages and foods (minus 0.3 percentage points).

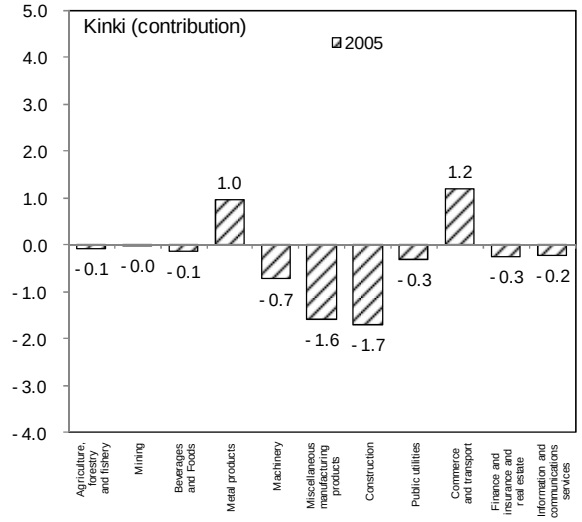
By region, commerce and transport made the largest contribution to increases in Okinawa, Kyushu, Kinki, and Hokkaido. Information and communications/service industries were the sectors making the largest contribution to increases in Kanto, Shikoku, and Tohoku. Machinery made the largest contribution to increases in Chubu and Chugoku.

As for sectors that contributed decreases, construction contributed the largest decreases in Okinawa, Hokkaido, Tohoku, Kyushu, Kinki, Chugoku, and Chubu. Miscellaneous manufacturing products contributed the largest decrease in Kanto, while beverages and foods contributed the largest in decrease in Shikoku.

Figure 1-8: Contributions to production by region and industry



(Percentage points)



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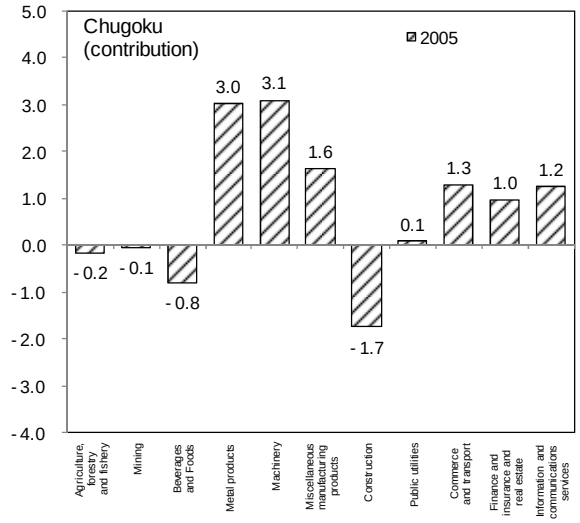

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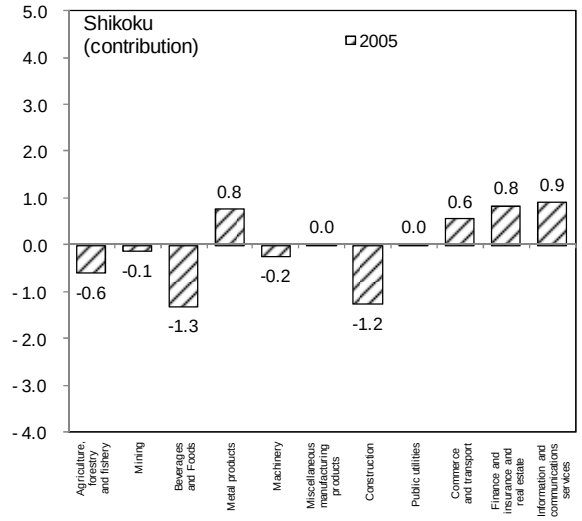

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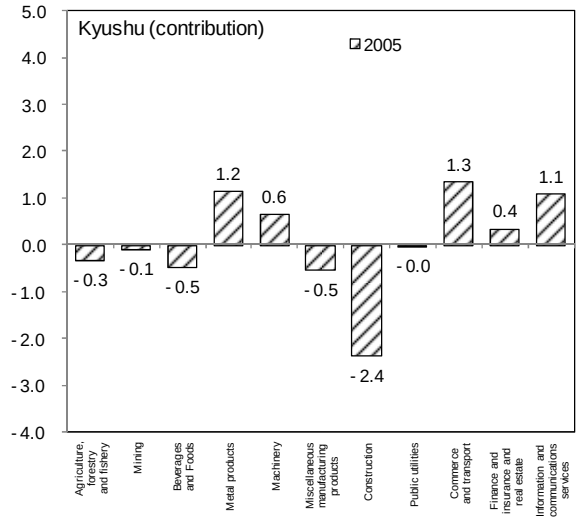

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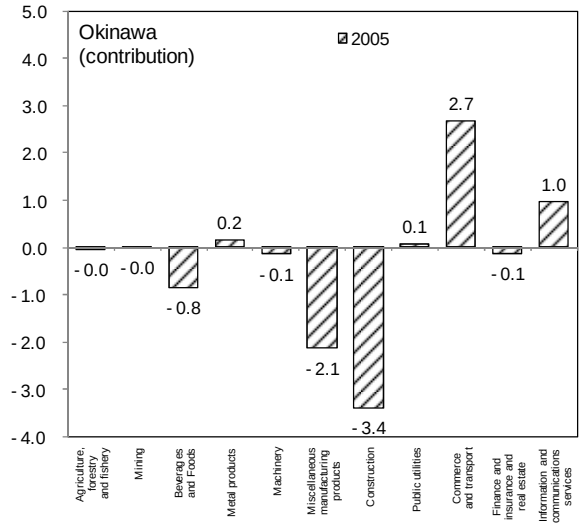

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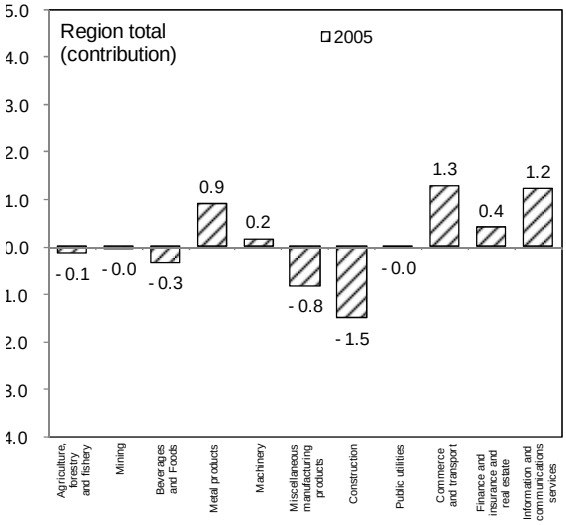


Table 1-4: Production by region

(Units: ¥100 million, %)

Region	Hokkaido											
	Regional production (gross outputs)			Composition ratio			Vs. regional total			Growth rate		Contribution
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005	2000 / 7	2005 / 12	2005
All industries	348,166	347,190	339,246	100.0	100.0	100.0	3.8	3.7	3.6	- 0.3	- 2.3	- 2.3
Agriculture, forestry and fishery	21,290	19,635	20,576	6.1	5.7	6.1	13.5	13.7	15.6	- 7.8	4.8	0.3
Industrial Production	68,192	67,346	62,718	19.6	19.4	18.5	2.2	2.2	2.0	- 1.2	- 6.9	- 1.3
Mining	1,602	1,522	996	0.5	0.4	0.3	9.7	11.0	9.9	- 5.0	- 34.6	- 0.2
Beverages and Foods	26,913	26,060	23,418	7.7	7.5	6.9	6.9	6.7	6.5	- 3.2	- 10.1	- 0.8
Metal products	6,352	5,930	8,002	1.8	1.7	2.4	1.5	1.6	1.8	- 6.6	34.9	0.6
Machinery	6,862	8,574	6,373	2.0	2.5	1.9	0.6	0.7	0.5	25.0	- 25.7	- 0.6
Miscellaneous manufacturing products	26,463	25,260	23,930	7.6	7.3	7.1	2.5	2.5	2.5	- 4.5	- 5.3	- 0.4
Construction and service industries	258,685	260,208	255,951	74.3	74.9	75.4	4.3	4.2	4.1	0.6	- 1.6	- 1.2
Construction	46,124	39,857	29,956	13.2	11.5	8.8	5.2	5.2	4.7	- 13.6	- 24.8	- 2.9
Public utilities	9,972	9,954	9,657	2.9	2.9	2.8	3.8	3.7	3.6	- 0.2	- 3.0	- 0.1
Commerce and transport	59,388	55,866	59,591	17.1	16.1	17.6	4.1	4.1	4.1	- 5.9	6.7	1.1
Finance and insurance and real estate	35,993	39,294	40,099	10.3	11.3	11.8	3.6	3.8	3.7	9.2	2.0	0.2
Information and communications services	107,208	115,238	116,648	30.8	33.2	34.4	4.5	4.2	4.1	7.5	1.2	0.4

(Units: ¥100 million, %)

Region	Tohoku											
	Regional production (gross outputs)			Composition ratio			Vs. regional total			Growth rate		Contribution
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005	2000 / 7	2005 / 12	2005
All industries	598,478	598,466	572,675	100.0	100.0	100.0	6.4	6.4	6.0	- 0.0	- 4.3	- 4.3
Agriculture, forestry and fishery	24,914	22,181	19,652	4.2	3.7	3.4	15.8	15.4	14.9	- 11.0	- 11.4	- 0.4
Industrial Production	173,763	180,567	167,948	29.0	30.2	29.3	5.5	5.9	5.5	3.9	- 7.0	- 2.1
Mining	1,962	1,619	1,068	0.3	0.3	0.2	11.8	11.7	10.6	- 17.5	- 34.0	- 0.1
Beverages and Foods	36,216	38,809	31,003	6.1	6.5	5.4	9.3	10.0	8.6	7.2	- 20.1	- 1.3
Metal products	15,914	15,313	18,049	2.7	2.6	3.2	3.7	4.1	4.0	- 3.8	17.9	0.5
Machinery	63,260	73,765	71,143	10.6	12.3	12.4	5.1	5.7	5.5	16.6	- 3.6	- 0.4
Miscellaneous manufacturing products	56,411	51,060	46,684	9.4	8.5	8.2	5.3	5.0	4.9	- 9.5	- 8.6	- 0.7
Construction and service industries	399,801	395,718	385,075	66.8	66.1	67.2	6.7	6.4	6.1	- 1.0	- 2.7	- 1.8
Construction	73,291	62,928	46,109	12.2	10.5	8.1	8.3	8.1	7.3	- 14.1	- 26.7	- 2.8
Public utilities	31,431	29,783	28,834	5.3	5.0	5.0	11.9	11.1	10.8	- 5.2	- 3.2	- 0.2
Commerce and transport	85,121	77,466	80,606	14.2	12.9	14.1	5.9	5.7	5.5	- 9.0	4.1	0.5
Finance and insurance and real estate	54,344	62,262	61,464	9.1	10.4	10.7	5.4	6.0	5.7	14.6	- 1.3	- 0.1
Information and communications servic	155,615	163,279	168,062	26.0	27.3	29.3	6.5	6.0	5.9	4.9	2.9	0.8

(Units: ¥100 million, %)

Region	Kanto											
	Regional production (gross outputs)			Composition ratio			Vs. regional total			Growth rate		Contribution
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005	2000 / 7	2005 / 12	2005
All industries	3,914,398	4,038,910	4,086,442	100.0	100.0	100.0	42.2	43.1	43.1	3.2	1.2	1.2
Agriculture, forestry and fishery	37,869	35,672	32,645	1.0	0.9	0.8	23.9	24.8	24.8	- 5.8	- 8.5	- 0.1
Industrial Production	1,285,303	1,248,737	1,181,382	32.8	30.9	28.9	40.9	40.5	38.5	- 2.8	- 5.4	- 1.7
Mining	4,572	3,650	3,241	0.1	0.1	0.1	27.6	26.5	32.1	- 20.2	- 11.2	- 0.0
Beverages and Foods	139,211	142,479	139,078	3.6	3.5	3.4	35.8	36.5	38.7	2.3	- 2.4	- 0.1
Metal products	152,077	126,574	148,702	3.9	3.1	3.6	35.8	34.2	32.6	- 16.8	17.5	0.5
Machinery	570,862	560,686	518,883	14.6	13.9	12.7	45.8	43.6	39.9	- 1.8	- 7.5	- 1.0
Miscellaneous manufacturing products	418,580	415,348	371,478	10.7	10.3	9.1	39.1	40.7	39.4	- 0.8	- 10.6	- 1.1
Construction and service industries	2,591,226	2,754,501	2,872,416	66.2	68.2	70.3	43.3	44.8	45.7	6.3	4.3	2.9
Construction	337,386	305,383	264,750	8.6	7.6	6.5	38.3	39.5	41.9	- 9.5	- 13.3	- 1.0
Public utilities	92,320	96,450	98,093	2.4	2.4	2.4	34.9	36.0	36.6	4.5	1.7	0.0
Commerce and transport	619,768	605,496	672,869	15.8	15.0	16.5	43.3	44.8	45.8	- 2.3	11.1	1.7
Finance and insurance and real estate	502,392	492,073	505,539	12.8	12.2	12.4	50.0	47.3	46.9	- 2.1	2.7	0.3
Information and communications services	1,039,360	1,255,099	1,331,166	26.6	31.1	32.6	43.4	46.2	47.0	20.8	6.1	1.9

(Units: ¥100 million, %)

Region	Chubu											
	Regional production (gross outputs)			Composition ratio			Vs. regional total			Growth rate		Contribution
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005	2000 / 7	2005 / 12	2005
All industries	1,145,778	1,145,334	1,235,014	100.0	100.0	100.0	12.3	12.2	13.0	- 0.0	7.8	7.8
Agriculture, forestry and fishery	12,915	11,442	10,215	1.1	1.0	0.8	8.2	8.0	7.8	- 11.4	- 10.7	- 0.1
Industrial Production	524,085	534,627	593,150	45.7	46.7	48.0	16.7	17.4	19.3	2.0	10.9	5.1
Mining	1,584	1,373	989	0.1	0.1	0.1	9.5	10.0	9.8	- 13.4	- 27.9	- 0.0
Beverages and Foods	38,990	39,308	37,152	3.4	3.4	3.0	10.0	10.1	10.3	0.8	- 5.5	- 0.2
Metal products	67,533	62,102	77,550	5.9	5.4	6.3	15.9	16.8	17.0	- 8.0	24.9	1.3
Machinery	255,618	280,883	332,823	22.3	24.5	26.9	20.5	21.8	25.6	9.9	18.5	4.5
Miscellaneous manufacturing products	160,360	150,962	144,635	14.0	13.2	11.7	15.0	14.8	15.3	- 5.9	- 4.2	- 0.6
Construction and service industries	608,779	599,265	631,650	53.1	52.3	51.1	10.2	9.7	10.1	- 1.6	5.4	2.8
Construction	91,416	84,402	71,382	8.0	7.4	5.8	10.4	10.9	11.3	- 7.7	- 15.4	- 1.1
Public utilities	30,017	29,766	33,805	2.6	2.6	2.7	11.3	11.1	12.6	- 0.8	13.6	0.4
Commerce and transport	163,358	149,015	154,641	14.3	13.0	12.5	11.4	11.0	10.5	- 8.8	3.8	0.5
Finance and insurance and real estate	88,368	82,658	100,936	7.7	7.2	8.2	8.8	7.9	9.4	- 6.5	22.1	1.6
Information and communications services	235,621	253,424	270,886	20.6	22.1	21.9	9.8	9.3	9.6	7.6	6.9	1.5

(Units: ¥100 million, %)

Region	Kinki											
	Regional production (gross outputs)			Composition ratio			Vs. regional total			Growth rate		Contribution
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005	2000 / 7	2005 / 12	2005
All industries	1,602,811	1,568,640	1,522,685	100.0	100.0	100.0	17.3	16.7	16.1	- 2.1	- 2.9	- 2.9
Agriculture, forestry and fishery	10,206	9,405	8,039	0.6	0.6	0.5	6.5	6.5	6.1	- 7.8	- 14.5	- 0.1
Industrial Production	547,066	513,195	489,063	34.1	32.7	32.1	17.4	16.7	15.9	- 6.2	- 4.7	- 1.5
Mining	1,399	1,428	994	0.1	0.1	0.1	8.4	10.4	9.9	2.0	- 30.4	- 0.0
Beverages and Foods	60,820	58,203	55,889	3.8	3.7	3.7	15.6	14.9	15.6	- 4.3	- 4.0	- 0.1
Metal products	96,396	77,957	93,040	6.0	5.0	6.1	22.7	21.1	20.4	- 19.1	19.3	1.0
Machinery	188,223	191,378	179,831	11.7	12.2	11.8	15.1	14.9	13.8	1.7	- 6.0	- 0.7
Miscellaneous manufacturing products	200,227	184,229	159,310	12.5	11.7	10.5	18.7	18.1	16.9	- 8.0	- 13.5	- 1.6
Construction and service industries	1,045,539	1,046,040	1,025,583	65.2	66.7	67.4	17.5	17.0	16.3	0.0	- 2.0	- 1.3
Construction	163,153	127,926	101,347	10.2	8.2	6.7	18.5	16.5	16.0	- 21.6	- 20.8	- 1.7
Public utilities	47,673	51,143	46,214	3.0	3.3	3.0	18.0	19.1	17.3	7.3	- 9.6	- 0.3
Commerce and transport	258,087	231,851	250,646	16.1	14.8	16.5	18.0	17.2	17.0	- 10.2	8.1	1.2
Finance and insurance and real estate	177,952	192,020	187,829	11.1	12.2	12.3	17.7	18.5	17.4	7.9	- 2.2	- 0.3
Information and communications services	398,673	443,101	439,548	24.9	28.2	28.9	16.6	16.3	15.5	11.1	- 0.8	- 0.2

(Units: ¥100 million, %)

Region	Chugoku											
	Regional production (gross outputs)			Composition ratio			Vs. regional total			Growth rate		Contribution
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005	2000 / 7	2005 / 12	2005
All industries	576,691	569,827	618,336	100.0	100.0	100.0	6.2	6.1	6.5	- 1.2	8.5	8.5
Agriculture, forestry and fishery	9,803	8,453	7,548	1.7	1.5	1.2	6.2	5.9	5.7	- 13.8	- 10.7	- 0.2
Industrial Production	239,599	234,100	273,171	41.5	41.1	44.2	7.6	7.6	8.9	- 2.3	16.7	6.9
Mining	1,458	1,060	701	0.3	0.2	0.1	8.8	7.7	6.9	- 27.3	- 33.9	- 0.1
Beverages and Foods	25,557	23,045	18,494	4.4	4.0	3.0	6.6	5.9	5.1	- 9.8	- 19.7	- 0.8
Metal products	47,202	45,503	62,626	8.2	8.0	10.1	11.1	12.3	13.7	- 3.6	37.6	3.0
Machinery	73,807	74,657	92,239	12.8	13.1	14.9	5.9	5.8	7.1	1.2	23.5	3.1
Miscellaneous manufacturing products	91,575	89,835	99,111	15.9	15.8	16.0	8.6	8.8	10.5	- 1.9	10.3	1.6
Construction and service industries	327,290	327,274	337,617	56.8	57.4	54.6	5.5	5.3	5.4	- 0.0	3.2	1.8
Construction	52,452	46,537	36,571	9.1	8.2	5.9	6.0	6.0	5.8	- 11.3	- 21.4	- 1.7
Public utilities	17,278	17,078	17,533	3.0	3.0	2.8	6.5	6.4	6.5	- 1.2	2.7	0.1
Commerce and transport	79,245	73,916	81,229	13.7	13.0	13.1	5.5	5.5	5.5	- 6.7	9.9	1.3
Finance and insurance and real estate	44,467	49,653	55,141	7.7	8.7	8.9	4.4	4.8	5.1	11.7	11.1	1.0
Information and communications services	133,847	140,089	147,144	23.2	24.6	23.8	5.6	5.2	5.2	4.7	5.0	1.2

(Units: ¥100 million, %)

Region	Shikoku											
	Regional production (gross outputs)			Composition ratio			Vs. regional total			Growth rate		Contribution
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005	2000 / 7	2005 / 12	2005
All industries	264,569	257,616	256,647	100.0	100.0	100.0	2.9	2.7	2.7	- 2.6	- 0.4	- 0.4
Agriculture, forestry and fishery	9,920	8,760	7,235	3.7	3.4	2.8	6.3	6.1	5.5	- 11.7	- 17.4	- 0.6
Industrial Production	87,717	81,924	79,694	33.2	31.8	31.1	2.8	2.7	2.6	- 6.6	- 2.7	- 0.9
Mining	989	893	542	0.4	0.3	0.2	6.0	6.5	5.4	- 9.7	- 39.3	- 0.1
Beverages and Foods	14,110	13,680	10,317	5.3	5.3	4.0	3.6	3.5	2.9	- 3.0	- 24.6	- 1.3
Metal products	7,406	7,503	9,500	2.8	2.9	3.7	1.7	2.0	2.1	1.3	26.6	0.8
Machinery	21,149	19,937	19,348	8.0	7.7	7.5	1.7	1.6	1.5	- 5.7	- 3.0	- 0.2
Miscellaneous manufacturing products	44,063	39,911	39,987	16.7	15.5	15.6	4.1	3.9	4.2	- 9.4	0.2	0.0
Construction and service industries	166,931	166,932	169,718	63.1	64.8	66.1	2.8	2.7	2.7	0.0	1.7	1.1
Construction	27,766	23,517	20,307	10.5	9.1	7.9	3.1	3.0	3.2	- 15.3	- 13.7	- 1.2
Public utilities	8,632	7,823	7,857	3.3	3.0	3.1	3.3	2.9	2.9	- 9.4	0.4	0.0
Commerce and transport	37,385	34,765	36,206	14.1	13.5	14.1	2.6	2.6	2.5	- 7.0	4.1	0.6
Finance and insurance and real estate	23,699	27,606	29,773	9.0	10.7	11.6	2.4	2.7	2.8	16.5	7.8	0.8
Information and communications services	69,450	73,221	75,576	26.3	28.4	29.4	2.9	2.7	2.7	5.4	3.2	0.9

(Units: ¥100 million, %)

Region	Kyushu											
	Regional production (gross outputs)			Composition ratio			Vs. regional total			Growth rate		Contribution
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005	2000 / 7	2005 / 12	2005
All industries	777,697	786,915	793,220	100.0	100.0	100.0	8.4	8.4	8.4	1.2	0.8	0.8
Agriculture, forestry and fishery	30,071	27,067	24,584	3.9	3.4	3.1	19.0	18.8	18.7	- 10.0	- 9.2	- 0.3
Industrial Production	212,694	211,875	217,513	27.3	26.9	27.4	6.8	6.9	7.1	- 0.4	2.7	0.7
Mining	2,865	2,051	1,363	0.4	0.3	0.2	17.3	14.9	13.5	- 28.4	- 33.5	- 0.1
Beverages and Foods	45,034	45,563	41,835	5.8	5.8	5.3	11.6	11.7	11.6	1.2	- 8.2	- 0.5
Metal products	31,020	28,533	37,618	4.0	3.6	4.7	7.3	7.7	8.3	- 8.0	31.8	1.2
Machinery	65,375	75,745	80,842	8.4	9.6	10.2	5.2	5.9	6.2	15.9	6.7	0.6
Miscellaneous manufacturing products	68,400	59,983	55,855	8.8	7.6	7.0	6.4	5.9	5.9	- 12.3	- 6.9	- 0.5
Construction and service industries	534,932	547,973	551,123	68.8	69.6	69.5	8.9	8.9	8.8	2.4	0.6	0.4
Construction	81,606	74,154	55,561	10.5	9.4	7.0	9.3	9.6	8.8	- 9.1	- 25.1	- 2.4
Public utilities	25,249	23,698	23,566	3.2	3.0	3.0	9.5	8.8	8.8	- 6.1	- 0.6	- 0.0
Commerce and transport	121,258	113,892	124,467	15.6	14.5	15.7	8.5	8.4	8.5	- 6.1	9.3	1.3
Finance and insurance and real estate	72,529	86,335	89,098	9.3	11.0	11.2	7.2	8.3	8.3	19.0	3.2	0.4
Information and communications services	234,290	249,893	258,431	30.1	31.8	32.6	9.8	9.2	9.1	6.7	3.4	1.1

(Units: ¥100 million, %)

Region	Okinawa											
	Regional production (gross outputs)			Composition ratio			Vs. regional total			Growth rate		Contribution
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005	2000 / 7	2005 / 12	2005
All industries	54,100	59,336	57,669	100.0	100.0	100.0	0.6	0.6	0.6	9.7	- 2.8	- 2.8
Agriculture, forestry and fishery	1,190	1,082	1,052	2.2	1.8	1.8	0.8	0.8	0.8	- 9.1	- 2.7	- 0.0
Industrial Production	7,238	7,638	5,876	13.4	12.9	10.2	0.2	0.2	0.2	5.5	- 23.1	- 3.0
Mining	164	191	190	0.3	0.3	0.3	1.0	1.4	1.9	16.3	- 0.6	- 0.0
Beverages and Foods	2,469	2,681	2,181	4.6	4.5	3.8	0.6	0.7	0.6	8.6	- 18.6	- 0.8
Metal products	632	531	624	1.2	0.9	1.1	0.1	0.1	0.1	- 16.0	17.6	0.2
Machinery	115	333	248	0.2	0.6	0.4	0.0	0.0	0.0	190.4	- 25.5	- 0.1
Miscellaneous manufacturing products	3,858	3,902	2,633	7.1	6.6	4.6	0.4	0.4	0.3	1.1	- 32.5	- 2.1
Construction and service industries	45,673	50,617	50,741	84.4	85.3	88.0	0.8	0.8	0.8	10.8	0.2	0.2
Construction	8,300	8,400	6,391	15.3	14.2	11.1	0.9	1.1	1.0	1.2	- 23.9	- 3.4
Public utilities	2,063	2,293	2,335	3.8	3.9	4.0	0.8	0.9	0.9	11.2	1.8	0.1
Commerce and transport	8,581	8,699	10,289	15.9	14.7	17.8	0.6	0.6	0.7	1.4	18.3	2.7
Finance and insurance and real estate	5,453	8,121	8,050	10.1	13.7	14.0	0.5	0.8	0.7	48.9	- 0.9	- 0.1
Information and communications services	21,276	23,102	23,676	39.3	38.9	41.1	0.9	0.9	0.8	8.6	2.5	1.0

(Units: ¥100 million, %)

Region	Region total											
	Regional production (gross outputs)			Composition ratio			Vs. regional total			Growth rate		Contribution
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005	2000 / 7	2005 / 12	2005
All industries	9,282,688	9,372,233	9,481,934	100.0	100.0	100.0				1.0	1.2	1.2
Agriculture, forestry and fishery	158,178	143,697	131,546	1.7	1.5	1.4				- 9.2	- 8.5	- 0.1
Industrial Production	3,145,655	3,080,009	3,070,514	33.9	32.9	32.4				- 2.1	- 0.3	- 0.1
Mining	16,595	13,787	10,084	0.2	0.1	0.1				- 16.9	- 26.9	- 0.0
Beverages and Foods	389,319	389,829	359,367	4.2	4.2	3.8				0.1	- 7.8	- 0.3
Metal products	424,533	369,946	455,711	4.6	3.9	4.8				- 12.9	23.2	0.9
Machinery	1,245,270	1,285,959	1,301,730	13.4	13.7	13.7				3.3	1.2	0.2
Miscellaneous manufacturing products	1,069,938	1,020,489	943,622	11.5	10.9	10.0				- 4.6	- 7.5	- 0.8
Construction and service industries	5,978,856	6,148,527	6,279,874	64.4	65.6	66.2				2.8	2.1	1.4
Construction	881,493	773,105	632,373	9.5	8.2	6.7				- 12.3	- 18.2	- 1.5
Public utilities	264,635	267,988	267,893	2.9	2.9	2.8				1.3	- 0.0	- 0.0
Commerce and transport	1,432,190	1,350,967	1,470,544	15.4	14.4	15.5				- 5.7	8.9	1.3
Finance and insurance and real estate	1,005,198	1,040,021	1,077,927	10.8	11.1	11.4				3.5	3.6	0.4
Information and communications services	2,395,340	2,716,446	2,831,137	25.8	29.0	29.9				13.4	4.2	1.2

(2) Comparison of specification quotient, location quotient, and industrial concentration quotient by region

(i) Specification quotient (comparison of the composition ratio with the national average, set at 1; a figure higher than 1 indicates a high degree of specification in the industry).

Looking at the 2005 specification quotients for the regions, each region has multiple industries that are more specified than the national industrial structure (Table 1-5).

With a specification quotient higher than 1 indicating a high degree of specificity, the regions with the highest scores are as follows. Hokkaido has a specification quotient above 4 for agriculture, forestry, and fishery, while Okinawa is above 3 for mining. They are followed in order by mining in Hokkaido, agriculture, forestry, and fishery in Tohoku, metal products in Chugoku, agriculture, forestry, and fishery in Shikoku, and agriculture, forestry, and fisheries in Kyushu, all with scores above 2. Low degrees of specificity, with specification quotients below 0.5, were found for machinery in Okinawa, machinery in Hokkaido, metal products in Okinawa, agriculture, forestry, and fisheries in Kinki, miscellaneous manufacturing products in Okinawa, and metal products in Hokkaido.

Table 1-5: Specification quotients

Region	Hokkaido			Tohoku			Kanto		
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005
Agriculture, forestry and fishery	3.5885	3.6886	4.3720	2.4430	2.4173	2.4736	0.5677	0.5760	0.5758
Mining	2.5737	2.9797	2.7602	1.8334	1.8392	1.7536	0.6534	0.6144	0.7458
Beverages and Foods	1.8431	1.8046	1.8213	1.4429	1.5591	1.4284	0.8480	0.8481	0.8980
Metal products	0.3989	0.4327	0.4908	0.5814	0.6482	0.6558	0.8495	0.7939	0.7571
Machinery	0.1469	0.1800	0.1368	0.7879	0.8983	0.9049	1.0871	1.0117	0.9249
Miscellaneous manufacturing products	0.6594	0.6682	0.7088	0.8178	0.7836	0.8191	0.9277	0.9445	0.9135
Construction	1.3951	1.3917	1.3240	1.2896	1.2747	1.2073	0.9076	0.9166	0.9714
Public utilities	1.0047	1.0026	1.0076	1.8422	1.7404	1.7821	0.8273	0.8352	0.8496
Commerce and transport	1.1056	1.1163	1.1326	0.9219	0.8980	0.9076	1.0262	1.0400	1.0617
Finance and insurance and real estate	0.9547	1.0199	1.0397	0.8385	0.9375	0.9441	1.1852	1.0979	1.0882
Information and communications services	1.1933	1.1452	1.1516	1.0076	0.9413	0.9829	1.0290	1.0722	1.0910

Region	Chubu			Kinki			Chugoku		
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005
Agriculture, forestry and fishery	0.6615	0.6516	0.5962	0.3737	0.3911	0.3805	0.9976	0.9675	0.8799
Mining	0.7735	0.8148	0.7533	0.4883	0.6187	0.6139	1.4138	1.2650	1.0655
Beverages and Foods	0.8114	0.8251	0.7937	0.9048	0.8921	0.9684	1.0566	0.9723	0.7892
Metal products	1.2888	1.3736	1.3065	1.3150	1.2590	1.2714	1.7897	2.0230	2.1074
Machinery	1.6630	1.7874	1.9630	0.8754	0.8892	0.8603	0.9540	0.9549	1.0866
Miscellaneous manufacturing products	1.2143	1.2105	1.1768	1.0838	1.0786	1.0513	1.3777	1.4479	1.6106
Construction	0.8402	0.8934	0.8666	1.0719	0.9886	0.9980	0.9578	0.9901	0.8868
Public utilities	0.9189	0.9089	0.9688	1.0433	1.1402	1.0742	1.0510	1.0482	1.0036
Commerce and transport	0.9241	0.9026	0.8074	1.0437	1.0254	1.0614	0.8906	0.8999	0.8470
Finance and insurance and real estate	0.7122	0.6504	0.7189	1.0253	1.1031	1.0851	0.7121	0.7852	0.7844
Information and communications services	0.7969	0.7634	0.7346	0.9639	0.9746	0.9668	0.8994	0.8482	0.7970

Region	Shikoku			Kyushu			Okinawa		
Sector / Year	1995	2000	2005	1995	2000	2005	1995	2000	2005
Agriculture, forestry and fishery	2.2005	2.2178	2.0319	2.2692	2.2434	2.2340	1.2905	1.1888	1.3148
Mining	2.0912	2.3570	1.9853	2.0606	1.7716	1.6158	1.6968	2.1860	3.0931
Beverages and Foods	1.2716	1.2767	1.0606	1.3807	1.3921	1.3916	1.0883	1.0863	0.9981
Metal products	0.6121	0.7378	0.7702	0.8722	0.9186	0.9868	0.2553	0.2266	0.2252
Machinery	0.5959	0.5640	0.5491	0.6266	0.7015	0.7424	0.0158	0.0409	0.0314
Miscellaneous manufacturing products	1.4449	1.4228	1.5656	0.7631	0.7001	0.7076	0.6186	0.6039	0.4587
Construction	1.1052	1.1067	1.1864	1.1050	1.1424	1.0503	1.6155	1.7161	1.6616
Public utilities	1.1444	1.0621	1.0835	1.1388	1.0532	1.0515	1.3376	1.3518	1.4331
Commerce and transport	0.9159	0.9362	0.9096	1.0106	1.0041	1.0118	1.0281	1.0171	1.1505
Finance and insurance and real estate	0.8272	0.9657	1.0204	0.8612	0.9887	0.9881	0.9308	1.2334	1.2279
Information and communications services	1.0173	0.9806	0.9862	1.1675	1.0956	1.0912	1.5241	1.3433	1.3750

Specification quotients were looked at by region and industry (Table 1-5 and Figure 1-9).
In Hokkaido, industries such as agriculture, forestry, and fishery (2005 specification quotient of 4.3720), mining (2.7602), and beverages and foods (1.8213) are highly specified. Of these, the degree of specificity for agriculture, forestry, and fishery increased especially sharply from 200 to 2005. Industries with a low degree of specificity included machinery (0.1368) and metal products (0.4908).
In Tohoku, agriculture, forestry, and fishery (2005 specification quotient of 2.4736), public utilities (1.7821), and mining (1.7536) have a high degree of specificity. The public utilities sector is particularly high compared with other regions. Industries with a low specification quotient include metal products (0.6558) and machinery (0.9049).
In Kanto, almost all industries have a specification quotient near 1. Industries with relatively low specificity are agriculture, forestry, and fishery (0.5758), mining (0.7458), and metal products (0.7571).
In Chubu, machinery (1.9630), metal products (1.3065), and miscellaneous manufacturing products (1.1768) have high specification quotients. Specificity is highly developed for machinery in particular. Other than those three industries, every sector has a specification quotient below 1.
In Kinki, the only industry with a high specification quotient is metal products (1.2714). Like Kanto, Kinki has few industries with a high degree of specificity. Industries with low specification quotients include agriculture, forestry, and fishery (0.3805) and mining (0.6139).
In Chugoku, metal products (2.1074) and miscellaneous manufacturing products (1.6106) have high specification quotients. Industries with a low degree of specificity include finance, insurance, and real estate (0.7844) and beverages and foods (0.7892).
In Shikoku, agriculture, forestry, and fishery (2.0319), mining (1.9853), and miscellaneous manufacturing products (1.5656) have high specification quotients. Industries with low specification quotients include machinery (0.5491) and metal products (0.7702).
In Kyushu, the agriculture, forestry, and fishery (2.2340), mining (1.6158), beverages and foods (1.3916) sectors have a high degree of specificity. Sectors with low specification quotients include miscellaneous manufacturing products (0.7076) and machinery (0.7424).
In Okinawa, mining (3.0931), construction (1.6616), public utilities (1.4331), and information and communications/service industries (1.3750) have high specification quotients. As for industries with low specification quotients, machinery (0.0314) has an extremely low degree of specificity, as do the other manufacturing industries metal products (0.2252) and miscellaneous manufacturing products (0.4587).

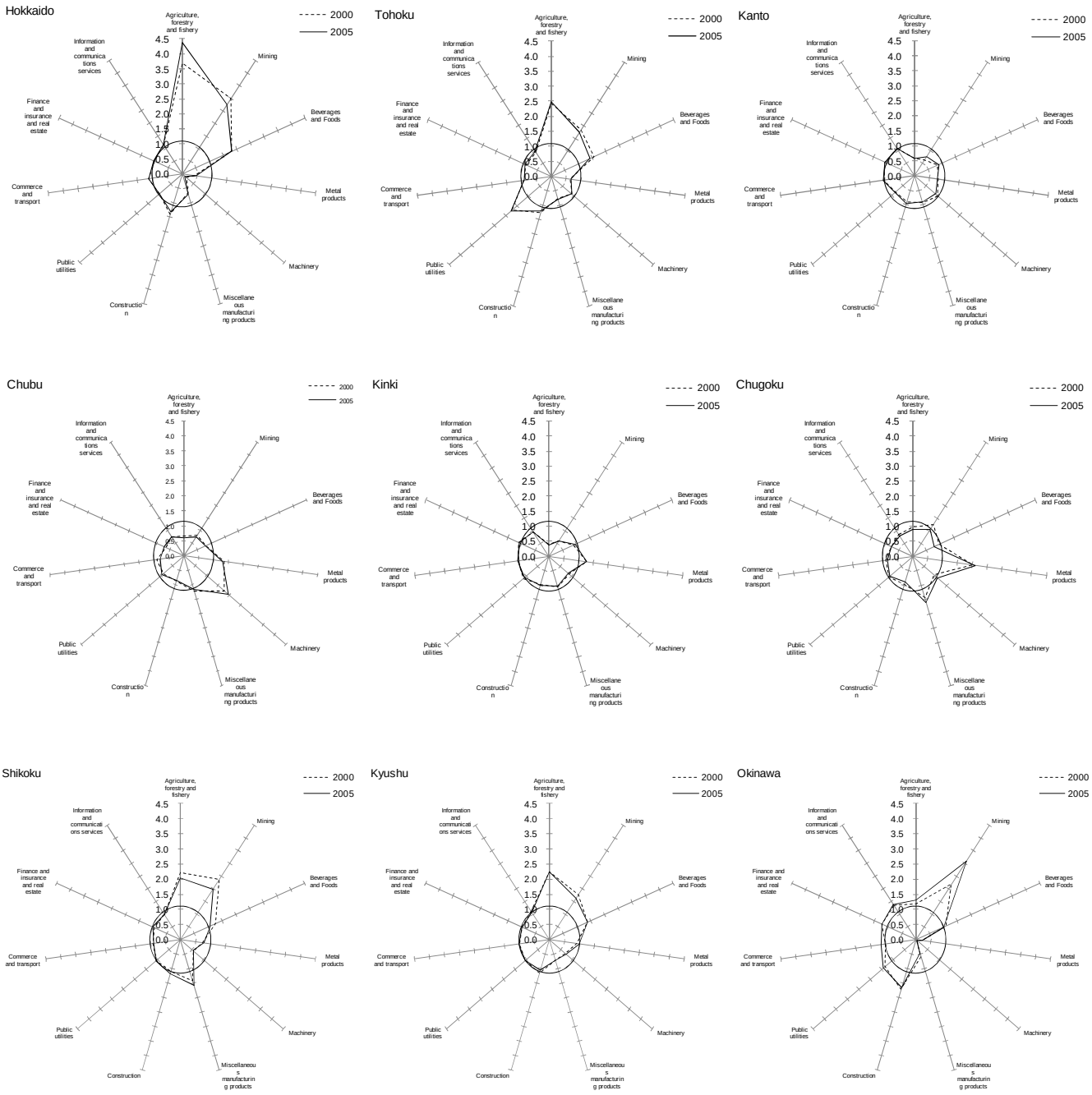
Notes: Specification quotient

$$\frac{X_j^r}{\sum_{j=1}^{n} X_j^r} \Bigg/ \frac{\sum_{r=1}^{9} X_j^r}{\sum_{r=1}^{9}\sum_{j=1}^{n} X_j^r} = \frac{\text{Composition ratio of Industry j in Region r}}{\text{National composition ratio of Industry j}}$$

(r: Region, j: Industry, X: Production)

Specification quotients are found using the above equation. If a given industry in a given region has a value above 1, it indicates that the industry's weight in the region is greater than the industry's national weight. (The industry is specified in that region.) A value below 1 indicates that the industry's weight in the region is less than its nationwide weight.

Figure 1-9: Specification quotients by region and industry



(ii) Location quotient (composition ratio of all-region total by industry − composition ratio of i-region by industry)

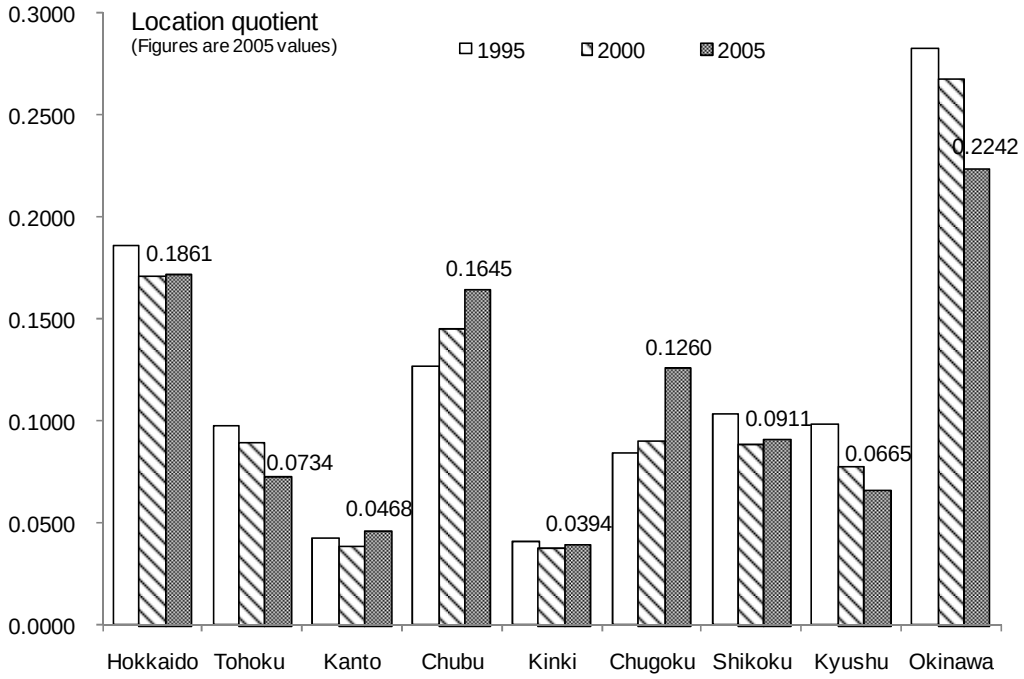
Looking at location quotients for 2005, Kinki had the smallest location quotient (0.0394), indicating that it is the region closest to the national industrial structure. It was followed by Kanto (0.0468), Kyushu (0.0665), and Tohoku (0.0734). The region with the highest location quotient was Okinawa (0.2242). It was followed by Hokkaido (0.1720), Chubu (0.1645), and Chugoku. (See Table 1-6.)

Table 1-6: Location quotient

Year / Region	Location quotient by region			Increase-decrease in percentage points	
	1995	2000	2005	(2000–1995)	(2005–2000)
Hokkaido	0.1861	0.1710	0.1720	- 0.0151	0.0009
Tohoku	0.0981	0.0901	0.0734	- 0.0081	- 0.0166
Kanto	0.0433	0.0392	0.0468	- 0.0041	0.0076
Chubu	0.1268	0.1457	0.1645	0.0189	0.0188
Kinki	0.0416	0.0379	0.0394	- 0.0037	0.0015
Chugoku	0.0842	0.0909	0.1260	0.0067	0.0351
Shikoku	0.1036	0.0888	0.0911	- 0.0149	0.0023
Kyushu	0.0983	0.0781	0.0665	- 0.0202	- 0.0116
Okinawa	0.2829	0.2680	0.2242	- 0.0149	- 0.0438

Comparing 1995, 2000, and 2005, the location quotients of Chubu and Chugoku are on a rising trend (Figure 1-10) because their industrial structures are dominated by specific industries.

Figure 1-10: Changes in location quotient by region



Note: Location quotient

1/2 × [|national primary industry composition ratio − r-region primary industry composition ratio| + |national secondary industry composition ratio − r-region secondary industry composition ratio| + •• + |national nth industry composition ratio − r-region nth industry composition ratio|]

Regions with industrial structures close to the national structure have location quotients close to 0. Regions with industrial structures dominated by specific industries compared to the national structure have location quotients close to 1.

(iii) Industrial concentration quotient (composition ratio by region for all industries − composition ratio by region for i-industry)

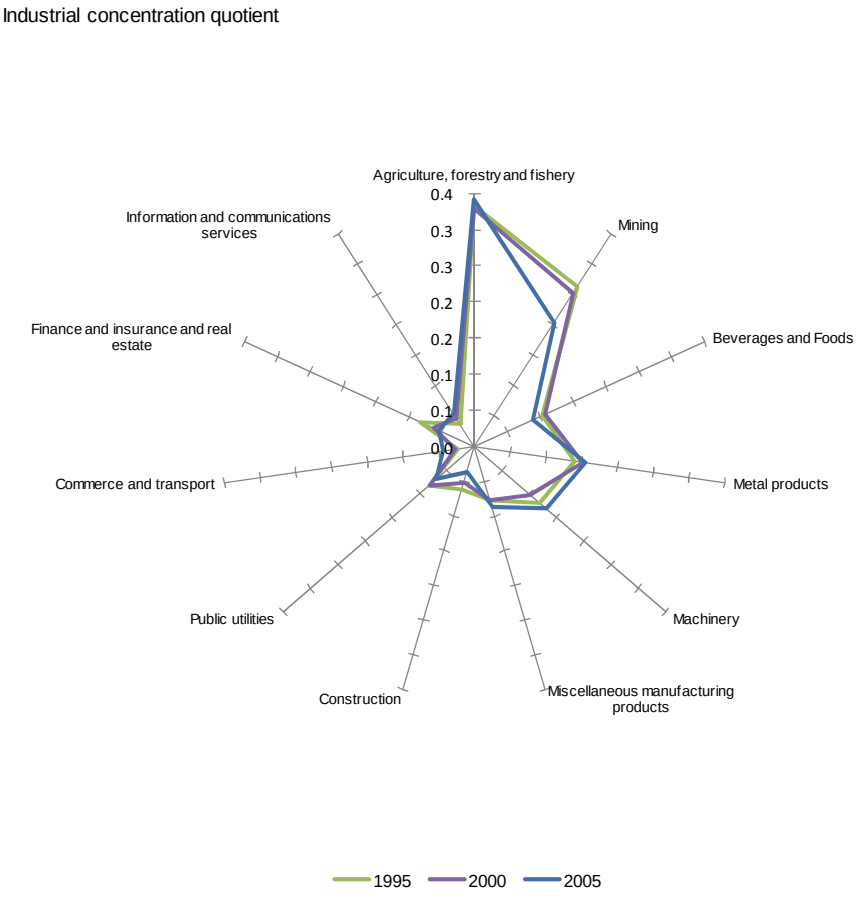
Looking at 2005 industrial concentration quotients, construction had the smallest figure (0.0374), followed in order by commerce and transport (0.0431), information and communications/service industries (0.0545), and finance, insurance, and real estate (0.0550). These industries have regional distributions relatively similar to that for all industries (Table 1-7).

Table 1-7: Industrial concentration quotient

Industry \ Year	Industrial concentration quotient			Increase-decrease in percentage points	
	1995	2000	2005	(2000–1995)	(2005–2000)
Agriculture, forestry and fishery	0.3324	0.3292	0.3427	- 0.0032	0.0135
Mining	0.2625	0.2526	0.2037	- 0.0099	- 0.0490
Beverages and Foods	0.1038	0.1066	0.0897	0.0027	- 0.0169
Metal products	0.1391	0.1512	0.1557	0.0121	0.0045
Machinery	0.1186	0.1013	0.1311	- 0.0173	0.0298
Miscellaneous manufacturing products	0.0771	0.0777	0.0864	0.0007	0.0087
Construction	0.0613	0.0515	0.0374	- 0.0098	- 0.0141
Public utilities	0.0828	0.0822	0.0689	- 0.0007	- 0.0133
Commerce and transport	0.0236	0.0263	0.0431	0.0027	0.0168
Finance and insurance and real estate	0.0825	0.0617	0.0550	- 0.0208	- 0.0066
Information and communications services	0.0375	0.0467	0.0545	0.0091	0.0079

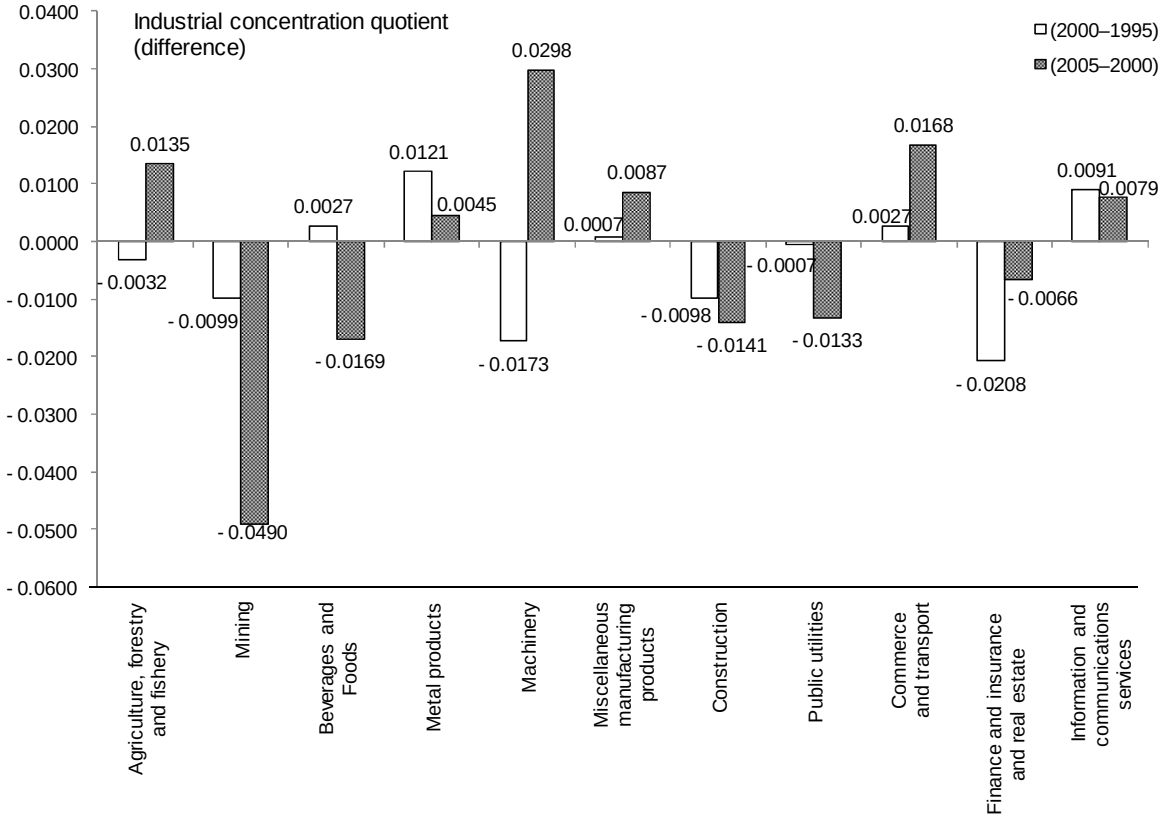
Industries with high industrial concentration quotients are agriculture, forestry, and fishery (0.3427), mining (0.2037), and metal products (0.1557). They are likely to be concentrated in specific regions (Figure 1-11).

Figure 1-11: Industrial concentration quotient by region



Comparing industrial concentration quotients in 2000 and 2005, mining (down 0.0490 percentage points), beverages and foods (down 0.0169 percentage points), construction (down 0.0141 percentage points), and public utilities (down 0.0133 percentage points) decreased, while machinery (up 0.0298 percentage points), commerce and transport (0.0168 percentage points), and agriculture, forestry, and fishery (up 0.0135 percentage points) increased (Figure 1-12).

Figure 1-12: Increase or decrease in industrial concentration quotient



Note: Industrial concentration quotient

$$\frac{1}{2}\cdot\sum_{r=1}^{9}\left|\frac{\sum_{j=1}^{n}X_j^r}{\sum_{r=1}^{9}\sum_{j=1}^{n}X_j^r}-\frac{X_j^r}{\sum_{r=1}^{9}X_j^r}\right|$$

(r: Region, j: Industry, X: Production)

$= \frac{1}{2}\cdot$ (| 1st region's composition ratio of all industries vs. national average − 1st region's composition ratio of Industry j vs. national average |
+ | 2nd region's composition ratio of all industries vs. national average − 2nd region's composition ratio of Industry j vs. national average | + • • •
+ | 9th region's composition ratio of all industries vs. national average − 9th region's composition ratio of Industry j vs. national average |)

The industrial concentration quotient is found using the above equations. When the distribution of an industry to the regions is similar to the distribution of all industries to the regions, the quotient approaches 0. When an industry is concentrated (specialized) in a specific region and the distribution of the industry to all regions diverges from the distribution of all industries to the regions, the quotient approaches 1.

2. Input structure

I-O Table inputs (cost structure = vertical vectors) can be broadly divided into "intermediate inputs," which represent transactions inputting raw materials, fuel, services, and so on input by industries for production activities, and "gross value added," which represents value added such as compensation of employees and operating surpluses. Here, intermediate inputs will be considered.

(1) Comparison of intermediate structure by region

The 2005 all-region total for regional production (gross outputs) was 948.1934 trillion yen. This was a 1.2 percent increase from 2000. The total intermediate inputs of goods and services required for this production was 456.1856 trillion yen, a 6.1 percent increase from 2000. Growth in intermediate input thus exceeded growth in domestic production (Table 2-1).

Looking at intermediate input by region, Tohoku declined slightly from 2000, falling 0.1 percent, but all other regions increased.

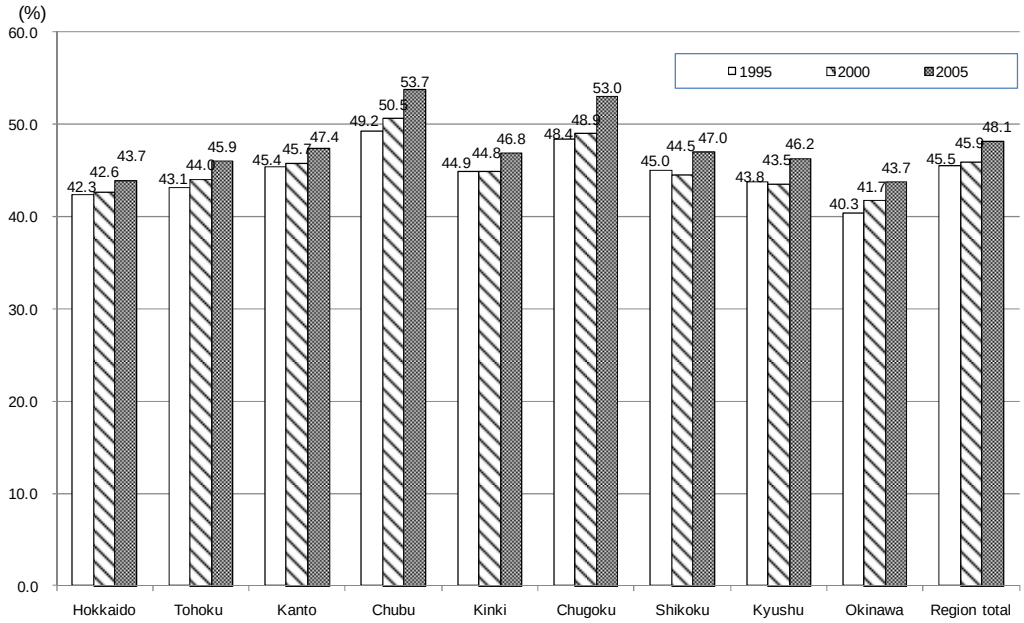
Table 2-1: Intermediate input and ratio of intermediate input to the value of total domestic production

	Intermediate input (¥100 million)			Growth rate (%)		Ratio of intermediate input to the value of total domestic production (%)			increase-decrease in ratio of intermediate input to the value of total domestic production (percentage points)	
	1995	2000	2005	2000 / 1995	2005 / 2000	1995	2000	2005	2000–1995	2005-2000
Hokkaido	147,318	147,779	148,404	0.3	0.4	42.3	42.6	43.7	0.3	1.2
Tohoku	258,168	263,214	262,824	2.0	-0.1	43.1	44.0	45.9	0.8	1.9
Kanto	1,776,200	1,845,911	1,935,509	3.9	4.9	45.4	45.7	47.4	0.3	1.7
Chubu	564,253	578,351	662,699	2.5	14.6	49.2	50.5	53.7	1.2	3.2
Kinki	719,596	702,231	712,378	-2.4	1.4	44.9	44.8	46.8	-0.1	2.0
Chugoku	278,958	278,738	327,568	-0.1	17.5	48.4	48.9	53.0	0.5	4.1
Shikoku	118,974	114,593	120,524	-3.7	5.2	45.0	44.5	47.0	-0.5	2.5
Kyushu	340,288	342,172	366,759	0.6	7.2	43.8	43.5	46.2	-0.3	2.8
Okinawa	21,798	24,736	25,192	13.5	1.8	40.3	41.7	43.7	1.4	2.0
Region total	4,225,553	4,297,725	4,561,856	1.7	6.1	45.5	45.9	48.1	0.3	2.3

The share of production accounted for by intermediate input (the ratio of intermediate input to the value of total domestic production) was 48.1 percent, an increase of 2.3 percentage points from the 2000 figure of 45.9 percent.

Broken down by region, the ratio of intermediate input to the value of total domestic production rose in every region compared with 2000. The regions with the largest increases were Chugoku, with a 4.1 percentage point rise, and Chubu, with a 3.2 percentage point rise.

Figure 2-1: Changes in ratio of intermediate input to the value of total domestic production by region

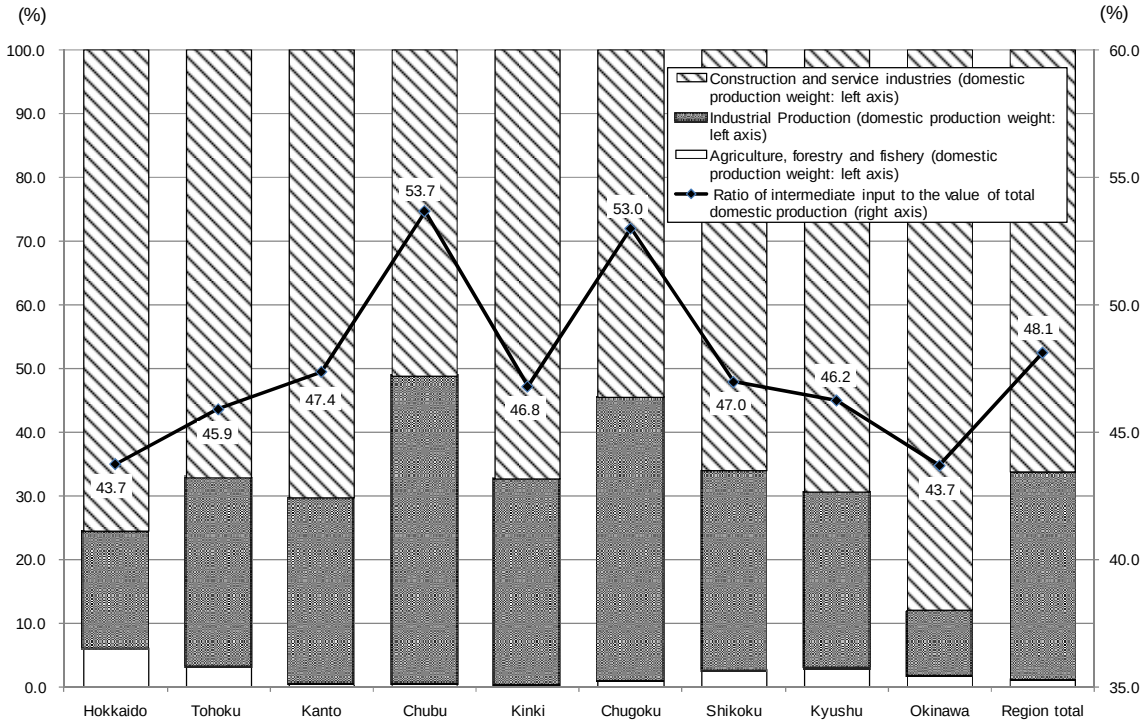


The regions with the highest ratios of intermediate input to the value of total domestic production were Chubu, with 53.7 percent, and Chugoku, with 53.0 percent. Looking at these regions' industrial structures in three sectors (agriculture, forestry, and fishery, industrial production, and construction service industries), domestic production has greater weight in industrial production than it does in other regions (Figures 2-1 and 2-2).

The regions with the lowest ratios of intermediate input to the value of total domestic production were Okinawa, with 43.7 percent, and Hokkaido, with 43.7 percent. Compared with other regions, industrial production has less weight in these regions and construction and service industries have more weight.

This is because many industries in the industrial production sector use many raw materials, so the ratio of intermediate input to the value of total domestic production tends to be high, and service industries are often labor-intensive, so they tend to have a high ratio of value added.

Figure 2-2: Ratio of intermediate input to the value of total domestic production and domestic production by industry weight



Breaking down intermediate input goods by region in order to see which ones influence variations in the ratio of intermediate input to the value of total domestic production, agriculture, forestry, and fishery had a negative impact in every region but Kanto and Kinki, lowering the regional total (Table 2-2). Looking at the ratio of intermediate input to the value of total domestic production, industrial production increased in every region but Okinawa. Of these, Chugoku at 30.6 percent (up 4.1 percentage points compared with 2000) and Chubu at 30.8 percent (up 2.4 percentage points) had the largest increases. Construction and service industries rose in every region, with the largest increases in Okinawa at 26.1 percent (up 2.8 percentage points) and Tohoku at 23.8 percent (up 2.1 percentage points).

Breaking down industrial production, metal products were basically unchanged in Okinawa but increased in every other region. The largest increases were in Chugoku at 7.7 percent (up 1.9 percentage points) and Chubu at 6.2 percent (up 1.1 percentage points). Mining also rose in every region but Okinawa. Shikoku, with 3.9 percent (up 2.0 percentage points) and Chugoku, with 4.0 percent (up 1.8 percentage points) saw the largest increases.

Looking in detail at construction and service industries, the all-region total increased for every sector but public utilities. Information and communications/service industries and commerce and transport contributed to the increase.

By region, information and communications/service industries rose in every region. The largest increases were in Tohoku at 10.8 percent (up 1.3 percentage points), Kyushu at 10.3 percent (up 1.0 percentage points), Kanto at 12.6 percent (up 0.8 percentage points), Hokkaido at 10.1 percent (up 0.7 percentage points), and Okinawa at 9.9 percent (up 0.7 percentage points). Commerce and transport increased in every region but Hokkaido. The largest rises were in Okinawa at 7.7 percent (up 1.1 percentage points), Shikoku at 7.0 percent (up 0.5 percentage points), and Kinki at 6.3 percent (up 0.5 percentage points).

Table 2-2: Industrial structure of ratio of intermediate input to the value of total domestic production by region

(Unit: %)

	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
All industries	43.7 (+1.2)	45.9 (+1.9)	47.4 (+1.7)	53.7 (+3.2)	46.8 (+2.0)	53.0 (+4.1)	47.0 (+2.5)	46.2 (+2.8)	43.7 (+2.0)	48.1 (+2.3)
Agriculture, forestry and fishery	3.5 (-0.1)	2.2 (-0.5)	0.8 (+0.0)	0.8 (-0.1)	0.8 (+0.0)	1.0 (-0.3)	1.5 (-0.3)	2.1 (-0.1)	1.4 (-0.2)	1.1 (-0.1)
Industrial Production	16.9 (+0.5)	19.9 (+0.4)	20.7 (+0.5)	30.8 (+2.4)	21.0 (+0.8)	30.6 (+4.1)	22.1 (+1.6)	20.9 (+1.6)	16.2 (-0.6)	22.5 (+1.2)
Mining	2.1 (+0.9)	1.5 (+0.6)	1.4 (+0.5)	1.8 (+0.6)	1.4 (+0.4)	4.0 (+1.8)	3.9 (+2.0)	1.4 (+0.5)	2.6 (-0.6)	1.7 (+0.7)
Beverages and Foods	2.4 (+0.2)	1.7 (+0.0)	1.3 (-0.0)	1.1 (-0.1)	1.3 (-0.0)	1.1 (-0.1)	1.6 (-0.2)	1.8 (-0.1)	2.0 (-0.1)	1.4 (-0.0)
Metal products	2.6 (+0.3)	3.2 (+0.2)	4.0 (+0.6)	6.2 (+1.1)	5.3 (+1.0)	7.7 (+1.9)	3.2 (+0.5)	4.2 (+0.7)	2.0 (+0.0)	4.6 (+0.8)
Machinery	1.9 (-0.2)	5.1 (+0.2)	5.8 (-0.0)	12.6 (+1.7)	4.4 (-0.0)	6.8 (+1.0)	2.6 (-0.4)	4.9 (+0.8)	1.9 (+0.1)	6.2 (+0.4)
Miscellaneous manufacturing products	8.0 (-0.7)	8.3 (-0.8)	8.1 (-0.6)	9.1 (-0.9)	8.6 (-0.6)	10.9 (-0.3)	10.8 (-0.3)	8.5 (-0.4)	7.6 (+0.0)	8.6 (-0.6)
Construction and service industries	23.3 (+0.9)	23.8 (+2.1)	25.9 (+1.2)	22.0 (+0.8)	24.9 (+1.2)	21.4 (+0.2)	23.4 (+1.2)	23.2 (+1.2)	26.1 (+2.8)	24.4 (+1.1)
Construction	0.7 (-0.1)	0.8 (+0.1)	1.1 (+0.0)	0.7 (-0.0)	1.2 (+0.0)	0.6 (-0.0)	0.6 (+0.0)	0.9 (-0.0)	0.8 (+0.0)	1.0 (+0.0)
Public utilities	1.9 (-0.1)	2.5 (+0.2)	1.8 (+0.0)	1.9 (-0.0)	2.0 (+0.0)	2.1 (-0.1)	1.9 (-0.2)	2.0 (-0.0)	2.4 (+0.1)	1.9 (-0.0)
Commerce and transport	6.4 (-0.1)	6.3 (+0.2)	6.0 (+0.4)	6.6 (+0.3)	6.3 (+0.5)	6.5 (+0.3)	7.0 (+0.5)	6.5 (+0.2)	7.7 (+1.1)	6.3 (+0.4)
Finance and insurance and real estate	4.2 (+0.5)	3.4 (+0.3)	4.5 (-0.0)	2.9 (-0.0)	4.3 (+0.1)	3.0 (+0.0)	3.8 (+0.3)	3.7 (+0.1)	5.3 (+0.8)	4.0 (+0.1)
Information and communications services	10.1 (+0.7)	10.8 (+1.3)	12.6 (+0.8)	9.9 (+0.5)	11.1 (+0.6)	9.1 (+0.1)	10.1 (+0.5)	10.3 (+1.0)	9.9 (+0.7)	11.3 (+0.7)

Note: Input coefficients are shown as percentages. Figures inside parentheses are increases in input coefficients since 2000.

(2) Input source ratio of intermediate input goods

Looking at what percentages of the intermediate input goods needed for production in each region comes from in-region products and from imports and inflows from other regions (the input source ratio), 66.1 percent of the intermediate input goods required for regional total production were in-region products. Products from other regions accounted for 25.7 percent, and imports from other countries for 8.2 percent (Table 2-3).

Turning next to the input ratios of regional products by region, the in-region supply ratio was very high in Kanto at 74.8 percent, followed by Kinki at 64.2 percent and Hokkaido at 63.8 percent.

In contrast, the input ratio for imported/inflow products (imported products + other-region products) was highest in Shikoku at 51.7 percent, followed by Tohoku at 44.3 percent, Chugoku at 43.7 percent, and Chubu at 41.6 percent. More than half of Shikoku's raw materials input volume comprised imported/inflow products from other-regions.

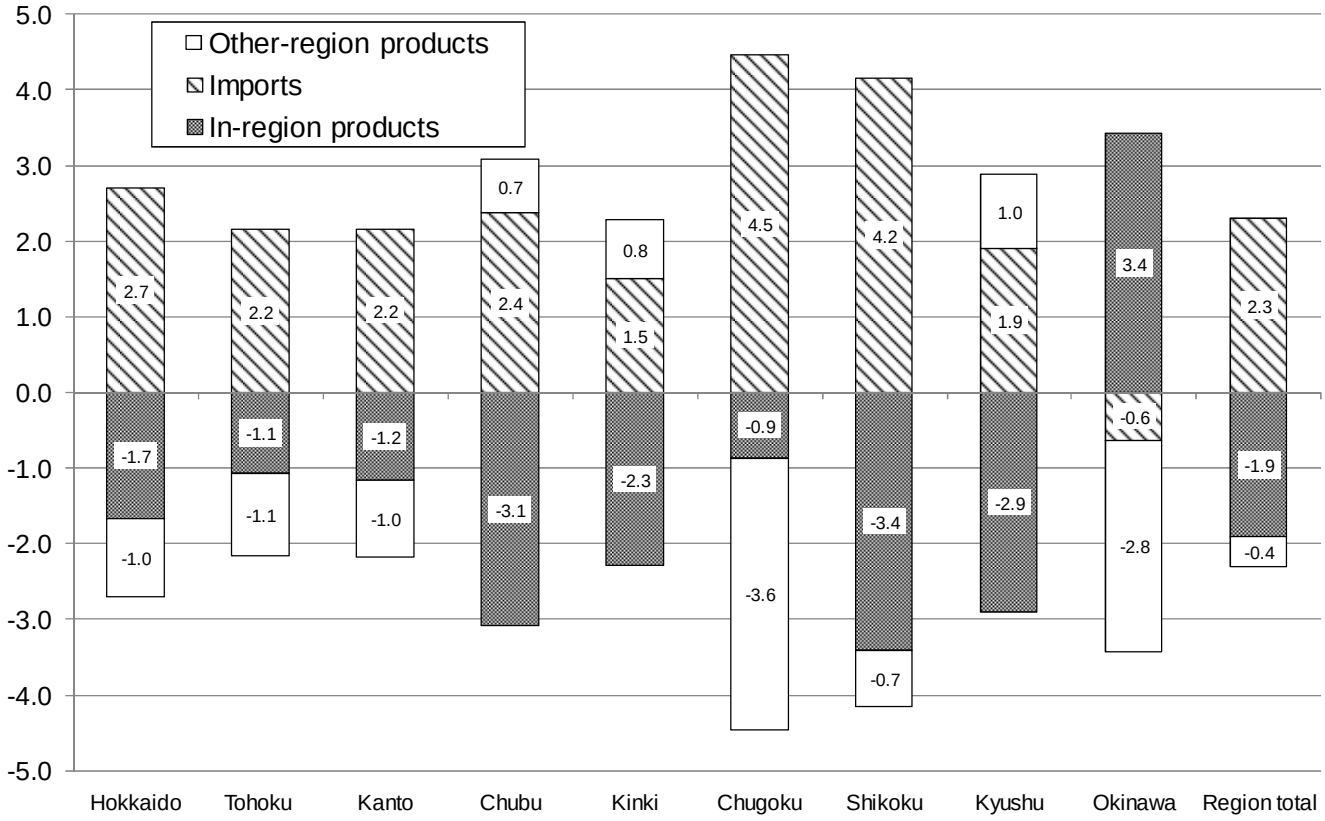
Table 2-3: Input source ratio of the ratio of intermediate input to the value of total domestic production by region (composition ratio: percent)

	Region / Industry	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
In-region products	Agriculture, forestry and fishery	79.0	72.2	59.2	55.8	43.7	58.4	65.5	77.2	60.4	63.7
	Mining	9.8	10.5	6.2	4.6	5.1	2.9	4.2	9.7	8.0	5.9
	Beverages and Foods	59.7	58.5	64.0	53.2	50.6	50.4	45.4	66.3	55.6	59.0
	Metal products	55.3	38.9	65.4	54.8	61.3	69.4	29.6	64.9	43.2	61.2
	Machinery	23.5	39.0	54.6	58.9	39.5	45.9	23.0	25.8	15.7	49.9
	Miscellaneous manufacturing products	42.8	40.5	60.0	48.4	46.1	51.5	39.1	39.9	42.5	51.3
	Construction	94.9	97.2	99.7	98.1	99.3	97.5	97.5	95.2	98.8	98.8
	Public utilities	97.5	93.3	87.1	93.0	92.3	96.5	98.1	99.1	99.5	91.6
	Commerce and transport	63.8	36.9	74.9	37.1	57.0	38.1	31.3	57.3	62.3	58.7
	Finance and insurance and real estate	93.3	93.9	99.1	90.6	98.8	94.5	95.0	93.6	99.0	97.0
	Information and communications services	76.1	70.4	94.0	75.3	81.6	70.7	67.0	75.3	75.1	84.6
	All industries	63.8	55.7	74.8	58.4	64.2	56.3	48.2	60.6	62.4	66.1
Other-region products	Agriculture, forestry and fishery	13.1	18.6	29.6	30.2	47.5	30.8	24.3	11.3	34.1	25.7
	Mining	2.1	1.7	1.5	1.6	2.2	1.5	1.3	1.8	0.4	1.7
	Beverages and Foods	29.5	32.3	25.6	38.7	41.4	42.1	47.8	23.8	40.2	31.6
	Metal products	40.4	56.0	27.7	38.5	33.1	26.4	67.2	29.9	55.8	32.9
	Machinery	70.2	50.7	33.9	32.9	51.3	46.2	71.8	68.7	82.9	40.6
	Miscellaneous manufacturing products	48.5	52.6	28.0	42.9	44.7	37.6	52.9	52.7	53.0	38.7
	Construction	5.1	2.8	0.3	1.9	0.7	2.5	2.5	4.8	1.2	1.2
	Public utilities	2.5	6.7	12.9	7.0	7.7	3.5	1.9	0.9	0.5	8.3
	Commerce and transport	35.2	62.7	22.2	61.7	41.0	60.8	68.1	41.0	34.8	39.3
	Finance and insurance and real estate	6.4	5.9	0.4	8.9	0.8	4.9	4.7	6.0	0.7	2.5
	Information and communications services	23.2	28.9	3.3	23.3	16.6	28.4	32.3	23.9	24.3	13.5
	All industries	28.4	37.6	16.8	33.5	28.8	31.9	40.8	32.9	30.2	25.7
Imports	Agriculture, forestry and fishery	7.9	9.2	11.3	14.0	8.8	10.7	10.2	11.5	5.5	10.5
	Mining	88.0	87.8	92.2	93.7	92.7	95.6	94.5	88.5	91.7	92.5
	Beverages and Foods	10.8	9.3	10.5	8.1	8.0	7.5	6.8	9.9	4.3	9.4
	Metal products	4.3	5.1	6.9	6.7	5.6	4.1	3.3	5.2	0.9	6.0
	Machinery	6.3	10.3	11.5	8.1	9.2	7.9	5.3	5.5	1.4	9.5
	Miscellaneous manufacturing products	8.7	6.9	12.0	8.7	9.2	10.9	8.0	7.4	4.5	10.0
	Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Public utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Commerce and transport	1.0	0.4	2.9	1.2	2.0	1.1	0.6	1.7	2.9	2.0
	Finance and insurance and real estate	0.3	0.2	0.5	0.5	0.4	0.6	0.3	0.4	0.3	0.5
	Information and communications services	0.6	0.7	2.7	1.4	1.7	0.8	0.6	0.8	0.6	1.9
	All industries	7.8	6.7	8.4	8.1	7.0	11.8	10.9	6.5	7.4	8.2

Comparing the ratio of intermediate input to the value of total domestic production by input source with the figures from 2000, the input ratio of imported products increased in every region but Okinawa, while the input ratio of in-region products decreased (Figure 2-3). Inflow products increased in Kyushu, Kinki, and Chubu, but decreased in the other regions.

Figure 2-3: Increases and decreases in ratio of intermediate input by input source (2000–2005)

(Percentage points)



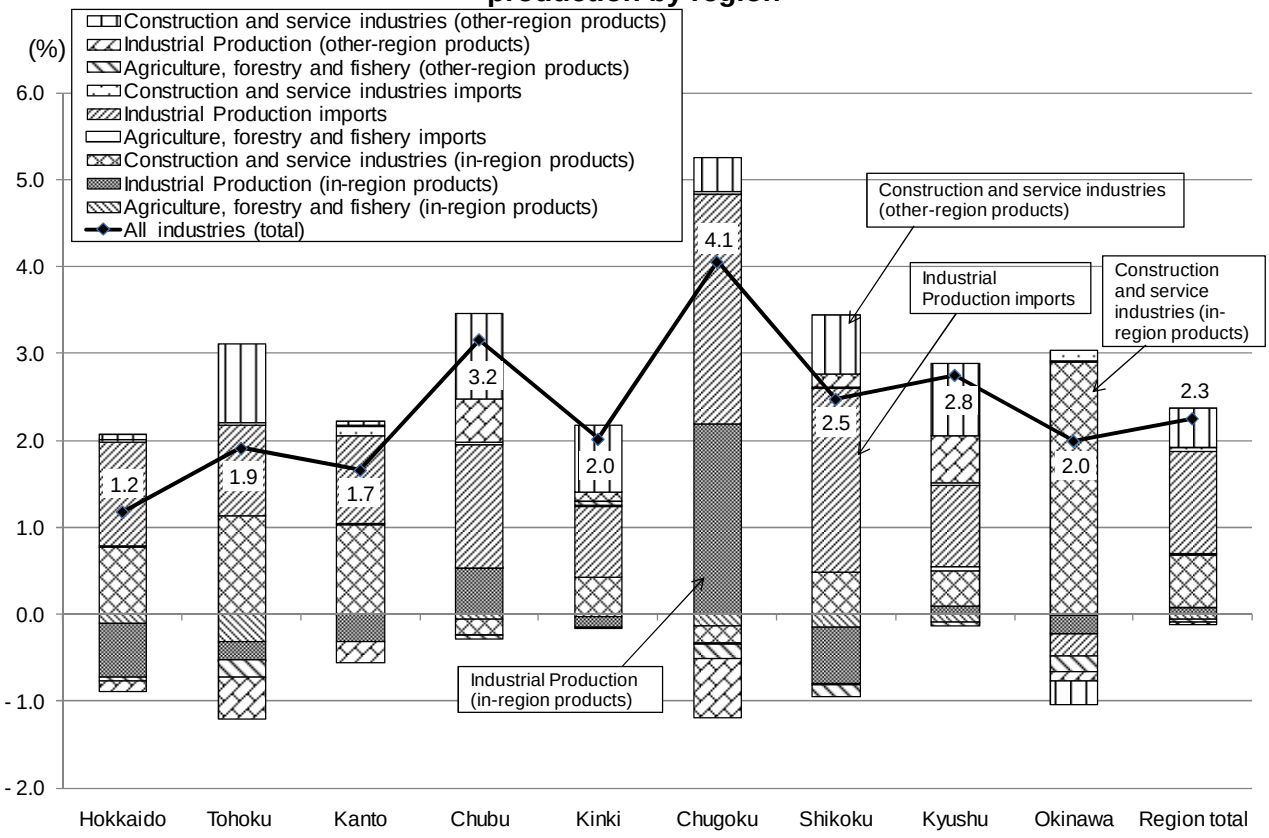
(3) Causes of changes to the ratio of intermediate input to the value of total domestic production by industry and input source

The ratio of intermediate input to the value of total domestic production increased in all regions. Looking by region, industry, and input source at the input sources (in-region products, other-region products, and imported products) in three sectors that contributed to this increase and caused input volume to rise, the ratio of intermediate input to the value of total domestic production for industrial production (imported products) and construction and service industries (other-region products) increased in every region but Okinawa (Figure 2-4).

The input ratio for construction and service industries (in-region products) increased in regions other than Chubu and Chugoku, accounting for almost all of the increase in the ratio of intermediate input to the value of total domestic production in these three industries in each region.

In contrast, the ratios of intermediate input to the value of total domestic production for agriculture, forestry, and fishery (in-region products), industrial production (other-region products), and agriculture, forestry, and fishery (other-region products) declined in the all-region total.

Figure 2-4: Factors in changes in the ratio of intermediate input to the value of total domestic production by region



Next is a breakdown of industrial production (imported products) and construction and service industries (regional products), which made a significant contribution to the increase in the ratio of intermediate input to the value of total domestic production.

Breaking down industrial production (imported products), mining (imported products), which includes crude petroleum, iron ores, and coal mining, contributed to the increase in the ratio of intermediate input to the value of total domestic production in every region but Okinawa. It contributed approximately 30 percent of the increase in the ratio of intermediate input to the value of total domestic production for all industries and regions (Figure 2-5).

By region, Chugoku at 3.9 percent (up 1.9 percentage points), Shikoku at 3.6 percent (up 1.9 percentage points), and Hokkaido at 1.8 percent (up 0.9 percentage points) showed large increases compared with 2000 (Figure 2-6).

This increase in the ratio of intermediate input to the value of total domestic production for industrial production (imported products) likely reflected a rise in the price of crude petroleum.

Figure 2-5: Factors in changes in the ratio of intermediate input to the value of total domestic production by region (industrial production [imported products])

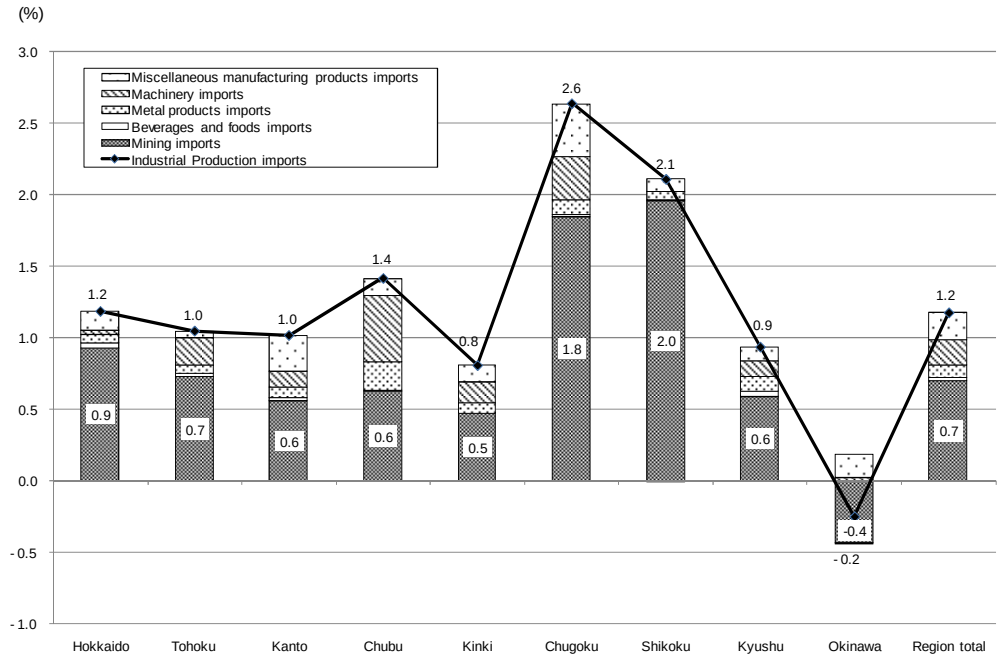
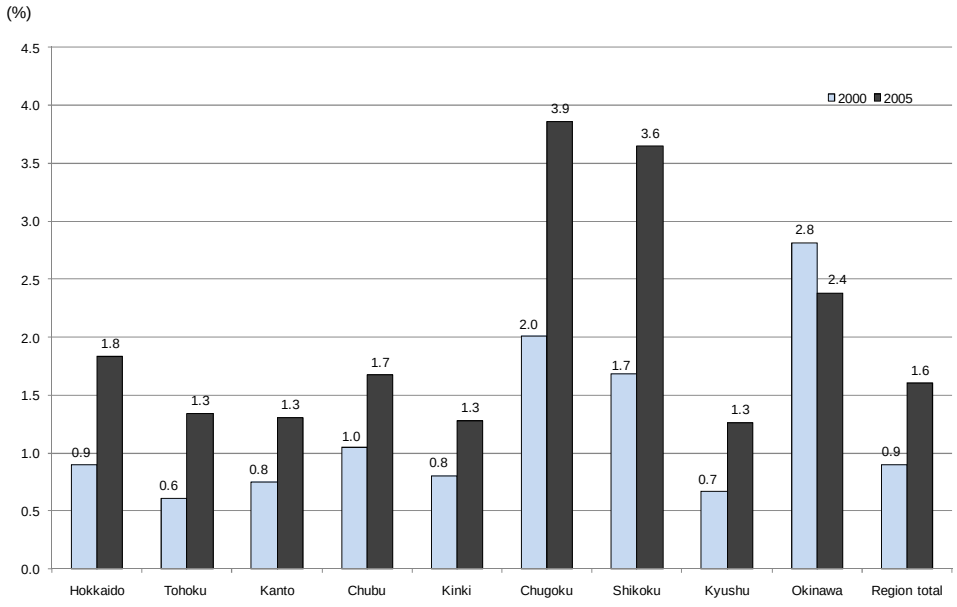


Figure 2-6: Changes in the ratio of intermediate input to the value of total domestic product (mining [imported products])



Breaking down construction and service industries (regional products), information and communications/service industries (regional products) increased in all regions. It contributed about 30 percent of the increase in the ratio of intermediate input to the value of total domestic production for all industries and regions (Figure 2-7).
Looking at information and communications/service industries (regional products) by region, Tohoku at 7.6 percent (up 0.9 percentage points compared with 2000), Okinawa at 7.4 percent (up 0.8 percentage points), and Kanto at 11.8 percent (up 0.6 percentage points) all had large increases (Figure 2-8).

Figure 2-7: Factors in changes in the ratio of intermediate input to the value of total domestic production by region (construction and service industries [regional products])

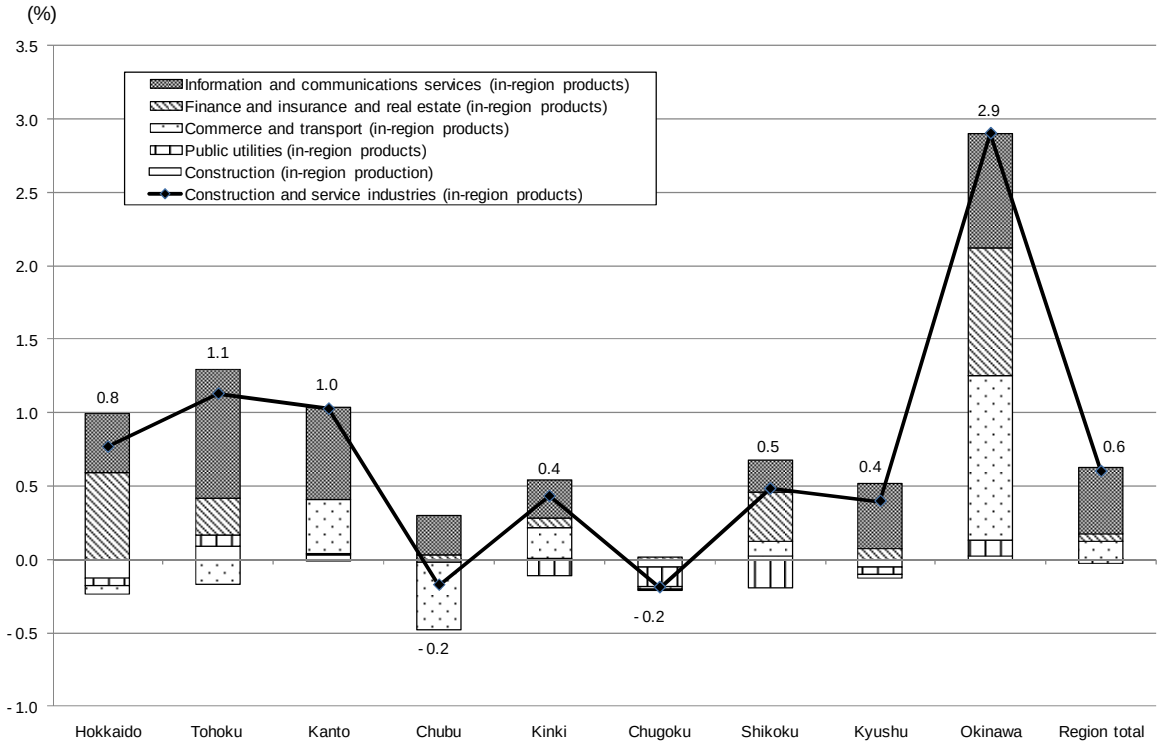
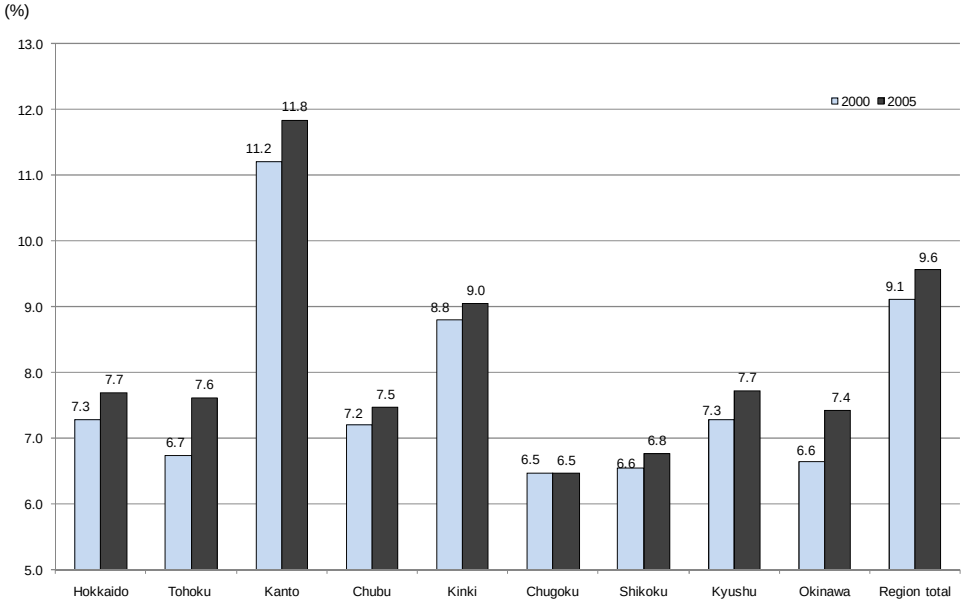


Figure 2-8: Changes in the ratio of intermediate input to the value of total domestic production (information and communications/service industries [regional products])



3. Gross value added

I-O Table inputs (cost structure = vertical vector) comprise intermediate input and gross value added. Here, gross value added will be considered. In contrast to the ratio of intermediate input to the value of total domestic production discussed above, the gross value added ratio described here is "if there is an increase somewhere, there is a corresponding decrease somewhere else."

*The I-O Tables' gross value added sector includes consumption expenditure outside households as well as value added items such as compensation of employees and operating surplus.

(1) Gross value added

Gross value added was 491.5224 trillion yen, a 3.1 percent decrease compared with 2000 (Table 3-1).

By region, only Chubu showed an increase, of 0.8 percent. Every other region had a decrease. The largest decreases were in Tohoku (down 7.6 percent), Kinki (down 6.6 percent), and Okinawa (down 6.1 percent).

Table 3-1: Gross value added

	Gross value added (¥100 million)			Growth rate (%)	
	1995	2000	2005	2000 / 1995	2005 / 2000
Region total	5,052,460	5,072,680	4,915,224	0.4	-3.1
Hokkaido	200,771	199,340	190,626	-0.7	-4.4
Tohoku	340,058	335,119	309,518	-1.5	-7.6
Kanto	2,136,444	2,192,210	2,149,398	2.6	-2.0
Chubu	580,538	566,767	571,218	-2.4	0.8
Kinki	882,138	866,118	809,336	-1.8	-6.6
Chugoku	297,450	290,988	290,561	-2.2	-0.1
Shikoku	145,569	142,971	135,971	-1.8	-4.9
Kyushu	437,199	444,580	426,138	1.7	-4.1
Okinawa	32,293	34,587	32,460	7.1	-6.1

(2) Gross value added ratio

The 2005 gross value added ratio (gross value added / domestic production) was 51.8 percent, a decrease of 2.3 percentage points compared with 2000 (Table 3-2).

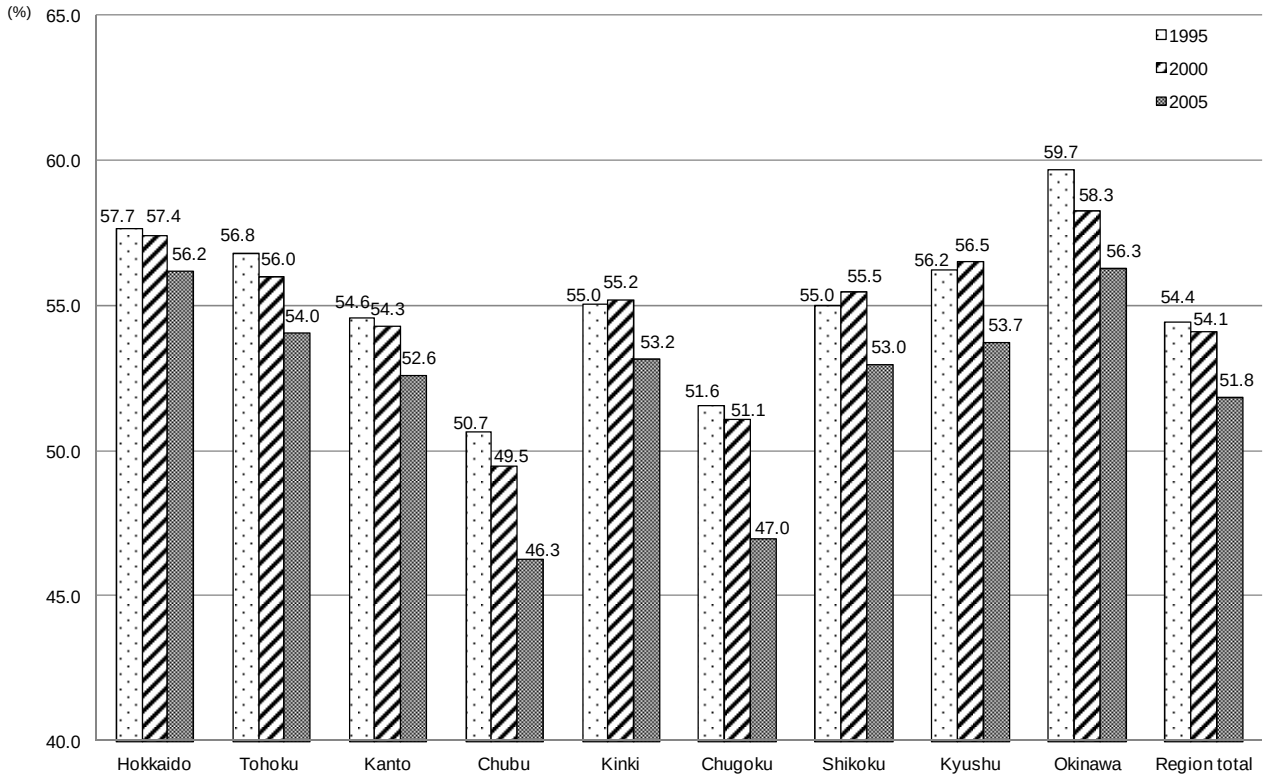
By region, every region but Chubu (46.3 percent) and Chugoku (47.0 percent) exceeded the average for all regions. Okinawa (56.3 percent) and Hokkaido (56.2 percent) were particularly high.

Compared with 2000, there was a decrease in every region. The decreases were particularly large in Chugoku (down 4.1 percentage points compared with 2000) and Chubu (down 3.2 percentage points). (See Figure 3-1.)

Table 3-2: Gross value added ratio

	Gross value added ratio (%)			Increase-decrease in gross value added ratio	
	1995	2000	2005	2000–1995	2005-2000
Region total	54.4	54.1	51.8	-0.3	-2.3
Hokkaido	57.7	57.4	56.2	-0.2	-1.2
Tohoku	56.8	56.0	54.0	-0.8	-1.9
Kanto	54.6	54.3	52.6	-0.3	-1.7
Chubu	50.7	49.5	46.3	-1.2	-3.2
Kinki	55.0	55.2	53.2	0.2	-2.1
Chugoku	51.6	51.1	47.0	-0.5	-4.1
Shikoku	55.0	55.5	53.0	0.5	-2.5
Kyushu	56.2	56.5	53.7	0.3	-2.8
Okinawa	59.7	58.3	56.3	-1.4	-2.0

Figure 3-1: Changes in gross value added ratio



Looking at gross value added ratio by region and three industrial sectors, every region has a high ratio in the agriculture, forestry, and fishery and construction and service industries and a low ratio in industrial production (Table 3-3). This made the gross value added ratio low in Chubu and Chugoku, where the weight of industrial production is high. On the other hand, the gross value added ratio is high in Okinawa and Hokkaido, where agriculture, forestry, and fishery and construction and service industries are important.
Compared with the all-region total, almost every industry in Hokkaido, Tohoku, and Kinki exceeds the average for all regions, while many industries in Okinawa, Kanto, and Chugoku fall below the average for all regions. Because service industries with high gross value added ratios are important in Okinawa, the region's gross value added ratio for all industry is high. Broken down by industry, however, the low levels become apparent.
Looking at gross value added ratio of industrial production by region, Chugoku and Chubu are low. This is because machinery (transportation equipment), which has a high ratio of intermediate input to the value of total domestic production because it includes parts, and metal products (iron or steel products and non-ferrous metal products), which have a high ratio of intermediate input to the value of total domestic production because of the jump in crude petroleum prices, are important in those regions.
Comparison by industry with 2000 finds that composition ratios have decreased for all regions and all industries. The declines in beverages and foods in Shikoku (down 7.8 percentage points) and Okinawa (down 7.0 percentage points), in machinery in Kyushu (down 8.4 percentage points), in public utilities in Tohoku (down 10.5 percentage points), and in commerce and transport in Okinawa (down 5.5 percentage points) are particularly striking.

Table 3-3: Gross value added ratio by region and industry

Industry \ Region	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
Gross value added ratio (%) (All industries)	56.2	54.0	52.6	46.3	53.2	47.0	53.0	53.7	56.3	51.8
Agriculture, forestry and fishery	54.0	51.8	53.7	52.5	56.4	56.3	52.3	49.8	51.2	52.8
Industrial Production	31.4	33.6	30.5	28.3	32.7	26.8	32.0	30.4	31.0	30.4
Mining	44.6	43.3	43.9	42.0	39.2	44.2	43.5	42.4	41.7	43.0
Beverages and Foods	27.9	39.7	39.1	37.6	41.3	37.1	34.9	36.9	32.5	38.1
Metal products	30.1	36.1	29.6	29.7	29.9	24.0	26.3	26.4	29.5	28.8
Machinery	29.2	28.4	26.3	24.0	29.9	24.3	32.7	26.1	27.3	26.3
Miscellaneous manufacturing products	35.4	36.4	33.4	34.8	34.5	28.7	32.1	34.1	29.7	33.5
Construction and service industries	62.4	63.1	61.7	63.0	62.9	63.2	62.9	63.1	59.3	62.3
Construction	46.6	46.4	46.2	46.5	46.4	45.5	45.8	45.6	45.6	46.2
Public utilities	49.4	51.6	47.0	45.4	52.1	45.8	49.6	51.2	42.4	48.6
Commerce and transport	66.0	68.5	65.0	68.0	66.1	66.7	66.8	67.2	57.2	66.0
Finance and insurance and real estate	78.1	79.4	75.9	78.5	76.4	79.2	78.5	79.7	76.8	77.1
Information and communications services	60.4	61.1	58.8	60.9	60.2	61.7	60.8	60.3	59.7	59.8
Difference in composition ratio (2005–2000) (All industries)	-1.2	-1.9	-1.7	-3.2	-2.1	-4.1	-2.5	-2.8	-2.0	-2.3
Agriculture, forestry and fishery	-2.3	-4.2	-2.8	-3.8	-2.5	-3.8	-3.4	-4.3	-2.1	-3.3
Industrial Production	-3.4	-2.9	-4.3	-4.7	-4.0	-5.5	-5.1	-5.4	-3.3	-4.4
Mining	-1.7	-5.8	-4.8	-5.0	-4.9	-6.3	-5.3	-4.0	-4.9	-4.6
Beverages and Foods	-3.2	2.3	-2.3	-2.7	-1.2	-2.5	-7.8	-1.1	-7.0	-1.8
Metal products	-3.2	-3.6	-7.5	-6.6	-6.3	-3.9	-9.1	-5.0	-7.1	-6.3
Machinery	-2.8	-5.1	-4.4	-4.7	-3.8	-5.3	-1.1	-8.4	-1.4	-4.8
Miscellaneous manufacturing products	-3.9	-2.4	-4.0	-2.9	-3.6	-5.7	-4.8	-3.3	-0.7	-3.9
Construction and service industries	-0.9	-1.8	-1.4	-1.0	-1.4	-1.2	-1.7	-1.5	-2.7	-1.4
Construction	-0.9	-1.2	-0.8	-0.5	-1.2	-1.6	-1.3	-1.3	-1.7	-1.0
Public utilities	-0.2	-10.5	-8.0	-6.8	-7.2	-7.5	-8.0	-6.5	-9.4	-7.7
Commerce and transport	-2.6	-2.6	-1.3	-1.6	-1.6	-2.3	-2.2	-2.4	-5.5	-1.7
Finance and insurance and real estate	-3.4	-2.9	-2.5	-1.7	-2.5	-2.2	-2.7	-1.9	-4.0	-2.4
Information and communications services	-0.9	-1.4	-1.3	-1.6	-1.4	-1.2	-1.7	-2.2	-1.8	-1.4

(3) Compensation of employees and ratio of compensation of employees

Compensation of employees is a major item among gross value added items. It was 258.8175 trillion yen, a decrease of 6.1 percent compared with 2000 (Table 3-4).

The employee compensation ratio (compensation of employees divided by gross value added) was 52.7 percent, down 1.7 percentage points compared with 2000. By region, every region but Kanto (51.5 percent) and Kinki (52.4 percent) exceeded the average for all regions, but every region was lower than in 2000.

Looking at employee compensation ratio by industry, construction and information and communications/service industries were high in every region. Finance, insurance, and real estate were low in every region. This is because value added is not counted in the industry's house rent (imputed house rent) sector.

Table 3-4: Compensation of employees by region and employee compensation ratio by region and industry

Industry \ Region	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
Compensation of employees (¥100 million)	102,016	167,648	1,107,781	311,763	423,725	155,375	72,611	228,983	18,275	2,588,175
2005 / 2000(%)	-6.9	-8.1	-5.6	-3.3	-8.7	-3.1	-7.7	-6.4	-8.0	-6.1
Ratio of compensation of employees (%)	53.5	54.2	51.5	54.6	52.4	53.5	53.4	53.7	56.3	52.7
Agriculture, forestry and fishery	18.4	19.4	19.5	21.6	18.9	19.2	22.9	20.2	19.3	19.7
Industrial Production	33.2	44.2	49.6	54.2	50.4	43.5	43.2	43.3	34.6	48.5
Mining	51.3	41.1	41.2	43.4	40.9	45.6	38.7	43.6	41.4	42.9
Beverages and Foods	38.7	28.6	33.7	37.2	33.1	38.4	40.9	30.3	37.9	33.8
Metal products	51.7	48.6	54.9	54.8	53.8	39.2	50.2	46.5	53.4	51.8
Machinery	62.6	62.6	62.8	63.6	60.7	61.8	60.8	60.0	49.3	62.4
Miscellaneous manufacturing products	35.7	46.6	44.5	47.2	48.4	36.1	40.0	48.6	35.8	44.7
Construction and service industries	57.4	56.9	52.0	54.8	52.9	57.1	56.2	56.1	58.0	53.7
Construction	75.4	75.6	76.8	76.0	76.8	76.6	76.3	75.8	75.8	76.4
Public utilities	37.4	30.7	37.5	38.1	34.3	39.6	36.4	36.3	36.9	36.2
Commerce and transport	62.6	63.6	56.7	58.1	57.5	61.8	62.5	61.6	63.0	58.5
Finance and insurance and real estate	16.6	15.9	16.6	16.8	16.3	16.8	17.0	16.0	15.6	16.5
Information and communications services	70.5	72.7	63.6	68.1	67.2	71.7	70.4	69.7	72.2	66.7
Difference in composition ratio (2005–2000)	-1.5	-0.3	-2.0	-2.3	-1.3	-1.6	-1.6	-1.3	-1.1	-1.7
Agriculture, forestry and fishery	2.2	3.7	6.3	3.1	2.8	1.9	3.8	3.8	3.7	3.9
Industrial Production	-9.2	-3.7	-0.7	1.1	-0.5	-1.0	-3.2	-3.5	-2.7	-1.3
Mining	0.2	6.1	6.4	2.9	8.4	9.0	2.0	4.4	2.6	5.0
Beverages and Foods	2.7	-1.9	1.0	2.7	-0.6	3.9	8.1	-1.0	4.4	0.8
Metal products	-5.8	-6.9	-1.2	-1.1	-1.8	-8.0	-3.4	-2.9	1.7	-2.8
Machinery	3.7	6.9	3.8	3.2	2.3	3.7	0.8	6.7	-14.1	3.8
Miscellaneous manufacturing products	-3.6	-2.2	-1.1	0.2	0.2	-0.7	-4.6	-1.9	-0.2	-1.0
Construction and service industries	-2.0	-1.1	-2.9	-4.5	-1.8	-2.7	-2.9	-2.3	-1.9	-2.7
Construction	3.5	2.2	2.9	3.0	3.1	3.3	2.6	3.0	0.5	2.9
Public utilities	0.2	5.8	4.9	5.0	5.0	5.4	4.0	4.5	0.4	4.9
Commerce and transport	-7.8	-7.5	-9.7	-10.5	-9.5	-7.7	-7.7	-8.0	-8.3	-9.3
Finance and insurance and real estate	-0.6	-0.1	-1.5	-3.7	-1.2	-2.0	-1.3	-1.3	1.4	-1.5
Information and communications services	-0.2	-0.8	-1.8	-0.3	0.4	-0.7	-1.9	-0.6	-2.0	-1.0

4. Final demand structure

(1) Scale of final demand in each region

(i) Total final demand for all regions in 2005 was 564.3390 trillion yen, a 0.5 percent increase compared with 2000 (Table 4-1). By demand item, consumption was 374.5269 trillion yen (up 0.2 percent compared with 2000) and investment was 116.2151 trillion yen (down 10.9 percent), for total domestic final demand of 490.742 trillion yen (down 2.7 percent). Exports were 73.5971 trillion yen (up 28.0 percent). Compared with 2000, total domestic final demand contracted, while exports expanded.

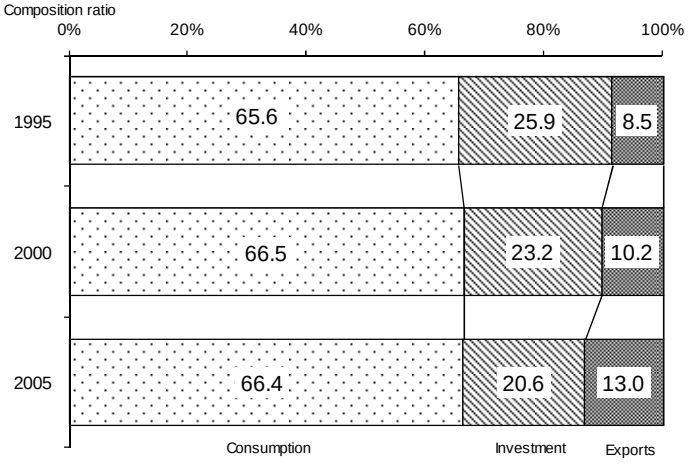
The percentages of final demand accounted for by demand items were consumption, 66.4 percent (down 0.2 percentage points compared with 2000), investment, 20.6 percent (down 2.6 percentage points), and exports, 13.0 percent (up 2.8 percentage points). Although total domestic final demand fell by 2.8 percentage points, exports rose by 2.8 percentage points (Figure 4-1).

Table 4-1: Final demand by item and increase-decrease rate

Units: ¥100 million, %

	Total final demand			Total domestic final demand						Exports	
						Consumption		Investment			
		2005 / 2000	Composition ratio		2005 / 2000		2005 / 2000		2005 / 2000		2005 / 2000
Hokkaido	228,924	-4.9	4.1	225,187	-5.3	175,167	-1.0	50,020	-18.0	3,737	27.7
Tohoku	365,840	-6.5	6.5	332,595	-8.7	250,602	-4.1	81,993	-20.4	33,245	22.7
Kanto	2,340,718	1.6	41.5	2,058,602	-0.5	1,556,074	1.6	502,529	-6.3	282,116	19.5
Chubu	685,754	9.6	12.2	534,294	3.5	396,492	8.7	137,802	-9.0	151,460	38.8
Kinki	910,872	-4.3	16.1	796,242	-7.0	625,408	-4.6	170,834	-14.8	114,629	19.3
Chugoku	350,754	4.7	6.2	290,679	-1.7	222,264	1.9	68,415	-11.8	60,074	52.8
Shikoku	170,643	-1.7	3.0	152,564	-3.2	117,393	-0.3	35,171	-11.6	18,079	13.1
Kyushu	547,339	-0.1	9.7	475,973	-5.0	369,524	-2.2	106,449	-13.3	71,366	51.9
Okinaw a	42,547	-7.6	0.8	41,282	-7.8	32,344	-1.3	8,938	-25.7	1,264	2.9
Region total	5,643,390	0.5	100.0	4,907,420	-2.7	3,745,269	0.2	1,162,151	-10.9	735,971	28.0

Figure 4-1: Percentages of final demand accounted for by demand items

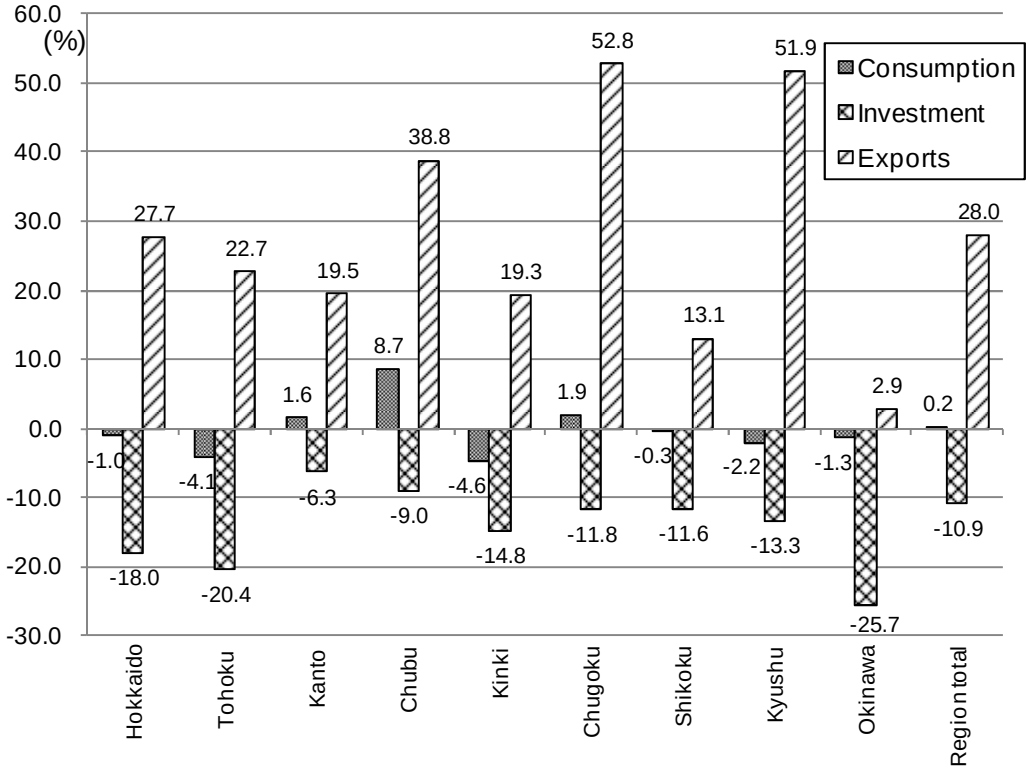


(ii) Turning next to the structure of total final demand by region, the regions with the largest final demand are Kanto at 41.5 percent, Kinki at 16.1 percent, and Chubu at 12.2 percent. Those three regions accounted for about 70 percent of the total (Table 4-1).

Compared with 2000 by region, although final demand decreased in Okinawa by 7.6 percent, in Tohoku by 6.5 percent, in Hokkaido by 4.9 percent, in Kinki by 4.3 percent, in Shikoku by 1.7 percent, and in Kyushu by 0.1 percent, it increased in Chubu by 9.6 percent, in Chugoku by 4.7 percent, and in Kanto by 1.6 percent.

Compared with 2000 by item, consumption declined in Kinki (down 4.6 percent), Tohoku (down 4.1 percent), Kyushu (down 2.2 percent), Okinawa (down 1.3 percent), Hokkaido (down 1.0 percent), and Shikoku (down 0.3 percent), but rose in Chubu (8.7 percent), Chugoku (1.9 percent), and Kanto (1.6 percent). (See Figure 4-2.) Investment fell in every region, and by double digits in seven, Okinawa (down 25.7 percent), Tohoku (down 20.4 percent), Hokkaido (down 18.0 percent), Kinki (down 14.8 percent), Kyushu (down 13.3 percent), Chugoku (down 11.8 percent), and Shikoku (down 11.6 percent). Exports, on the other hand, rose in every region, led by Chugoku (up 52.8 percent), Kyushu (up 51.9 percent), and Chubu (up 38.8 percent). The increase was in double digits in every region but Okinawa. Exports of iron or steel products and transportation equipment were a major factor in the high growth in Chugoku, Kyushu, and Chubu.

Figure 4-2: Growth rate by region of final demand items (compared with 2000)



Comparing the structure of final demand by item in each region with 2000, exports expanded in every region, led by Chugoku (up 5.4 percentage points), Chubu (up 4.6 percentage points), and Kyushu (up 4.5 percentage points), but investment contracted in every region (Table 4-2). Consumption expanded in Okinawa (up 4.8 percentage points), Hokkaido (up 3.1 percentage points), Tohoku, and Shikoku, was basically unchanged in Kanto, and contracted in the other four regions.

Table 4-2: Changes in the structure of final demand by item and region

(Unit: %)

	Total	Consumption			Investment			Exports		
		2000	2005	2005–2000	2000	2005	2005–2000	2000	2005	2005–2000
Hokkaido	100.0	73.5	76.5	3.1	25.3	21.9	-3.5	1.2	1.6	0.4
Tohoku	100.0	66.8	68.5	1.7	26.3	22.4	-3.9	6.9	9.1	2.2
Kanto	100.0	66.5	66.5	0.0	23.3	21.5	-1.8	10.2	12.1	1.8
Chubu	100.0	58.3	57.8	-0.5	24.2	20.1	-4.1	17.4	22.1	4.6
Kinki	100.0	68.9	68.7	-0.2	21.1	18.8	-2.3	10.1	12.6	2.5
Chugoku	100.0	65.1	63.4	-1.7	23.2	19.5	-3.6	11.7	17.1	5.4
Shikoku	100.0	67.9	68.8	0.9	22.9	20.6	-2.3	9.2	10.6	1.4
Kyushu	100.0	69.0	67.5	-1.5	22.4	19.4	-3.0	8.6	13.0	4.5
Okinawa	100.0	71.2	76.0	4.8	26.1	21.0	-5.1	2.7	3.0	0.3
Region total	100.0	66.5	66.4	-0.2	23.2	20.6	-2.6	10.2	13.0	2.8

(2) In-region final demand and the in-region supply ratio

(i) Looking at where in-region final demand (consumption and investment) came from in terms of in-region supply (supply from the same region), inflows (supply from other regions), and imports (supply from foreign countries), total domestic final demand for all regions was 490.7420 trillion yen. Of this 80.0 percent came from the same region, 17.0 percent from inflows, and 3.0 percent from imports (Table 4-3).

By industry, industrial production accounted for 96.4890 trillion yen (19.7 percent of the total for all industries). Taking that amount as 100, in-region supply accounted for 47.8 percent, inflows for 42.9 percent, and imports for 9.3 percent. Inflows were high compared with other industries. Of the 4.4830 trillion yen of agriculture, forestry, and fishery (0.9 percent of the total), 59.3 percent was supplied in-region, 29.3 percent came from inflows, and 11.4 percent came from imports. Compared with industrial production, the in-region supply ratio was higher, while the ratio of inflows was lower. Construction and service industries accounted for 389.7700 trillion yen (79.4 percent of the total). In-region supply was 88.2 percent, inflows were 10.4 percent, and imports were 1.4 percent. The in-region supply ratio was high due to the nature of the industry.

For all industries compared with 2000, in-region supply increased by 0.3 percentage points, inflows decreased by 0.8 percentage points, and imports increased by 0.5 percentage points.

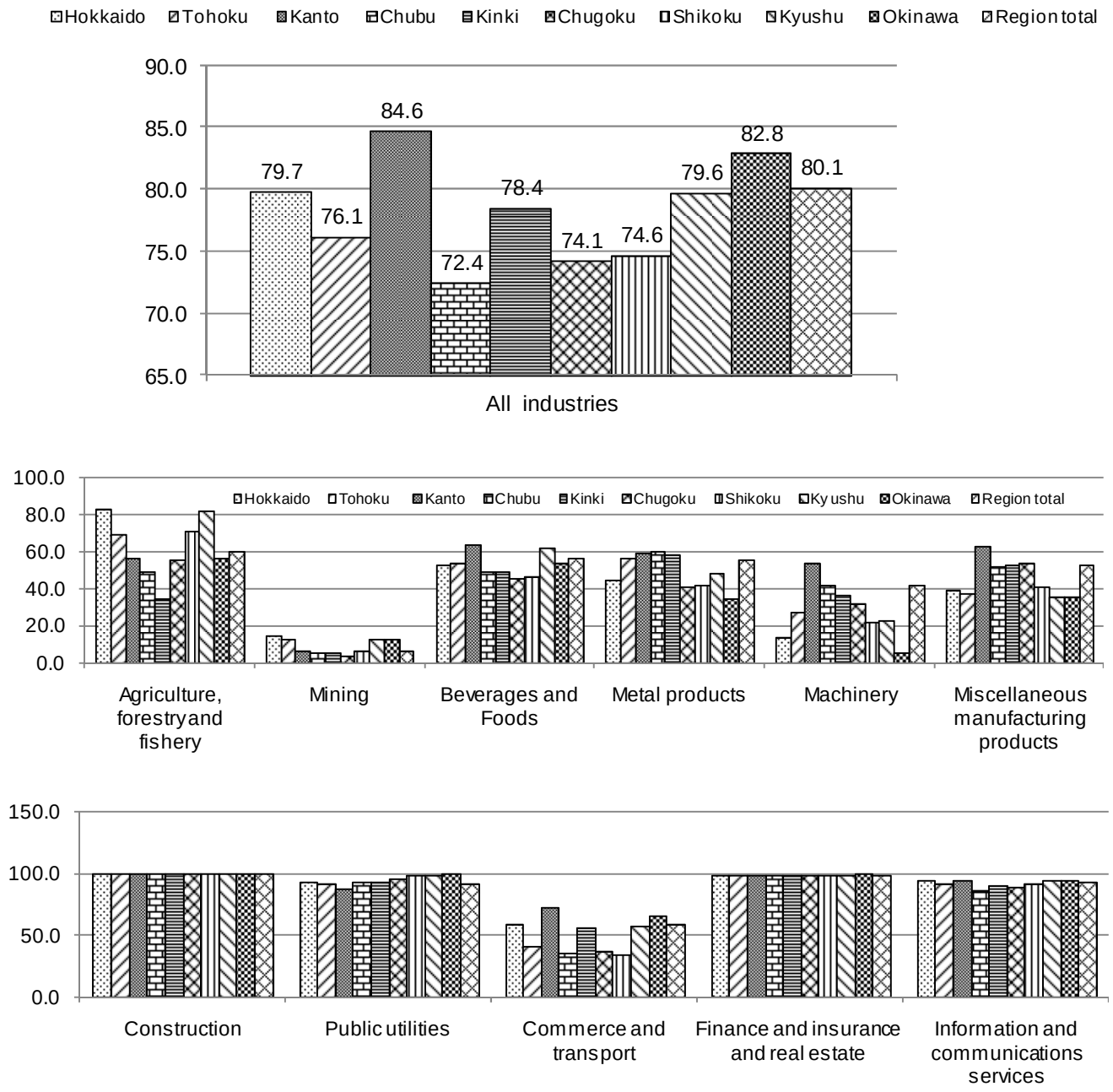
By industry, in industrial production, in-region supply fell by 1.6 percentage points, inflows fell by 0.5 percentage points, and imports rose by 2.1 percentage points. In agriculture, forestry, and fishery, although inflows declined by 2.3 percentage points, in-region supply climbed by 0.6 percentage points, and imports by 1.6 percentage points. In construction and service industries as well, inflows decreased by 0.4 percentage points, while in-region supply and imports increased slightly, 0.2 percentage points each.

Table 4-3: Percentages of in-region final demand by supply source

	In-region Total regional final demand (¥100 million)				Ratio by item (%)			2005–2000		
		Same region	Inflows	Imports	Same region	Inflows	Imports	Same region	Inflows	Imports
Agriculture, forestry and fishery	44,830	26,603	13,130	5,097	59.3	29.3	11.4	0.6	-2.3	1.6
Industrial Production	964,890	461,376	413,905	89,609	47.8	42.9	9.3	-1.6	-0.5	2.1
Mining	-1,211	-1,321	66	44	109.0	-5.4	-3.6	-107.6	6.4	101.2
Beverages and Foods	283,224	159,289	98,118	25,817	56.2	34.6	9.1	-3.3	1.9	1.4
Metal products	12,690	6,973	4,973	744	54.9	39.2	5.9	5.4	-6.9	1.5
Machinery	479,892	196,561	240,228	43,103	41.0	50.1	9.0	-1.5	-0.7	2.2
Miscellaneous manufacturing products	190,295	99,874	70,519	19,902	52.5	37.1	10.5	0.6	-3.9	3.3
Construction and service industries	3,897,700	3,439,328	404,878	53,494	88.2	10.4	1.4	0.2	-0.4	0.2
Construction	541,176	541,176	0	0	100.0	0.0	0.0	0.0	0.0	0.0
Public utilities	84,688	77,424	7,255	9	91.4	8.6	0.0	-1.6	1.6	0.0
Commerce and transport	777,465	460,653	301,490	15,322	59.3	38.8	2.0	-1.8	1.5	0.2
Finance and insurance and real estate	698,875	693,500	2,148	3,227	99.2	0.3	0.5	-0.2	0.1	0.1
Information and communications services	1,795,496	1,666,575	93,985	34,935	92.8	5.2	1.9	2.5	-2.8	0.3
All industries	4,907,420	3,927,308	831,913	148,200	80.0	17.0	3.0	0.3	-0.8	0.5

Looking next at the in-region supply ratio in final demand (the percentage of final demand accounted for by in-region products [1 − (ratio of inflow to the total demand within one region + ratio of import to the total demand)]) by region, Kanto at 84.6 percent and Okinawa at 82.8 percent were highest, followed by Hokkaido at 79.7 percent and Kyushu at 79.6 percent. The regions with the lowest in-region self-sufficient rates were Chubu at 72.4 percent, Chugoku at 74.1 percent, and Shikoku at 74.6 percent (Figure 4-3).
Looked at by 11 industry sectors, agriculture, forestry, and fishery was high in Hokkaido (82.5 percent) and Kyushu (81.0 percent) and extremely low in Kinki (34.2 percent). Beverages and foods were high in Kanto (63.2 percent), and metal products were low in Okinawa (34.3 percent), Chugoku (40.2 percent), and Shikoku (40.9 percent). Machinery had a wide spread in its in-region supply ratios, ranging from a high of 53.5 percent in Kanto to lows of 4.8 percent Okinawa, 13.5 percent in Hokkaido, and 21.1 percent in Shikoku. Miscellaneous manufacturing products were also high in Kanto (61.8 percent). For the industries from construction to information and communications/service industries, each region had a high in-region self-sufficient rate. Of them, commerce and transport had a wide spread in its regional in-region supply ratios, with the high in Kanto (73.3 percent) more than double the low in Shikoku (34.6 percent).

Figure 4-3: In-region supply ratio (percent) in final demand by industry and region



(3) Structure of in-region products by final demand source

(i) Final demand for domestic products, i.e., domestic final demand minus imported products, was 549.5191 trillion yen. When this domestic product final demand is divided by output destination into in-region outputs, outflows (outputs to other regions), and exports (outputs to foreign countries), of the all-region total, 71.5 percent is output to in-region outputs, 15.1 percent to outflows, and 13.4 percent to exports (Table 4-4).

By industry, domestic product final demand in industrial production was 143.6365 trillion yen, accounting for 26.1 percent of the whole. Taking that amount as 100, in-region outputs accounted for 32.1 percent of outputs, outflows for 28.8 percent, and exports for 39.1 percent. Compared with other industries, in-region outputs were low, and exports were high. In agriculture, forestry, and fishery, domestic final demand was 4.0357 trillion yen, accounting for 0.7 percent of all industry. Output to exports was low, with 65.9 percent output in-region, while 32.5 percent went to outflows, and 1.5 percent to exports. In construction and service industries, domestic final demand was 401.8468 trillion yen, accounting for 73.1 percent of all industry. In-region outputs accounted for 85.6 percent, outflows for 10.1 percent, and exports for 4.3 percent of outputs. Compared with other industries, the ratio of in-region outputs was high.

For all industry compared with 2000, in-region outputs fell 1.8 percentage points and outflows fell 1.2 percentage points, while exports rose 2.9 percentage points.

By industry, in industrial production, in-region outflows decreased by 3.9 percentage points and outflows by 2.8 percentage points, while exports increased sharply by 6.7 percentage points. In agriculture, forestry, and fishery, in-region outflows grew by 1.9 percentage points, but outflows declined by 1.9 percentage points, and exports were basically unchanged. In construction and service industries, in-region outflows decreased by 1.1 percentage points, and outflows by 0.5 percentage points, while exports increased by 1.6 percentage points.

Compared with the composition ratio by industry in 2000, industrial production was basically unchanged, agriculture, forestry, and fishery decreased by 0.1 percentage points, and construction and service industries increased by 0.1 percentage points.

Table 4-4: Amount of final demand for in-region products and ratio by demand source

	Total final demand for domestic products (total domestic final demand – imports)				Ratio by item (%)			2005–2000		
	(¥100 million)	Same region	Outflows	Exports	Same region	Outflows	Exports	Same region	Outflows	Exports
Agriculture, forestry and fishery	40,357	26,603	13,130	625	65.9	32.5	1.5	1.9	-1.9	0.0
Industrial Production	1,436,365	461,376	413,905	561,084	32.1	28.8	39.1	-3.9	-2.8	6.7
Mining	-944	-1,321	66	311	139.9	-7.0	-32.9	2.0	0.6	-2.5
Beverages and Foods	260,058	159,289	98,118	2,651	61.3	37.7	1.0	-2.9	2.5	0.3
Metal products	57,042	6,973	4,973	45,096	12.2	8.7	79.1	-1.4	-3.9	5.3
Machinery	849,378	196,561	240,228	412,589	23.1	28.3	48.6	-2.7	-2.6	5.4
Miscellaneous manufacturing products	270,831	99,874	70,519	100,438	36.9	26.0	37.1	-4.6	-6.7	11.4
Construction and service industries	4,018,468	3,439,328	404,878	174,262	85.6	10.1	4.3	-1.1	-0.5	1.6
Construction	541,176	541,176	0	0	100.0	0.0	0.0	0.0	0.0	0.0
Public utilities	85,123	77,424	7,255	444	91.0	8.5	0.5	-1.8	1.6	0.2
Commerce and transport	905,042	460,653	301,490	142,899	50.9	33.3	15.8	-4.6	-0.5	5.1
Finance and insurance and real estate	702,386	693,500	2,148	6,738	98.7	0.3	1.0	-0.4	0.1	0.4
Information and communications services	1,784,741	1,666,575	93,985	24,180	93.4	5.3	1.4	2.4	-2.8	0.4
Region total	5,495,191	3,927,308	831,913	735,971	71.5	15.1	13.4	-1.8	-1.2	2.9

(ii) Looking at the output destinations of in-region products by region, regions with high rates of in-region consumption and investment were Okinawa (86.9 percent), Hokkaido (84.4 percent), and Kanto (75.4 percent). Regions with low rates of in-region outputs were Chubu (57.3 percent) and Chugoku (63.8 percent). They had high rates of outputs to other regions (Figure 4-4).
Turning to the ratio of in-region consumption and investment by industry, in industrial production it was remarkably high for Okinawa (78.8 percent), which was followed by Hokkaido (51.0 percent) and Kanto (42.6 percent). In agriculture, forestry, and fishery, Kinki (82.8 percent), Kanto (78.4 percent), and Hokkaido (75.8 percent) were high, while Shikoku (35.6 percent) and Okinawa (45.8 percent) were low. In construction and service industries, in-region consumption and investment accounted for more than 80 percent of the whole in every region (Figure 4-5).

Figure 4-4: Rate of in-region consumption and investment for in-region products by region (percent)

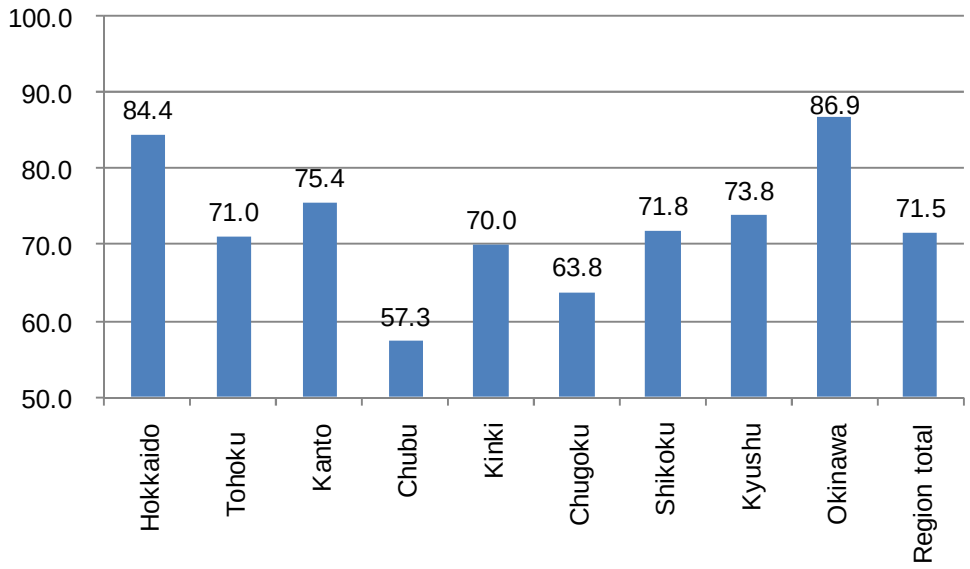
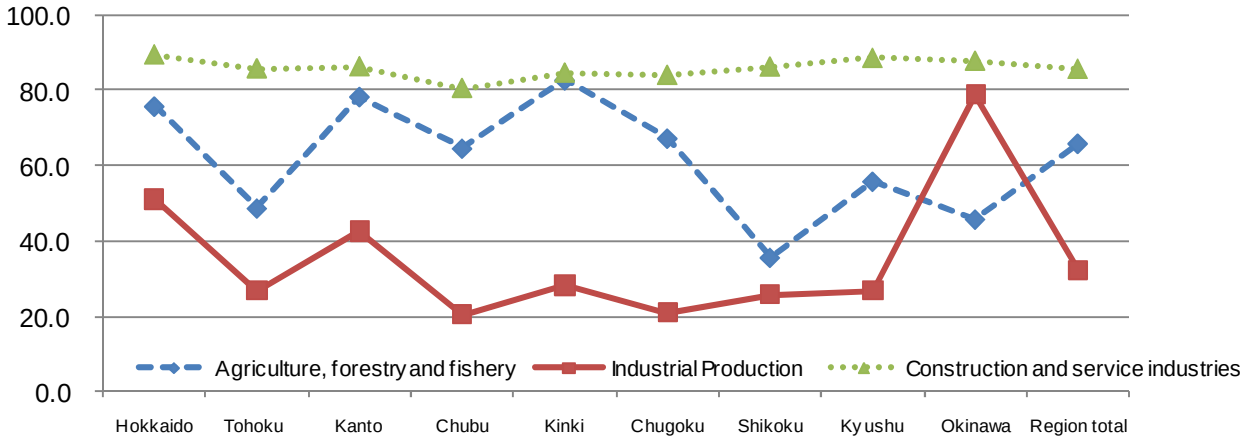


Figure 4-5: Ratio of in-region consumption and investment by industry (percent)



5. Inter-regional trade structure

(1) Change.0s in total inter-regional trade

(i) Changes in total inter-regional trade

Total inter-regional trade (total outflows and inflows for all regions) during 2005 was 200.5997 trillion yen, a 0.7 percent decrease compared with 2000 (Table 5-1).

Looking at outflows, the ratio of outflow to the total production within one region was 1.2 percent, down 0.4 percentage points compared with 2000.

Turning next to inflows, the ratio of inflow to the total demand within one region was 21.2 percent, a decrease of 0.4 percentage points compared with 2000.

Looking at the in-region supply ratio (the share of all regional demand accounted for by in-region products [1 − (ratio of inflow to the total demand within one region + ratio of import to the total demand)]), it was 71.2 percent, a drop of 1.4 percentage points compared with 2000.

Table 5-1: Amount of inter-regional trade

Item / Region	Outflows (¥100 million)			Composition ratio (%)			Rate of increase-decrease (%)		Ratio of outflow to the total production within one region (%)			
	1995	2000	2005	1995	2000	2005	2005 / 1995	2005 / 2000	1995	2000	2005	2005-2000
Hokkaido	62,468	66,187	69,252	3.2	3.3	3.5	10.9	4.6	17.9	19.1	20.4	1.3
Tohoku	160,965	159,164	155,994	8.2	7.9	7.8	-3.1	-2.0	26.9	26.6	27.2	0.6
Kanto	641,390	714,172	681,270	32.6	35.4	34.0	6.2	-4.6	16.4	17.7	16.7	-1.0
Chubu	323,281	316,763	339,496	16.4	15.7	16.9	5.0	7.2	28.2	27.7	27.5	-0.2
Kinki	370,284	373,802	364,235	18.8	18.5	18.2	-1.6	-2.6	23.1	23.8	23.9	0.1
Chugoku	172,684	164,516	173,945	8.8	8.1	8.7	0.7	5.7	29.9	28.9	28.1	-0.7
Shikoku	77,161	74,311	74,265	3.9	3.7	3.7	-3.8	-0.1	29.2	28.8	28.9	0.1
Kyushu	152,468	142,270	140,383	7.8	7.0	7.0	-7.9	-1.3	19.6	18.1	17.7	-0.4
Okinawa	6,276	7,993	7,157	0.3	0.4	0.4	14.0	-10.5	11.6	13.5	12.4	-1.1
Region total	1,966,977	2,019,177	2,005,997	100.0	100.0	100.0	2.0	-0.7	21.2	21.5	21.2	-0.4

Item / Region	Inflows (¥100 million)			Composition ratio (%)			Rate of increase-decrease (%)		Ratio of inflow to the total demand within one region (%)				Same-region supply ratio (%)			
	1,995	2,000	2,005	1995	2000	2005	2005 / 1995	2005 / 2000	1995	2000	2005	2005-2000	1995	2000	2005	2005-2000
Hokkaido	85,081	89,672	82,600	4.3	4.4	4.1	-2.9	-7.9	22.2	23.3	22.1	-1.1	73.9	72.1	71.3	-0.8
Tohoku	172,562	182,972	172,003	8.8	9.1	8.6	-0.3	-6.0	27.8	29.2	28.9	-0.3	68.0	65.7	64.4	-1.3
Kanto	595,146	586,252	561,578	30.3	29.0	28.0	-5.6	-4.2	15.5	15.0	14.1	-0.9	79.7	78.9	78.2	-0.7
Chubu	297,224	311,714	356,374	15.1	15.4	17.8	19.9	14.3	27.5	28.5	29.8	1.3	67.8	65.7	62.2	-3.6
Kinki	359,827	367,175	354,537	18.3	18.2	17.7	-1.5	-3.4	22.6	23.6	23.5	-0.1	72.6	70.5	69.2	-1.3
Chugoku	164,201	171,163	173,813	8.3	8.5	8.7	5.9	1.5	29.0	29.8	28.1	-1.7	65.7	63.7	62.2	-1.6
Shikoku	86,601	88,060	85,075	4.4	4.4	4.2	-1.8	-3.4	31.3	32.4	31.2	-1.2	63.5	61.5	60.2	-1.3
Kyushu	192,182	205,756	205,986	9.8	10.2	10.3	7.2	0.1	23.4	24.4	24.4	0.0	72.4	70.9	69.0	-1.9
Okinawa	14,153	16,414	14,030	0.7	0.8	0.7	-0.9	-14.5	22.5	23.6	21.1	-2.5	72.7	72.1	74.1	2.0
Region total	1,966,977	2,019,177	2,005,997	100.0	100.0	100.0	2.0	-0.7	21.3	21.6	21.2	-0.4	74.0	72.6	71.2	-1.4

(ii) Changes in trade by region in terms of outflows

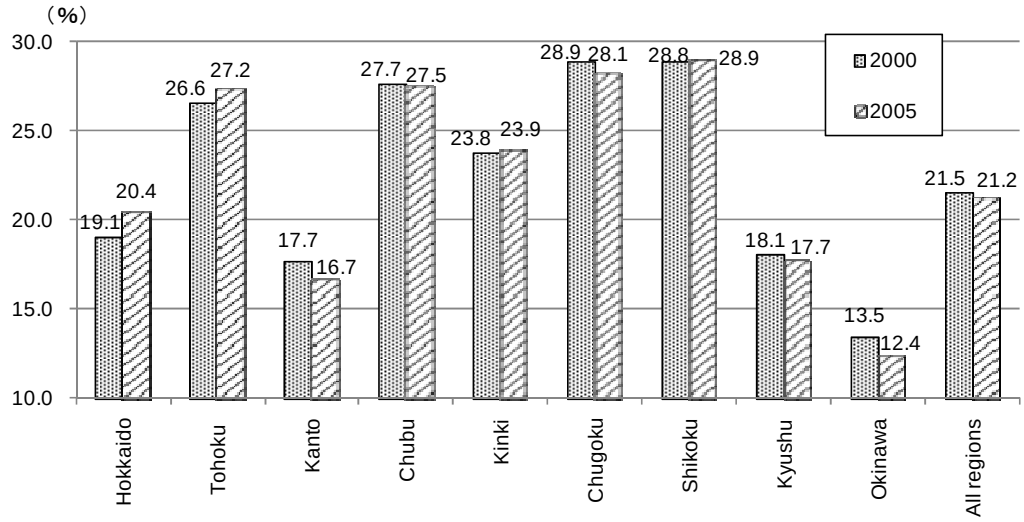
Changes in the amount of trade by region can be looked at in terms of outflows (Table 5-1).

Looking at outflows by region, in Kanto they were 68.1270 trillion yen (composition ratio of 34.0 percent), in Kinki 36.4235 trillion yen (18.2 percent), and in Chubu 33.9496 trillion yen (16.9 percent). Those top three regions accounted for about 70 percent of all outflows.

Compared with outflows in 2000, Chubu (up 7.2 percent), Chugoku (up 5.7 percent), and Hokkaido (up 4.6 percent) increased, but the other regions, including Kanto (down 4.6 percent) and Kinki (down 2.6 percent) decreased. Okinawa had the largest decrease (10.5 percent).

Looking at the ratio of outflow to the total production within one region by region, Shikoku (28.9 percent), Chugoku (28.1 percent), Chubu (27.5 percent), and Tohoku (27.2 percent) were high, while Okinawa (12.4 percent) and Kanto (16.7 percent) were low. Compared with 2000, Hokkaido, Tohoku, Kinki, increased Shikoku, while Okinawa, Kanto, Chugoku, Kyushu, and Chubu decreased (Figure 5-1).

Figure 5-1: Change in the ratio of outflow to the total production within one region by region



(iii) Changes in trade by region in terms of inflows

Changes in the amount of trade by region can be looked at in terms of inflows (Table 5-1).

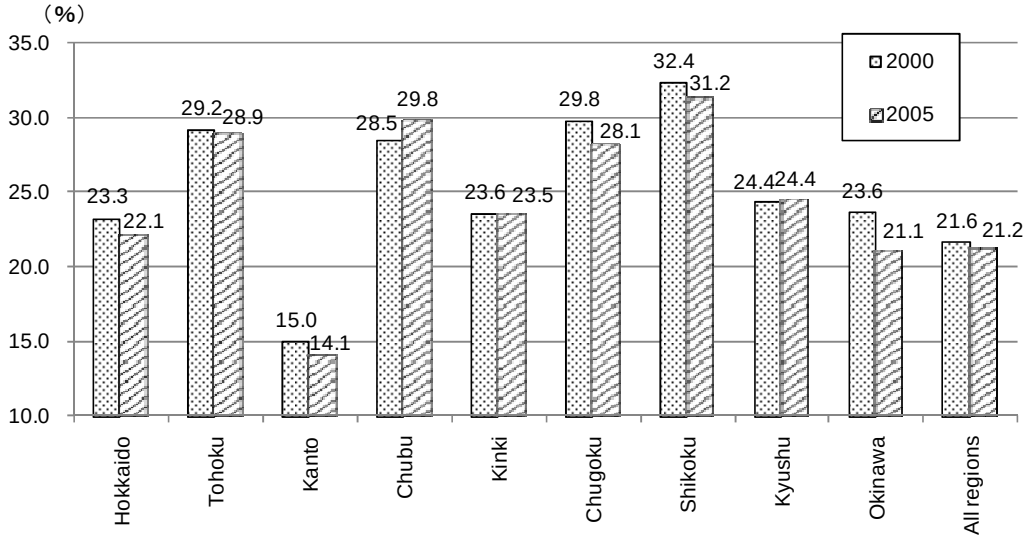
Looking at inflows by region, Kanto had 56.1578 trillion yen (composition ratio 28.0 percent) in inflows, Chubu 35.6374 trillion yen (17.8 percent), and Kinki 35.4537 trillion yen (17.7 percent). The top three regions accounted for about 60 percent of all inflows.

Compared with 2000, inflows increased in Chubu (up 14.3 percent) and Chugoku (up 1.5 percent), where outflows also increased, as well as in Kyushu (up 0.1 percent). Inflows decreased in all other regions. As with outflows, the largest decrease was in Okinawa (down 14.5 percent).

Looking at the ratio of inflow to the total demand within one region by region, Shikoku (31.2 percent), Chubu (29.8 percent), Tohoku (28.9 percent), and Chugoku (28.1 percent) were high, while Kanto (14.1 percent) was strikingly low. Compared with 2000, the ratio increased in Chubu, was basically unchanged in Kyushu, and declined in every other region (Figure 5-2).

Kanto, Okinawa, and Hokkaido had low ratios of inflow to the total demand within one region and high in-region supply ratios, while Chugoku and Shikoku had high ratios of inflow to the total demand within one region and low in-region supply ratios.

Figure 5-2: Change in the ratio of inflow to the total demand within one region by region



(iv) Characteristics of each region in comparison to averages for all regions

Characteristics of and changes in each region can be observed through comparison of each region's ratios of inflow/outflow with the average ratios for all regions (Figure 5-3).

Regions in Quadrant I exceed the average for all regions in both ratio of outflow to the total production within one region and ratio of inflow to the total demand within one region. This group can be called the interdependent (trade) type. Shikoku, Chugoku, Chubu, and Tohoku were highly dependent on inflow/outflow; Kinki was part of this group as well.

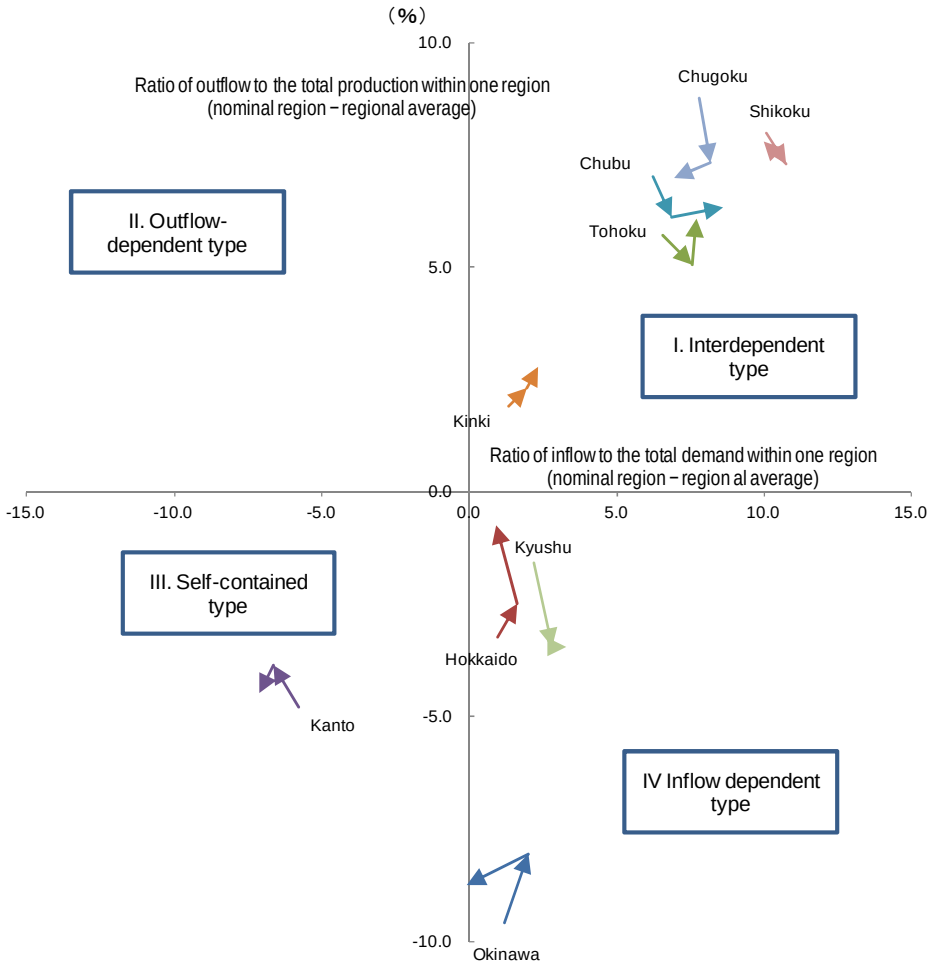
Quadrant II is for regions that exceed the average ratio of outflow to the total production within one region but have a ratio of inflow to the total demand within one region below the average for all regions. This group could be called outflow-dependent. However, no regions fell into this quadrant.

Regions in Quadrant III are below average for both ratio of outflow to the total production within one region and ratio of inflow to the total demand within one region. This group could be called the self-contained (Regional trade) type. Kanto and Okinawa are in this group.

Regions in Quadrant IV exceed the average in ratio of inflow to the total demand within one region but fall below the average in ratio of outflow to the total production within one region. This group can be called inflow-dependent. Kyushu and Hokkaido are in this group.

Regarding the above characteristics, Okinawa shifted from inflow-dependent to self-contained, but all other regions were unchanged from 1995 to 2005. In the Quadrant IV inflow-dependent group, Kyushu has become more dependent on inflows, while Hokkaido has shifted towards the interdependent group.

Figure 5-3: Changes in ratios of inflow/outflow by region



Note 1: The two connected arrows originate in 1995, with the first arrow ending in 2000, and the second arrow beginning there and ending in 2005.

Note 2: The vertical axis represents each region's deviance from the year's national average ratio of outflow to the total production within one region (each region minus the national average). The horizontal axis represents the same thing for the ratio of inflow to the total demand within one region.

(2) Trade structure by industry

(i) Trade structure by industry (all-region total)

Looking by industry at the composition ratio of total trade for all regions in 2005, the highest shares were held by commerce and transport (26.7 percent), machinery (23.9 percent), and miscellaneous manufacturing products (19.3 percent). (See Table 5-2.)

Compared with 2000, miscellaneous manufacturing products, information and communications/service industries, machinery, and agriculture, forestry, and fishery contracted, while commerce and transport and metal products expanded.

Table 5-2: Trade amount by industry

	Trade amount (¥100 million)			Composition ratio (%)			Increase-decrease
	1995	2000	2005	1995	2000	2005	2005–2000
Agriculture, forestry and fishery	58,801	45,486	41,058	3.0	2.3	2.0	-0.2
Mining	2,676	2,772	2,793	0.1	0.1	0.1	0.0
Beverages and Foods	132,098	140,847	139,282	6.7	7.0	6.9	0.0
Metal products	141,724	125,722	149,071	7.2	6.2	7.4	1.2
Machinery	456,830	498,784	478,637	23.2	24.7	23.9	-0.8
Miscellaneous manufacturing products	447,719	422,529	386,195	22.8	20.9	19.3	-1.7
Construction	0	1,014	1,132	0.0	0.1	0.1	0.0
Public utilities	27,204	18,808	22,504	1.4	0.9	1.1	0.2
Commerce and transport	500,060	488,185	535,097	25.4	24.2	26.7	2.5
Finance and insurance and real estate	26,643	11,533	11,742	1.4	0.6	0.6	0.0
Information and communications services	173,221	263,499	238,487	8.8	13.0	11.9	-1.2
All industries	1,966,977	2,019,177	2,005,997	100.0	100.0	100.0	0.0

(ii) Composition of outflows by industry and region

Looking at the composition of outflows by industry and region (composition ratio with all regions at 100), Kanto, which accounts for more than 30 percent of all outflows, holds the top share in almost every industry, including finance, insurance, and real estate (68.9 percent), information and communications/service industries (67.3 percent), and construction (55.6 percent). Tohoku is fist in electricity and other public utilities (46.4 percent) and in agriculture, forestry, and fishery (21.1 percent), and Kinki is first ion metal products (23.1 percent). (See Table 5-3.)

Table 5-3: Composition of outflows by industry and region (percent)

	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
Agriculture, forestry and fishery	17.8	21.1	14.3	7.4	3.6	6.3	9.6	18.9	1.0	100.0
Mining	14.9	9.5	15.2	10.0	12.7	11.7	8.9	14.4	2.7	100.0
Beverages and Foods	9.1	12.2	24.7	11.7	18.6	6.6	3.8	13.1	0.3	100.0
Metal products	2.0	6.4	20.4	21.3	23.1	15.5	4.4	7.0	0.1	100.0
Machinery	0.9	8.0	30.9	26.0	18.0	8.7	1.9	5.6	0.0	100.0
Miscellaneous manufacturing products	2.8	6.0	27.5	18.8	19.9	12.9	6.4	5.5	0.1	100.0
Construction	0.6	1.1	55.6	5.8	32.1	2.3	0.1	2.2	0.0	100.0
Public utilities	0.1	46.4	14.4	18.4	14.0	2.4	3.2	1.0	0.0	100.0
Commerce and transport	4.7	8.0	34.4	13.2	19.3	7.5	3.8	8.5	0.7	100.0
Finance and insurance and real estate	3.3	1.6	68.9	3.9	13.8	1.4	3.3	3.7	0.1	100.0
Information and communications services	2.1	2.4	67.3	6.7	12.8	2.7	1.3	4.0	0.7	100.0

(iii) Composition of inflows by industry and region

Looking at the composition of inflows by industry and region, as with outflows, Kanto is first in almost all industries, led by public utilities (61.7 percent) and agriculture, forestry, and fishery (35.6 percent). Kyushu is first in construction (28.8 percent) and Chubu is first in finance, insurance, and real estate (31.0 percent) and information and communications/service industries (20.6 percent). (See Table 5-4.)

Table 5-4: Composition of inflows by industry and region (percent)

	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
Agriculture, forestry and fishery	5.2	7.7	35.6	11.6	22.9	7.4	3.0	5.8	1.0	100.0
Mining	5.5	5.4	32.8	13.1	17.1	13.8	4.6	7.4	0.2	100.0
Beverages and Foods	5.6	7.6	31.8	13.8	20.6	7.5	4.2	8.0	1.0	100.0
Metal products	2.5	7.1	31.5	20.0	18.7	8.6	3.9	7.2	0.5	100.0
Machinery	3.5	7.2	32.7	17.5	15.7	7.8	3.0	12.1	0.6	100.0
Miscellaneous manufacturing products	4.6	8.4	29.4	14.9	18.0	7.7	4.6	11.5	0.8	100.0
Construction	11.5	10.7	10.5	14.7	11.0	8.6	3.6	28.8	0.5	100.0
Public utilities	1.7	6.1	61.7	10.0	15.6	3.0	0.6	1.2	0.0	100.0
Commerce and transport	3.9	9.5	25.6	19.8	17.2	9.7	4.9	8.9	0.6	100.0
Finance and insurance and real estate	10.2	12.7	7.4	31.0	6.3	9.3	4.8	18.2	0.2	100.0
Information and communications services	4.9	11.3	13.7	20.6	20.0	11.0	5.4	12.1	1.0	100.0

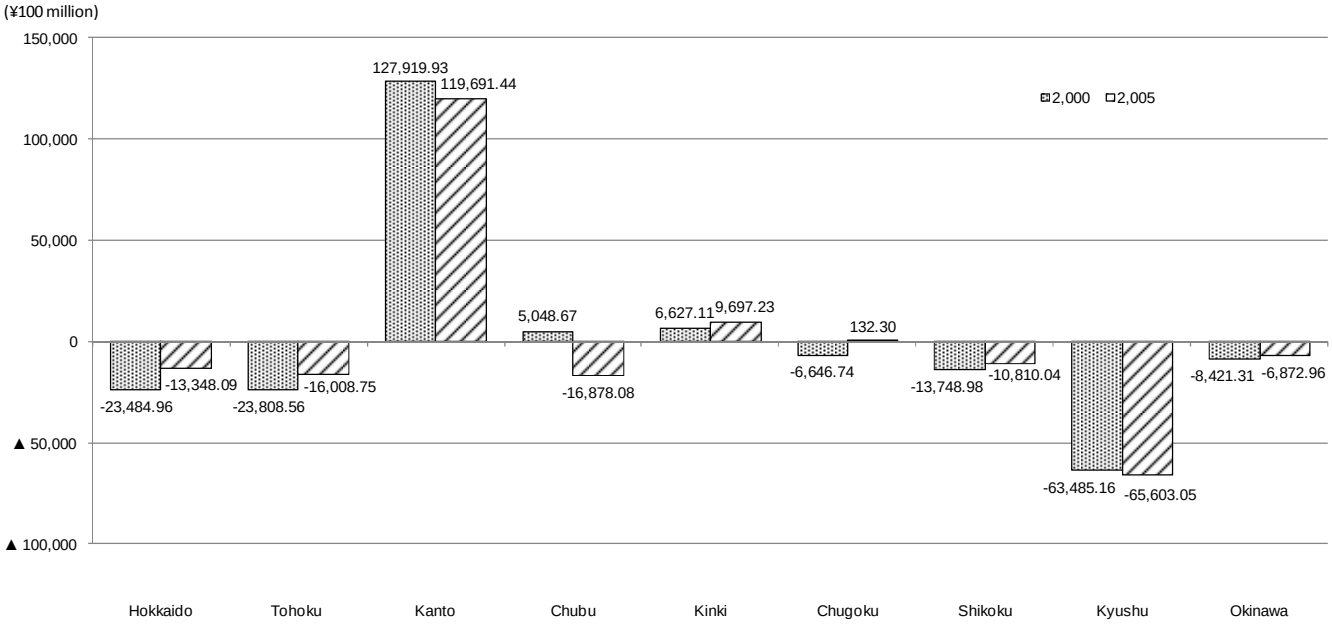
(3) Inter-regional balance of payments for each region

(i) Inter-regional balance of payments by region

Looking at the inter-regional balance of payments (outflows minus inflows) by region, only three regions, Kanto, Kinki, and Chugoku have outflow surpluses. As in 2000, Kanto's outflow surplus is strikingly high (Figure 5-4). Six regions have inflow surpluses. Kyushu's is remarkably high; next in order come Chubu, Tohoku, Hokkaido, Shikoku, and Okinawa.

Chugoku had an inflow surplus in 2000, but shifted to a slight outflow surplus in 2005. Chubu had an outflow surplus in 2000, but shifted to an inflow surplus in 2005.

Figure 5-4: Inter-regional balance of payments by region



(ii) Inter-regional balance of payments by region and industry

The balance between each region's inflows and outflows was examined by region and industry (Table 5-5).

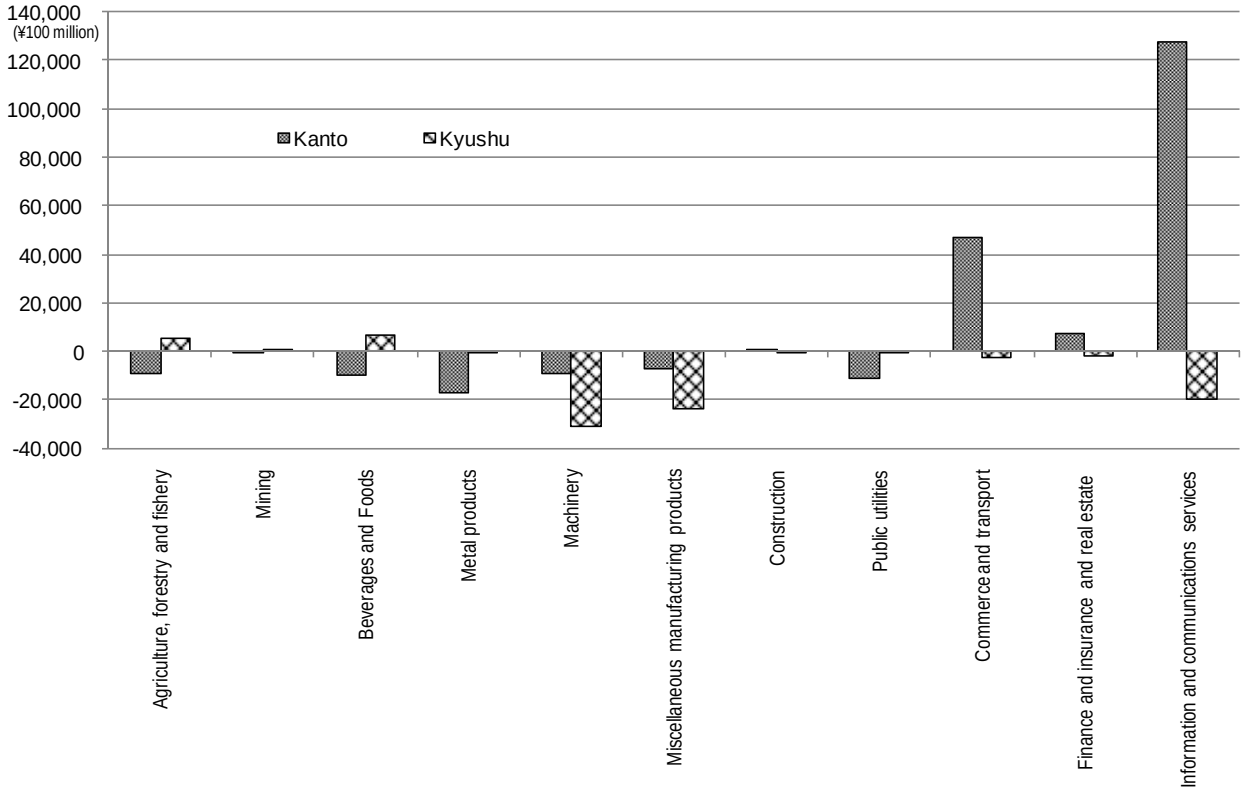
Looking at outflow surplus regions, the strikingly high Kanto had a large outflow surplus in information and communications/service industries (12.7618 trillion yen), followed by commerce and transport (4.6882 trillion yen). Kinki had large surpluses in commerce and transport (1.1399 trillion yen) and machinery (1.1365 trillion yen), and Chugoku had a large surplus in miscellaneous manufacturing products (2.0019 trillion yen).

Looking at inflow surplus regions, Kyushu had large inflow surpluses in machinery 3.0965 trillion yen) and miscellaneous manufacturing products (2.3343 trillion yen), and Chubu had a large surplus in commerce and transport (3.5626 trillion yen).

Table 5-5: Inter-regional balance of payments by region and industry (100 million yen)

	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa
Agriculture, forestry and fishery	5,172	5,510	-8,734	-1,743	-7,910	-436	2,738	5,383	20
Mining	263	115	-492	-87	-122	-60	118	195	70
Beverages and Foods	4,822	6,322	-9,888	-2,874	-2,698	-1,269	-603	7,134	-945
Metal products	-839	-1,145	-16,591	1,907	6,602	10,156	820	-309	-601
Machinery	-12,165	3,863	-8,974	40,788	11,365	4,358	-5,318	-30,965	-2,953
Miscellaneous manufacturing products	-6,951	-9,512	-7,191	15,199	7,429	20,019	7,048	-23,343	-2,698
Construction	-123	-109	510	-101	239	-71	-39	-302	-5
Public utilities	-353	9,068	-10,665	1,891	-343	-122	582	-48	-9
Commerce and transport	4,366	-7,635	46,882	-35,626	11,399	-11,695	-6,133	-2,372	813
Finance and insurance and real estate	-810	-1,305	7,218	-3,175	890	-930	-179	-1,697	-12
Information and communications services	-6,728	-21,182	127,618	-33,058	-17,153	-19,817	-9,846	-19,280	-554
All industries	-13,348	-16,009	119,691	-16,878	9,697	132	-10,810	-65,603	-6,873

Figure 5-5: Inter-regional balance of payments for Kanto and Kyushu by industry (100 million yen)



6. I-O Table analysis of regional economies

Each region's production activities begin when there is demand. Final demand and production activities are intimately linked.
Here, dependency is analyzed by region using domestic products induced by individual final demand items ("induced domestic products"). Induced domestic products in the Inter-regional I-O Table have regions in both rows and columns, so caution is required.
In the case of simple induced domestic products by region, totals are indicated in the ordinary horizontal direction, but note that for (1) and (2) below, induced domestic products are analyzed vertically, and for (3) induced domestic products are analyzed horizontally.

(1) Induced domestic products

(i) Total final demand

Total induced domestic products for all regions from total final demand in the 2005 Inter-regional I-O Table was 948.1934 trillion yen, an increase of 1.2 percent compared with 2000 (Table 6-1). This can be divided into the case in which final demand in a region induces production in that same region ("in-region induced domestic products") and the case in which it induces production in another region ("other-region induced domestic products"). In-region induced domestic products were 669.2298 trillion yen, an increase of 1.9 percent. Other-region induced domestic products were 278.9635 trillion yen, a decrease of 0.6 percent.

Examined by region, in-region induced domestic products were higher than other-region induced domestic products in every region (Figure 6-1). Looking at the in-region production inducement ratio (in-region induced domestic products divided by total induced domestic products), the all-region total was 70.6 percent. Kanto was strikingly high at 79.9 percent, and was followed by Kinki at 67.8 percent and Okinawa 66.3 percent.

Comparing figures for in-region induced domestic products and other-region induced domestic products with 2000, both in-region induced domestic products and other-region induced domestic products increased in Chubu, Chugoku, and Kyushu and decreased in Hokkaido, Tohoku, Kinki, and Okinawa.

Figure 6-1: Production inducement ratio from total final demand (in-region and other-region ratios by region)

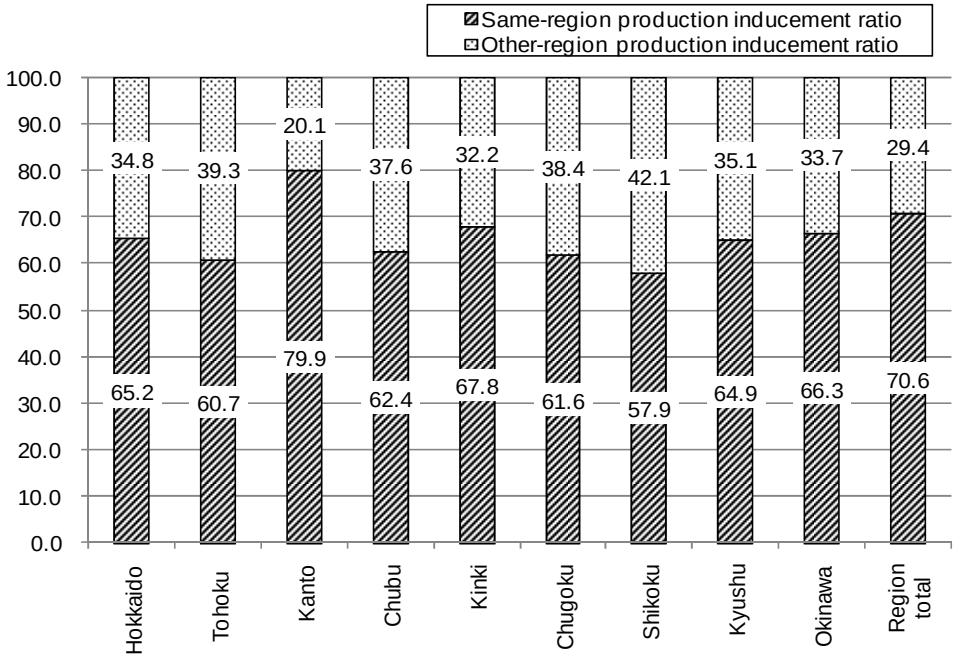


Table 6-1: Induced domestic products from total final demand

(Units: ¥100 million, %)

				Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
Total	Induced domestic products		1995	396,983	628,027	3,849,354	1,065,118	1,583,111	548,687	283,652	857,035	70,720	9,282,688
			2000	397,052	647,166	3,827,358	1,096,214	1,561,988	566,327	286,993	912,189	76,946	9,372,233
			2005	371,183	605,679	3,908,590	1,213,409	1,506,115	600,204	281,229	923,629	71,896	9,481,934
		Growth rate (%)	2000 / 1995	0.0	3.0	-0.6	2.9	-1.3	3.2	1.2	6.4	8.8	1.0
			2005 / 2000	-6.5	-6.4	2.1	10.7	-3.6	6.0	-2.0	1.3	-6.6	1.2
		Production inducement ratio		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Same region	Same-region induced domestic products		1995	257,631	383,284	3,009,242	679,993	1,084,588	332,361	162,315	563,059	45,773	6,518,246
			2000	253,545	389,966	3,030,078	695,162	1,055,830	339,608	162,191	591,056	48,684	6,566,120
			2005	242,103	367,679	3,123,171	757,766	1,021,329	369,963	162,775	599,826	47,688	6,692,298
		Growth rate (%)	2000 / 1995	-1.6	1.7	0.7	2.2	-2.7	2.2	-0.1	5.0	6.4	0.7
			2005 / 2000	-4.5	-5.7	3.1	9.0	-3.3	8.9	0.4	1.5	-2.0	1.9
		Production inducement ratio	2000	63.9	60.3	79.2	63.4	67.6	60.0	56.5	64.8	63.3	70.1
			2005	65.2	60.7	79.9	62.4	67.8	61.6	57.9	64.9	66.3	70.6
			2005–2000	1.4	0.4	0.7	-1.0	0.2	1.7	1.4	0.1	3.1	0.5
Other regions	Other-region induced domestic products		1995	139,352	244,743	840,112	385,125	498,523	216,326	121,337	293,976	24,947	2,764,442
			2000	143,507	257,200	797,280	401,052	506,158	226,719	124,802	321,133	28,262	2,806,113
			2005	129,080	238,000	785,420	455,643	484,786	230,241	118,454	323,802	24,208	2,789,635
		Growth rate (%)	2000 / 1995	3.0	5.1	-5.1	4.1	1.5	4.8	2.9	9.2	13.3	1.5
			2005 / 2000	-10.1	-7.5	-1.5	13.6	-4.2	1.6	-5.1	0.8	-14.3	-0.6
		Production inducement ratio	2000	36.1	39.7	20.8	36.6	32.4	40.0	43.5	35.2	36.7	29.9
			2005	34.8	39.3	20.1	37.6	32.2	38.4	42.1	35.1	33.7	29.4
			2005–2000	-1.4	-0.4	-0.7	1.0	-0.2	-1.7	-1.4	-0.1	-3.1	-0.5

(ii) By final demand items

Looking at domestic products induced by individual final demand items, total consumption for all regions was 582.7511 trillion yen (up 0.7 percent compared with 2000), investment was 212.2457 trillion yen (down 11.4 percent), and exports were 153.1966 trillion yen (up 29.0 percent). Exports increased sharply from 2000 (Table 6-2).

Dividing domestic products induced by individual final demand items into in-region induced domestic products and other-region induced domestic products and comparing them with 2000, in consumption, in-region and other-region induced domestic products moved in opposite directions, with in-region induction increasing. In-region induced domestic products increased by 2.1 percent, while other-region induced domestic products decreased by 3.1 percent. In investment, in-region induced domestic products and other-region induced domestic products both declined, with a high rate of decrease in in-region induced domestic products (down 14.1 percent). In exports, both in-region induced domestic products and other-region induced domestic products rose markedly.

Comparing domestic products induced by individual final demand items by region with 2000, in consumption, five regions, Chubu, Kanto, Chugoku, Okinawa, and Shikoku, increased, while four regions, Kinki, Tohoku, Hokkaido, and Kyushu, decreased. In investment, all regions decreased, in double digits everywhere but Kanto and Chubu. In contrast, exports increased in all regions, with Kyushu (up 57.1 percent compared with 2000), Chugoku (up 53.6 percent), and Chubu (40.2 percent) rising sharply by more than 40 percent.

Finally, turning to in-region production inducement ratio by final demand item and region, the ratio for consumption was at least 60 percent in every region. Kanto was extremely high (81.8 percent). Like consumption, investment was highest in Kanto (73.3 percent). It was lowest in Shikoku (45.3 percent). In all regions, the in-region production inducement ratio was lower for investment than for consumption. The highest region for exports was Okinawa (84.3 percent); the lowest was Shikoku (65.4 percent).

The in-region production inducement ratio for exports is higher than for the other final demand items because exports differ from the others in that they are in-region products.

Table 6-2: Domestic products induced by final demand items

Consumption			Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
Total	Induced domestic products	1995	271,287	397,985	2,300,591	559,479	970,251	320,316	178,515	560,781	46,452	5,605,656
		2000	279,691	404,903	2,369,582	569,872	1,002,837	339,406	182,754	588,437	52,102	5,789,585
		2005	275,043	390,030	2,416,579	618,570	966,212	345,756	183,232	579,360	52,729	5,827,511
	Growth rate (%)	2000 / 1995	3.1	1.7	3.0	1.9	3.4	6.0	2.4	4.9	12.2	3.3
		2005 / 2000	-1.7	-3.7	2.0	8.5	-3.7	1.9	0.3	-1.5	1.2	0.7
	Production inducement ratio		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Same region	Same-region induced domestic products	1995	180,776	250,122	1,812,968	353,285	672,165	196,986	105,073	380,853	31,542	3,983,771
		2000	184,588	256,764	1,901,096	359,659	694,035	207,638	108,474	401,824	35,091	4,149,167
		2005	185,330	251,772	1,977,073	382,458	673,203	216,989	111,357	403,280	36,446	4,237,907
	Growth rate (%)	2000 / 1995	2.1	2.7	4.9	1.8	3.3	5.4	3.2	5.5	11.3	4.2
		2005 / 2000	0.4	-1.9	4.0	6.3	-3.0	4.5	2.7	0.4	3.9	2.1
	Production inducement ratio	2000	66.0	63.4	80.2	63.1	69.2	61.2	59.4	68.3	67.3	71.7
		2005	67.4	64.6	81.8	61.8	69.7	62.8	60.8	69.6	69.1	72.7
		2005–2000	1.4	1.1	1.6	-1.3	0.5	1.6	1.4	1.3	1.8	1.1
Other regions	Other-region induced domestic products	1995	90,511	147,862	487,623	206,194	298,086	123,330	73,442	179,928	14,910	1,621,885
		2000	95,103	148,140	468,486	210,213	308,802	131,768	74,280	186,613	17,011	1,640,417
		2005	89,713	138,258	439,505	236,112	293,009	128,767	71,875	176,081	16,283	1,589,603
	Growth rate (%)	2000 / 1995	5.1	0.2	-3.9	1.9	3.6	6.8	1.1	3.7	14.1	1.1
		2005 / 2000	-5.7	-6.7	-6.2	12.3	-5.1	-2.3	-3.2	-5.6	-4.3	-3.1
	Production inducement ratio	2000	34.0	36.6	19.8	36.9	30.8	38.8	40.6	31.7	32.7	28.3
		2005	32.6	35.4	18.2	38.2	30.3	37.2	39.2	30.4	30.9	27.3
		2005–2000	-1.4	-1.1	-1.6	1.3	-0.5	-1.6	-1.4	-1.3	-1.8	-1.1
Investment			**Hokkaido**	**Tohoku**	**Kanto**	**Chubu**	**Kinki**	**Chugoku**	**Shikoku**	**Kyushu**	**Okinawa**	**Region total**
Total	Induced domestic products	1995	120,928	197,563	1,120,848	305,274	460,989	158,791	80,593	233,025	21,205	2,699,217
		2000	111,728	187,840	974,653	287,428	366,444	144,697	72,446	227,153	22,876	2,395,264
		2005	89,338	148,491	913,821	259,931	310,094	128,146	63,034	192,508	17,094	2,122,457
	Growth rate (%)	2000 / 1995	-7.6	-4.9	-13.0	-5.8	-20.5	-8.9	-10.1	-2.5	7.9	-11.3
		2005 / 2000	-20.0	-20.9	-6.2	-9.6	-15.4	-11.4	-13.0	-15.3	-25.3	-11.4
	Production inducement ratio		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Same region	Same-region induced domestic products	1995	73,370	110,535	843,687	179,993	297,282	86,565	41,200	137,071	11,619	1,781,323
		2000	64,934	96,526	732,434	162,605	219,470	74,663	33,166	122,973	11,954	1,518,724
		2005	51,635	71,179	669,613	137,206	178,015	62,714	28,547	96,870	9,495	1,305,275
	Growth rate (%)	2000 / 1995	-11.5	-12.7	-13.2	-9.7	-26.2	-13.7	-19.5	-10.3	2.9	-14.7
		2005 / 2000	-20.5	-26.3	-8.6	-15.6	-18.9	-16.0	-13.9	-21.2	-20.6	-14.1
	Production inducement ratio	2000	58.1	51.4	75.1	56.6	59.9	51.6	45.8	54.1	52.3	63.4
		2005	57.8	47.9	73.3	52.8	57.4	48.9	45.3	50.3	55.5	61.5
		2005–2000	-0.3	-3.5	-1.9	-3.8	-2.5	-2.7	-0.5	-3.8	3.3	-1.9
Other regions	Other-region induced domestic products	1995	47,558	87,027	277,161	125,281	163,708	72,226	39,393	95,955	9,586	917,894
		2000	46,795	91,314	242,219	124,822	146,974	70,034	39,280	104,180	10,922	876,540
		2005	37,703	77,312	244,208	122,725	132,080	65,432	34,486	95,638	7,599	817,182
	Growth rate (%)	2000 / 1995	-1.6	4.9	-12.6	-0.4	-10.2	-3.0	-0.3	8.6	13.9	-4.5
		2005 / 2000	-19.4	-15.3	0.8	-1.7	-10.1	-6.6	-12.2	-8.2	-30.4	-6.8
	Production inducement ratio	2000	41.9	48.6	24.9	43.4	40.1	48.4	54.2	45.9	47.7	36.6
		2005	42.2	52.1	26.7	47.2	42.6	51.1	54.7	49.7	44.5	38.5
		2005–2000	0.3	3.5	1.9	3.8	2.5	2.7	0.5	3.8	-3.3	1.9
Exports			**Hokkaido**	**Tohoku**	**Kanto**	**Chubu**	**Kinki**	**Chugoku**	**Shikoku**	**Kyushu**	**Okinawa**	**Region total**
Total	Induced domestic products	1995	4,768	32,480	427,915	200,365	151,871	69,581	24,544	63,229	3,063	977,816
		2000	5,633	54,423	483,122	238,914	192,707	82,224	31,793	96,600	1,968	1,187,384
		2005	6,803	67,158	578,190	334,908	229,809	126,302	34,963	151,760	2,072	1,531,966
	Growth rate (%)	2000 / 1995	18.1	67.6	12.9	19.2	26.9	18.2	29.5	52.8	-35.8	21.4
		2005 / 2000	20.8	23.4	19.7	40.2	19.3	53.6	10.0	57.1	5.3	29.0
	Production inducement ratio		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Same region	Same-region induced domestic products	1995	3,485	22,627	352,587	146,715	115,142	48,809	16,042	45,135	2,612	753,153
		2000	4,024	36,676	396,548	172,898	142,325	57,308	20,551	66,260	1,639	898,228
		2005	5,138	44,728	476,484	238,102	170,112	90,260	22,871	99,677	1,746	1,149,116
	Growth rate (%)	2000 / 1995	15.5	62.1	12.5	17.8	23.6	17.4	28.1	46.8	-37.2	19.3
		2005 / 2000	27.7	22.0	20.2	37.7	19.5	57.5	11.3	50.4	6.5	27.9
	Production inducement ratio	2000	71.4	67.4	82.1	72.4	73.9	69.7	64.6	68.6	83.3	75.6
		2005	75.5	66.6	82.4	71.1	74.0	71.5	65.4	65.7	84.3	75.0
		2005–2000	4.1	-0.8	0.3	-1.3	0.2	1.8	0.8	-2.9	0.9	-0.6
Other regions	Other-region induced domestic products	1995	1,283	9,853	75,328	53,650	36,730	20,771	8,502	18,094	451	224,663
		2000	1,609	17,747	86,575	66,016	50,382	24,916	11,241	30,340	328	289,156
		2005	1,665	22,431	101,706	96,807	59,697	36,042	12,092	52,083	326	382,850
	Growth rate (%)	2000 / 1995	25.4	80.1	14.9	23.0	37.2	20.0	32.2	67.7	-27.3	28.7
		2005 / 2000	3.5	26.4	17.5	46.6	18.5	44.7	7.6	71.7	-0.6	32.4
	Production inducement ratio	2000	28.6	32.6	17.9	27.6	26.1	30.3	35.4	31.4	16.7	24.4
		2005	24.5	33.4	17.6	28.9	26.0	28.5	34.6	34.3	15.7	25.0
		2005–2000	-4.1	0.8	-0.3	1.3	-0.2	-1.8	-0.8	2.9	-0.9	0.6

(iii) Inter-regional interdependent relationships of induced domestic products

Looking at inter-regional interdependent relationships between a region's other-region induced domestic products from final demand (vertical direction) and its induced domestic products from other-region final demand (horizontal direction), there are regions with strikingly unbalanced "one-way" relationships (a coefficient below 0.8 or above 1.4) between production in Region B induced by final demand in Region A and production in Region A induced by final demand in Region B (Table 6-3).

The regions with such relationships include Hokkaido (production inducement region) with Kanto, Chubu, Kinki, Chugoku, and Shikoku (final demand regions) and Tohoku (production inducement region) with Chubu and Chugoku (final demand regions). In these cases, the amount of induced domestic products through the former region's final demand is high in the latter region. The opposite holds for Shikoku (final demand region) with Kanto (production inducement region), Kyushu (final demand region) with Kanto, Chubu, Kinki, and Chugoku (production inducement regions), and Okinawa (final demand region) with all regions (production inducement regions). In these cases, the amount of induced domestic products through the former region's final demand is high in the latter region. Final demand in Okinawa in particular induces large production in other regions, but final demand in other regions has an extremely small inducement effect on production in Okinawa.

Table 6-3: Comparison of regional interdependent relationships of induced domestic products through final demand in all industries

(Unit: ¥1 billion)

Production inducement region \ Final demand region	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa
Hokkaido		1074 (0.982)	4689 (0.691)	1281 (0.765)	1425 (0.762)	435 (0.602)	176 (0.760)	591 (1.167)	43 (2.217)
Tohoku	1093 (1)		12078 (0.844)	2272 (0.773)	2399 (0.822)	850 (0.760)	419 (0.953)	1302 (1.355)	86 (2.707)
Kanto	6791 (1)	14317 (1)		23940 (1.082)	22173 (1.080)	9400 (1.115)	4590 (1.482)	14086 (1.971)	1031 (2.274)
Chubu	1673 (1)	2941 (1)	22118 (1)		10827 (1.035)	3323 (0.962)	1526 (1.245)	5002 (1.786)	314 (2.511)
Kinki	1870 (1)	2919 (1)	20533 (1)	10465 (1)		5160 (0.967)	2768 (1.318)	6047 (1.493)	374 (2.270)
Chugoku	723 (1)	1118 (1)	8428 (1)	3455 (1)	5338 (1)		1480 (1.276)	4125 (1.553)	171 (4.207)
Shikoku	231 (1)	439 (1)	3097 (1)	1226 (1)	2099 (1)	1160 (1)		1083 (1.246)	52 (2.846)
Kyushu	506 (1)	960 (1)	7146 (1)	2801 (1)	4051 (1)	2656 (1)	869 (1)		349 (2.415)
Okinawa	19 (1)	32 (1)	453 (1)	125 (1)	165 (1)	41 (1)	18 (1)	145 (1)	

Note 1: Numbers at the top of the table indicate induced domestic products in all industries in regions at the side of the table induced through final demand in the regions at the top of the table

Note 2: If numbers at the bottom of the table are the induction amount 1 when regions with lower region codes are at the top of the table, the opposite coefficient can be found in the opposite case.
For example, the value at the intersection of Kinki at the top of the table and Kanto at the side of the table is divided by the value at the intersection of Kanto at the top of the table and Kinki at the side of the table.

(2) Production inducement coefficient

(i) Total final demand

Looking at the production inducement coefficient (induced domestic products divided by final demand), the production inducement coefficient of total final demand for all regions was 1.6785, 0.0075 percentage points higher than in 2000 (Table 6-4). Dividing this into in-region and other-region, the in-region production inducement coefficient was 1.0943, an increase of 0.0198 percentage points compared with 2000, while the other-region production inducement coefficient was 0.5842, a decrease of 0.0123 percentage points.

Looking at production inducement coefficients by region, four regions, Chubu, Chugoku, Okinawa, and Kyushu, exceeded the all-region total. Of the other five regions, Hokkaido was strikingly low at 1.6214. Compared with 2000, the coefficient rose in every region but Shikoku and Hokkaido. As for in-region production inducement coefficients, Kanto's was extremely high at 1.3343, while Shikoku at 0.9539 was the only region below 1.0000 (Figure 6-2). As for other-region production inducement coefficients, Shikoku at 0.6942 and Chubu at 0.6644 were high, but Kanto at 0.3355 was only about half the all-region total. This indicates that compared with other regions, Kanto and Okinawa have a relatively large influence on other regions' in-region production, while Shikoku, Chugoku, and Chubu have a relatively large influence on other regions' other-region production.

Figure 6-2: Production inducement coefficient through final demand by region

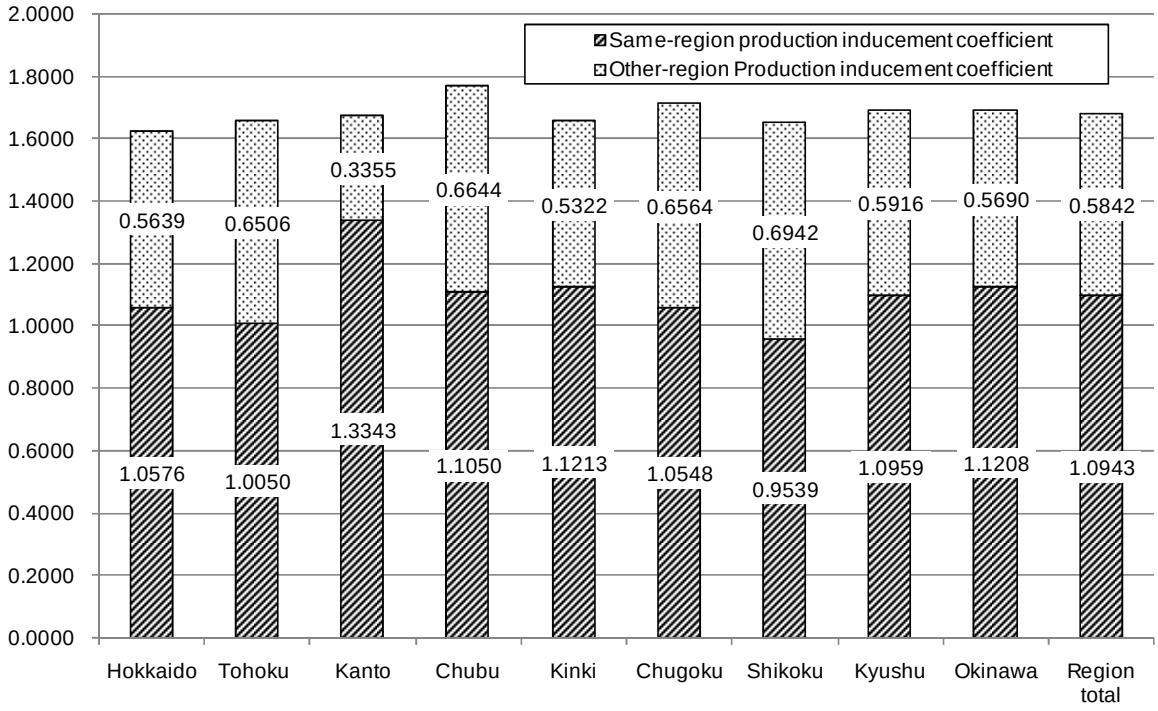


Table 6-4: Production inducement coefficient by region

			Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
Total	Production inducement coefficient	1995	1.6668	1.6619	1.6889	1.7569	1.6687	1.7192	1.6745	1.6772	1.6356	1.6899
		2000	1.6490	1.6540	1.6610	1.7527	1.6406	1.6910	1.6534	1.6652	1.6719	1.6688
		2005	1.6214	1.6556	1.6698	1.7695	1.6535	1.7112	1.6480	1.6875	1.6898	1.6802
	Difference in increase-decrease	2000–1995	-0.0179	-0.0079	-0.0279	-0.0041	-0.0281	-0.0283	-0.0212	-0.0120	0.0363	-0.0211
		2005–2000	-0.0275	0.0016	0.0088	0.0167	0.0129	0.0202	-0.0053	0.0223	0.0179	0.0114
Same region	Same-region production inducement coefficient	1995	1.0817	1.0143	1.3203	1.1216	1.1432	1.0414	0.9582	1.1019	1.0586	1.0935
		2000	1.0530	0.9967	1.3150	1.1115	1.1089	1.0140	0.9344	1.0790	1.0578	1.0745
		2005	1.0576	1.0050	1.3343	1.1050	1.1213	1.0548	0.9539	1.0959	1.1208	1.0943
	Difference in increase-decrease	2000–1995	-0.0287	-0.0176	-0.0053	-0.0101	-0.0343	-0.0274	-0.0238	-0.0229	-0.0008	-0.0190
		2005–2000	0.0046	0.0084	0.0193	-0.0065	0.0123	0.0407	0.0195	0.0169	0.0630	0.0198
Other regions	Other-region Production inducement coefficient	1995	0.5851	0.6476	0.3686	0.6352	0.5255	0.6778	0.7163	0.5753	0.5770	0.5898
		2000	0.5960	0.6573	0.3460	0.6412	0.5316	0.6770	0.7190	0.5862	0.6141	0.5965
		2005	0.5639	0.6506	0.3355	0.6644	0.5322	0.6564	0.6942	0.5916	0.5690	0.5842
	Difference in increase-decrease	2000–1995	0.0109	0.0097	-0.0226	0.0060	0.0062	-0.0009	0.0027	0.0109	0.0371	0.0067
		2005–2000	-0.0321	-0.0068	-0.0105	0.0232	0.0006	-0.0205	-0.0248	0.0054	-0.0451	-0.0123

(ii) By final demand items

Looking at total production inducement coefficient for all regions by final demand items, the coefficient for consumption was 1.5666 (up 0.0083 percentage points compared with 2000). For investment, it was 1.8337 (down 0.0149 percentage points) and for exports, it was 1.9898 (down 0.0004 percentage points). (See Table 6-5.)

Dividing this into in-region and other-region coefficients, the in-region production inducement coefficients for consumption and exports rose. They were 1.0575 (up 0.0220 percentage points) for consumption, 0.9968 (down 0.0396 percentage points) for investment, and 1.4456 (up 0.0055 percentage points) for exports. As for other-region production inducement coefficients, investment increased. Consumption was 0.5091 (down 0.0137 percentage points), investment was 0.8369 (up 0.0247 percentage points), and exports were 0.5442 (down 0.0059 percentage points).

By region, the coefficient for consumption was low in Kinki at 1.5449, Kanto at 1.5530, and Chugoku at 1.5556, and high in Okinawa at 1.6303 and Hokkaido at 1.5702. Inter-regional disparities were relatively small. For investment, Okinawa at 1.9125 and Chubu at 1.8863 were highest, with a gap of 0.1265 with the lowest region, Hokkaido at 1.7860, indicating large inter-regional disparities. For exports, the three highest regions were Chubu at 2.2112, Kyushu at 2.1265, and Chugoku at 2.1024. Okinawa was extremely low at 1.6391.

Dividing this into in-region and other-region coefficients, the in-region production inducement coefficients for consumption and exports were higher than the other-region production inducement coefficients in all regions. For investment, the other-region production inducement coefficient was higher than the in-region production inducement coefficient in Tohoku, Chugoku, and Shikoku.

Table 6-5: Production inducement coefficient by final demand item

Consumption			Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
Total	Production inducement coefficient	1995	1.5848	1.5507	1.5528	1.5581	1.5401	1.5676	1.5648	1.5696	1.5577	1.5607
		2000	1.5813	1.5501	1.5471	1.5619	1.5298	1.5565	1.5514	1.5568	1.5898	1.5583
		2005	1.5702	1.5564	1.5530	1.5601	1.5449	1.5556	1.5608	1.5679	1.6303	1.5666
	Difference in increase-decrease	2005–2000	-0.0111	0.0063	0.0059	-0.0018	0.0151	-0.0009	0.0094	0.0110	0.0404	0.0083
Same region	Same-region production inducement coefficient	1995	1.0561	0.9746	1.2237	0.9838	1.0669	0.9640	0.9211	1.0660	1.0577	1.0349
		2000	1.0436	0.9830	1.2412	0.9858	1.0587	0.9522	0.9209	1.0631	1.0708	1.0355
		2005	1.0580	1.0047	1.2706	0.9646	1.0764	0.9763	0.9486	1.0913	1.1268	1.0575
	Difference in increase-decrease	2005–2000	0.0144	0.0217	0.0294	-0.0211	0.0177	0.0241	0.0277	0.0283	0.0561	0.0220
Other regions	Other-region Production inducement coefficient	1995	0.5287	0.5761	0.3291	0.5742	0.4731	0.6036	0.6438	0.5036	0.5000	0.5258
		2000	0.5377	0.5671	0.3059	0.5762	0.4711	0.6043	0.6306	0.4937	0.5191	0.5228
		2005	0.5122	0.5517	0.2824	0.5955	0.4685	0.5793	0.6123	0.4765	0.5034	0.5091
	Difference in increase-decrease	2005–2000	-0.0255	-0.0154	-0.0234	0.0194	-0.0026	-0.0249	-0.0183	-0.0172	-0.0157	-0.0137
Investment			Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
Total	Production inducement coefficient	1995	1.8766	1.8781	1.8956	1.9409	1.8969	1.9269	1.8633	1.8976	1.8599	1.8929
		2000	1.8320	1.8241	1.8170	1.8975	1.8278	1.8662	1.8206	1.8494	1.9028	1.8486
		2005	1.7860	1.8110	1.8184	1.8863	1.8152	1.8731	1.7922	1.8085	1.9125	1.8337
	Difference in increase-decrease	2005–2000	-0.0460	-0.0131	0.0014	-0.0113	-0.0126	0.0069	-0.0284	-0.0410	0.0097	-0.0149
Same region	Same-region production inducement coefficient	1995	1.1386	1.0508	1.4269	1.1444	1.2233	1.0505	0.9525	1.1162	1.0191	1.1247
		2000	1.0647	0.9374	1.3655	1.0735	1.0947	0.9629	0.8335	1.0012	0.9943	1.0364
		2005	1.0323	0.8681	1.3325	0.9957	1.0420	0.9167	0.8117	0.9100	1.0623	0.9968
	Difference in increase-decrease	2005–2000	-0.0324	-0.0693	-0.0330	-0.0778	-0.0527	-0.0463	-0.0218	-0.0912	0.0680	-0.0396
Other regions	Other-region Production inducement coefficient	1995	0.7380	0.8273	0.4687	0.7965	0.6736	0.8765	0.9108	0.7814	0.8408	0.7682
		2000	0.7673	0.8868	0.4516	0.8240	0.7331	0.9032	0.9871	0.8482	0.9085	0.8122
		2005	0.7537	0.9429	0.4860	0.8906	0.7731	0.9564	0.9805	0.8984	0.8502	0.8369
	Difference in increase-decrease	2005–2000	-0.0135	0.0561	0.0344	0.0665	0.0400	0.0531	-0.0066	0.0502	-0.0583	0.0247
Exports			Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
Total	Production inducement coefficient	1995	1.8719	2.0229	2.0735	2.2289	2.0063	2.1473	2.0353	2.0452	1.5201	1.9946
		2000	1.9247	2.0091	2.0459	2.1899	2.0056	2.0915	1.9881	2.0555	1.6012	1.9902
		2005	1.8205	2.0201	2.0495	2.2112	2.0048	2.1024	1.9339	2.1265	1.6391	1.9898
	Difference in increase-decrease	2005–2000	-0.1043	0.0110	0.0035	0.0213	-0.0008	0.0109	-0.0542	0.0710	0.0380	-0.0004
Same region	Same-region production inducement coefficient	1995	1.3681	1.4092	1.7085	1.6321	1.5211	1.5063	1.3303	1.4599	1.2960	1.4702
		2000	1.3748	1.3539	1.6793	1.5848	1.4812	1.4577	1.2851	1.4099	1.3339	1.4401
		2005	1.3749	1.3454	1.6890	1.5720	1.4840	1.5025	1.2650	1.3967	1.3810	1.4456
	Difference in increase-decrease	2005–2000	0.0001	-0.0086	0.0097	-0.0128	0.0028	0.0448	-0.0201	-0.0132	0.0471	0.0055
Other regions	Other-region Production inducement coefficient	1995	0.5038	0.6137	0.3650	0.5968	0.4852	0.6410	0.7051	0.5853	0.2240	0.5244
		2000	0.5499	0.6552	0.3666	0.6051	0.5243	0.6338	0.7030	0.6456	0.2673	0.5501
		2005	0.4456	0.6747	0.3605	0.6392	0.5208	0.6000	0.6688	0.7298	0.2581	0.5442
	Difference in increase-decrease	2005–2000	-0.1043	0.0195	-0.0061	0.0340	-0.0036	-0.0338	-0.0341	0.0842	-0.0091	-0.0059

(3) Production inducement distribution ratio

(i) Total final demand

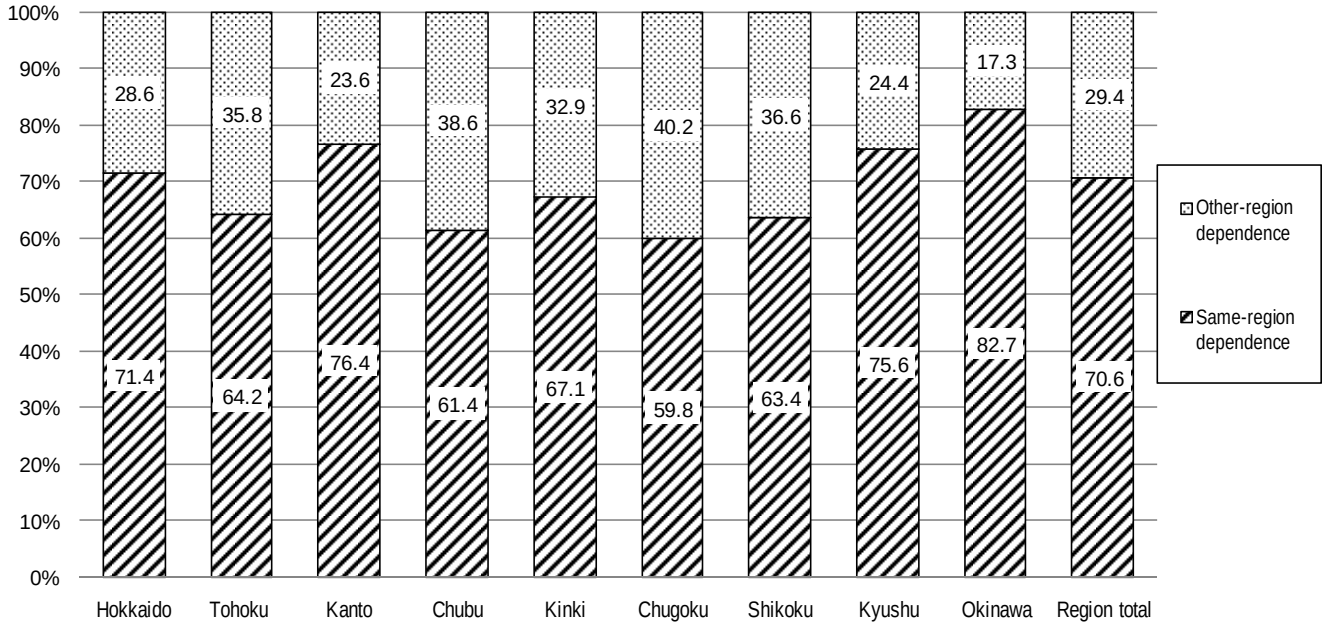
Looking at the degree to which a region's production depends on in-region final demand (degree of in-region dependence [in-region induced domestic products divided by induced domestic products]) and on other-region final demand dependence (degree of other-region dependence [other-region induced domestic products divided by induced domestic products]), four regions, Okinawa, Kanto, Kyushu, and Hokkaido, the degree of in-region dependence was higher than the average for all regions. Surpassing 80 percent, Okinawa at 82.7 percent had a particularly high degree of dependence on in-region final demand for its in-region production (degree of in-region dependence of induced domestic products). (See Table 6-6 and Figure 6-3.) In contrast, five regions, Chugoku, Chubu, Shikoku, Tohoku, and Kinki were below the average for all regions. Chugoku (59.8 percent) and Chubu's (61.4 percent) degrees of in-region dependence around 60 percent indicate that production in those regions is easily influenced by final demand in other regions.

Compared with 2000, the degree of in-region dependence increased (and the degree of other-region dependence decreased) in six regions, Kanto, Chubu, Okinawa, Shikoku, Kyushu, and Chugoku. Kanto' increase of 1.4 percentage points was particularly large. The degree of in-region dependence decreased (and the degree of other-region dependence increased) in three regions, Hokkaido, Tohoku, and Kinki. Hokkaido was particularly low following its decline of 1.7 percentage points.

Table 6-6: Production inducement distribution ratio

		Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Region total
Same-region dependence (%)	1995	74.0	64.0	76.9	59.3	67.7	57.6	61.4	72.4	84.6	70.2
	2000	73.0	65.2	75.0	60.7	67.3	59.6	63.0	75.1	82.0	70.1
	2005	71.4	64.2	76.4	61.4	67.1	59.8	63.4	75.6	82.7	70.6
Difference in increase-decrease	2000–1995	-1.0	1.1	-1.9	1.3	-0.4	2.0	1.6	2.7	-2.6	-0.2
	2005–2000	-1.7	-1.0	1.4	0.7	-0.2	0.2	0.5	0.5	0.6	0.5
Other-region dependence (%)	1995	26.0	36.0	23.1	40.7	32.3	42.4	38.6	27.6	15.4	29.8
	2000	27.0	34.8	25.0	39.3	32.7	40.4	37.0	24.9	18.0	29.9
	2005	28.6	35.8	23.6	38.6	32.9	40.2	36.6	24.4	17.3	29.4
Difference in increase-decrease	2000–1995	1.0	-1.1	1.9	-1.3	0.4	-2.0	-1.6	-2.7	2.6	0.2
	2005–2000	1.7	1.0	-1.4	-0.7	0.2	-0.2	-0.5	-0.5	-0.6	-0.5

Figure 6-3: Production inducement distribution ratio (in-region dependence and other-region dependence)



(ii) By final demand item

Looking at the production inducement distribution ratio by final demand item, the degree of dependence on consumption was high in all regions. Okinawa at 77.2 percent and Hokkaido at 75.6 percent were about three-fourths dependent on consumption (Figure 6-4). In contrast, Chubu has the lowest degree of dependence on consumption at 50.3 percent. There was relatively little disparity among regions in terms of dependence on investment. It was highest in Chubu at 24.6 percent, and lowest in Kyushu at 18.4 percent. On the other hand, there was a large inter-regional disparity in dependence on exports, with Chubu and Chugoku above 20 percent, and Hokkaido and Okinawa both at 4.1 percent. Disparities in the degree of dependence on exports are likely due to differences in the specificity of industries that manufacture products for export.

Compared with 2000, dependence on investment decreased in every region, while dependence on exports increased in each region.

Turning next to the production inducement distribution ratio (degree of in-region dependence) from in-region demand in a region by final demand items, consumption was highest in Okinawa at 63.2 percent, and lowest in Chubu at 31.0 percent (Table 6-7). The difference between the two regions in degree of dependence on in-region consumption is strikingly high at more than double. There were no large inter-regional differences in degree of dependence on investment. Investment was in the tens in all regions. The highs for exports were Chubu at 19.3 percent and Chugoku at 14.6 percent, while Hokkaido at 1.5 percent and Okinawa at 3.0 percent had an extremely low dependence on in-region exports.

Figure 6-4: Production inducement distribution ratio by final demand item (by region)

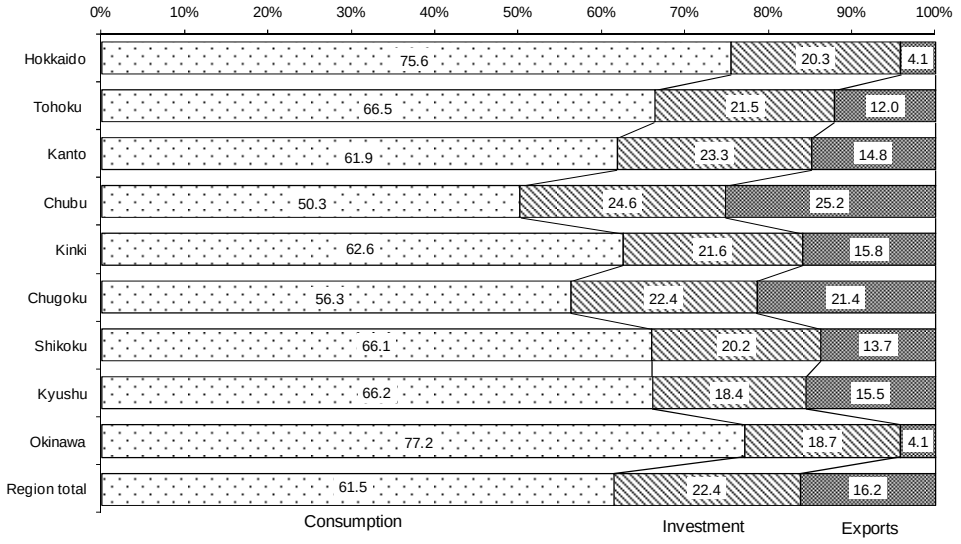


Table 6-7: Production inducement distribution ratio by final demand item (percent)

(Unit: %)

		Production inducement distribution ratio				Same-region production inducement distribution ratio				Other-region production inducement distribution ratio			
		Total	Consumption	Investment	Exports	Total	Consumption	Investment	Exports	Total	Consumption	Investment	Exports
2005	Hokkaido	100.0	75.6	20.3	4.1	71.4	54.6	15.2	1.5	28.6	21.0	5.1	2.6
	Tohoku	100.0	66.5	21.5	12.0	64.2	44.0	12.4	7.8	35.8	22.5	9.1	4.2
	Kanto	100.0	61.9	23.3	14.8	76.4	48.4	16.4	11.7	23.6	13.5	6.9	3.1
	Chubu	100.0	50.3	24.6	25.2	61.4	31.0	11.1	19.3	38.6	19.3	13.5	5.9
	Kinki	100.0	62.6	21.6	15.8	67.1	44.2	11.7	11.2	32.9	18.4	9.9	4.7
	Chugoku	100.0	56.3	22.4	21.4	59.8	35.1	10.1	14.6	40.2	21.2	12.2	6.8
	Shikoku	100.0	66.1	20.2	13.7	63.4	43.4	11.1	8.9	36.6	22.7	9.1	4.8
	Kyushu	100.0	66.2	18.4	15.5	75.6	50.8	12.2	12.6	24.4	15.3	6.2	2.9
	Okinawa	100.0	77.2	18.7	4.1	82.7	63.2	16.5	3.0	17.3	14.0	2.3	1.1
2005–2000	Hokkaido	0.0	1.7	-3.0	1.3	-1.7	1.5	-3.5	0.4	1.7	0.2	0.5	1.0
	Tohoku	0.0	1.1	-3.5	2.4	-1.0	1.1	-3.7	1.7	1.0	0.0	0.2	0.7
	Kanto	0.0	0.3	-2.9	2.6	1.4	1.3	-1.7	1.8	-1.4	-1.0	-1.2	0.7
	Chubu	0.0	-1.6	-4.0	5.6	0.7	-0.4	-3.1	4.2	-0.7	-1.1	-0.9	1.4
	Kinki	0.0	-0.4	-2.8	3.2	-0.2	0.0	-2.3	2.1	0.2	-0.4	-0.5	1.1
	Chugoku	0.0	-2.5	-3.9	6.4	0.2	-1.3	-3.0	4.5	-0.2	-1.1	-0.9	1.8
	Shikoku	0.0	-0.2	-2.3	2.4	0.5	1.3	-1.8	0.9	-0.5	-1.5	-0.5	1.5
	Kyushu	0.0	-0.4	-4.1	4.5	0.5	-0.2	-3.4	4.1	-0.5	-0.2	-0.7	0.3
	Okinawa	0.0	3.1	-3.7	0.5	0.6	4.1	-3.7	0.3	-0.6	-0.9	0.0	0.3

(iii) Induced domestic products in regions through other-region final demand

Looking at induced domestic products in regions through final demand in other regions, Kanto had the highest ratio in very region, indicating a high degree of dependence on Kanto. Tohoku was highest at nearly 60 percent (58.9 percent). (See Figure 6-5.) In every region, Kinki or Chubu accounted for the next highest ratio. Those three regions each accounted for at least 10 percent in every region.

Compared with 2000, Chubu's composition ratio increased in every region. Dependence on Chubu is rising (Table 6-8). On the other hand, Kanto's composition ratio fell in every region but Shikoku and Chubu. It dropped especially sharply in Hokkaido (down 7.3 percentage points), Okinawa (down 5.2 percentage points), and Tohoku (down 3.6 percentage points). Dependence on Kanto is decreasing.

Figure 6-5: Induced domestic products in regions through other-region final demand (composition ratio: 2005)

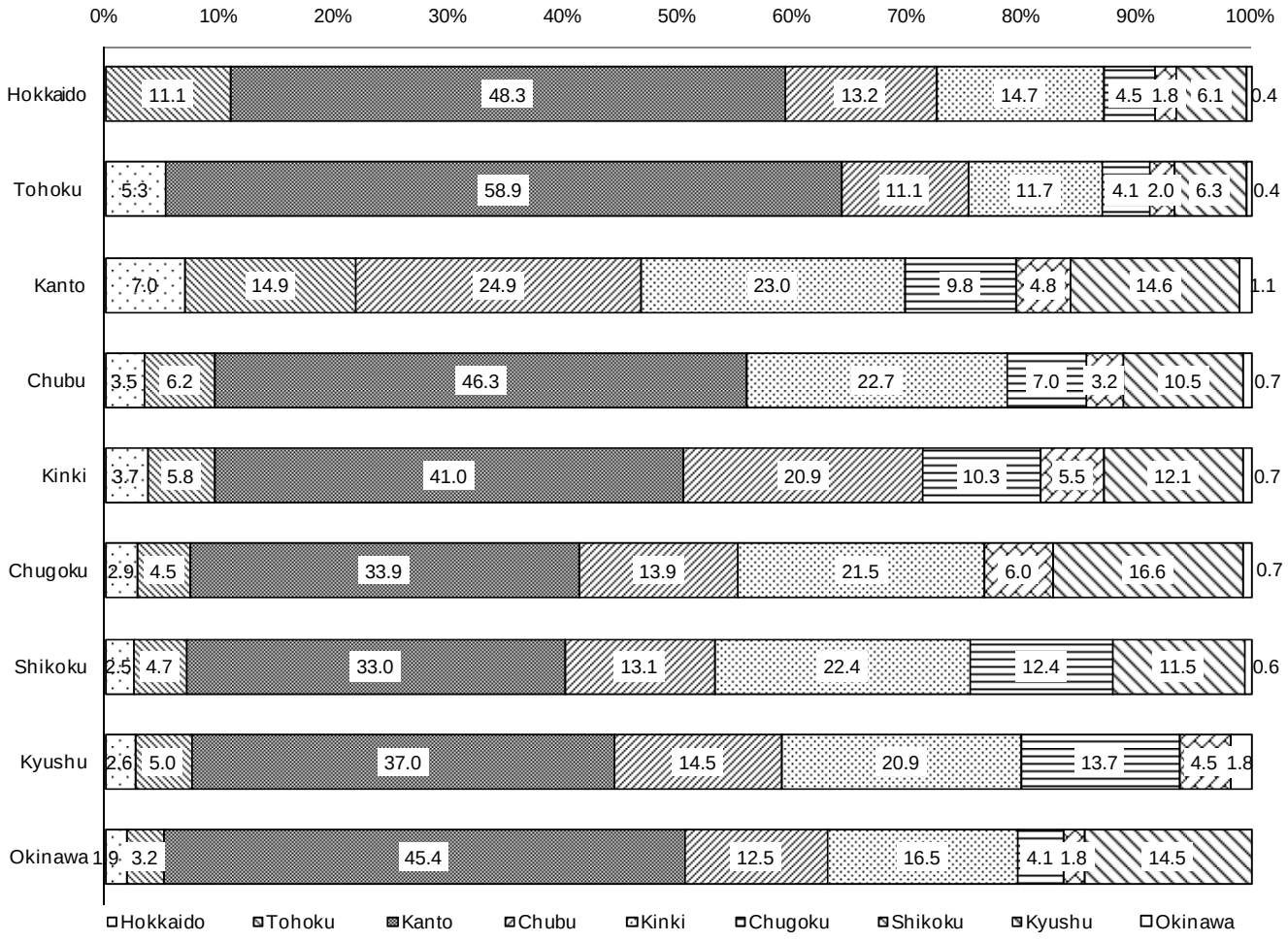


Table 6-8: Induced domestic products in regions through other-region demand (composition ratio: percent)

	Final demand region / Production region	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa
1995	Hokkaido		10.6	51.4	9.8	15.7	4.1	2.0	6.1	0.3
	Tohoku	4.6		62.7	9.4	12.2	3.7	1.9	5.2	0.4
	Kanto	8.0	15.5		22.1	24.6	9.4	5.1	14.3	1.1
	Chubu	4.3	7.6	47.6		21.2	6.5	3.6	8.5	0.8
	Kinki	4.2	6.3	43.5	17.8		10.1	5.6	11.6	0.9
	Chugoku	2.9	5.0	34.5	12.2	23.9		6.0	14.8	0.7
	Shikoku	2.3	4.8	33.9	11.0	27.1	10.6		9.9	0.5
	Kyushu	2.5	4.6	41.4	10.4	23.0	12.1	4.3		1.6
	Okinawa	1.6	3.2	45.2	6.4	19.3	4.5	1.6	18.2	
2000	Hokkaido		10.0	55.5	8.9	14.9	3.3	1.5	5.4	0.4
	Tohoku	4.7		62.5	8.3	12.4	3.9	2.2	5.6	0.4
	Kanto	7.9	15.7		22.0	23.9	9.3	4.9	15.0	1.2
	Chubu	4.1	6.9	46.3		23.1	6.2	3.4	9.2	0.8
	Kinki	4.0	5.8	41.4	18.9		10.6	6.1	12.2	1.0
	Chugoku	3.1	5.4	35.1	11.5	22.9		6.0	15.2	0.8
	Shikoku	2.4	5.3	32.2	11.6	23.6	12.3		12.1	0.5
	Kyushu	2.5	5.3	39.2	9.8	22.8	14.1	4.4		2.0
	Okinawa	1.8	2.6	50.6	5.8	12.4	3.1	1.7	22.1	
2005	Hokkaido		11.1	48.3	13.2	14.7	4.5	1.8	6.1	0.4
	Tohoku	5.3		58.9	11.1	11.7	4.1	2.0	6.3	0.4
	Kanto	7.0	14.9		24.9	23.0	9.8	4.8	14.6	1.1
	Chubu	3.5	6.2	46.3		22.7	7.0	3.2	10.5	0.7
	Kinki	3.7	5.8	41.0	20.9		10.3	5.5	12.1	0.7
	Chugoku	2.9	4.5	33.9	13.9	21.5		6.0	16.6	0.7
	Shikoku	2.5	4.7	33.0	13.1	22.4	12.4		11.5	0.6
	Kyushu	2.6	5.0	37.0	14.5	20.9	13.7	4.5		1.8
	Okinawa	1.9	3.2	45.4	12.5	16.5	4.1	1.8	14.5	
2005–2000	Hokkaido		1.1	-7.3	4.3	-0.2	1.2	0.3	0.6	0.0
	Tohoku	0.6		-3.6	2.8	-0.7	0.2	-0.1	0.7	0.0
	Kanto	-0.9	-0.9		2.9	-0.9	0.5	-0.1	-0.4	-0.2
	Chubu	-0.6	-0.7	0.0		-0.4	0.8	-0.2	1.3	-0.1
	Kinki	-0.3	0.0	-0.5	2.0		-0.3	-0.6	-0.1	-0.2
	Chugoku	-0.2	-0.9	-1.2	2.5	-1.4		-0.1	1.4	-0.1
	Shikoku	0.0	-0.6	0.8	1.4	-1.3	0.1		-0.5	0.1
	Kyushu	0.2	-0.3	-2.3	4.7	-1.8	-0.4	0.1		-0.2
	Okinawa	0.1	0.6	-5.2	6.8	4.1	1.0	0.2	-7.6	

7. Case Study (i)

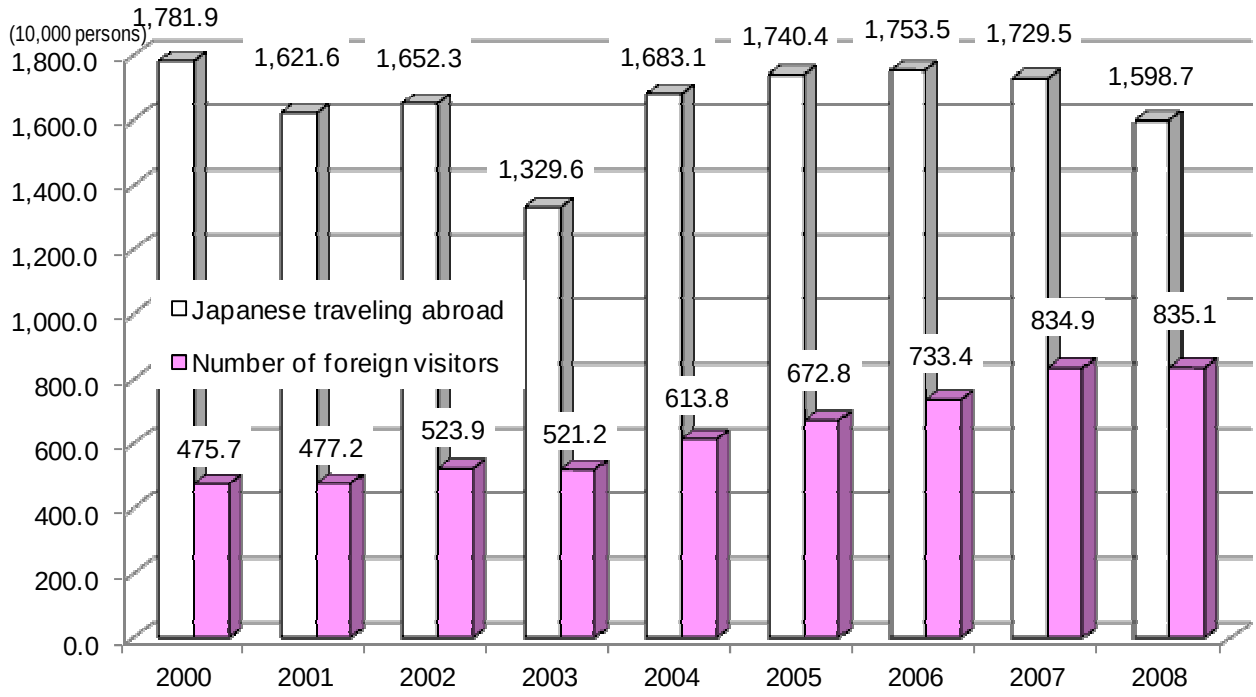
Inter-regional repercussion effects brought about by consumption by foreign visitors to Japan who travel to Hokkaido

As a case study, the 2005 Inter-regional I-O Table are used to discuss the production repercussion effects in each region brought about by consumption by foreign visitors to Japan who travel to Hokkaido.

(1) The number of foreign visitors to Japan and the number of Japanese who travel abroad

The number of Japanese who traveled abroad in 2008 was 15.987 million. This was a decline of 7.6 percent from the previous year. During the same year, the number of foreign visitors to Japan was 8.351 million, essentially the same number as the year before, with a growth rate of 0.0 percent. The surplus of Japanese traveling abroad continues, although the number of foreign visitors to Japan has been trending upwards since 2000 (Figure 7-(i)-1).

Figure 7-(i)-1: Numbers of foreign visitors to Japan and of Japanese who travel abroad



Source: Japan Tourism Agency

Looking at the nationalities of foreign visitors to Japan by region, Asia accounted for the largest percentage in 2008 at 73.7 percent, followed by North America and Europe. By nationality in 2008, visitors from South Korea, the UK, and the USA decreased, while those from Hong Kong increased by double digits, and those from China, Australia, and France also increased (Table 7-(i)-1).
During 2009, the (estimated) number of foreign visitors to Japan was 6.79 million, down sharply by 18.7 percent. by nationality, visitors from almost every country decreased, including South Korea (down 33.4 percent from the previous year), Taiwan (down 26.3 percent), Hong Kong (down 18.3 percent), Australia (down 12.6 percent), and the USA (down 8.9 percent). However, visitors from China increased slightly, by 0.6 percent (Table 7-(i)-1).

Table 7-(i)-1: State of the number of foreign visitors to Japan by nationality

Nationality	2007 (persons)	Composition ratio (%)	2008 (persons)	Composition ratio (%)	2008 / 2007 growth rate (%)	2009 (persons)	Composition ratio (%)	2009 / 2008 growth rate (%)
Total	8,346,969	100.0	8,350,835	100.0	0.0	6,789,900	100.0	-18.7
Total for Asia	6,130,283	73.4	6,153,827	73.7	0.4	…	…	…
South Korea	2,600,694	31.2	2,382,397	28.5	-8.4	1,586,900	23.4	-33.4
Taiwan	1,385,255	16.6	1,390,228	16.6	0.4	1,024,200	15.1	-26.3
China	942,439	11.3	1,000,416	12.0	6.2	1,006,200	14.8	0.6
Hong Kong	432,042	5.2	550,190	6.6	27.3	449,700	6.6	-18.3
Total for Europe	877,531	10.5	886,723	10.6	1.0	…	…	…
UK	221,945	2.7	206,564	2.5	-6.9	181,400	2.7	-12.2
France	137,787	1.7	147,580	1.8	7.1	141,200	2.1	-4.3
Germany	125,193	1.5	126,207	1.5	0.8	110,600	1.6	-12.4
Total for North America	1,017,018	12.2	967,125	11.6	-4.9	…	…	…
USA	815,882	9.8	768,345	9.2	-5.8	699,800	10.3	-8.9
Canada	165,993	2.0	168,307	2.0	1.4	152,600	2.2	-9.3
Total for Oceania	260,788	3.1	278,988	3.3	7.0	…	…	…
Australia	222,518	2.7	242,031	2.9	8.8	211,600	3.1	-12.6
Others	61,349	0.7	64,172	0.8	4.6	…	…	…

Note: "…" is unknown. Figures for November and December 2009 are estimates by the Japan National Tourism Organization (JNTO).

Source: Japan National Tourism Organization (JNTO)

Looking at the number of foreign visitors to Japan by destination region,(Note 2) Kanto had an overwhelmingly large share at 45.8 percent, followed by Kinki at 27.0 percent and Kyushu at 10.7 percent. The top three regions accounted for more than 80 percent of all visitors (Figure 7-(i)-2).
Turning to the growth rate from 2005 to 2008,(Note 2) every region grew, led by Tohoku with a 104.7 percent increase and Hokkaido with a 93.2 percent increase roughly doubling their numbers, followed by Kyushu at 69.8 percent and Kinki at 44.2 percent (Table 7-(i)-2).

Figure 7-(i)-2: Composition of foreign visitors to Japan by region (2008)

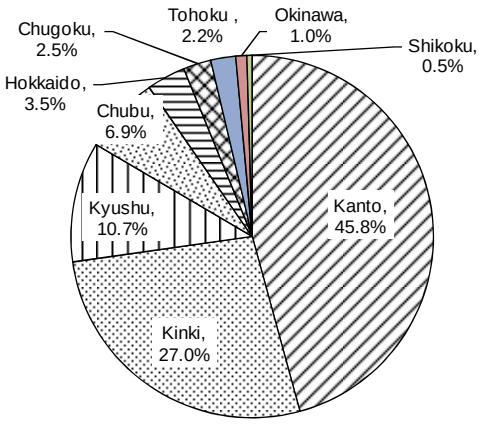


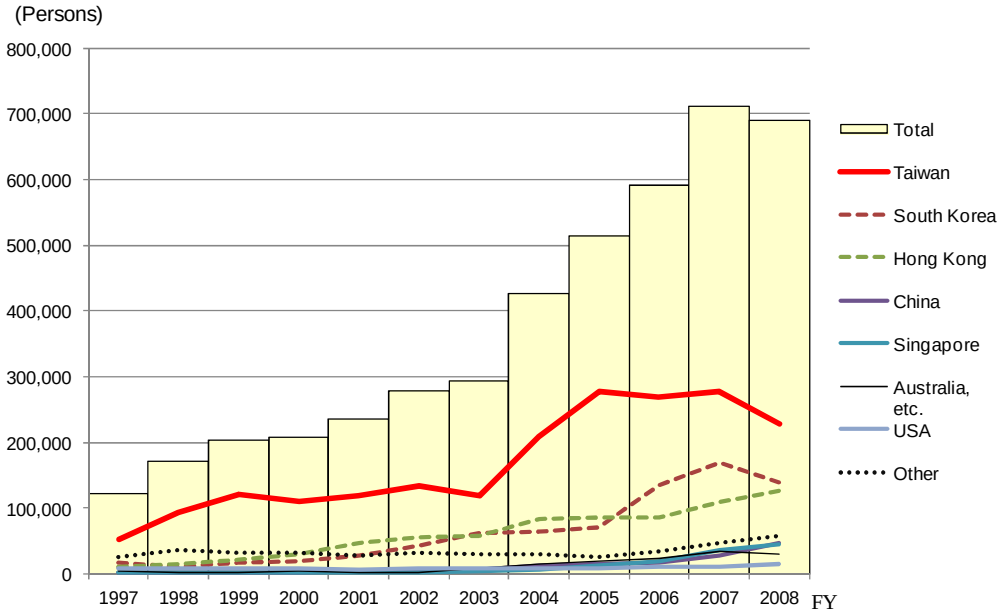
Table 7-(i)-2: Growth rates of foreign visitors to Japan by region

	2008 / 2005 growth rate (%)
Hokkaido	93.2
Tohoku	104.7
Kanto	19.4
Chubu	29.7
Kinki	44.2
Chugoku	36.1
Shikoku	12.0
Kyushu	69.8
Okinawa	26.2
Region total	34.1

Source: Japan National Tourism Organization (JNTO)
Note : By-region estimates by the Economic Analysis Office, Ministry of Economy, Trade and Industry, based on Japan National Tourism Organization (JNTO) data

Looking at the number of foreign visitors to Japan who travel to Hokkaido, which has recently become a popular destination for foreign tourists, although the most recent year, FY 2008, saw a drop to 689,000, the overall trend is upwards (Figure 7-(i)-3).

Figure 7-(i)-3: Change in the number of foreign visitors to Japan who travel to Hokkaido



Source: Hokkaido Government

As for the nationalities of foreign visitors to Japan who traveled to Hokkaido during FY 2008, most are from Taiwan, South Korea, and Hong Kong, with 228,000, 139,000, and 126,000 visitors, respectively (Table 7-(i)-3).

Looking at growth rates for recent years, however, China had the highest growth rate in FY 2008 compared to the previous year at 75.9 percent, followed by the USA (up 32.2 percent), Singapore (up 21.9 percent), and Hong Kong (up 16.7 percent).

Table 7-(i)-3: Number of foreign visitors to Japan who traveled to Hokkaido by nationality, composition ratio, and year-on-year growth rate

Persons	China	South Korea	Taiwan	Hong Kong	Singapore	USA	Australia, etc.	Other	Total
FY 2005	15,650	70,050	276,800	86,500	11,800	8,750	19,600	24,500	513,650
FY 2006	17,350	133,850	267,900	86,050	18,950	9,700	23,750	33,100	590,650
FY 2007	26,950	169,300	277,400	108,000	37,150	10,850	34,500	46,800	710,950
FY 2008	47,400	139,100	227,600	126,000	45,300	14,350	30,800	58,600	689,150

Composition ratio	China	South Korea	Taiwan	Hong Kong	Singapore	USA	Australia, etc.	Other	Total
FY 2005	3.0%	13.6%	53.9%	16.8%	2.3%	1.7%	3.8%	4.8%	100.0%
FY 2006	2.9%	22.7%	45.4%	14.6%	3.2%	1.6%	4.0%	5.6%	100.0%
FY 2007	3.8%	23.8%	39.0%	15.2%	5.2%	1.5%	4.9%	6.6%	100.0%
FY 2008	6.9%	20.2%	33.0%	18.3%	6.6%	2.1%	4.5%	8.5%	100.0%

Year-on-year growth rate	China	South Korea	Taiwan	Hong Kong	Singapore	USA	Australia, etc.	Other	Total
FY 2005	29.9	9.7	32.7	4.5	96.7	-3.8	26.9	-16.2	20.3
FY 2006	10.9	91.1	-3.2	-0.5	60.6	10.9	21.2	35.1	15.0
FY 2007	55.3	26.5	3.5	25.5	96.0	11.9	45.3	41.4	20.4
FY 2008	75.9	-17.8	-18.0	16.7	21.9	32.3	-10.7	25.2	-3.1

Note: Numbers of foreign visitors to Hokkaido have been published since FY 1997.

Note: The number of municipalities surveyed was 202 in FY 1997 and 1998, 212 in FY 1999–2005, and 180 from FY 2006 on.

Source: Hokkaido Government

(2) Measuring economic repercussion effects (domestic products induced by individual final demand items)

The 2005 Inter-regional I-O Table (53-sector tables) can be used in order to understand how much production consumption by foreign visitors to Japan who traveled to Hokkaido induced in each region. Since the Inter-regional I-O Table cover the nine rgions under the jurisdiction of their respective Bureaus of Economy, Trade and Industry, Hokkaido was selected because it is divided into both a prefecture and a region. The degree of influence demand in Hokkaido has on production activities in other regions is analyzed here.

Since the Hokkaido Government, the Hokkaido Development Agency, and the Hokkaido Bureau of Economy, Trade and Industry all consider development of the tourism industry to be an important policy, one may surmise that they measure and analyze its economic repurcussion effects. However, that usually involves measurement and analysis of economic effects inside Hokkaido or divison of Hokkaido into several regions in order to create Inter-regional I-O Table for the prefecture.
Here, the production repercussions for each region nationwide are measured using broad regions under the jurisdiction of Bureaus of Economy, Trade and Industry.

1) Compiling data

- The number of foreign visitors to Japan who visited Hokkaido in 2005 was estimated from Hokkaido Government data as follows.

  Foreign visitors to Japan who traveled to Hokkaido (FY 2005): 513,650 (A)
  " (FY 2006): 590,650 (B)
  " (2005 calendar year conversion): 532,900 • • • (A) × 0.75 + (B) × 0.25

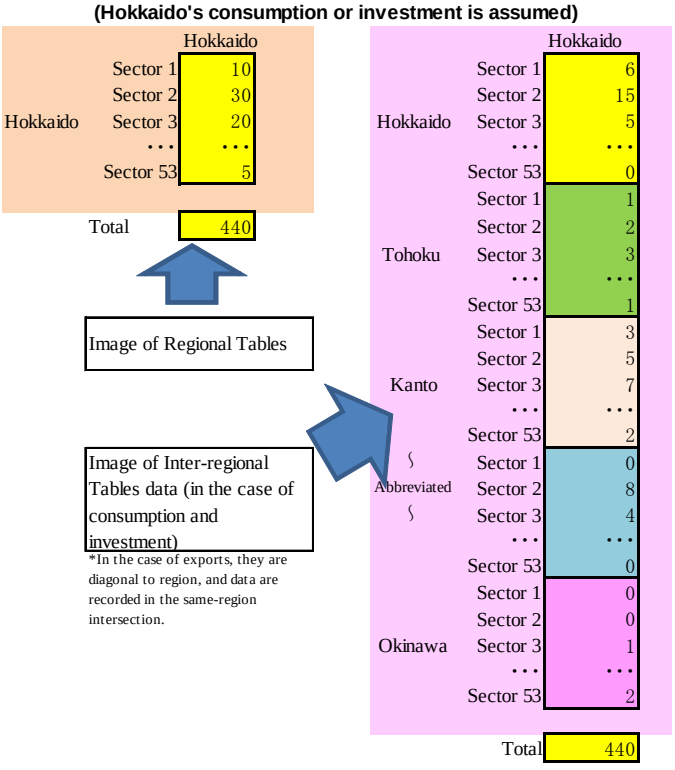
- The consumption amount per foreign visitor to Japan who traveled to Hokkaido was found by dividing the amount of "9212-00 Exports (direct purchase)" from the 2005 Hokkaido Regional I-O Tables (20,473 million yen) by the number of people derived above (532,900) and rounding off that amount (38,418 yen) to 40,000 yen.

- The consumption pattern of foreign visitors to Japan who traveled to Hokkaido was estimated based on "9212-00 Exports (direct purchase)."
  In addition to tourists, "9212-00 Exports (direct purchase)" includes foreign military forces stationed in Japan, so the vector was created after excluding goods and services likely to have been purchased by the foreign military forces.

- Ordinary Regional tables only give data for inside the region, but in the case of consumption and investment, inter-regional tables must give data differentiating between products from the same region and products from other regions.
  *In the case of exports, data intersecting the same region are accounted for with regions as diagonals.

  In this case, the data assumed that foreign visitors to Japan who traveled to Hokkaido engaged in consumption activity in Hokkaido consistent with their consumption patterns regarding goods to have and that they received services only from Hokkaido. Thus, goods were distributed using commerce patterns from the 2005 Inter-regional I-O Table, while services were not purchased. Of services, however, commerce and transport margins were engaged in association with goods.
  Regarding transport, not only margins but also transportation for travel, such as buses, taxis, and railways, is included. This was balanced and distributed to regions.

Image of Regional Tables and Inter-regional Tables' data
(Hokkaido's consumption or investment is assumed)



The Hokkaido Government's target figure for the number of foreign visitors (real number) to Hokkaido in FY 2012 is 1.1 million. Data assumptions are as follows:

- Number of foreign visitors to Hokkaido: 1.1 million
- Average expenditure per foreign visitor to Hokkaido: 40,000 yen
- Consumption and domestic trade patterns of foreign visitors to Hokkaido: 2005 Inter-regional I-O Table (53 sectors)

Thus, consumption by foreign visitors to Japan who travel to Hokkaido is assumed to be **44 billion yen** for the purposes of this analysis.

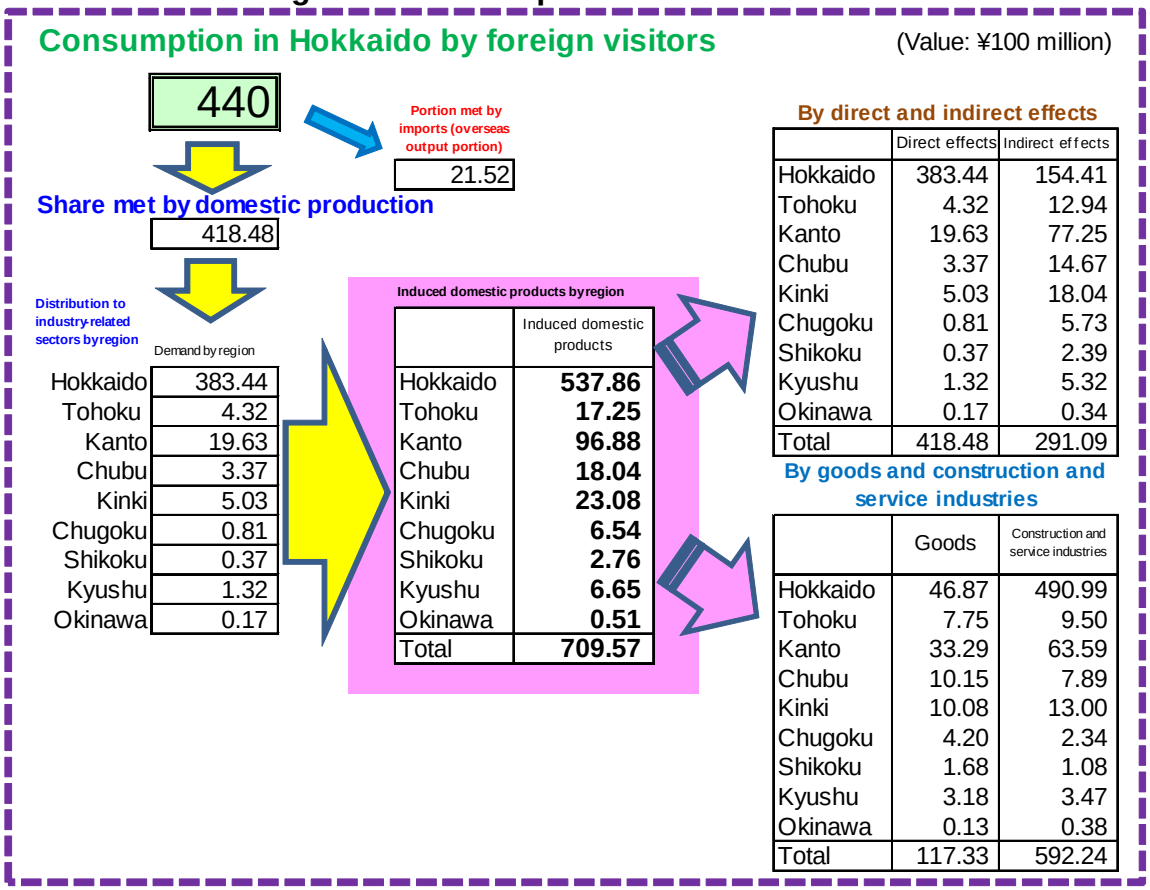
In I-O Table analysis, the data analyzed may be either change (amount and rate of increase or decrease, etc.) or total effects (current status, forecasts, etc.). In this case, total effects are analyzed. By using the Inter-regional I-O Table, the repercussions of production inducement effects to all regions, not just Hokkaido, can be measured.

In the case of Regional I-O Tables, only repercussion effects analysis in the specific region are observed. With the Inter-regional I-O Table, when increased demand in Hokkaido, for example, leads to increased production in Kanto, which leads to increased demand in Tohoku (required for production in Kanto), which leads to increased demand in Chubu (required for production in Tohoku), which leads to increased demand in Hokkaido, etc., these links can be measured. Thus, not only can situations where in-region demand induces other-region production be measured, boomerang effects in which the repercussions return to the original region can be measured. This creates the advantage of enabling measurement of final repercussions in all regions.

2) Economic repercussion effects (domestic products induced by individual final demand items)

Consumption by foreign visitors to Hokkaido totaling 44 billion yen brings about a domestic production inducement effect of 71 billion yen (about 1.7 times direct demand). (See Figure 7-(i)-4.)

Figure 7-(i)-4: Pinter-regional repercussion effects brought about by consumption by foreign visitors to Japan who travel to Hokkaido



	Demand by region
Hokkaido	383.44
Tohoku	4.32
Kanto	19.63
Chubu	3.37
Kinki	5.03
Chugoku	0.81
Shikoku	0.37
Kyushu	1.32
Okinawa	0.17

	Induced domestic products
Hokkaido	**537.86**
Tohoku	**17.25**
Kanto	**96.88**
Chubu	**18.04**
Kinki	**23.08**
Chugoku	**6.54**
Shikoku	**2.76**
Kyushu	**6.65**
Okinawa	**0.51**
Total	**709.57**

	Direct effects	Indirect effects
Hokkaido	383.44	154.41
Tohoku	4.32	12.94
Kanto	19.63	77.25
Chubu	3.37	14.67
Kinki	5.03	18.04
Chugoku	0.81	5.73
Shikoku	0.37	2.39
Kyushu	1.32	5.32
Okinawa	0.17	0.34
Total	418.48	291.09

	Goods	Construction and service industries
Hokkaido	46.87	490.99
Tohoku	7.75	9.50
Kanto	33.29	63.59
Chubu	10.15	7.89
Kinki	10.08	13.00
Chugoku	4.20	2.34
Shikoku	1.68	1.08
Kyushu	3.18	3.47
Okinawa	0.13	0.38
Total	117.33	592.24

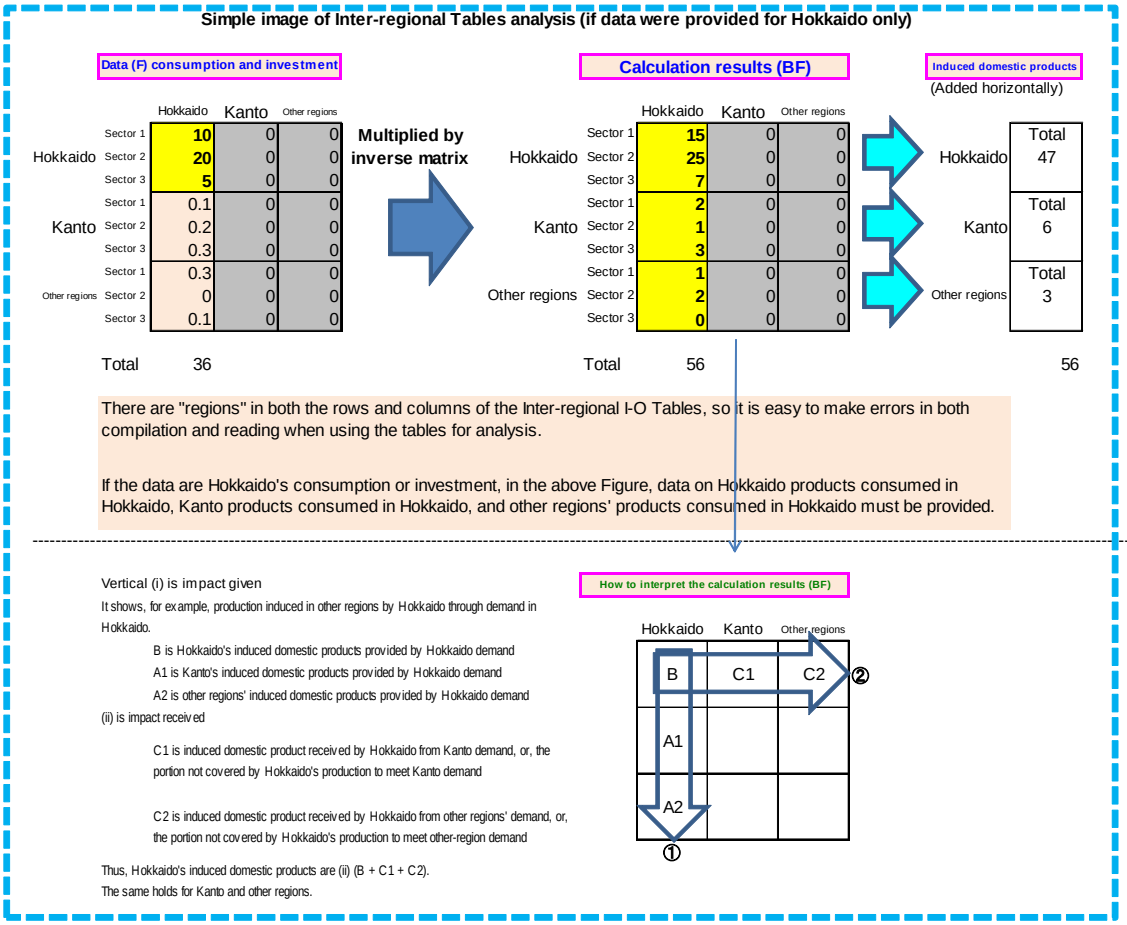
Looking at induced domestic products by region,[(Note 3)] Hokkaido had the largest amount at 53.786 billion yen, followed by Kanto at 9.688 billion yen, Kinki at 2.308 billion yen, Chubu at 1.804 billion yen, and Tohoku at 1.725 billion yen (Figure 7-(i)-4).
Because the above includes direct effects, regarding indirect effects, Hokkaido had the highest amount at 15.441 billion yen, followed by Kanto at 7.725 billion yen, Kinki at 1.804 billion yen, and Chubu at 1.467 billion yen.
Turning to induced domestic products by goods and construction and service industries, the two highest regions for goods were Hokkaido at 4.687 billion yen and Kanto at 3.329 billion yen. For construction and service industries, Hokkaido was highest at 49.099 billion yen, followed by Kanto at 6.359 billion yen, and Kinki at 1.3 billion yen. It is apparent that except for in-region products, other regions are heavily dependent on Kanto.

Turning next to induced domestic products by region and goods (all-region total), food and drink related sectors were highest, with beverages and foods at 3.445 billion yen and agriculture, forestry, and fishery at 1.695 billion yen. Looking at construction and service industries, personal services, which includes accommodations, was highest at 31.574 billion yen, followed by transport and commerce, which mainly accompany transactions and movement of goods. Their totals were 8.493 billion yen and 5.519 billion yen, respectively (Table 7-(i)-4).

Table 7-(i)-4: Top 10 sectors for induced domestic products in goods and construction and service industries (all-region total)

(Value: ¥100 million)

	Goods sector			Construction and service industries sector	
1	Beverages and Foods	34.45	1	Personal services	315.74
2	Agriculture, forestry and fishery	16.95	2	Transport	84.93
3	Petroleum and coal products	12.45	3	Commerce	55.19
4	Miscellaneous manufacturing products	11.35	4	Other business services	23.43
5	Pulp, paper, paperboard, building paper	5.45	5	Finance and insurance	21.90
6	Printing, plate making and book binding	4.06	6	Other information and communications	21.26
7	Plastic products	4.04	7	Electricity	10.88
8	Final chemical products	3.96	8	Real estate	10.57
9	Chemical basic product	3.56	9	Others	9.03
10	Iron and steel	2.50	10	Water supply and waste disposal business	8.45



Looking at goods by region, although beverages and foods topped every region, and agriculture, forestry, and fishery were also near the top in Hokkaido, Tohoku, Shikoku, Kyushu, and Okinawa, it was apparent that production repercussions span diverse regions. These include, for example, miscellaneous manufacturing products including souvenirs in Kanto, motor vehicle parts and accessories in Chubu, petroleum and coal products and iron and steel in Chugoku, and pulp, paper, paperboard, and building paper in Shikoku (Table 7-(i)-5).

Turning to the construction and service industries by region, transport and commerce topped almost every region. They are the margins and transportation expenses accompanying transactions and movement of goods. In Hokkaido, personal services were highest because they include accommodation.

Table 7-(i)-5: Top five sectors for induced domestic products in goods and construction and service industries (by region)

Hokkaido (Value: ¥1 million)

	Goods sector			Construction and service industries sector	
1	Beverages and Foods	1965.69	1	Personal services	31523.42
2	Agriculture, forestry and fishery	1114.71	2	Transport	5571.32
3	Petroleum and coal products	526.72	3	Commerce	2951.95
4	Miscellaneous manufacturing products	277.06	4	Other business services	1553.95
5	Printing, plate making and book binding	218.35	5	Finance and insurance	1516.53

Tohoku (Value: ¥1 million)

	Goods sector			Construction and service industries sector	
1	Beverages and Foods	294.83	1	Transport	357.78
2	Agriculture, forestry and fishery	204.33	2	Commerce	322.95
3	Miscellaneous manufacturing products	48.38	3	Other business services	54.42
4	Pulp, paper, paperboard, building paper	46.13	4	Finance and insurance	49.48
5	Petroleum and coal products	35.55	5	Electricity	45.41

Kanto (Value: ¥1 million)

	Goods sector			Construction and service industries sector	
1	Beverages and Foods	695.91	1	Transport	1660.90
2	Petroleum and coal products	464.82	2	Commerce	1367.19
3	Miscellaneous manufacturing products	456.22	3	Other information and communications	594.27
4	Final chemical products	225.18	4	Other business services	537.71
5	Pulp, paper, paperboard, building paper	182.36	5	Finance and insurance	405.44

Chubu (Value: ¥1 million)

	Goods sector			Construction and service industries sector	
1	Beverages and Foods	146.89	1	Commerce	280.78
2	Miscellaneous manufacturing products	113.79	2	Transport	242.92
3	Motor vehicle parts and accessories	112.45	3	Finance and insurance	53.35
4	Petroleum and coal products	94.05	4	Other business services	53.29
5	Plastic products	69.54	5	Electricity	30.55

Kinki (Value: ¥1 million)

	Goods sector			Construction and service industries sector	
1	Beverages and Foods	216.16	1	Commerce	393.94
2	Miscellaneous manufacturing products	163.12	2	Transport	388.92
3	Final chemical products	67.60	3	Finance and insurance	105.46
4	Plastic products	57.37	4	Other business services	99.62
5	Pulp, paper, paperboard, building paper	54.36	5	Other information and communications	52.42

Chugoku (Value: ¥1 million)

	Goods sector			Construction and service industries sector	
1	Petroleum and coal products	68.09	1	Transport	84.53
2	Chemical basic product	57.44	2	Commerce	64.30
3	Iron and steel	39.88	3	Finance and insurance	15.94
4	Beverages and Foods	31.97	4	Other business services	15.64
5	Motor vehicle parts and accessories	31.53	5	Electricity	12.65

Shikoku (Value: ¥1 million)

	Goods sector			Construction and service industries sector	
1	Pulp, paper, paperboard, building paper	39.51	1	Transport	30.83
2	Agriculture, forestry and fishery	20.27	2	Commerce	29.22
3	Beverages and Foods	18.74	3	Finance and insurance	18.04
4	Miscellaneous manufacturing products	15.75	4	Electricity	6.34
5	Chemical basic product	12.33	5	Other business services	5.77

Kyushu (Value: ¥1 million)

	Goods sector			Construction and service industries sector	
1	Agriculture, forestry and fishery	81.76	1	Transport	129.80
2	Beverages and Foods	72.57	2	Commerce	105.73
3	Miscellaneous manufacturing products	39.42	3	Finance and insurance	23.86
4	Chemical basic product	17.65	4	Other business services	21.12
5	Iron and steel	14.71	5	Other information and communications	11.86

Okinawa (Value: ¥1 million)

	Goods sector			Construction and service industries sector	
1	Agriculture, forestry and fishery	6.09	1	Transport	26.26
2	Beverages and Foods	2.72	2	Commerce	3.18
3	Petroleum and coal products	2.53	3	Finance and insurance	2.18
4	Other transport equipment	0.40	4	Other business services	1.53
5	Chemical basic product	0.35	5	Other information and communications	1.07

(3) Comparison of the measurement effects of Regional I-O Tables and Inter-regional I-O Table (for reference)

The difference between Regional I-O Tables and the Inter-regional I-O Table is not only that the former measures production inducement effects inside a region while the latter measures them for all regions. The Inter-regional I-O Table can also measure the so-called boomerang effect, in which inter-regional transactions ultimately come back to the original region. This enables more accurate measurement.

With Regional I-O Tables, once a production repercussion effect flows outside the region, the effects of subsequent transactions cannot be measured. Thus, in terms of measurement results, one may generally say that "Regional I-O Tables ≦ Inter-regional I-O Table."

This time, it must be noted that although table definitions and sector definitions and numbers are identical for Regional I-O Tables and Inter-regional I-O Table, they differ concretely in that the Regional I-O Tables have 53 sectors, but the Inter-regional I-O Table have 53 sectors multiplied by nine regions, totaling 477 sectors. It is important to remember that even when definitions are exactly the same, if the number of sectors differs, they are different tables.

The table below shows the result of rearranging the data for comparison with Regional I-O Tables, so the figures are different from those discussed above. Furthermore, in the analysis above, data were compiled by region and sector, but the table below was calculated accounting only data intersecting in-region in Hokkaido.

Looking at the differences while noting those dissimilarities, induced domestic products are 50.007 billion yen in the Hokkaido Regional I-O Tables and 57.51 billion yen in the equivalent Inter-regional I-O Table. The Inter-regional I-O Table are 7.502 billion yen higher, a difference of about 15 percent (Table 7-(i)-6).

By goods and construction and service industries, the total for goods in the Inter-regional I-O Table is slightly higher at 853 million yen. For construction and service industries, however, the Inter-regional I-O Table measured 6.649 billion yen more.

The Inter-regional I-O Tables are not necessarily higher by sector. In the comparison table below, the Regional I-O Tables are higher for some sectors. This is related in part to numerical precision and error factors from converting the trade amounts found from trade coefficients into integers, but basically it stems from the difference between Regional I-O Tables and Inter-regional I-O Table in terms of the strength (structure) of transaction links.

Table 7-(i)-6 Comparison of the production inducement effects of Regional Tables and Inter-regional Tables (reference)

[Value: ¥1 million]

	Sector	A Regional Tables	B Inter-regional Table	B-A Difference
Goods	Agriculture, forestry and fishery	1028.21	1120.89	92.69
	Mining	4.85	4.50	-0.36
	Coal mining , crude petroleum and natural gas	11.07	14.56	3.48
	Beverages and Foods	1716.50	1973.85	257.35
	Textile products	7.38	19.52	12.14
	Wearing apparel and other textile products	12.38	15.27	2.90
	Timber, wooden products and furniture	93.44	92.96	-0.48
	Pulp, paper, paperboard, building paper	173.21	159.37	-13.84
	Printing, plate making and book binding	202.57	234.48	31.92
	Chemical basic product	28.47	32.95	4.49
	Synthetic resins	1.41	1.66	0.26
	Final chemical products	42.12	44.02	1.90
	Medicaments	0.31	0.37	0.06
	Petroleum and coal products	422.83	585.82	162.98
	Plastic products	67.59	84.58	16.99
	Ceramic, stone and clay products	74.64	63.84	-10.80
	Iron and steel	31.71	27.60	-4.10
	Non-ferrous metals	1.15	1.73	0.59

	Sector	A Regional Tables	B Inter-regional Table	B-A Difference
Goods	Metal products	60.13	66.81	6.68
	General machinery	3.78	6.07	2.29
	Machinery for office and service industry	0.40	0.42	0.03
	Electrical devices and parts	1.98	2.41	0.44
	Other electrical machinery	0.19	0.21	0.02
	Household electric appliances	0.18	0.76	0.58
	Household electronics equipment	3.56	12.45	8.88
	----------	0.00	0.00	0.00
	Electronic components	0.82	1.45	0.62
	Passenger motor cars	0.00	0.00	0.00
	Other cars	0.00	0.00	0.00
	Motor vehicle parts and accessories	3.28	4.30	1.02
	Other transport equipment	15.49	19.28	3.79
	Precision instruments	0.53	0.65	0.12
	Miscellaneous manufacturing products	181.06	450.38	269.32
	Reuse and recycling	4.94	5.79	0.85
Note	Construction	266.94	289.78	22.84
	Electricity	794.35	897.41	103.07

	Sector	A Regional Tables	B Inter-regional Table	B-A Difference
Construction and service industries	Gas and heat supply	74.34	82.87	8.54
	Water supply and waste disposal business	695.29	766.47	71.18
	Commerce	2806.46	3836.07	1029.61
	Finance and insurance	1409.97	1659.39	249.42
	Real estate	783.56	856.03	72.47
	House rent (imputed house rent)	0.00	0.00	0.00
	Transport	5139.14	7419.27	2280.12
	Other information and communications	1252.73	1459.46	206.73
	Information services	139.06	91.19	-47.87
	Government services	159.05	169.19	10.14
	Education and research	123.18	58.24	-64.94
	Medical service, health, social security and nursing care	194.92	211.94	17.02
	Advertising services	246.39	281.12	34.72
	Goods rental and leasing services	251.81	308.70	56.89
	Other business services	1470.94	1723.31	252.37
	Personal services	29229.49	31526.65	2297.16
	Others	772.92	822.22	49.30
Total		**50006.73**	**57508.28**	**7501.55**

Note: Construction and service industries

Total of B / A 1.15

	A Regional Tables	B Inter-regional Table	B-A Difference	B/A
Goods	4196.19	5048.96	852.77	1.20
Construction and service industries	45810.53	52459.32	6648.78	1.15

Conclusion

- This analysis was carried out using 53 sector tables. In the sector classifications, although manufacturing was broken down in relatively high detail, service industries were less so. This causes a lack of accuracy in repercussion analysis of service industries. Furthermore, the Ministry of Economy, Trade and Industry's regional divisions are very broad, so there are some service industry sectors that are depicted as having no inflows or outflows. Improved inflow/outflow data for service industries is needed.
- As for data, much of it depends on the views of analysts. The most accurate data possible are needed. The consumption vector estimate was based on estimates in the 2005 Inter-regional I-O Table. The most recent data on the consumption vector of foreign visitors to Japan is needed. Analysis with more accurate data is particularly needed in the cases of people visiting for sightseeing and shopping.

8. Case Study (ii)

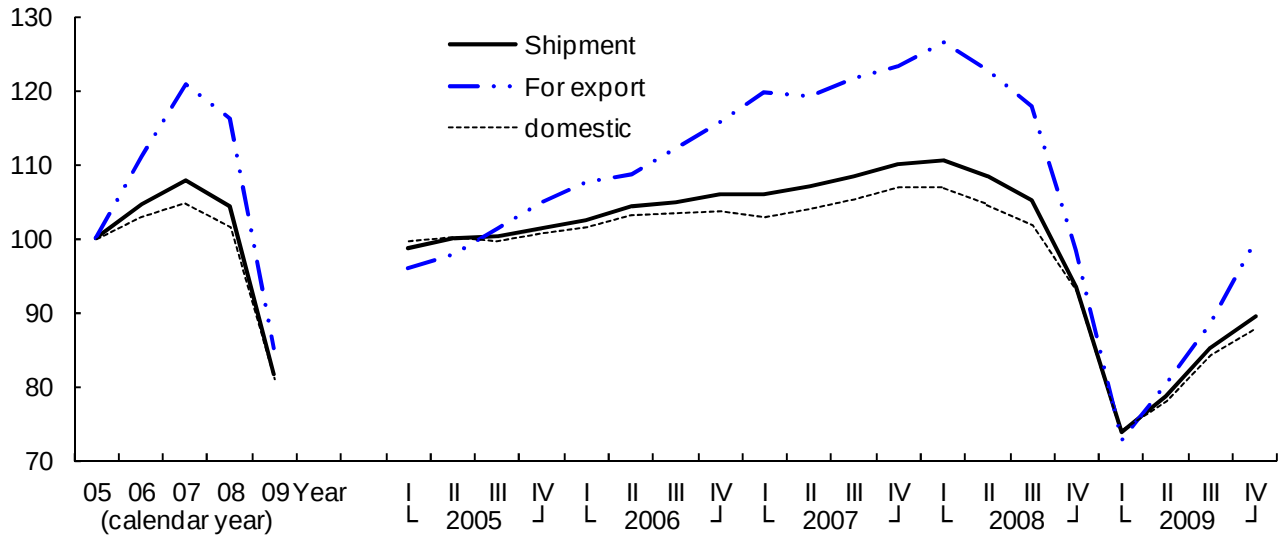
The inter-regional repercussion effects of decreases in major exports

The 2009 Indices of Industrial Production show three straight quarters of growth through the fourth quarter, but for the year there was a 20 percent drop from 2008.
Looking at domestic and foreign demand, there was more movement in shipments for exports than in domestic shipments. Although there was an aspect of recovery in business conditions in Japan being led by exports, export shipments fell during 2009. The production inducement distribution ratio and the value added inducement distribution ratio were 16.5 percent and 12.3 percent, respectively. They were very low compared with consumption's 61.4 percent and 68.4 percent (2005 National I-O Tables 34-sector table, producers' price).
Analysis of the inter-regional repercussion effects of a decrease in major exports will therefore be carried out here.
As for the data used for analysis, the Indices of Industrial Domestic Shipments and Exports do not include data on export shipments by region, so the same export shipment index year-on-year comparison was used for all regions. Additionally, it should be noted that the Indices of Industrial Domestic Shipments and Exports are 2009 data (the rate of change from 2008 to 2009), while the Inter-regional I-O Table are as of 2005. The main purpose of this analysis is to understand how much change a decline in exports ultimately causes in regional production.

(1) Changes in industrial production shipments

In 2009, the industrial production shipment index fell by 21.7 percent on a year-on-year basis. Breaking this down by domestic and foreign demand, domestic shipments declined by 20.3 percent, while exports shipments declined even more, by 26.6 percent (Figure 7-(ii)-1).
By industry, the machinery industry suffered a large decline. The general machinery industry decreased by 39.6 percent, the transportation equipment industry by 37.7 percent, and the information and communications machinery industry and precision instruments industry by 26.1 percent.

Figure 7-(ii)-1: Changes in industrial production shipments



Source: Indices of Industrial Domestic Shipments and Exports

(2) Production repercussion effects by region

Using data from the 2005 Inter-regional I-O Table (53-sector tables), the 2009 decline in shipments for exports is to be analyzed in terms of its impact on production by region and on inter-regional production.

About the data

- The decrease was calculated from the 2009 year-on-year growth rate for shipment for exports from the Indices of Industrial Domestic Shipments and Exports by region and goods. Because there is no breakdown of industrial production shipments by region, a uniform growth rate in all regions is assumed for goods and multiplied by each region's exports by type of goods. Hereinafter, these data are referred to as "major exports."
- The sectors are goods that correspond to both the Indices of Industrial Domestic Shipments and Exports and the I-O Tables.

When both sectors do not match, the industry was brought together and made to correspond.

- The decrease in major exports in each region that accompanied the fall in major exports also decreased commerce and transport margins.
- Here the goal is to measure degree of influence and interdependence by region. It should be noted that growth in the quantity of major exports was used, and analysis assumed that the industrial structure of each region would not change significantly from 2005 to 2009. The actual situation could be different.

Correspondence between 2005 Inter-regional I-O Tables (53-sector tables) and Indices of Industrial Domestic Shipments and Exports

2005 Inter-regional I-O Tables (53 sectors)			Indices of Industrial Domestic Shipments and Exports	Shipments for export 2009/2008 year-on-year
Agriculture, forestry and fishery	0.0	Data not provided		
Mining	0.0	Same as above		
Coal mining , crude petroleum and natural gas	0.0	Same as above		
Beverages and Foods	0.0	Same as above		
Textile products	-21.6		Textile industry	-21.6
Wearing apparel and other textile products	-21.6			
Timber, wooden products and furniture	0.0	Data not provided		
Pulp, paper, paperboard, building paper	-22.7		Pulp, paper, and paper products industry	-22.7
Printing, plate making and book binding	0.0	Data not provided		
Chemical basic product	8.1		Chemical industry	7.1
Synthetic resins	8.1		Chemical industry (except medicaments)	8.1
Final chemical products	8.1			
Medicaments	8.1			
Petroleum and coal products	-5.7		Petroleum and coal products industry	-5.7
Plastic products	-9.8		Plastic products industry	-9.8
Ceramic, stone and clay products	-7.9		Ceramic, stone, and clay industry	-7.9
Iron and steel	-13.9		Iron and steel industry	-13.9
Non-ferrous metals	-12.8		Non-ferrous metals industry	-12.8
Metal products	-25.7		Metal products industry	-25.7
General machinery	-39.6		General machinery industry	-39.6
Machinery for office and service industry	-39.6			
Electrical devices and parts	-22.2		Electrical machinery industry	-22.2
Other electrical machinery	-22.2			
Household electric appliances	-22.2			
Household electronics equipment	-26.1		Information and communications machinery industry	-26.1
Electronic computing equipment and accessory equipment of electronic computing equipment	-26.1			
Electronic components	-25.6		Electronic components and devices industry	-25.6
Passenger motor cars	-37.7		Transportation equipment industry	-37.7
Other cars	-37.7			
Motor vehicle parts and accessories	-37.7			
Other transport equipment	-37.7			
Precision instruments	-26.1		Precision instruments industry	-26.1
Miscellaneous manufacturing products	0.0	Data not provided		

For the construction and service industries sector, data are provided only for the commerce and transport sectors

Commerce	Growth rate calculated from total decrease in major export goods by region
Transport	Same as above

About the Regional Tables and Inter-regional Tables' data on export increases (decreases) (image)

How data were provided for export increases (decreases) in the Regional Tables

Export increase (decrease) data is provided for each region.

Hokkaido	Exports
Sector 1	100
Sector 2	200
Sector 3	300
…	…
Sector 53	500
Total	1500

Tohoku	Exports
Sector 1	500
Sector 2	600
Sector 3	700
…	…
Sector 53	100
Total	3000

Kanto	Exports
Sector 1	3000
Sector 2	5000
Sector 3	1000
…	…
Sector 53	2000
Total	30000

Abbreviated	Exports
Sector 1	1111
Sector 2	2222
Sector 3	3333
…	…
Sector 53	5555
Total	20000

Okinawa	Exports
Sector 1	10
Sector 2	20
Sector 3	30
…	…
Sector 53	10
Total	300

How data were provided for each region's export increase (decrease) in the Inter-regional Tables

Unlike consumption and investment, exports are all covered by same-region products.

Thus, the Inter-regional Tables' export data are recorded only where they intersect in the same region.

		Hokkaido	Tohoku	Kanto	Abbreviated	Okinawa
Hokkaido	Sector 1	100	0	0	0	0
	Sector 2	200	0	0	0	0
	Sector 3	300	0	0	0	0
	…	…	0	0	0	0
	Sector 53	500	0	0	0	0
Tohoku	Sector 1	0	500	0	0	0
	Sector 2	0	600	0	0	0
	Sector 3	0	700	0	0	0
	…	0	…	0	0	0
	Sector 53	0	100	0	0	0
Kanto	Sector 1	0	0	3000	0	0
	Sector 2	0	0	5000	0	0
	Sector 3	0	0	1000	0	0
	…	0	0	…	0	0
	Sector 53	0	0	2000	0	0
~Abbreviated~	Sector 1	0	0	0	1111	0
	Sector 2	0	0	0	2222	0
	Sector 3	0	0	0	3333	0
	…	0	0	0	…	0
	Sector 53	0	0	0	5555	0
Okinawa	Sector 1	0	0	0	0	10
	Sector 2	0	0	0	0	20
	Sector 3	0	0	0	0	30
	…	0	0	0	0	…
	Sector 53	0	0	0	0	10

The decrease in exports by region and sector in 2009 was 16.8304 trillion yen. Total regional production fell by 39.1467 trillion yen, a 4.1 percent decline (an impact of about 2.3 times direct demand).
As a result, value added (GDP equivalent) decreased by 14.3592 trillion yen, a 2.9 percent drop (Figure 7-(ii)-2).

Figure 7-(ii)-2: The inter-regional repercussion effects of decreases in major exports

Decrease in shipments for exports

(Value: ¥100 million)

Estimation of decrease by region and sector

Export decrease by region and sector

	Decrease in exports	Rate of decrease of exports
Hokkaido	-512	-14
Tohoku	-7,512	-23
Kanto	-60,765	-21
Chubu	-42,803	-28
Kinki	-23,975	-21
Chugoku	-12,167	-20
Shikoku	-3,272	-18
Kyushu	-17,277	-24
Okinawa	-21	-2
Total	-168,304	-23

Within the total, decrease in goods is

-141,315

Decrease in construction and service industries was

-26,989

Induction effect

	Induced domestic products	Rate of decrease
Hokkaido	**-3,015**	**-0.9**
Tohoku	**-17,163**	**-3.0**
Kanto	**-148,596**	**-3.6**
Chubu	**-96,072**	**-7.8**
Kinki	**-57,394**	**-3.8**
Chugoku	**-31,211**	**-5.0**
Shikoku	**-7,032**	**-2.7**
Kyushu	**-30,811**	**-3.9**
Okinawa	**-171**	**-0.3**
Total	**-391,467**	**-4.1**

Induction effect

	Induced value added	Rate of decrease
Hokkaido	**-1,276**	**-0.7**
Tohoku	**-6,722**	**-2.2**
Kanto	**-57,357**	**-2.7**
Chubu	**-30,973**	**-5.4**
Kinki	**-23,149**	**-2.9**
Chugoku	**-10,170**	**-3.5**
Shikoku	**-2,801**	**-2.1**
Kyushu	**-11,062**	**-2.6**
Okinawa	**-81**	**-0.3**
Total	**-143,592**	**-2.9**

By direct and indirect effects

	Direct effects	Indirect effects
Hokkaido	-512	-2,503
Tohoku	-7,512	-9,652
Kanto	-60,765	-87,831
Chubu	-42,803	-53,269
Kinki	-23,975	-33,419
Chugoku	-12,167	-19,045
Shikoku	-3,272	-3,760
Kyushu	-17,277	-13,534
Okinawa	-21	-150
Total	**-168,304**	**-223,162**

By goods and construction and service industries

	Goods	Construction and service industries
Hokkaido	-1,821	-1,194
Tohoku	-12,314	-4,849
Kanto	-97,743	-50,853
Chubu	-76,431	-19,641
Kinki	-39,255	-18,139
Chugoku	-24,546	-6,665
Shikoku	-5,008	-2,024
Kyushu	-22,422	-8,390
Okinawa	-38	-133
Total	**-279,578**	**-111,889**

By region, production decreased most in Chubu, with a 7.8 percent drop, followed by Chugoku (down 5.0 percent), Kyushu (down 3.9 percent), Kinki (down 3.8 percent), and Kanto (down 3.6 percent). (See Figure 7-(ii)-2.)
As with production, value added fell most in Chubu (down 5.4 percent). It was followed by Chugoku (down 3.5 percent), Kinki (down 2.9 percent), Kanto (down 2.7 percent), and Kyushu (down 2.6 percent).

1) Situation by type of goods

Looking at the all-region total by type of goods, motor vehicle parts and accessories had the largest decrease, falling by 6.0755 trillion yen. They were followed in order by general machinery (down 4.1684 trillion yen), iron and steel (down 2.9506 trillion yen), passenger motor cars (down 2.9068 trillion yen), and electronic components (down 2.8560 trillion yen). (See Table 7-(ii)-1.)

The data are for major exports only. Because inputs of service industries are essential to these production activities, they have repercussions in the production of service industries as well. In construction and service industries, the largest decrease was in commerce, which accompanies transactions in goods. It was down 3.3467 trillion yen. It was followed by transport for distribution (down 1.8760 trillion yen), education and research including research and development (intra-enterprise) (down 1.1318 trillion yen), other business services including worker dispatching services (down 1.1147 trillion yen), and finance and insurance including interest and fees for insurance and fund procurement (down 863.4 billion yen).

Table 7-(ii)-1: Status of decrease in induced domestic products by type of goods (Region total)

Region total (Value: ¥100 million)

Goods sector			Construction and service industries sector		
1	Motor vehicle parts and accessories	-60,755	1	Commerce	-33,467
2	General machinery	-41,684	2	Transport	-18,760
3	Iron and steel	-29,506	3	Education and research	-11,318
4	Passenger motor cars	-29,068	4	Other business services	-11,147
5	Electronic components	-28,560	5	Finance and insurance	-8,634
6	Other transport equipment	-10,159	6	Electricity	-4,994
7	Electrical devices and parts	-8,605	7	Other information and communications	-4,936
8	Other electrical machinery	-8,551	8	Goods rental and leasing services	-4,400
9	Non-ferrous metals	-7,949	9	Advertising services	-2,997
10	Plastic products	-7,571	10	Information services	-2,534

Looking at growth rates to see how much production was depressed in each sector, in goods, motor vehicle parts and accessories decreased the most, falling 21.2 percent. They were followed by passenger motor cars (down 19.9 percent), other transportation equipment (down 18.0 percent), electronic components (down 17.6 percent), electronic computing equipment and accessory equipment of electronic computing equipment (down 16.2 percent), and general machinery (down 15.8 percent). The impact on transportation equipment related sectors was large (Table 7-(ii)-2).

In the construction and service industries, although the decreases were not as large as in goods, transport (down 4.6 percent), goods rental and leasing services (down 3.6 percent), education and research (down 3.3 percent), and advertising services (down 3.3 percent) fell.

Table 7-(ii)-2: Status of rate of decrease of induced domestic products by type of goods (Region total)

Region total (%)

Goods sector			Construction and service industries sector		
1	Motor vehicle parts and accessories	-21.2	1	Transport	-4.6
2	Passenger motor cars	-19.9	2	Goods rental and leasing services	-3.6
3	Other transport equipment	-18.0	3	Education and research	-3.3
4	Electronic components	-17.6	4	Advertising services	-3.3
5	Electronic computing equipment and accessory equipment of electronic computing equipment	-16.2	5	Others	-3.2
6	General machinery	-15.8	6	Electricity	-3.2
7	Other electrical machinery	-13.5	7	Commerce	-3.1
8	Other cars	-13.4	8	Other business services	-2.6
9	Electrical devices and parts	-12.6	9	Finance and insurance	-2.1
10	Iron and steel	-11.5	10	Gas and heat supply	-2.0

2) Situation by region, by type of goods, and by construction and service industry

By region, production of major exports decreased in each region. By type of goods, the largest decreases in Hokkaido were in iron and steel, motor vehicle parts and accessories, in Tohoku they were in electronic components and general machinery, in Kanto they were in motor vehicle parts and accessories and general machinery, in Chubu they were in motor vehicle parts and accessories and passenger motor cars, in Kinki they were in general machinery and iron and steel, in Chugoku they were in iron and steel and motor vehicle parts and accessories, in Shikoku they were in other transportation equipment and general machinery, in Kyushu they were in passenger motor cars, electronic components, and iron and steel, and in Okinawa the largest decrease was in petroleum and coal products. In construction and service industries, commerce, transport, education and research, finance and insurance, and other business services suffered large decreases in almost all regions (Table 7-(ii)-3).

Table 7-(ii)-3: Status of decrease in induced domestic products by type of goods and construction and service industry (by region)

Hokkaido (Value: ¥100 million)

Goods sector			Construction and service industries sector		
1	Iron and steel	-553	1	Transport	-374
2	Motor vehicle parts and accessories	-415	2	Commerce	-346
3	Pulp, paper, paperboard, building paper	-163	3	Other business services	-97
4	Electronic components	-158	4	Finance and insurance	-76
5	General machinery	-110	5	Electricity	-59

Tohoku (Value: ¥100 million)

Goods sector			Construction and service industries sector		
1	Electronic components	-3,071	1	Commerce	-1,509
2	General machinery	-1,486	2	Transport	-715
3	Motor vehicle parts and accessories	-1,264	3	Electricity	-599
4	Electronic computing equipment and ancillary equipment of electronic computing equipment	-1,058	4	Education and research	-552
5	Passenger motor cars	-717	5	Other business services	-394

Kanto (Value: ¥100 million)

Goods sector			Construction and service industries sector		
1	Motor vehicle parts and accessories	-21,630	1	Commerce	-14,166
2	General machinery	-16,388	2	Transport	-7,947
3	Electronic components	-9,477	3	Other business services	-5,383
4	Iron and steel	-7,914	4	Education and research	-5,134
5	Passenger motor cars	-7,332	5	Finance and insurance	-3,865

Chubu (Value: ¥100 million)

Goods sector			Construction and service industries sector		
1	Motor vehicle parts and accessories	-26,966	1	Commerce	-6,361
2	Passenger motor cars	-13,258	2	Transport	-3,041
3	General machinery	-8,160	3	Education and research	-2,335
4	Electronic components	-5,361	4	Other business services	-1,998
5	Iron and steel	-4,721	5	Finance and insurance	-1,428

Kinki (Value: ¥100 million)

Goods sector			Construction and service industries sector		
1	General machinery	-9,654	1	Commerce	-5,805
2	Iron and steel	-6,110	2	Transport	-2,845
3	Electronic components	-4,370	3	Other business services	-1,802
4	Motor vehicle parts and accessories	-3,385	4	Education and research	-1,708
5	Other transport equipment	-1,707	5	Finance and insurance	-1,537

Chugoku (Value: ¥100 million)

Goods sector			Construction and service industries sector		
1	Iron and steel	-6,219	1	Commerce	-1,871
2	Motor vehicle parts and accessories	-4,325	2	Transport	-1,477
3	Passenger motor cars	-3,545	3	Education and research	-738
4	General machinery	-2,637	4	Other business services	-578
5	Electronic components	-1,971	5	Finance and insurance	-548

Shikoku (Value: ¥100 million)

Goods sector			Construction and service industries sector		
1	Other transport equipment	-1,189	1	Commerce	-661
2	General machinery	-828	2	Transport	-436
3	Other electrical machinery	-603	3	Finance and insurance	-203
4	Non-ferrous metals	-511	4	Education and research	-155
5	Electronic components	-478	5	Other business services	-130

Kyushu (Value: ¥100 million)

Goods sector			Construction and service industries sector		
1	Passenger motor cars	-3,754	1	Commerce	-2,728
2	Electronic components	-3,674	2	Transport	-1,853
3	Iron and steel	-3,190	3	Other business services	-758
4	Motor vehicle parts and accessories	-2,747	4	Education and research	-653
5	General machinery	-2,420	5	Finance and insurance	-625

Okinawa (Value: ¥100 million)

Goods sector			Construction and service industries sector		
1	Petroleum and coal products	-21	1	Transport	-73
2	Mining	-5	2	Commerce	-20
3	Other transport equipment	-5	3	Finance and insurance	-7
4	Metal products	-2	4	Other information and communications	-7
5	Iron and steel	-1	5	Other business services	-6

3) Inter-regional interdependent relationships

Each region's decreased exports induced not only a decrease in production in that region, but also a decrease in production in customers' other regions and industries.

The impact on production activities spanned not only sectors but regions. For example, the decrease in Tohoku's exports of passenger motor cars (production decrease) led to a production decrease in Kanto's motor vehicle parts and accessories, leading to a production decrease in Chubu's iron and steel. In addition, that impact was not on goods alone. There was a heavy impact on the activities of trading companies and transport companies that accompany such transactions, as well as on service industries in terms of lower advertising services fees, fewer workers dispatched, and so on.

The table below aggregates sectors to illustrate the inter-regional dependency of production inducement (Table 7-(ii)-4).

Table 7-(ii)-4: Inter-regional status of induced domestic products (sector totals)

(¥100 million)

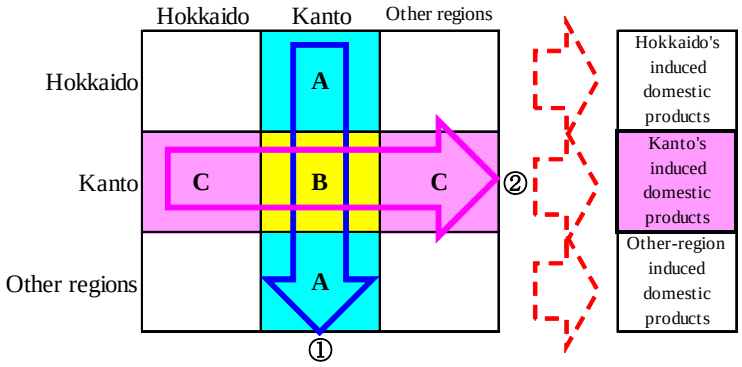
	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Total	Same-region induced domestic products from same-region demand	Same-region induced domestic products through other-region demand
Hokkaido	-716	-132	-808	-763	-255	-126	-31	-184	0	-3,015	-716	-2,299
Tohoku	-16	-10,285	-3,666	-1,539	-593	-344	-79	-641	0	-17,163	-10,285	-6,878
Kanto	-162	-3,103	-109,491	-18,367	-6,156	-3,736	-862	-6,715	-3	-148,596	-109,491	-39,105
Chubu	-72	-1,123	-9,978	-73,415	-4,223	-2,558	-427	-4,272	-3	-96,072	-73,415	-22,657
Kinki	-51	-773	-7,064	-6,951	-36,507	-2,600	-789	-2,658	-1	-57,394	-36,507	-20,887
Chugoku	-30	-339	-3,655	-3,205	-2,145	-19,256	-513	-2,068	-1	-31,211	-19,256	-11,955
Shikoku	-8	-103	-981	-721	-492	-283	-4,047	-397	0	-7,032	-4,047	-2,985
Kyushu	-13	-214	-2,305	-1,777	-993	-890	-267	-24,352	-1	-30,811	-24,352	-6,459
Okinawa	0	-4	-52	-37	-20	-8	-2	-22	-26	-171	-26	-145
Total	-1,069	-16,078	-137,999	-106,774	-51,383	-29,801	-7,018	-41,310	-35	Total		
Same-region induced domestic products fromsame-region demand	-716	-10,285	-109,491	-73,415	-36,507	-19,256	-4,047	-24,352	-26	-391,467		
Other-region induced domestic products fromsame-region demand	-352	-5,792	-28,508	-33,359	-14,876	-10,545	-2,971	-16,958	-8			

How to interpret the results for induced domestic products in the Inter-regional I-O Tables

For example, in the Figure below with regions abbreviated to Hokkaido, Kanto, and Other regions, looking mainly at Kanto,

- Production inducement provided by Kanto demand is (i).
- Production inducement received by Kanto through demand in other regions is (ii).

- B is induced domestic products to Kanto from Kanto's demand
- A is induced domestic products Kanto provided to other regions through Kanto demand
- C is induced domestic products that other regions provide Kanto through demand in other regions



- Thus, in Kanto's case, what moved towards (ii) is generally called Kanto's induced domestic products
- From Kanto's perspective, C could not by met by Kanto's production inducement by other regions, so from the Kanto side it becomes "outflow concept." A is covered by Kanto products in order to meet other regions' demand, so from Kanto it becomes "inflow concept."
- Furthermore, the "production repercussion balance of payments" can be calculated from these inflow/outflc On the Figure are the equivalents of C–A.

The table above can be made into a simplified table as in Table 7-(ii)-5 below. As shown in the table, for Hokkaido the decrease in in-region production (C) of 229.9 billion yen from demand in other regions is greater than the decrease in in-region demand (B) of 71.6 billion yen. This indicates that other regions have a larger influence. Okinawa is also more influenced by demand from other regions than by in-region demand.

Additionally, comparing impact on other regions (A) with impact from other regions (C), impact on other regions (A) is greater for Chubu and Kyushu, while impact from other regions (C) is greater for Kanto, Kinki, and Hokkaido. Impact both ways is roughly equal in Tohoku, Chugoku, and Shikoku.

In the case of the current data, Kanto sharply decreased production in order to meet reduced demand from other regions. This effect was particularly large for construction and service industries compared with other regions. On the other hand, Kyushu and Chubu had greater impacts on other regions.

This is highly dependent on regional industrial structure. Chubu and Kyushu, for example, are heavily weighted towards the automobile industry and thus have a large impact on other regions. In contrast, the industrial structures of Kanto and Kinki are weighted towards service industries, and are thus easily influenced by demand in other regions (Table 7-(ii)-6).

Table 7-(ii)-5: Inter-regional interdependent relationships of induced domestic products (sector totals)

Sector total (¥100 million)

		B+C	B	A	C	C-A
	Data	Induced domestic products	Induced domestic products from same-region demand	Other-region induced domestic products from same-region	same-region induced domestic products through other-region	Production repercussion balance of payments
Hokkaido	-512	-3,015	-716	-352	-2,299	-1,946
Tohoku	-7,512	-17,163	-10,285	-5,792	-6,878	-1,086
Kanto	-60,765	-148,596	-109,491	-28,508	-39,105	-10,597
Chubu	-42,803	-96,072	-73,415	-33,359	-22,657	10,702
Kinki	-23,975	-57,394	-36,507	-14,876	-20,887	-6,012
Chugoku	-12,167	-31,211	-19,256	-10,545	-11,955	-1,410
Shikoku	-3,272	-7,032	-4,047	-2,971	-2,985	-14
Kyushu	-17,277	-30,811	-24,352	-16,958	-6,459	10,499
Okinawa	-21	-171	-26	-8	-145	-136
Total	-168,304	-391,467	-278,095	-113,371	-113,371	0

Table 7-(ii)-6: Inter-regional interdependent relationships of induced domestic products (by type of goods)

Goods sector (¥100 million)

	B+C	B	A	C	C-A
	Induced domestic products	Induced domestic products from same-region demand	Other-region induced domestic products from same-region demand	same-region induced domestic products through other-region demand	Production repercussion balance of payments
Hokkaido	-1,821	-460	-230	-1,361	-1,131
Tohoku	-12,314	-7,670	-3,539	-4,644	-1,105
Kanto	-97,743	-75,371	-21,031	-22,372	-1,341
Chubu	-76,431	-58,111	-21,145	-18,320	2,826
Kinki	-39,255	-25,396	-9,809	-13,859	-4,050
Chugoku	-24,546	-15,027	-6,822	-9,519	-2,696
Shikoku	-5,008	-2,984	-1,932	-2,024	-92
Kyushu	-22,422	-18,092	-11,936	-4,330	7,607
Okinawa	-38	-16	-5	-23	-17
Total	-279,578	-203,127	-76,451	-76,451	0

Construction and service industries sector (¥100 million)

	B+C	B	A	C	C-A
	Induced domestic products	Induced domestic products from same-region demand	Other-region induced domestic products from same-region demand	same-region induced domestic products through other-region demand	Production repercussion balance of payments
Hokkaido	-1,194	-256	-122	-938	-816
Tohoku	-4,849	-2,615	-2,253	-2,234	19
Kanto	-50,853	-34,120	-7,478	-16,733	-9,255
Chubu	-19,641	-15,304	-12,214	-4,338	7,876
Kinki	-18,139	-11,111	-5,067	-7,028	-1,961
Chugoku	-6,665	-4,228	-3,723	-2,437	1,286
Shikoku	-2,024	-1,063	-1,039	-961	78
Kyushu	-8,390	-6,261	-5,022	-2,129	2,892
Okinawa	-133	-11	-3	-122	-119
Total	-111,889	-74,969	-36,920	-36,920	0

Conclusion

Results of measurement found sufficient impact to significantly change almost every region's GDP. Each region's final demand carries out production activities through transactions that cross regions and sectors. This means that induction effects are large. This study only created an outline of inter-regional repercussions, but the calculations resulted in an enormous amount of data, i.e., nine regions multiplied by nine regions multiplied by 53 sectors making 4,293 cells. Multifaceted analysis of this data will enable more detailed study of regional dependency. Although the data points are from 2005 and are thus five years old, this has little impact when considering structural change in industry inter-regional links as the whole economy. Additionally, use is likely to broaden through analysis methods and ingenuity.

IV. 2005 Outline of the work of creating Regional I-O Tables

IV. 2005 Outline of the work of creating Regional I-O Tables

1. History of their creation

I-O Tables (Nationwide I-O Tables) comprise an important part of the System of National Accounts (SNA statistics). They clarify I-O Table transactions that are not made clear in national income statistics and put those facts into table form.

Japan's I-O Tables began with tables compiled separately by the Ministry of International Trade and Industry (now the Ministry of Economy, Trade and Industry) and the Economic Council Agency (name changed to Economic Planning Agency on July 22, 1955; now the Cabinet Office) in 1951. Since unified I-O Tables were created in 1955 as a joint project of the Administrative Management Agency (now the Ministry of Internal Affairs and Communications), the Ministry of International Trade and Industry, and other relevant ministries and agencies, they have been created every five years in years ending with 0 or 5. The 2005 tables are the 11th in this series.

The I-O Tables are not only basic references that clarify the overall economic structure, they are widely used in fields such as economic forecasting and planning and measurement of the effects of development and investment.

In parallel with the Nationwide I-O Tables, Ministry of Economy, Trade and Industry and Bureaus of Economy, Trade and Industry have been jointly creating the Regional I-O Tables. They divide the nation into nine regions in order to elucidate facts about regional economic and industrial structures that are not clarified by the national tables, and to provide an effective tool for regional economic planning and various types of economic analysis. (An Okinawa Table was added to the 1975 tables, and Okinawa Prefecture began participating in the creation of the tables with the 1980 tables.) The first tables were created in 1960; the current 2005 tables are the 10th set.

2. Basic items covered

1) Year covered

2005

2) Target regions

As follows:

Region	Extent of region (prefectures included)	Entities in charge
Hokkaido	Hokkaido	Hokkaido Bureau of Economy, Trade and Industry
Tohoku	Aomori, Iwate, Miyagi, Akita, Yamagata, Fukushima	Tohoku Bureau of Economy, Trade and Industry
Kanto	Ibaraki, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa, Niigata, Yamanashi, Nagano, Shizuoka	Kanto Bureau of Economy, Trade and Industry
Chubu	Toyama, Ishikawa, Gifu, Aichi, Mie	Chubu Bureau of Economy, Trade and Industry
Kinki	Fukui, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama	Kansai Bureau of Economy, Trade and Industry
Chugoku	Tottori, Shimane, Okayama, Hiroshima, Yamaguchi	Chugoku Bureau of Economy, Trade and Industry
Shikoku	Tokushima, Kagawa, Ehime, Kochi	Shikoku Bureau of Economy, Trade and Industry
Kyushu	Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima	Kyushu Bureau of Economy, Trade and Industry
Okinawa	Okinawa	Okinawa General Bureau of the Cabinet Office Okinawa Prefecture

3) Sector classification

(i) Sector classification in principle is based on "production activity units" that produce goods and services. The Establishment and Enterprise Census and the Census of Manufactures use establishments as the basic unit of classification. In an establishment where two or more activities take place at the same time, it is classified in accordance with the primary activity. In the Regional Tables' sector classifications, if two or more activities take place in a single establishment, in principle each production activity is classified. This is so-called activity-based classification. Conceptually, it is similar to product classification.

(ii) Production (CT) estimates are basic sectors (519 rows by 406 columns).

(iii) Four types of aggregated sectors were created: "80 sector classification," "53 sector classification," "29 sector classification," and "12 sector classification."

(iv) The Nationwide I-O Tables' basic sectors and the Regional Tables' basic sectors and aggregated sectors correspond as follows.

Changes in the number of sector classifications

	Regional I-O tables						Nationwide I-O Tables	
	Basic sector classification		Aggregated sector classification		Intermediate products sector		Basic sector classification	
	Row	Column			Row	Column	Row	Column
1995 tables	300	282	100	46	1	1	519	403
2000 tables	514	402	75	52	1	1	517	405
2005 tables	519	406	80	53	1	1	520	407

(v) Beginning with the 2005 tables, in the Regional I-O Tables, in order to ensure the confidentiality of information from individual enterprises (establishments) in each region, it was concealed through consolidation in 404 row sectors and 350 column sectors and published as "basic sectors for publication."

4) Evaluation methods

(i) In principle, price evaluation of commerce activities is on an accrual basis.

(ii) Price evaluation of production evaluates producers' prices based on actual prices.

(iii) Amounts of production and trading are based on gross presentation including consumption tax.

(iv) Price evaluation of imports/exports for ordinary trade exports is the (Free On Board) FOB price. For imports, it is the CIF price (price including transport and insurance costs).

5) Handling of imports/inflows

Imports/inflows are represented in the form of inverse matrices as $\left[I-\left(I-\hat{M}-\hat{N}\right)A\right]^{-1}$ conventional "competitive import/inflow types" tables. For inflows, however, inflow/outflow by region is divided by partner region, and inflows and outflows are placed in mutually responsive "inter-regional competitive inflow type" tables. In other words, Kinki's inflows from Kanto are the same as Kanto's outflows to Kinki.

[Explanation of symbols]

I : unit matrix..... A : input coefficient matrix

$\hat{M}$: import coefficient diagonal matrix ..... $\hat{N}$: inflow coefficient diagonal matrix

6) Handling of scrap and by-products

Through the 1995 tables, scrap and by-products in principle were handled using the negative input method (Stone's method). The scrap and by-products amount was recorded as a negative at the intersection of the column for the sector generating the scrap and by-products and the row for its competitive sector (the sector to which the same or similar commodities as the scrap and by-products belong). In the 2000 tables, the reuse and recycling sector, which includes scrap and by-products, was established in light of recent concern over environmental issues. However, treating different types of scrap and by-products as belonging to the

same sector meant that the various types were input together. In terms of analysis, input coefficients were unstable, and scrap and by-products transactions were added together, so scrap and by-products output to each input sector could not be specified. Because of these problems, the 2005 tables use a format in which scrap and by-products do not bypass the reuse and recycling sector, but are output to the direct input sector. The reuse and recycling sector covers only collection and processing/disposal costs.
Thus, inputs generated by scrap and by-products were handled the same as was done through the 1995 tables. Only the reuse and recycling sector's collection and processing/disposal costs accompany each scrap and by-products input and are output. Compared with the 2000 tables, production is therefore decreased only for scrap and by-products.

7) Transaction amount tables and inverse matrices

Note that in this Ministry's Regional I-O Tables, the following two steps are taken when creating transaction amount tables and inverse matrices.

(i) Of regional final demand, increase in producer's stocks of finished goods and increase in semi-finished goods and work in progress are essentially inventory inside production plants, so their portion of imports/inflows are not included. Therefore, when finding import/inflow coefficients, that portion is considered when creating inverse matrices. (Those two sectors are considered as having self-sufficient rates of 100 percent.)

(ii) Of scrap and by-products, used paper, scrap iron, and non-ferrous metal scrap (ferrous metal scrap) are excluded from endogeny on a transaction amount table basis when creating the inverse matrices. The impact of other scrap and by-products on analysis is considered small, so they are consolidated on a basic sectors basis. Note that this is done because of interference with trade coefficients when creating the Inter-regional I-O Table. For Regional I-O Tables or other simplified analysis, it might not be performed.

8) Publication

(i) "Twenty-nine sector classification" and "12 sector classification" transaction amount tables, input coefficient tables, and inverse matrices are included in this report (in a separate volume). In addition, "53 sector classification" is published on our website.

(ii) Each Bureau of Economy, Trade and Industry published Regional I-O Tables.

3. Features of and changes in the 2005 tables

1) Creation of the Basic Sector Classification Table

In the 1995 tables, primary estimation and primary balancing of production estimates and inputs and outputs was estimated based on the national Basic Sector Classification Table. After that, inter-regional input and output balancing was carried out at the aggregated basic sectors level, which consolidates basic sectors. Beginning with the 2000 tables, input and output balancing was carried out as before in the basic sectors, creating the Basic Sector Classification Table. The 2005 tables follow the 2000 tables.

2) Relationship to the Nationwide I-O Tables

Through the 1995 tables, totals for the nine regions in all transaction amount cells were adjusted to perfectly match the Nationwide I-O Tables. This adjustment did not simply align them with the Nationwide I-O Tables. It also meant integration of unique Regional I-O Table sectors and concepts such as intermediate products across all regions. In the 2000 tables, for the sake of faster publication, complete adjustment was not carried out, and each region's estimated values were given priority. For the 2005 tables, with the exception of some cells,* totals for the nine regions were adjusted to perfectly match the nationwide figures while incorporating unique Regional I-O Tables concepts.

* This time, adjustment was not performed to match imports and trade statistics for the semi-finished products "2621-015 Other hot rolled steel (ordinary steel)" and "2621-016 Hot rolled steel (special steel)" in the Nationwide I-O Tables, so in the Regional Tables a unique methods was used to adjust theme with trade statistics. This, they are handled differently than in the 2000 tables.

3) Major sector changes

Major sector changes from the 2000 tables in the 2005 Regional Tables (working basic sectors) are as follows.

(A) New sectors

(i) 3029-05, -051 Vacuum equipment and vacuum components
In revisions to the Standard Industrial Classification for Japan, the sub-classification "2668 Vacuum equipment and vacuum components manufacturing" was established. Accordingly, this sector was established. The vacuum equipment and vacuum components sectors in the 2000 tables, "3019-01, -011 Pumps and compressors," "3019-09, -099 Other general industrial machinery and equipment," "3022-01, -011 Chemical machinery," and "3029-09, -099 Other special machinery for industrial use, n. e. c." were separated and consolidated into this sector.

(ii) 7341-01, -011 Internet based services
In revisions to the Standard Industrial Classification for Japan, the middle classification "40 Internet based services" was established for industries difficult to classify in either of the middle classifications "37 Communication," or "39 Information services. Accordingly, this sector was established. "Server hosting services" from the sector "7312-03, -031 Other telecommunication" were consolidated in this sector.

(iii) 8313-05, -051 Social welfare (profit-making)
Because nursery schools, home support establishments, and so on have been approved as stock corporations, limited liability companies, etc., this sector was established to cover the activities of private social welfare service providers.

(iv) 8614-09, -099 Other cleaning, barber shops, beauty shops and public baths
In revisions to the Standard Industrial Classification for Japan, the small classifications "Laundries and dye shops" and "Other cleaning, barber shops, and public baths" were consolidated and the small classification "829 Other cleaning, barber shops, beauty shops and public baths" was established. Accordingly, this sector was established. Laundry and dye shops from "8619-01, -011 Cleaning, laundry, and dye shops" and beauty treatments, manicures, pedicures, and beauty doctors, from "8619-03, -031 Beauty shops" in the 2000 tables were separated and consolidated into this sector.

(B) Divided sectors

(i) Used paper
"Used paper" was a dummy sector included in the pulp sector. In order to align its terminology with other dummy sectors, the row sector "1811-012P Used paper" was divided from the 2000 tables' "1811-01 Pulp" and the code was changed to "1811-021P Used paper" to make it a separate dummy sector.

1811-01	Pulp	→	1811-01	Pulp
-011	Pulp		-011	Pulp
-012P	Used paper	→	1811-021P	Used paper

(C) Changes in sector concepts

(i) 921-01, -011 Reuse and recycling
This sector was newly adopted in the 2000 tables as activities including scrap and by-products themselves. Advantages and issues were arranged and studies from the perspectives of the formatting of "scrap and by-products," analysis, production, and basic references. This resulted in handling "scrap and by-products" in the 2005 tables by not bypassing this sector outputting to direct input sectors. This sector is handled in such a way that it accounts only for necessary costs of collection and processing/disposal. Compared with the 2000 tables, production is therefore decreased only for scrap and by-products.

(ii) 7311-01, -011 Postal service and mail delivery
In revisions to the Standard Industrial Classification for Japan, the existing small classification "Postal service" was reorganized into the small classifications "371 Mail delivery," which includes the mail delivery activities of private enterprises and "781 Post offices," which is postal services other than mail delivery. Accordingly, the "Postal services" classification was combined with new mail delivery activities of private enterprises into "Postal service and mail delivery."

(iii) 8519-04, -041 Worker dispatching services
In accordance with a revision to the Act for Securing the Proper Operation of Worker Dispatching Undertakings and Improved Working Conditions for Dispatched Workers (implemented March 1, 2004), the scope of the work covered by "Worker dispatching services" was expanded.

(D) Sector aggregation

(i) 0711-01 Coal mining, crude petroleum and natural gas
With the decline in coal mining production as well as from a policy standpoint, it no longer made sense to keep "coal mining" as a separate column sector. It was therefore consolidated into the "Crude petroleum and natural gas" column sector.

(ii) 8611-02, -021 Performances (except otherwise classified), theatrical companies
In revisions to the Standard Industrial Classification for Japan, the existing small classifications "Theaters and performances" and "Theatrical companies" were consolidated into the small classification "842 Performances (except otherwise classified) and theatrical companies." It thus became impossible to obtain estimates and basic data for the previous classifications. Accordingly, "8611-03, -031 Theaters and performances" and "8611-07, -071 Theatrical companies" from the 2000 tables were consolidated in this sector.

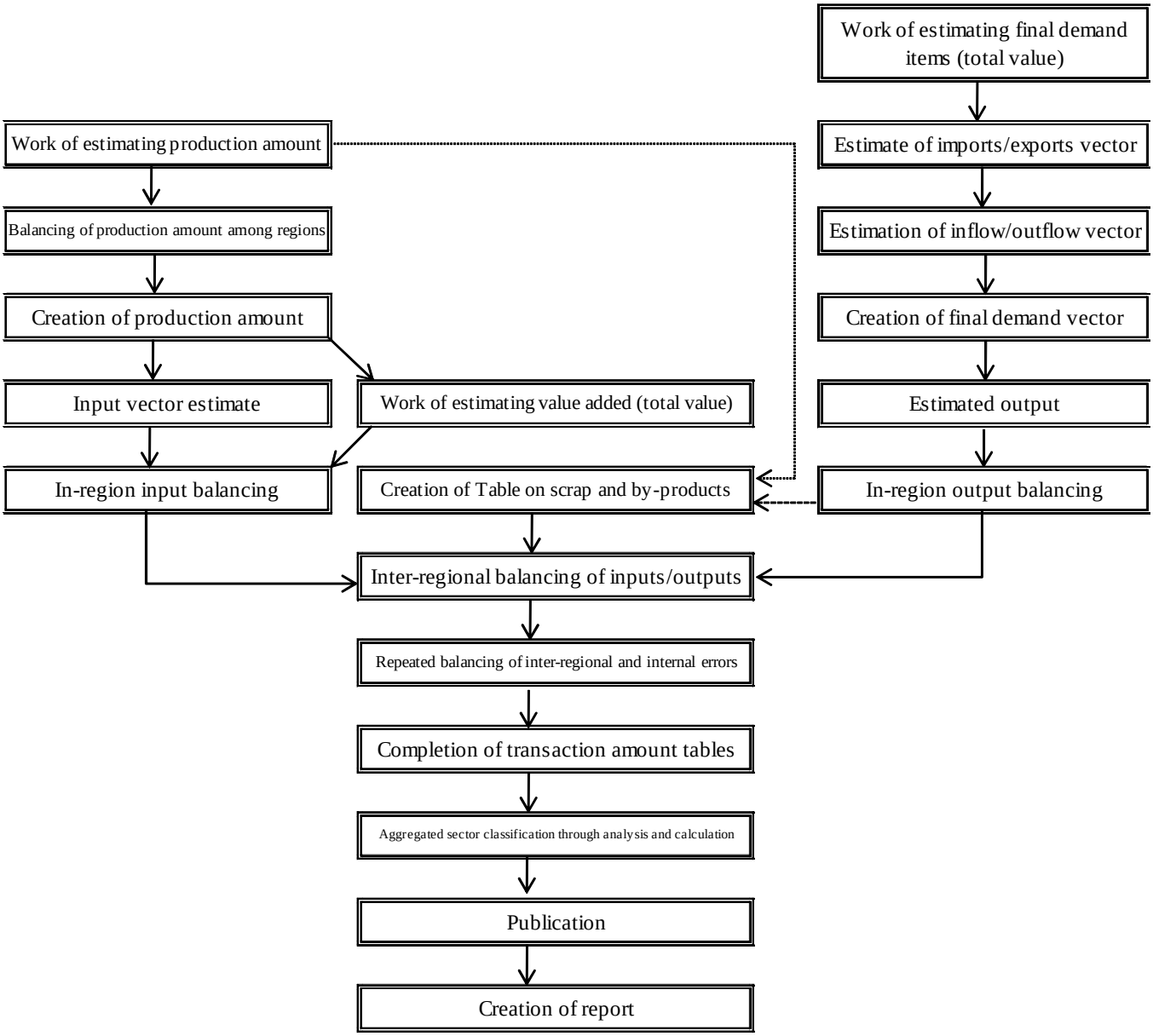
1) Response to SNA 93

In the Nationwide I-O Tables, the gross value added sectors and final demand items "Depreciation of fixed capital (social fixed capital depreciation)" and "Social capital depreciation of central and local governments' individual and collective consumption" were accounted for response to SNA 93 in the 2000 tables. Because of problems with estimates in the Regional Tables, they were not accounted for in the 2000 and 2005 tables.

4. Outline of the creation process

The work of creating the 2005 Regional I-O Tables was carried out jointly by the Research and Statistics Department of the Economic and Industrial Policy Bureau of the Ministry of Economy, Trade and Industry, Bureaus of Economy, Trade and Industry, the Economy, the Trade and Industry Department of the Okinawa General Bureau of the Cabinet Office, and Okinawa Prefecture. By year, the following process was followed.

Work flow of the creation of the 2005 Regional I-O Tables



1) During FY 2005 into FY 2006, the 2005 Commodity Distribution Survey was carried out in order to grasp inter-regional trade.
2) During FY 2006, the data from the 2005 Commodity Distribution Survey were examined and tabulated. In addition, the (Draft) Basic Direction on Creation of the 2005 Regional I-O Tables was created and studied.
3) During FY 2007, in light of the Basic Guidelines for Creation of the (Nationwide) I-O Tables, the basic Guidelines for Creation of the 2005 Regional I-O Tables were created. At the same time, the basic sectors were decided in light of decisions on the sectors for the Nationwide I-O Tables (Basic Sectors). Additionally, production estimates were carried out in accordance with the basic sectors in the Nationwide I-O Tables (Basic Table) based on the 2005 production estimate methodology in the Basic Guidelines for Creation of the 2005 Regional I-O Tables.

4) During FY 2008 into FY 2009, checking and correction of production and primary estimates of input and output amounts were performed based on the basic sectors in the Nationwide I-O Tables (Basic Tables). Additionally, after estimates of final demand, imports/exports, inflow/outflow, and scrap and by-products tables by region were carried out based on the basic sectors in the Nationwide I-O Tables (Basic Tables), final balancing of both the input and output sides was performed, various coefficients and analyses were calculated, and a report was compiled.

5. Estimation methods by sector

1) Regional production (gross inputs/outputs)

Regional production (gross inputs/outputs) follows the sector classifications in the 2005 Nationwide I-O Tables. For each of the approximately 3,600 subdivided commodities, to the extent possible uniform estimation methods were used for each region based on the 2005 production estimate methodology. This was consolidated into 519 row sectors and 406 column sectors.
The estimation methodology for goods was production volume multiplied by unit price, production volume by region compared with national figures multiplied by national production, etc.
Totals for production by region in principle were adjusted to match production in the Nationwide I-O Tables. The "nationwide" figures used in this report are the aggregate figures for the regions (hereinafter called the "all-region total").

(A) Major references used

(i) Agriculture, forestry, and fishery:
Production agriculture income statistics, vegetable production shipment statistics, crop statistics, cultivated land and crop acreage statistics, Ministry of Agriculture, Forestry and Fisheries statistics, agriculture and forestry census, livestock distribution statistics, statistical overview of forestry, production forestry income statistics, industrial forest products basic materials, fishery and aquaculture production statistics, fishery census, etc.
(ii) Mining: Survey of Mining Trends in Japan, annual report of quarrying statistics, tabulation results of report on the business status of quarries, etc.
(iii) Manufacturing: Production dynamics statistics, industrial statistics, milk and dairy products statistics, sugar statistics yearbook, Canners Journal, distribution of fisheries products statistics, lumber supply and demand reports, etc.
(iv) Construction: building construction statistics, road statistics, Report on Current Survey of Orders Received for Construction, comprehensive construction statistics, etc.
(v) Electricity and gas: electric power handbook, annual gas report, heat supply handbook, etc.
(vi) Transport: surveys of regional movement of tourists, Annual Statistics on Railways and Transportation, Land and Transport Statistics Directory, port statistics, statistical surveys of aviation, etc.
(vii) Service industries and others: basic statistics on service industries, reports on surveys of special service industries, reports on basic school surveys, surveys of local education expenses, private school finances today, surveys of medical institutions, Hospital Report, report on long-term care businesses, report on labor dispatch businesses, etc.

(B) Extent covered by Regional production (gross inputs/outputs)

The production scope of Japan's Nationwide I-O Tables is a "domestic concept." It is limited to production activities within Japanese territory. In other words, it excludes foreign government missions, military, and international institutions inside Japan and includes Japanese government missions overseas. It excludes the production activities of enterprises overseas and includes the production activities of branches and offices of foreign-registered enterprises in Japan.
The Regional Tables also follow the Nationwide I-O Tables' "domestic concept," while incorporating the following "regional concept."
Because the production activities of industrial production generally take place in establishments located in specific regions, those establishments' production is accounted for. However, agriculture, forestry, and fishery, construction, commerce, transport, communication, service industries, and so on transcend geographical boundaries. No matter where their establishments are located, many of them carry out

production activities in other regions. Furthermore, a variety of concepts are mixed into real-world "production regions."

The following describes how the extent of the production covered was arranged especially for the Regional Tables.

- ○ Fisheries production was recorded according to the locations of the markets where catches were landed rather than those of the seas where the fishing took place.
- ○ For transport production, sales were recorded according to the location of the enterprise that shipped the cargo rather than the location of the roads and railways on which transport activities took place (establishment basis).
- ○ On the other hand, the same "establishment basis" as freight transport was not used with railway transport (passengers). The number of passengers multiplied by the number of kilometers traveled inside a given region was apportioned as that region's production. Conceptually, this means that production on the actual railways was recorded.
- ○ In the case of construction, production was recorded according to the location of the actual site of the construction activities rather than the location of the construction company (territorial basis). Therefore, in extreme cases, construction companies may have had extensive production even in regions in which they have little actual presence. It should be noted that in such cases, simple employment analysis was impossible.

  As special cases, Japanese diplomatic missions aboard, such as the Japanese embassy in the USA, were assigned to the Tokyo region.

  In the case of production from goods and services whose production prices are not necessarily fully collected or that are provided free, as by government or private non-profit groups, in principle the expenses required for production were added and recorded.

(C) Price evaluation of regional production (gross inputs/outputs)

The following are some concrete examples of the price evaluation of regional production (gross inputs/outputs).

(i) Manufacturing industry products were evaluated according to the producer's delivery price. Producers' price* is equivalent to an enterprise's factory shipment price, which includes headquarters and sales office expenses and profit allocation.

*The price that records everything from the producer to the final consumer, including wholesale and retail trade margins and the carrier's margin (commerce margin and transport margin) is called the "purchasers' price." The purchasers' price minus those margins is called the "producers' price."

(ii) Production activities in manufacturing retail trade were divided into manufacturing activities and retail trade activities, and recorded in the appropriate sector's regional production (gross inputs/outputs).

(iii) For secondhand goods, transaction margins only were recorded as "cost trade margins" in the commerce sector.

(iv) Prices of products of establishments in industries that cannot be easily partitioned, such as forestry, fisheries, and gravel quarrying products, were evaluated in the markets nearest to their production places.

(v) In the case of land deals, only agency fees and addition/remodeling costs were recorded.*

*Conceptually, land was included among secondhand goods, and thus not handled.

(vi) Of indirect taxes, taxes imposed on goods during production stages were included in the production of the production sector that directly pays the taxes. Taxes imposed during the distribution stage were included in commerce production. (However, because of light oil's relationship with other petroleum refinery products [including greases] produced at the same time, the light oil delivery tax was handled specially as imposed during the production stage.)

(vii) The standard for evaluating producers' prices of in-house production and personally-produced consumer goods was product prices in the market.

(viii) Price evaluation of increases and decreases in inventory of semi-finished goods and work-in-progress in principle used the average of the prices at the beginning and end of the year.

(ix) Service industries were evaluated at the price born by the one receiving the services. The producers' price and the purchasers' price were thus identical.

(x) Evaluation of production in sectors such as finance and insurance and house rent (imputed house rent) was by imputation.

(xi) Evaluation of the production of producers of government service activity and producers of private non-profit service for households in principle used total costs.

(D) Sectors receiving special treatment

(i) Handling of intermediate products
As in the 2000 tables, hot rolled steel semifinished products were recorded as an intermediate products sector in the 2005 tables. As for sugar, it was a 10-digit sub-commodity of production and was recorded as raw sugar (domestic raw material) for beet sugar and cane sugar. There is therefore a bulge in production compared to the Nationwide I-O Tables only to the extent that production of these intermediate products was reported.

(ii) Cost transport margins and cost trade margins
In the Regional Tables, even though goods transaction amounts from inflows/outflows not found in the Nationwide I-O Tables are not reported, in some cases the amounts of transport and commerce margin inflows/outflows only were reported. For example, if a product produced in Region A was consumed by a household in Region B, and the transporter and seller (trader) was a business in Region C, then the product and the transport and commerce margins were reported in Region B's consumption expenditure of households, and the product was reported an inflow from Region A. However, the transport and commerce margins were inflows from Region C. From Region C's perspective, the transport and commerce margins alone became outflows to Region B's consumption expenditure of households, even though there were no outflows of goods. This actually occurs in the Regional Tables, so this kind of handling of cost transport margins and cost trade margins is generally necessary. It is difficult to actually estimate such figures, however. Estimates handled as cost transport margins and cost trade margins the difference of transport and commerce margins transacted through regional demand from each region's production plus the added transport and commerce margins generated when export/outflow takes place, and reported them as inflow/outflow. Therefore, if a region happens to have particularly large transport and commerce inflows/outflows, in the Nationwide I-O Tables these are seen as transport and commerce margins accompanying the movement of goods, but from a given region's perspective, transport and commerce margins handled as costs are reported.

(iii) Dummy sectors
The Regional Tables do not include self-transport by private cars (passengers) and self-transport by private cars (freight) from the self-transport by private cars sector in the Nationwide I-O Tables. Production was therefore smaller to that degree than production in the Nationwide I-O Tables.

2) Inputs and outputs

(A) Input amounts

Because there are few materials than can form the basis for estimates, the rate of change of the 2005 Nationwide I-O Tables' input coefficients from the 2000 Nationwide I-O Tables was multiplied by the 2000 Regional Tables' input coefficients to calculate an input coefficient table, which was multiplied by previously obtained production for the input amounts (estimated values).
Next, regarding major raw materials and value added, corrections were made using materials such as the Input survey of mining and manufacturing industry, the Ministry of Agriculture, Forestry and Fisheries' Current Survey of Production, the Ministry of Economy, Trade and Industry's Current Survey of Production, and the Census of Manufactures. Additionally, for sectors where the composition of commodities in production in basic sectors is strikingly varied, inputs were corrected for each commodity with the production structure in mind.

(B) Output amounts

As with estimates for input amounts, there are very few materials on which to base output estimates. Therefore, for some sectors, supply and demand surveys were used for estimation, but where input figures were reliable, they were adopted for outputs as well.

(C) Estimates for reuse and recycling sector inputs and outputs

This was a new sector in the 2000 tables. Because of its peculiarity, a separate Nationwide I-O Tables supplementary table, the "Table on scrap and by-products," was made for the Regional Tables as well when

the input amounts for reuse and recycling were estimated. (See VI. The "Reuse and recycling" sector and estimation of scrap and by-products)

3) Final demand estimates

(A) Consumption expenditure outside households

Consumption expenditure outside households comprises the row sectors "Lodging expenses and daily allowances," "Social expenses," and "Costs for health and welfare." It indicates consumption expenditure by good and service in the final demand sector.
A converter was created, and estimates were allocated according to the composition ratios of the corresponding nationwide figures for each good and service after examining which sector "Lodging expenses and daily allowances," "Social expenses," and "Costs for health and welfare" correspond with for each good and service. Seven-digit production amounts by region corresponding to the values were allocated to the regions.

(B) Consumption expenditure (private)

Consumption expenditure (private) comprises consumption expenditure of households and consumption expenditure of private non-profit institutions serving households.

(i) Consumption expenditure of households
First, consumption expenditure of households from prefectural accounting was added for each region. They were compared with the nationwide figures from the Nationwide I-O Tables' total consumption expenditure of households and multiplied by that ratio to obtain primary consumption expenditures of households by region. They were used along with the nationwide household consumption vector's composition ratio and supplemental data on households of two or more and single-person households, etc., from the Family Income and Expenditure Survey annual report to estimate the household consumption vector by region.

(ii) Consumption expenditure of private non-profit institutions serving households
It was divided by the ratio to the nationwide figure of by-region production in the non-profit sector (starred items) in the sector classification table.

(C) Government consumption expenditure

Government consumption expenditure comprises "central" and "local" and "Collective consumption expenditure" and "Individual consumption expenditure."
Collective consumption expenditure: services for society as a whole, such as diplomacy and police
Individual consumption expenditure: services for individuals, such as education and health
The "central" estimates were found by dividing with a series representing demand. "Local" estimates were found by tabulating by region a breakdown by purpose of the "FY 2005 survey of prefectural accounting" and the "FY 2005 survey of municipal accounting," finding the regional composition ratio by purpose, and distributing the nationwide figures proportionally. "Collective consumption expenditure" and "Individual consumption expenditure" can be broken down by purpose and divided into separate consumption expenditures.

(D) Gross regional fixed capital formation

Fixed capital formation comprises "public" and "private." Regarding capital goods with a service life of at least one year and a unit price of at least 100,000 yen, with exceptions such as those purchased by the construction sector as intermediate materials for construction activities (construction bypass), machinery included in steel ships (shipbuilding bypass), and ordnance purchased by the Self-Defense Forces, they were all reported as final demand sector "Gross regional fixed capital formation" rather than transaction amounts of endogenous sectors.

(i) Estimates of capital investment
"Public" estimates were divided for each industry with a series that can represent the demand. "Private" estimates were made for each industry from statistics such as the "Industrial statistics rearrangement table," the "Service industries basic statistics rearrangement table," the "Report based on gas business accounting rules," and the "Construction by funding by facility."

(ii) Use of fixed capital matrix
Each commodity's output by industry in the Nationwide I-O Tables' fixed capital matrix was multiplied by the ratios of the amount of capital investment by region and industry to obtain the amount of output by region, which was added for each commodity.

(iii) Vector correction work
Asset increases corresponding to 10-digit CT capital formation and so on were used to make corrections.

(E) Increase in stocks

Increase in stocks comprises the following four items.
Inventory of imported/inflow products was reported as "Increase in dealer's stocks of goods" or "Increase in stocks of raw materials and supplies."

(i) Increase in producer's stocks of finished goods
Increase in producer's stocks of finished goods was estimated according to the production estimate method from the Current Survey of Production and industry statistical tables, etc.

(ii) Increase in semi-finished goods and work in progress
Regarding growth and development, relevant sectors with 10-digit production used that. Outside of growth and development, figures for semi-finished goods and work-in-progress within the 10-digit production were reported.

(iii) Increase in dealer's stocks of goods
Each region's in-region demand by sector (intermediate demand plus regional total final demand) divided by the all-region total is the composition ratio by region. The Nationwide I-O Tables' increase in dealer's stocks of goods by commodity was divided by the composition ratio by region to obtain the primary estimate values.

(iv) Increase in stocks of raw materials and supplies
Each region's in-region demand by sector divided by the all-region total is the composition ratio by region. The Nationwide I-O Tables' increase in stocks of raw materials and supplies by commodity was divided by the composition ratio by region to obtain the primary estimate values.

(F) Imports/exports

Imports/exports comprise "ordinary trade," "special trade," and "direct purchase." Exports are recorded as positive numbers, and imports as negative numbers. In addition, imports and exports do not include re-imports and re-exports. For secondhand goods such as art and antiques, only equivalent margins are reported.

(i) Exports (ordinary trade)
Estimates are made with reference to the "Current Survey of Production" and the "Commodity Distribution Survey."
Trade statistics were arranged by customs office as reference values and further tabulated by region. However, since a product imported into or exported from a custom house's region was not necessarily produced or consumed in that region, their use was limited to some regions and goods.

(ii) Imports (ordinary trade), customs duties, and commodity taxes on imported goods
Each region's in-region demand divided by the all-region total is the composition ratio by region. The values from the Nationwide I-O Tables were divided by the composition ratio by region.
As with exports, a table rearranging trade statistics by customs office was created for reference values, but because not all consumption is limited to the region in which the port of imports is located, their use was limited to some regions and goods.

(iii) Imports/exports (special trade and direct purchase)
Regarding exports, US Department of Defense procurement data and surveys of foreign visitors to Japan were used. Regarding imports, apportionment indexes such as shipping and aviation statistics and immigration control statistics were used, and divided by the nationwide ratio.

(G) Inflow and outflow

Inflow and outflow are unique to the Regional Tables. They are inter-regional transactions in goods and services inside Japan. Outflows are recorded as positive numbers, and inflows as negative numbers.

The following data were used to obtain primary estimate values, which were balanced with output balance in mind. In the agriculture, forestry, and fishery sector, meat distribution statistics and milk and dairy products statistics were used. In the industrial production sector, commodity distribution surveys and surveys of regional movement of freight were used. In the service industries sector, inter-regional traveler fares, inter-prefectural passengers carried tables, and headquarters/sales office expenses were used.

1) Gross value added estimates

Gross value added sectors comprise the items in "consumption expenditure outside households," "compensation of employees," "operating surplus," "depreciation of fixed capital," "indirect taxes" and "subsidies." Primary estimate values were obtained by multiplying the value added coefficient for each region's gross value added items in 2000 by the rate of change versus 2000 of the 2005 Nationwide I-O Tables' value added coefficient.

(A) Consumption expenditure outside households

Consumption expenditure outside households comprises "Lodging expenses and daily allowances," "Social expenses," and "Costs for health and welfare." In the gross value added sectors, they indicate expenditures on production by sector.

(B) Compensation of employees

Compensation of employees refers to income (wages and salaries [pay], contributions of employers to social insurance, and other payments and allowances) of employees who are paid officials, permanent employees, and temporary and day workers. Income of sole proprietors and family business owners was included in operating surpluses.
Although things like commuter passes, company housing rent subsidies, and so on appear in actual payments, expenses for fringe benefits were handled as consumption expenditure outside households.
Estimated values were obtained using the Population Census, establishments and enterprises statistics, industrial statistics, etc., to calculate compensation of employees balanced by regional employment. Because cost burdens are also generated by inflow/outflow of headquarters and sales office expenses, estimates were balanced accordingly.

(C) Operating surpluses

Operating surplus is the amount remaining when consumption expenditure outside households, compensation of employees, depreciation of fixed capital, and net indirect taxes (indirect taxes minus current subsidies) are subtracted from gross value added.
Operating surplus comprises, each industrial sector's operating profit, interests paid, and so on. Non–operating income (interest earned and dividends received) is not included. The income of sole proprietors and unpaid family employees is counted as operating surplus. Producers of government service activity and producers of private non-profit service for households have no operating surpluses.

(D) Depreciation of fixed capital

Depreciation of fixed capital comprises depreciation and contingent loss of capital. Depreciation refers to attrition and damage to fixed capital. Contingent loss of capital is real estate loss due to fire, wind and water damage, accidents, etc.
The scope of depreciation of fixed capital is the same as that of gross regional fixed capital formation. Depreciation of social capital of general roads and other public infrastructure is not included.

(E) Indirect taxes (exempted customs duties and commodity taxes on imported goods

The following were reported as indirect taxes. Customs duties and commodity taxes on imported goods and not included in the gross value added sectors' indirect taxes. They were reported as items exempt from final demand.
National taxes: consumption tax, liquor tax, tobacco tax, gasoline tax, automobile weight tax, etc.
Local taxes: business taxes, local tobacco taxes, special local consumption taxes, property taxes, etc.
Non-tax burden: various fees, etc.

Property taxes are imposed not only to factory land and enterprises, but also to houses and residential land. The total amount of property taxes imposed was treated as indirect taxes.

(F) Current subsidies

Current subsidies refer not only to items that are commonly referred to as subsidies in regulations and budgets, but also to compensation, contributions, incentives, grants, bonuses, and grants. Transfers from the general account of the Foodstuff Control Special Account were considered current subsidies.
Transfers from the government to compensate for operating losses by public enterprises are included in current subsidies. Producers of private non-profit service for households and producers of government service activity do not receive current subsidies.
Estimates cover the same scope as subsidies in prefectural accounting.

2) Handling of consumption tax

The transaction amounts of regional production (gross inputs/outputs), along with endogenous sectors, final demand sector, and gross value added sectors are gross presentation that in principle evaluates prices that include consumption tax.

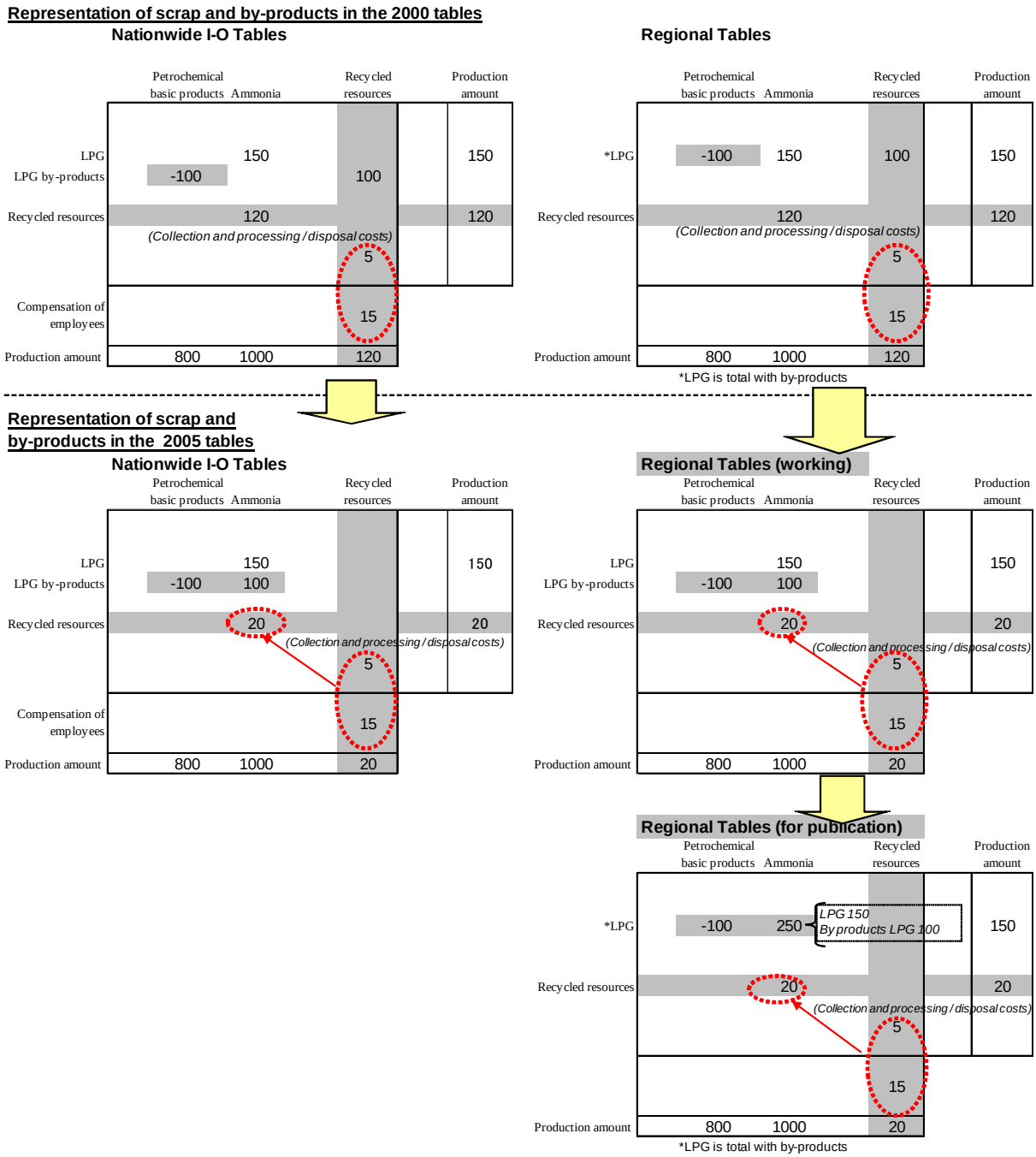
6. The "Reuse and recycling" sector and estimation of scrap and by-products

2000 The "Reuse and recycling (3921-01, 3921-011)" sector was added to the Nationwide I-O Tables in 2000, and the same sector was established in the Regional Tables as well. The Nationwide I-O Tables' "Reuse and recycling (3921-01, 3921-011)" work was estimated based on special code data appended to scrap and by-products. In the Regional Tables, however, scrap and by-products were not assigned a special code in the manner of the Nationwide I-O Tables. The "Table on Scrap and By-Products by region" was therefore created to enable use of the same estimation method used for the Nationwide I-O Tables, and estimates for "Reuse and recycling" were carried out.

In the 2005 Nationwide I-O Tables, the "Reuse and recycling" sector was changed to report only collection and processing/disposal costs, so costs were output incidental to scrap and by-products in the same way they were for transport margins. The Regional Tables followed this as well.

The relationships between the 2000 and 2005 Nationwide I-O Tables and Regional Tables are as illustrated below.

Representation of scrap and by-products



(A) Creation of the "Primary Table on Scrap and By-Products" in order to make the "Table on Scrap and By-Products" by region

There was a "Table on Scrap and By-Products" in the 2000 Regional Tables, so it was changed in accordance with the definitions in the 2005 tables.
At time of publication, scrap and by-products were consolidated into competitive sector and published. However, the working "Table on Scrap and By-Products" was divided into "scrap and by-products" and "collection and processing/disposal costs" from before consolidation, so that was used and processed.

Scrap and by-products output and input table (2000, Kanto region)

(Value unit: ¥1 million)

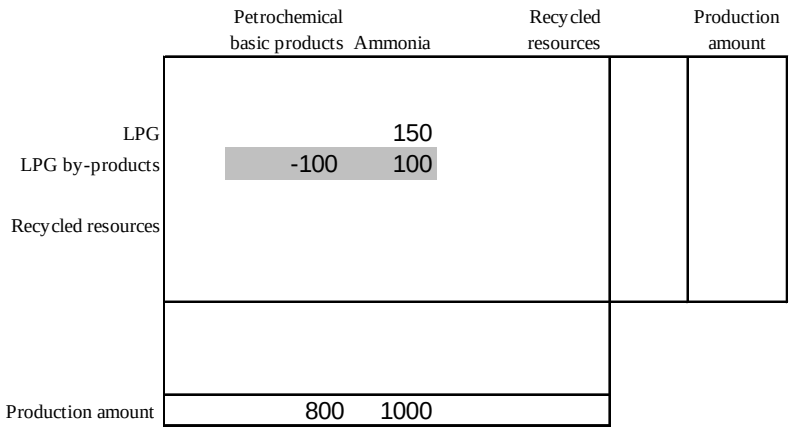
Competitive sectors (rows)	Generating sector (column)			Input sector (Column)				Code
Code/name	Code	Name (scrap and by-products commodities)	Amount generated	Code	Name	Input amount	Input of recycled products	
0116-093 Raw cotton (imported)	1511-01	Fiber yarns (waste cotton)	- 103					3
	9411-10	(Less) Imports (ordinary trade) (waste cotton)	- 120					3
	9414-00	(Less) Commodity taxes on imported goods	- 6					3
				1511-01	Fiber yarns	167	183	2
				1519-09	Other fabricated textile	36	40	2
				9211-10	Exports (ordinary trade)	25	25	2
				9213-00	Balancing sector	1	1	2
	Total		- 229	Total		229	249	
0121-091 Sheep and lamp wool	1511-01	Fiber yarns (flock)	- 9		This difference (249 − 229 = 20) is collection and processing/disposal costs			3
	9411-10	(Less) Imports (ordinary trade) (flock)	- 26					3
	9414-00	(Less) Commodity taxes on imported	- 1					3
				1511-01	Fiber yarns	23	24	2
				1519-09	Other fabricated textile	13	14	2
				9211-10	Exports (ordinary trade)	0	0	2
				9213-00	Balancing sector	0	0	2
	Total		- 36	Total		36	38	

1) Processing of scrap and by-products input and output amounts

In the 2000 Regional Tables, the above table was included as a supplementary table, so it was processed. Output was taken from the output sector. For input in the 2000 tables, generated scrap and by-products were temporarily input into the "Reuse and recycling" sector. "Collection and processing/disposal costs" were added and it was output to each industry as the "Reuse and recycling" sector. In the 2005 tables, as in the 1995 tables, scrap and by-products themselves were input directly from the generating sector into the appropriate goods and services.

Scrap and by-products input and output amounts

((i) Handling of scrap and by-products input / output)



2) Reuse and recycling sector production estimates

The reuse and recycling sector's column vectors were created by excluding input of scrap and by-products. Row vectors were created by the value of recycled products input minus input (Figure 2) and associating it with input column sectors.

The ratio of collection and processing/disposal costs to scrap and by-products input from the "Table on Scrap and By-Products" was found and multiplied by the scrap and by-products that should be input for each region in order to find the amount of collection costs and obtain the amount of production of collection and processing/disposal costs.

(B) Creation of "reuse and recycling" by region vectors

Although the Primary Table on Scrap and By-Products created in (1) above was matched to the definitions in the 2005 tables, the data were from the 2000 tables. The rate of change between the nationwide Table on Scrap and By-Products' input coefficients from the 2000 tables to the 2005 tables was therefore found, and interim Table on Scrap and By-Products estimates were obtained.

Figures for outputs from exports/outflows, imports/inflows, and household investments were balanced by balancing competitive sectors and grasping the actual situation.

Estimates of primary scrap and by-products

((ii) Reuse and recycling sector [column])

	Petrochemical basic products	Ammonia	Recycled resources	Production amount
LPG		150		
LPG by-products	-100	100	0	
Recycled resources	*(Collection and processing / disposal costs)*		5	
			15	
Production amount	800	1000	20	

((iii) Reuse and recycling sector [row])

	Petrochemical basic products	Ammonia	Recycled resources	Production amount
LPG		150		
LPG by-products	-100	100	0	
Recycled resources		20		20
	(Collection and processing / disposal costs)		5	
			15	
Production amount	800	1000	20	

7. The relationship between Regional I-O Tables and prefectural accounting

Both Regional I-O Tables and prefectural accounting take the administrative districts "prefectures" as their units and measure the results of economic activity during a given period.

By enabling understanding of the economic cycles and structures of prefectures and their residents in terms of macro-level factors such as production, distribution, and expenditure, prefectural accounting systematically elucidates the state of prefectural economies.

In contrast, I-O Tables take the perspective of grasping intermediate product transactions by commodity, which is not addressed in prefectural accounting.

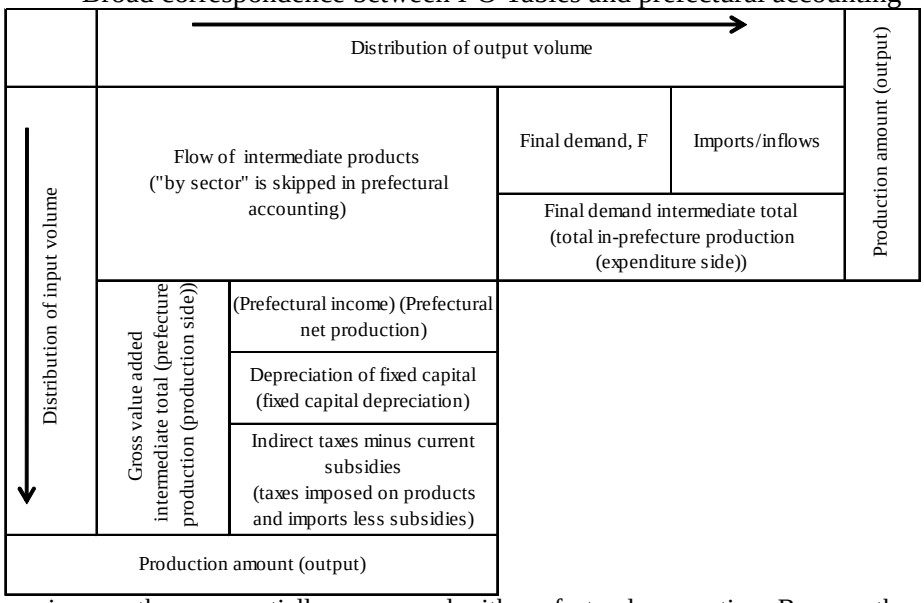
Additionally, because the tables expressly address production technology-related links between industries, transactions between sectors are limited to nonrecurring transactions in goods and services. Transactions related to payment of income and financial balance of payments are excluded.

Thus, although they both address the same targets, their basic character as statistics differs.

By nature, the figures in prefectural accounting and the figures in the I-O Tables' exogenous sectors (gross value added and final demand) address the cycles of the same prefectural economies and thus essentially should match. However, the I-O Tables and prefectural accounting use unique definitions and do not match perfectly as-is. Their broad correspondence is as follows.

*These comparisons are based on 2000 standard prefectural accounting and the 2000 Regional I-O Tables.

Broad correspondence between I-O Tables and prefectural accounting



Note: Items in parentheses essentially correspond with prefectural accounting. Because they are addressed on a prefectural basis while the Regional I-O Tables address them on a regional basis, if some conceptual adjustment is made based on this, income of prefectural residents will accord with the Regional I-O Tables. In the prefectural accounting, production and expenditure are addressed on an in-prefecture basis, while distribution is addressed on a prefectural resident basis.

The broad correspondence between I-O Tables and prefectural accounting by item is as follows.

Broad correspondence between I-O Tables and prefectural accounting by item

I-O table	Balancing items	Prefectural accounting
Total Final demand = Consumption outside households + Private consumption + Government consumption + Private fixed capital formation + Public fixed capital formation + Increase in stocks + Exports/outflows	− Imports/inflows − Consumption outside households	≈ **Total in-prefecture production (expenditure side)**
Total gross value added = Consumption outside households + Compensation of employees + Operating surplus + Depreciation of fixed capital + Indirect taxes − Current subsidies	− Consumption outside households	≈ **Total in-prefecture production (production side)**
In-prefecture production = Intermediate input total + Total gross value added = Intermediate demand total + Total Final demand − Imports/inflows		≈ **Producers' price Display output**

The main differences are as follows.

(1) The periods covered by the work are fiscal years for prefectural accounting and calendar years for I-O Tables.
(2) Sector classification is carried out on an establishment basis for prefectural accounting and on an activity basis for I-O Tables.
(3) In order to understand prefectural economies, prefectural accounting addresses a prefectural boundary concept (territorial basis) and a prefectural resident concept (residency basis). In contrast, the I-O Tables use only a prefectural boundary concept (territorial basis).
(4) I-O Tables account for consumption expenditure outside households as part of gross value added and final demand. Prefectural accounting accounts for it as part of intermediate transactions, not as part of gross value added and final demand.
(5) The prefectural boundary concept used in the prefectural accounting system assesses economic activity within the administrative districts called prefectures without reference to the residency of those engaging in them. In contrast, the prefectural resident concept assesses the economic activity of residents in a prefecture without reference to the production region. "Resident" in this case includes not only individuals, but also corporate enterprises and government institutions.

Since 2000, both national accounting and the Nationwide I-O Tables have reported depreciation of fixed capital for social capital, and prefectural accounting does so as well. However, the 2005 Regional Tables, like the 2000 tables, do not report depreciation of social capital, creating a divergence from both the Nationwide I-O Tables and prefectural accounting. Simple comparisons are therefore not possible.

8. Content and calculation methods of the coefficients used for I-O Table analysis

(1) Method of calculating input coefficients

"Input coefficients" are the value of inputs such as raw materials and fuel used by an industry to produce its various products, divided by the industry's regional production. Input coefficients are equivalent to the basic unit of production. They were calculated by industry and arranged in a table to create the "Input coefficient table."

Assuming for the sake of simplification that a regional economy has only two industries, Industry 1 and Industry 2, a transaction basic table can be expressed as below.

Transactions basic table

	Industry 1	Industry 2	Final demand	Regional production
Industry 1	χ_{11}	χ_{12}	F_1	X_1
Industry 2	χ_{21}	χ_{22}	F_2	X_2
Gross value added	V_1	V_2		
Regional production	X_1	X_2		

If, in Industry 1, the inputs χ_{11} from Industry 1 divided by Industry 1's regional production X_1 equals the value a_{11}, then

$$a_{11} = \frac{\chi_{11}}{X_1} \qquad \cdots\cdots\cdots\cdots\cdots \text{(i)}$$

expresses the raw materials and other basic units (coefficients) input from Industry 1 to produce one product unit in Industry 1.

Similarly, $a_{21} = \frac{\chi_{21}}{X_1}$ expresses the raw materials and other basic units (coefficients) input from Industry 2 to produce one product unit in Industry 1.

Similar to intermediate input, dividing value added V_1, meaning Industry 1's inputs of labor, capital, and other primary production elements, by regional production X_1 obtains the value v_1. Therefore, $v_1 = V_1 / X_1$ can be considered the input basic unit (coefficient) of production elements.
Carrying out the same procedure for Industry 2 (the table's second column) enables creation of an "input coefficient table" as follows.

Input coefficient table

	Industry 1	Industry 2
Industry 1	a_{11}	a_{12}
Industry 2	a_{21}	a_{22}
Gross value added	v_1	v_2
Regional production	1.000	1.000

Note: $a_{ij} = \frac{\chi_{ij}}{X_j}$ (i expresses the row and j the column)

$$v_i = \frac{V_j}{X_j}$$

The input coefficient table shows the amount of raw materials and so on required for production of one unit in each industry. It can also be considered a table of basic units of production. For each industry, the sum of the input coefficients including the value added portion is 1.000 by definition.
However, the actual I-O Tables that we use display monetary values, not physical quantities. The assumption that allows these value-display tables to be used in the same way as quantity-display tables is the yen value unit. If 100 units of a good with a unit price of 2 yen are inputs for a total of 200 yen,

200 (yen) = 2 (yen / unit) × 100 (units)

then, in practice what is handled is yen value units.

200 (yen) = 1(yen / value *unit*) × 200 (value *units*)

Seen in this way, this new quantity shows the value when the unit price is 1 yen.
"Yen value unit" I-O Tables enable evaluation of those physical quantities and comparison of each industry's production units using the amount of every industry's production volume as a quantity of value units of 1 yen (or 1 dollar, or 1 million yen, or any other uniform amount). When doing so, evaluation using the base year's "yen value unit" is the very meaning of nominal value. Applying the base year's "yen value unit" to the comparison year and evaluating it using the base table's yen value equivalent is a "substantial evaluation."

(2) The meaning of input coefficients

[Measurement of production repercussion with input coefficients]
Next, the meaning of input coefficients is considered using the transaction amount tables and the input coefficient table above.
If demand in Industry 1 has increased by just one unit, because Industry 1 produced that one unit, naturally it required raw materials and so on. In accordance with those input coefficients, Industry 1 generated intermediate demand for a_{11} units and a_{21} units of raw materials, etc., from Industry 1 and Industry 2, respectively. This is a primary production repercussion. Having received demand, Industry 1 and Industry 2 generated secondary production repercussions in accordance with their input coefficients when they produced a_{11} and a_{21} units, respectively. This process of production repercussion can continue without limits. Consequently, the final industrial sectors' regional production (gross inputs/outputs) can be calculated as the sum total of each level of production repercussion.
Input coefficients are thus the key to measuring how much production is ultimately induced in each industrial sector when demand is generated in industrial sectors.
In practice, however, it is difficult and impractical to trace and calculate the process of every production repercussion. The "inverse matrices" discussed below were prepared in order to simplify calculation of production repercussions. Preliminary to that, we should first discuss the calculation of production repercussion.

[Quantitative calculation of production repercussions]
Using a numerical formula on the transactions table above to find the horizontal (on the rows) supply and demand balance formula results in the following.

$$\begin{cases} \chi_{11} + \chi_{12} + F_1 = X_1 \\ \chi_{21} + \chi_{22} + F_2 = X_2 \end{cases} \quad \cdots\cdots\cdots\cdots\cdots\cdots \text{(ii)}$$

Using input coefficients to express Formula (ii), from $\chi_{ij} = a_{ij} X_i$

$$\begin{cases} a_{11} X_1 + a_{12} X_2 + F_1 = X_1 \\ a_{21} X_1 + a_{22} X_2 + F_2 = X_2 \end{cases} \quad \cdots\cdots\cdots\cdots\cdots\cdots \text{(iii)}$$

As seen in Formula (iii), there is a certain relationship between final demand and regional production (gross inputs/outputs). That relationship is regulated by the input coefficients.

Displaying Formula (iii) in a matrix results in

$$\begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix} \begin{pmatrix} X_1 \\ X_2 \end{pmatrix} + \begin{pmatrix} F_1 \\ F_2 \end{pmatrix} = \begin{pmatrix} X_1 \\ X_2 \end{pmatrix} \quad \cdots\cdots\cdots\cdots\cdots\cdots \text{(iii)}'$$

$A = \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}$ is called an "input coefficient matrix."

By plugging concrete values for final demand F_1 and F_2 into Formula (iii)'s simultaneous equation and solving, Industry 1 and Industry 2's levels of regional production (gross inputs/outputs) can be calculated as production repercussion effects.
Because increased demand for a given industrial sector requires that raw materials, fuel, etc., from other industries be input so that industrial sector can carry out production, production in other industries is also influenced. That in turn leads to a production repercussion effect in which demand rebounds to the first sector. Formula (iii) shows a means to calculate the cumulative effects of such production repercussion effects. This is the thinking underlying I-O Table analysis based on input coefficients.
When using this idea, however, the assumption of stability of coefficient (described below) must be remembered. This is because if input coefficients are constantly fluctuating, an unambiguous relationship between final demand and regional production (gross inputs/outputs) cannot be found.

(3) Stability of coefficient

[Invariance of production technology levels]
In I-O Table analysis, it is assumed that there were no major changes in the input ratios of the raw materials, fuel, etc., required for production of goods and services represented by input coefficients during the period under analysis.
Input coefficients, in short, reflect the production technology that has been adopted in a specific year. If production technology changes, then naturally input coefficients are likely to change as well.
Generally speaking, extensive changes in production technology over a short period of time are unlikely. However, in a country like Japan where the pace of technological innovation is swift, because the year being analyzed is separate from the year being compiled, a method of obtaining information on change in input coefficients and correcting them before use is necessary.

[Uniformity of production scale]
Each industrial sector is composed of different enterprises and establishments with varying production scales. Even when producing the same products, if production scale differs, then differences in production technology levels, economies of scale, and so on are likely to lead to differing input coefficients.
However, the I-O Tables are created reflecting the economic structure of the year that is the subject of compilation. In I-O Table analysis, it is assumed that the production scales of the enterprises and establishments rated in each industrial sector do not change substantially during the period of analysis.

(4) Fluctuations in input coefficients

In I-O Table analysis, it is assumed that input coefficients do not change during the period being analyzed. In fact, in addition to the reasons mentioned above, they may change over time due to causes such as the following.

[Changes in relative price]
The size of each transaction in the transactions basic table is evaluated at the price during the year of compilation, so if the relative prices of goods and services change, input coefficients will change too, even if the technical structure is uniform.
When performing a time series comparison, Linked I-O Tables through fixed price evaluation that eliminates the influence of such changes in relative prices are necessary.

[Changes in product mixes]
When a number of products in the same sector with different input structures and unit prices (this is called the product mix) are rated, even if the various input structures and unit prices do not change, if the production composition of products within the sector changes, the input coefficients for the whole sector will change.

(5) Derivation of inverse matrices (Leontief inverse matrix)

One of the most important parts of I-O Table analysis is analyzing what kind of direct and indirect impacts generation of a certain amount of demand in a given industrial sector has on each industrial sector. As described above, input coefficients for each industrial sector play a decisive role in this.
Assuming a regional economy consisting only of Industry 1 and Industry 2, if final demand is provided, solution of a simultaneous equation such as the following can be used to calculate the regional production (gross inputs/outputs) levels of Industry 1 and Industry 2.

$$\begin{cases} a_{11}X_1 + a_{12}X_2 + F_1 = X_1 \\ a_{21}X_1 + a_{22}X_2 + F_2 = X_2 \end{cases} \quad \cdots\cdots\cdots\cdots\cdots \text{(iii)}$$

Taking final demand $(F_1 and F_2)$ as determinates, and production $(X_1 and X_2)$ as unknowns, solution of Formula (iii)'s simultaneous linear equation with two unknowns is expressed as follows.

$$\begin{aligned} X_1 &= \frac{1-a_{22}}{(1-a_{11})(1-a_{22})-a_{12}a_{21}}F_1 + \frac{a_{12}}{(1-a_{11})(1-a_{22})-a_{12}a_{21}}F_2 \\ X_2 &= \frac{a_{21}}{(1-a_{11})(1-a_{22})-a_{12}a_{21}}F_1 + \frac{1-a_{11}}{(1-a_{11})(1-a_{22})-a_{12}a_{21}}F_2 \end{aligned} \quad \cdots\cdots\cdots\cdots\cdots \text{(iv)}$$

This means that when each final demand F_1 and F_2 is provided, the final production volumes X_1 and X_2 directly and indirectly required in order to meet that demand are derived. Formula (iv)'s model equation transformed and solved from Formula (ii)'s horizontal balance equation is called an equilibrium output model.

However, calculation is simple when there are only two sectors involved. In the real world, even with consolidated sectors there are 53 of them. It would be impractical to solve a simultaneous equation like Formula (iii) each time, and it would be nearly impossible to carry out analysis.

It would thus be extremely convenient for analysis if it were possible to calculate in advance what kind of production repercussions appear in each sector and how much regional production (gross inputs/outputs) by sector is finally created when one unit of final demand is generated in a sector. "Inverse matrices" were created in answer to this need.

Taking the matrix of Formula (iii) above

$$\begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}\begin{pmatrix} X_1 \\ X_2 \end{pmatrix}+\begin{pmatrix} F_1 \\ F_2 \end{pmatrix}=\begin{pmatrix} X_1 \\ X_2 \end{pmatrix} \quad \cdots\cdots\cdots\cdots\cdots \text{(iii)}'$$

and inserting

$A=\begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}$: Input coefficient matrix $\qquad F=\begin{pmatrix} F_1 \\ F_2 \end{pmatrix}$: Final demand column vector

$X=\begin{pmatrix} X_1 \\ X_2 \end{pmatrix}$: Regional production column vector

we get

$$AX+F=X \quad \cdots\cdots\cdots\cdots\cdots \text{(iii)}''$$

Solving for X,

$$X-AX=F$$
$$(I-A)X=F$$

and multiplying both sides by $(I-A)^{-1}$, we get

$$(I-A)^{-1}(I-A)X=(I-A)^{-1}F$$
$$\therefore\ X=(I-A)^{-1}F$$

Here, I is the unit matrix, and $(I-A)^{-1}$ is the inverse matrix of $(I-A)$.

$$(I-A)^{-1}=\begin{pmatrix} 1-a_{11} & -a_{12} \\ -a_{21} & 1-a_{22} \end{pmatrix}^{-1}$$

The components of the matrix $(I-A)^{-1}$ are called an "inverse matrix (or Leontief inverse matrix)." Expressed as a single table, this is an "inverse matrix." It shows how many units of production are ultimately produced in which industries when there is an increase of one unit of demand in an industry. Once an inverse matrix has been calculated, there is no need to solve Formula (iii)'s simultaneous equation each time. If demand is provided to an industrial sector, the regional production (gross inputs/outputs) of the industrial sectors responding to that final demand can immediately be calculated.

(6) The meaning of inverse matrices

Input coefficients show the amount of raw materials and so on directly required when one unit of a good or service is produced. Inverse matrices show the size of the direct and indirect final production repercussions in each industrial sector when there is one unit of final demand.
Looking in this way at the relationship of inverse matrices to production inducement, when one unit of final demand is generated in a given sector such as agriculture, forestry, and fishery, that sector itself must first increase production by one unit in order to meet the demand (direct effects).
Next, in order for the agriculture, forestry, and fishery sector itself to increase production, production other industries must also increase. In response to this influence, agriculture, forestry, and fishery production will increase additionally (indirect effects).
As a result, ordinarily the increase in production in the agriculture, forestry, and fishery sector would be greater than one unit. Thus, the diagonal element in an inverse matrix showing the degree of production increase in the same sector is usually greater than 1.
When an inverse matrix is expressed as $B = (b_{ij})$, with the column vector in which the j th element is 1, and other elements are 0 expressed as uj, we get the following.

$$B \cdot uj = \begin{pmatrix} b_{11} & \mathrm{L} & b_{1j} & \mathrm{L} & b_{1n} \\ \mathrm{M} & \mathrm{O} & \mathrm{M} & \mathrm{O} & \mathrm{M} \\ b_{i1} & \mathrm{L} & b_{ij} & \mathrm{L} & b_{in} \\ \mathrm{M} & \mathrm{O} & \mathrm{M} & \mathrm{O} & \mathrm{M} \\ b_{n1} & \mathrm{L} & b_{nj} & \mathrm{L} & b_{nn} \end{pmatrix} \cdot \begin{pmatrix} 0 \\ \mathrm{M} \\ 1 \\ \mathrm{M} \\ 0 \end{pmatrix} = \begin{pmatrix} b_{1j} \\ \mathrm{M} \\ b_{ij} \\ \mathrm{M} \\ b_{nj} \end{pmatrix}$$

From this as well, we can see that the j th column vector of inverse matrix B expresses the increase in production in each sector when one unit of final demand is generated in Sector j.

(7) Index of the power of dispersion

When just one unit of final demand (i.e., demand for domestic products) has been generated in a column sector, the values in each column of an inverse matrix show in each row sector the production amount directly and indirectly required. That total (the column sum) shows the size of the production repercussion on industry as a whole brought about by one unit of final demand in that column sector.
Finding the ratio of the sector column total divided by the average of all column sums obtains an index that shows relative influence in terms of the strength of production repercussions on industry as a whole when there is final demand in any column sector. This is called the "index of the power of dispersion." It is calculated using the following formula.

The j th sector's index of the power of dispersion = $\sum_{i=1}^{n} b_{ij} \Big/ \frac{1}{n} \sum_{j=1}^{n} \sum_{i=1}^{n} b_{ij}$

(8) Index of the sensitivity of dispersion

When there is one unit of final demand for each column sector at the top of the table, each row of the inverse matrix shows the directly and indirectly required supply amount in that row sector. The ratio of that total (the row sum) divided by the average of all row sums is an index that shows which row sectors are relatively strongly influenced when there is one unit of final demand in each column sector. This is called the "index of the sensitivity of dispersion." It is calculated using the following formula.

The i th sector's index of the power of dispersion = $\sum_{j=1}^{n} b_{ij} \Big/ \frac{1}{n} \sum_{i=1}^{n} \sum_{j=1}^{n} b_{ij}$

9. Types of equilibrium output models and inverse matrices

When using the I-O Tables to perform actual analysis of production repercussion, how to handle imports (inflows) is an important question. A brief summary of typical models of their handling and of characteristics of those inverse matrices follows below.

(1) Analytical model that does not consider the concept of imports (inflows)

The type discussed in (5) above is called the $(I-A)^{-1}$ type. It is based on a simple model that does not take imports (inflows) into account (or that considers them to be provided exogenously).
In this model, production can be found by providing exogenously that which has subtracted imports in advance from total final demand including exports.
This type of inverse matrix is good at capturing I-O Table technological structures and interdependent relationships, and has stable input coefficients. From those aspects, it is considered appropriate for analysis of long-term forecast models and import (inflow) supply constraints. However, import (inflow) is not something that is provided exogenously; it is believed to be endogenous. The problem is that given final demand must be final demand with imports (inflows) added. Because imports (inflows) cannot be broken down by final demand item for analysis, it is not suitable for analysis of current economic structure. When used for forecasting and planning, it is problematic that to find production, the amount of imports (inflows), which is very closely related to production and demand, must be decided ahead of time.

(2) Competitive import (inflow) type analytical model that considers the concept of imports (inflows)

In the real economy, various types of things are imported (inflow) and consumed by industries and households along with domestic (regional) products. Repercussion effects brought about by final demand do not induce demand only within the country (region) some flow elsewhere. In other words, they must depend on imports (inflows).

Regional I-O Tables (template)

	Industry 1	Industry 2	Regional final demand	Exports	Outflows	(Subtracted) imports	(Subtracted) inflows	Regional production
Industry 1	χ_{11}	χ_{12}	Y_1	E_1	U_1	$-M_1$	$-N_1$	X_1
Industry 2	χ_{21}	χ_{22}	Y_2	E_2	U_2	$-M_2$	$-N_2$	X_2
Gross value added	V_1	V_2						
Regional production	X_1	X_2						

In the actual Regional I-O Tables, imports and inflows are reported as in the following hypothetical example. It divides final demand into exports, outflows, and in-region final demand to set a supply and demand balance equation. It does not provide imports and inflows exogenously.
In other words, the supply and demand balance equation is

$$\begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}\begin{pmatrix} X_1 \\ X_2 \end{pmatrix}+\begin{pmatrix} Y_1 \\ Y_2 \end{pmatrix}+\begin{pmatrix} E_1 \\ E_2 \end{pmatrix}+\begin{pmatrix} U_1 \\ U_2 \end{pmatrix}-\begin{pmatrix} M_1 \\ M_2 \end{pmatrix}-\begin{pmatrix} N_1 \\ N_2 \end{pmatrix}=\begin{pmatrix} X_1 \\ X_2 \end{pmatrix}$$

Taking

$Y = \begin{pmatrix} Y_1 \\ Y_2 \end{pmatrix}$: Regional final demand column vector

$E = \begin{pmatrix} E_1 \\ E_2 \end{pmatrix}$: Export column vector $\quad U = \begin{pmatrix} U_1 \\ U_2 \end{pmatrix}$: Outflow column vector

$M = \begin{pmatrix} M_1 \\ M_2 \end{pmatrix}$: Import column vector $\quad N = \begin{pmatrix} N_1 \\ N_2 \end{pmatrix}$: Inflow column vector

the supply and demand balance equation for the matrix can be expressed as follows.

$$AX + Y + E + U - M - N = X \quad \cdots\cdots\cdots\cdots\cdots \text{(i)}$$

Assuming that the import ratio and the inflow ratio for each product (row) are constant within gross in-region demand (intermediate demand plus regional final demand) and defining the import coefficient m_i as the ratio of imports M_i to the i th industry product's regional gross demand, the import coefficient m_i can be expressed as follows.

Import coefficient $\quad m_i = M_i \Big/ (\sum_j \chi_{ij} + Y_i)$

Taking the diagonal matrix of the import coefficient m_i as $\hat{M}$ and showing the relationship with the value of imports

$$M = \hat{M}(AX + Y) \quad \cdots\cdots\cdots\cdots\cdots \text{(ii)}$$

Similarly, inflows may be shown as

Inflow coefficient $\quad n_i = N_i \Big/ (\sum_j \chi_{ij} + Y_i)$

$$N = \hat{N}(AX + Y) \quad \cdots\cdots\cdots\cdots\cdots \text{(iii)}$$

Formula (ii) and Formula (iii) into Formula (i), we get

$$AX + Y + E + U - \hat{M}(AX + Y) - \hat{N}(AX + Y) = X$$
$$AX - \hat{M}AX - \hat{N}AX + Y - \hat{M}Y - \hat{N}Y + E + U = X$$
$$X - AX + \hat{M}AX + \hat{N}AX = Y - \hat{M}Y - \hat{N}Y + E + U$$
$$[I - (I - \hat{M} - \hat{N})A]X = (I - \hat{M} - \hat{N})Y + E + U$$
$$X = [I - (I - \hat{M} - \hat{N})A]^{-1} \cdot [(I - \hat{M} - \hat{N})Y + E + U] \quad \cdots\cdots\cdots\cdots\cdots \text{(iv)}$$

Formula (iv)'s $(I - \hat{M} - \hat{N})A$ refers to the in-region product input coefficient when it is assumed that there are no differences between sectors in the import and inflow product consumption ratio. $(I - \hat{M} - \hat{N})Y$ refers to in-region final demand met by in-region products, with the same assumption.

In other words, if the input coefficient (A), import coefficient matrix $(\hat{M})$, and inflow coefficient matrix $(\hat{N})$ are known, production meeting the provided final demand (Y, E, U) can be calculated using the inverse matrix $[I - (I - \hat{M} - \hat{N})A]^{-1}$.

The Regional I-O Tables have been explained using hypothetical examples. A similar idea can be used to develop models for analysis of the Nationwide I-O Tables as competitive import type tables.

Nationwide I-O Tables (template)

	Industry 1	Industry 2	Domestic final demand	Exports	(Subtracted) imports	Domestic production
Industry 1	χ_{11}	χ_{12}	Y_1	E_1	$-M_1$	X_1
Industry 2	χ_{21}	χ_{22}	Y_2	E_2	$-M_2$	X_2
Gross value added	V_1	V_2	–			
Domestic production	X_1	X_2				

The balance equation is as follows.

$$\begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}\begin{pmatrix} X_1 \\ X_2 \end{pmatrix}+\begin{pmatrix} Y_1 \\ Y_2 \end{pmatrix}+\begin{pmatrix} E_1 \\ E_2 \end{pmatrix}-\begin{pmatrix} M_1 \\ M_2 \end{pmatrix}=\begin{pmatrix} X_1 \\ X_2 \end{pmatrix}$$

$$AX + Y + E - M = X$$

$$X = [I - (I - \hat{M})A]^{-1} \cdot [(I - \hat{M})Y + E]$$

As a result, the Nationwide I-O Tables and the Regional I-O Tables may appear to be different types at first glance, both are inverse matrices that consider the "self-sufficient rate." By definitions in the models, the self-sufficient rate for domestic products is $(1 - m_i)$, and the self-sufficient rate for regional products is $(1 - m_i - n_i)$. Their diagonalizing matrices are $(I - \hat{M})$ and $(I - \hat{M} - \hat{N})$, respectively. The matrices are sometimes expressed simply as "Γ."

In short, the above two inverse matrices can collectively be called the $(I - \Gamma A)^{-1}$ type.

This type of inverse matrix divides the classes of domestic (in-region) products and imported (inflow) products for each industrial sector using the given ratio of the import (inflow) coefficient. Thus, the domestic (in-region) product input coefficient is stable. This makes the matrix suitable for analyses such as forecasts. In addition, it captures I-O Table technology structure and interdependent relationships well, making it suitable for analysis of long-term forecast model and import (inflow) supply constraints. However, its distinction between domestic (in-region) products and imported (inflow) products is the same for each industry, which lowers accuracy in actual analysis.

(3) Non-competitive import (inflow) type analytical model

First, the Nationwide I-O Tables' transaction amounts are modeled with a non-competitive import type table that uses the supplementary table "table on imports" to divide domestic products and imports.

Non-competitive import type I-O Tables (template)

		Industry 1	Industry 2	Domestic final demand	Exports	(Subtracted) imports	Domestic production
Domestic products	Industry 1	χ_{11}^d	χ_{12}^d	Y_1^d	E_1	-	X_1
	Industry 2	χ_{21}^d	χ_{22}^d	Y_2^d	E_2	-	X_2
Imports	Industry 1	χ_{11}^m	χ_{12}^m	Y_1^m	-	$-M_1$	-
	Industry 2	χ_{21}^m	χ_{22}^m	Y_2^m	-	$-M_2$	-
Gross value added		V_1	V_2				
Domestic production		X_1	X_2				

First, the horizontal balance equation for domestic products is expressed using the domestic products input coefficient $a_{ij}^{d} = \frac{\chi_{ij}^{d}}{X_j}$.

$$\begin{pmatrix} a_{11}^{d} & a_{12}^{d} \\ a_{21}^{d} & a_{22}^{d} \end{pmatrix}\begin{pmatrix} X_1 \\ X_2 \end{pmatrix} + \begin{pmatrix} Y_1^{d} \\ Y_2^{d} \end{pmatrix} + \begin{pmatrix} E_1 \\ E_2 \end{pmatrix} = \begin{pmatrix} X_1 \\ X_2 \end{pmatrix}$$

This matrix's output balance equation can be developed as follows.

$$A^{d}X + Y^{d} + E = X$$
$$X = (I - A^{d})^{-1} \cdot (Y^{d} + E)$$

Next, in the case of in-region non-competitive inflow and competitive import type I-O Tables, from the output balance equation for in-region products plus imported products,

$A^{d}X + Y^{d} + E + U - M = X$ (with ^{d} equaling regional products plus imported products)

Taking $M = \hat{M}(A^{d}X + Y^{d})$,

$$[I - (I - \hat{M})A^{d}]X = (I - \hat{M})Y^{d} + E + U$$

Thus, we find

$$X = [I - (I - \hat{M})A^{d}]^{-1} \cdot [(I - \hat{M})Y^{d} + E + U]$$

as an equilibrium solution.
Handling imports as well with the non-competitive import method,

$X = (I - A^{d})^{-1} \cdot (Y^{d} + E + U)$ (with ^{d} limited to in-region products)

In this type of inverse matrix, the shares of domestic (in-region) products and imports (inflows) in every sector are divided in their actual ratios. This enables the industrial structure at that point to be accurately grasped. That makes it an inverse matrix that can be considered suitable for analysis of the current situation. However, although the technical basic unit (input coefficients) is constant, when used in forecasting and other analysis, whether to use domestic (in-region) products or imported (inflow) products is fluid, so the domestic (in-region) product input coefficients cannot be considered stable. This makes it difficult to say that it is suitable for forecasting.

(4) Inter-regional non-competitive inflow and competitive import type analytical model

Inter-regional I-O Table simultaneously cover two or more regions, consistently recording inter-regional and I-O Table transaction amounts. Therefore, it is more difficult to compare the mechanisms and ideas of Inter-regional I-O Table with those of the Nationwide I-O Tables or the Regional I-O Tables.
In the Inter-regional I-O Table as well, there are a number of models for handling imports (inflows). Here, the analytical model of the inter-regional non-competitive inflow and competitive import type tables created by the Ministry of Economy, Trade and Industry will be discussed.
With this type of Inter-regional I-O Table, it is very clear how much of which sector's products from which region a given sector in a given region consumes. In addition, how much of a given sector in a given region's products are consumed in which sector in which region is made clear by reading the table horizontally. In other words, the intersection of a region with itself on the table shows the region's inter-sector transactions (the in-region supply's in-region product), the intersection of an in-region column with an other-region row shows a breakdown of inflows by sector, and the intersection of an in-region row with and other-region column shows outflows by sector.

For imports, the competitive imports method is used. As explained above, imports are not handled by reporting them in the region in which they passed through customs. Imported products are recorded as direct imports into the regions in which there was demand for them. It must be noted that imports consumed in a given region are thus included in the in-region supply of in-region product, and are not included in the intersection of the row equivalent to the region's outflows and the other-region column. (There are no roundabout imports.) Exports are similarly recorded as passing abroad directly from their production regions.

Inter-regional non-competitive inflow and competitive import type table (template)

	Region 1				Region 2				Region 3				Production
Region 1	χ^{11}	Y^{11}	E^{11}	$-M^{11}$	χ^{12}	Y^{12}	-	-	χ^{13}	Y^{13}	-	-	X^{I}
	V^{11}				V^{12}				V^{13}				
Region 2	χ^{21}	Y^{21}	-	-	χ^{22}	Y^{22}	E^{22}	$-M^{22}$	χ^{23}	Y^{23}	-	-	X^{II}
	V^{21}				V^{22}				V^{23}				
Region 3	χ^{31}	Y^{31}	-	-	χ^{32}	Y^{32}	-	-	χ^{33}	Y^{33}	E^{33}	$-M^{33}$	X^{III}
	V^{31}				V^{32}				V^{33}				
Production	X^{I}				X^{II}				X^{III}				

For the above table, use a numerical formula to find a supply and demand balance equation for the horizontal direction for each region finds the following.

$$\begin{cases} \chi^{11}+Y^{11}+E^{11}-M^{11}+\chi^{12}+Y^{12}+\chi^{13}+Y^{13}=X^{\mathrm{I}} \\ \chi^{21}+Y^{21}+\chi^{22}+Y^{22}+E^{22}-M^{22}+\chi^{23}+Y^{23}=X^{\mathrm{II}} \\ \chi^{31}+Y^{31}+\chi^{32}+Y^{32}+\chi^{33}+Y^{33}+E^{33}-M^{33}=X^{\mathrm{III}} \end{cases} \quad \cdots\cdots\cdots\cdots \text{ (i)}$$

Expressing Formula (i) using input coefficients, it becomes

$$\begin{cases} A^{11}X^{\mathrm{I}}+Y^{11}+E^{11}-M^{11}+A^{12}X^{\mathrm{II}}+Y^{12}+A^{13}X^{\mathrm{III}}+Y^{13}=X^{\mathrm{I}} \\ A^{21}X^{\mathrm{I}}+Y^{21}+A^{22}X^{\mathrm{II}}+Y^{22}+E^{22}-M^{22}+A^{23}X^{\mathrm{III}}+Y^{23}=X^{\mathrm{II}} \\ A^{31}X^{\mathrm{I}}+Y^{31}+A^{32}X^{\mathrm{II}}+Y^{32}+A^{33}X^{\mathrm{III}}+Y^{33}+E^{33}-M^{33}=X^{\mathrm{III}} \end{cases} \quad \cdots\cdots\cdots\cdots \text{ (ii)}$$

This is expressed as

$$A=\begin{pmatrix} A^{11} & A^{12} & A^{13} \\ A^{21} & A^{22} & A^{23} \\ A^{31} & A^{32} & A^{33} \end{pmatrix} \qquad A^{*}=\begin{pmatrix} A^{11} & 0 & 0 \\ 0 & A^{22} & 0 \\ 0 & 0 & A^{33} \end{pmatrix} \qquad Y=\begin{pmatrix} Y^{11} & Y^{12} & Y^{13} \\ Y^{21} & Y^{22} & Y^{23} \\ Y^{31} & Y^{32} & Y^{33} \end{pmatrix}$$

$$Y^{*}=\begin{pmatrix} Y^{11} \\ Y^{22} \\ Y^{33} \end{pmatrix} \qquad M=\begin{pmatrix} M^{11} & 0 & 0 \\ 0 & M^{22} & 0 \\ 0 & 0 & M^{33} \end{pmatrix} \qquad X=\begin{pmatrix} X^{\mathrm{I}} \\ X^{\mathrm{II}} \\ X^{\mathrm{III}} \end{pmatrix}$$

Substituted as $M=\hat{M}(A^{*}X+Y^{*})$, $\hat{M}=M\ /\ (A^{*}X+Y^{*})$ into Formula (ii),

$$\begin{cases} A^{11}X^{\mathrm{I}}+Y^{11}+E^{11}-\hat{M}^{11}(A^{11}X^{\mathrm{I}}+Y^{11})+A^{12}X^{\mathrm{II}}+Y^{12}+A^{13}X^{\mathrm{III}}+Y^{13}=X^{\mathrm{I}} \\ A^{21}X^{\mathrm{I}}+Y^{21}+A^{22}X^{\mathrm{II}}+Y^{22}+E^{22}-\hat{M}^{22}(A^{22}X^{\mathrm{II}}+Y^{22})+A^{23}X^{\mathrm{III}}+Y^{23}=X^{\mathrm{II}} \\ A^{31}X^{\mathrm{I}}+Y^{31}+A^{32}X^{\mathrm{II}}+Y^{32}+A^{33}X^{\mathrm{III}}+Y^{33}+E^{33}-\hat{M}^{33}(A^{33}X^{\mathrm{III}}+Y^{33})=X^{\mathrm{III}} \end{cases}$$

becoming

$$\begin{cases} (A^{11}-\hat{M}^{11}A^{11})X^{\mathrm{I}}+A^{12}X^{\mathrm{II}}+A^{13}X^{\mathrm{III}}+(Y^{11}-\hat{M}^{11}Y^{11})+Y^{12}+Y^{13}+E^{11}=X^{\mathrm{I}} \\ A^{21}X^{\mathrm{I}}+(A^{22}-\hat{M}^{22}A^{22})A^{\mathrm{II}}+A^{23}X^{\mathrm{III}}+Y^{21}+(Y^{22}-\hat{M}^{22}Y^{22})+Y^{23}+E^{22}=X^{\mathrm{II}} \\ A^{31}X^{\mathrm{I}}+A^{32}X^{\mathrm{II}}+(A^{33}-\hat{M}^{33}A^{33})X^{\mathrm{III}}+Y^{31}+Y^{32}+(Y^{33}-\hat{M}^{33}Y^{33})+E^{33}=X^{\mathrm{III}} \end{cases} \quad \cdots \text{(iii)}$$

Furthermore, when Formula (iii) is rewritten from the matrix display by region into the overall matrix display, it becomes

$$\begin{pmatrix} A^{11}-\hat{M}^{11}A^{11} & A^{12} & A^{13} \\ A^{21} & A^{22}-\hat{M}^{22}A^{22} & A^{23} \\ A^{31} & A^{32} & A^{33}-\hat{M}^{33}A^{33} \end{pmatrix}\begin{pmatrix} X^{\mathrm{I}} \\ X^{\mathrm{II}} \\ X^{\mathrm{III}} \end{pmatrix}$$

$$+\begin{pmatrix} Y^{11} & Y^{12} & Y^{13} \\ Y^{21} & Y^{22} & Y^{23} \\ Y^{31} & Y^{32} & Y^{33} \end{pmatrix}-\begin{pmatrix} \hat{M}^{11} & 0 & 0 \\ 0 & \hat{M}^{22} & 0 \\ 0 & 0 & \hat{M}^{33} \end{pmatrix}\begin{pmatrix} Y^{11} \\ Y^{22} \\ Y^{33} \end{pmatrix}+\begin{pmatrix} E^{11} \\ E^{22} \\ E^{33} \end{pmatrix}=\begin{pmatrix} X^{\mathrm{I}} \\ X^{\mathrm{II}} \\ X^{\mathrm{III}} \end{pmatrix}$$

$$\begin{pmatrix} A^{11} & A^{12} & A^{13} \\ A^{21} & A^{22} & A^{23} \\ A^{31} & A^{32} & A^{33} \end{pmatrix}\begin{pmatrix} X^{\mathrm{I}} \\ X^{\mathrm{II}} \\ X^{\mathrm{III}} \end{pmatrix}-\begin{pmatrix} \hat{M}^{11} & 0 & 0 \\ 0 & \hat{M}^{22} & 0 \\ 0 & 0 & \hat{M}^{33} \end{pmatrix}\begin{pmatrix} A^{11} & 0 & 0 \\ 0 & A^{22} & 0 \\ 0 & 0 & A^{33} \end{pmatrix}\begin{pmatrix} X^{\mathrm{I}} \\ X^{\mathrm{II}} \\ X^{\mathrm{III}} \end{pmatrix}$$

$$+\begin{pmatrix} Y^{11} & Y^{12} & Y^{13} \\ Y^{21} & Y^{22} & Y^{23} \\ Y^{31} & Y^{32} & Y^{33} \end{pmatrix}-\begin{pmatrix} \hat{M}^{11} & 0 & 0 \\ 0 & \hat{M}^{22} & 0 \\ 0 & 0 & \hat{M}^{33} \end{pmatrix}\begin{pmatrix} Y^{11} \\ Y^{22} \\ Y^{33} \end{pmatrix}+\begin{pmatrix} E^{11} \\ E^{22} \\ E^{33} \end{pmatrix}=\begin{pmatrix} X^{\mathrm{I}} \\ X^{\mathrm{II}} \\ X^{\mathrm{III}} \end{pmatrix}$$

Thus,

$$AX-\hat{M}A^{*}X+Y-\hat{M}Y^{*}+E=X$$
$$X-AX+\hat{M}A^{*}X=Y-\hat{M}Y^{*}+E$$
$$[I-(A-\hat{M}A^{*})]X=Y-\hat{M}Y^{*}+E$$

and the equilibrium solution

$$X=[I-(A-\hat{M}A^{*})]^{-1}\cdot(Y-\hat{M}Y^{*}+E)$$

is therefore found.

10. Applications of I-O Table analysis methods and their issues

Broadly divided, the applied analysis fields for the I-O Tables are analysis of current economic conditions, economic planning and forecasting, and measurement of the effects of economic policies. Below, basic application methods for each of these fields will be discussed. Finally, this will be followed by discussion of issues related to application.

(1) Application to analysis of current economic conditions

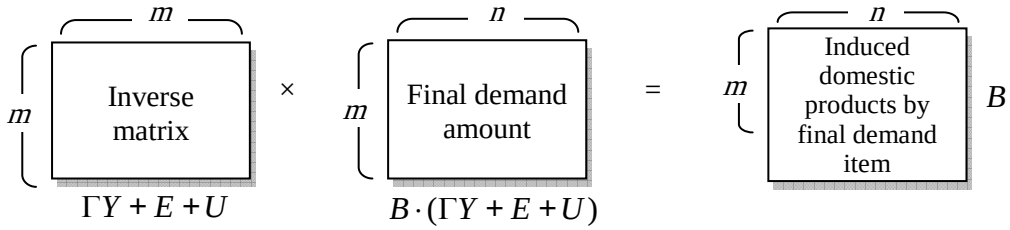
The first type of current analysis is direct reading of the figures in the I-O Tables.

Second, as described above, is using inverse matrices to analyze the relationships between final demand and production, final demand and value added, and final demand and import/inflows.

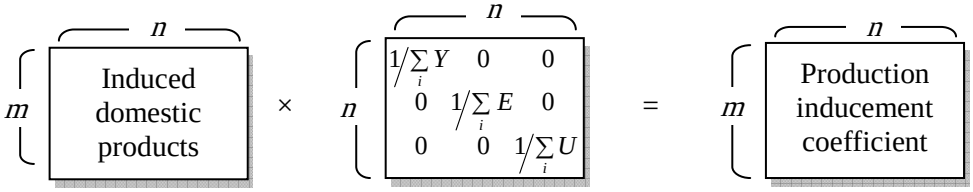
First, in order to look at the relationship between final demand and production, final demand is divided into expenditure items such as consumption, investment, and exports (outflows) in order to find their induced domestic products, production inducement coefficients, and production inducement distribution ratios. This can clarify final market structure, including which final demand items the size of each type of final demand's production inducement and each sector's production depend on directly and indirectly. (Applied to

the Inter-regional I-O Table, this method can find what type of final demand in which region induces how much of which sector's production in which region, clarifying the inter-regional repercussion structure.)
Below, concrete meaning and calculation methods using Regional I-O Tables are shown.

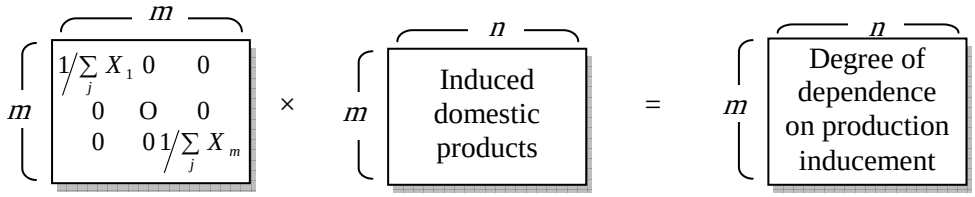
[Domestic products induced by individual final demand items]
Each industry carries out production to meet intermediate demand and final demand, but production levels ultimately are determined by final demand. Thus, by looking at what type of final demand each industrial sector's production is supported by, influence on production levels in response to fluctuations in final demand can be analyzed.
Based on the above thinking, which final demand items induced how much of each industry's production can be seen, so induced domestic products are found by multiplying the inverse matrix by final demand (matrix). Inverse matrix (B) is the $[I-(I-\hat{M}-\hat{N})A]^{-1}$ type, i.e., the $(I-\Gamma A)^{-1}$ type. With regional final demand met by in-region products represented graphically as ΓY , exports as E , and outflows as U , it becomes as follows. (However, *m* the number of endogenous sectors, and *n* is the number of final demand items.)



[Production inducement coefficients by final demand item]
Next, the production inducement coefficient is the ratio found by dividing domestic products induced by individual final demand items by the corresponding total values of final demand items (the column sum of I-O Tables). When the total of the final demand items increases by one unit, it shows the ratio of the increase in each industrial sector's production.
Represented graphically, it becomes as follows.

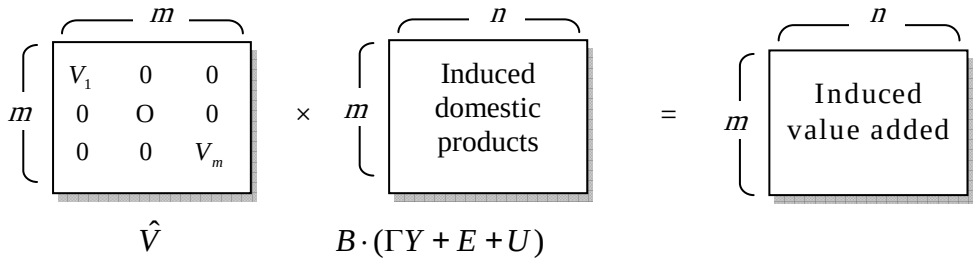


[Production inducement distribution ratio by final demand item]
The degree of production dependence by final demand items is the composition ratio found by dividing each industry's domestic products induced by individual final demand items in each row by the total. It shows how much each industry depends on which final demand.
Represented graphically, it becomes as follows.



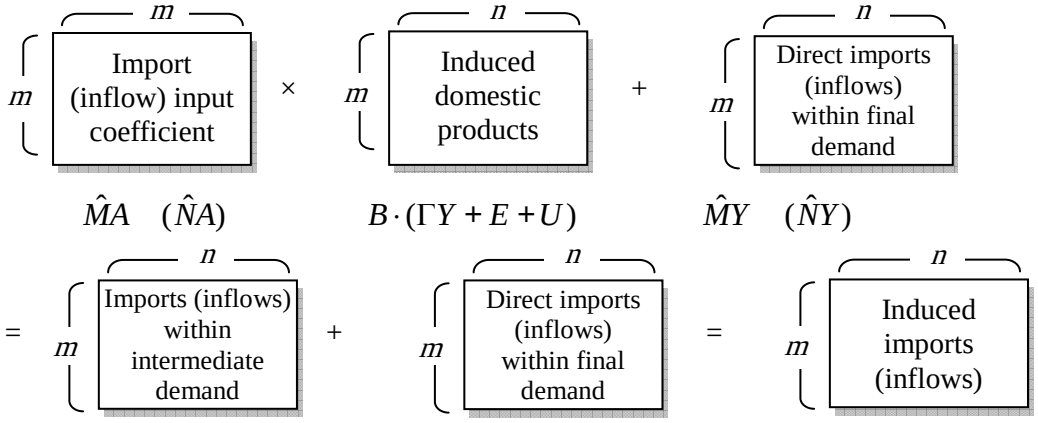
[Value added induction by final demand item]
Value added is output in association with production activities. In the I-O Tables, production is assumed to be induced by final demand, so value added is also ultimately induced by final demand. Based on that thinking, induced value added shows which sectors induced how much of each industry's value added

within final demand. It is found by multiplying each industry's domestic products induced by individual final demand items by the industries' ratios of value added (gross value added divided by production).
Represented graphically, it becomes



[Value added inducement coefficient by final demand item]
The value added inducement coefficient is the ratio found by dividing induced value added by final demand item by the total for the corresponding final demand sector (the column sum in the I-O Tables). It shows the ratio of increase in value added in each industrial sector when the total of the final demand items increases by one unit.

[Import (inflow) induction by final demand item]
Each industrial sector carries out production in order to meet demand. Since not all demand depends on in-region products, some must depend on imported or inflow products.
Imported (inflow) goods and services are consumed as raw materials for production. Whether any of them address direct final demand, production activities are ultimately performed to meet final demand, so imports and inflows can be seen as induced by final demand.
Import (inflow) induction is found by multiplying final demand induced domestic products by the input coefficient for imported (inflow) products and adding the corresponding amount of direct imports (inflows).
Represented graphically, it becomes



[Import (inflow) inducement coefficients by final demand item]
The import (inflow) inducement coefficient is the ratio found by dividing import (inflow) induction by the total for the corresponding final demand sector (the column sum in the I-O Tables). It shows the ratio of increase in imports (inflows) in each industrial sector when the total of the final demand items increases by one unit

[Value added inducement distribution ratio and import (inflow) inducement distribution ratio by final demand item]

The degree of dependence of induced value added and induced imports/inflows can be calculated in the same way as for production inducement.

(2) Economic planning and forecasting

Macro econometric models are often used for general economic planning and forecasting. With these models, however, it is extremely difficult to simultaneously determine final demand and production level by industry production level with consistency. Thus, I-O Table models are adopted. This methodology is summarized below.

First, input coefficients for the planning or forecast year are estimated using the RAS method, and an inverse matrix is calculated. Often, input coefficients for the forecast year are not forecast, and analysis is performed based on an assumed "real input coefficient constant." Next, final demand and imports/inflows by item found using macro econometric models are plugged into the I-O Tables' sector classifications, and each industry is divided. With the data obtained through this methodology, production by industry is forecast. From the forecast production by industry, value added, employment, capital investment, and so on can be successively estimated. These data are balanced remove any contradictions, planning or forecasting values are calculated.

The most typical examples of this application are the setting of Japanese economic plans since the medium-term economic plan.

In Bureaus of Economy, Trade and Industry, prefectures, municipalities, and various types of organizations, this methodology is widely used in the forecasting and planning of regional economies and industrial structures.

(3) Measurement of the effects of economic policies

There are two models used in the measurement of the effects of economic policies. They are repercussion effect analysis of specific demand or specific industries and analysis of fluctuations in value added and in the prices of specific products. The former is an application of an equilibrium output model; the latter is an application of a price model.

(i) Repercussion effect analysis of specific demand or specific industries

The effects on various industries ultimately brought about by public investment such as construction of roads, ports, and railways or by specific final demand such as exports can be measured using the same methodology used for analysis of current economic conditions. The results of such analysis are useful for studying the appropriateness of economic policies and measuring their impacts.

Analysis of repercussion effects in specific industries is effective when attempting to attract factories to (or establish them in) a specific region. In such cases, the subjects of analysis are the raw materials and other intermediate input goods and services constantly demanded by a new factory that would be engendered by attracting a factory. This type of analysis belongs to the above repercussion effect analysis of specific demand. In this analysis methodology, if the industry already exists in that region, it is exogenized. If it does not exist there, then some method will be used for a separate estimate of input by commodity. In either case, this method would give an input vector in the same way as final demand is given in order to find production levels.

(ii) Analysis of value added fluctuations and price fluctuations in specific products

The models discussed to this point are equilibrium output models that place final demand in inverse matrices to find production levels. In contrast, by placing a ratio of value added in a transposed matrix of an inverse matrix, cost fluctuations can be found. In other words, how much influence fluctuations in value added per unit have on price systems through each industry's cost structure price system can be clarified. This is called an equilibrium price model. Because value added is structured by wage and salary costs, depreciation, indirect taxes, and so on, increases in various product costs stemming from a product's increase in, for example, wage and salary costs can be quantitatively measured.

In the same way analysis of repercussion effects in specific industries is possible in equilibrium output model, equilibrium price models can easily be used to measure the influence of price fluctuations of specific products by exogenizing the products.

(4) Issues with application to I-O Table analysis

Inverse matrices, value added coefficients, import (inflow) coefficient, and so on play a core role in I-O Table analysis. The accuracy of analysis results is therefore affected by whether these coefficients are appropriate.

First, the thinking behind import (inflow) coefficients when using competitive import (inflow) type I-O Tables to analyze current conditions must be considered. Import (inflow) coefficients in this case are defined as import (inflow) versus domestic (in-region) demand. In this model, analysis proceeds under the assumption that the rate of consumption of imported (inflow) products is the same for all demand sectors in each row sector. In the case of import coefficients, the figures are generally low and thus not problematic. However, inflow coefficients are sometimes strikingly larger than import coefficients, so it must be said that their appropriateness can have an extremely large effect on analysis results.

In non-competitive inflow type I-O Tables, in contrast, inflow products are separated by demand sector, so this is not a problem.

Second, when applying I-O Table analysis to economic planning and forecasting, there are problems with the stability of input coefficients and other coefficients and with related estimates of future coefficients.

Looking at input coefficients, possible causes of change, as explained above, include changes in relative prices, changes in product mixes, and changes in technological structure. With the exception of very special cases, however, they are probably stable over the short term. Yet, in the case of analysis over long terms, input coefficients may become unstable relative to past data due to the appearance of new products, higher value added products, higher performance products, and so on. Methods to correct for or estimate this are needed. Comprehensive forecast correction methods include the RAS method, the average rate of increase method, and the undetermined multipliers method. Although the fact that they are mechanical is an issue, they are widely used, including in Japanese government economic planning.

In the case of import coefficients, their values are small, and, except in specific sectors that are highly dependent on exports, fluctuations rarely have a striking impact. It is therefore possible to use imports functions and so on to estimate imports. However, inflow coefficients and regional trade coefficients are less stable than import coefficients and the influence of their fluctuations on results are extremely large. It is therefore necessary to estimate these coefficients when forecasts are made, but currently there are few resources for accurately grasping the fluctuation situation in terms of a time series. This will remain an issue into the future.

In regions where inflow/outflow is important, in-region products (outflow portion) are sometimes used as raw materials that are inflows from other regions, so inter-regional analysis is more necessary than analysis with Regional I-O Tables. This is because analysis with Regional Tables alone does not calculate the repercussion effects of the inflows.

Third, when measuring specific policies, measurement results for repercussion effects do not at all consider interruption or slowing of repercussions due to constraints on productive capacity and resources or to inventory appropriation.

Moreover, when price repercussion effects are measured through various products' cost structures, it must be duly noted that interruption of repercussions or problems substituting raw materials due the existence of factors like amplification through opportunistic price hikes, absorption of repercussions through productivity increases and reductions in profits, and public fees are not included.

In addition, price fluctuations are not determined in one region, but on a national scale. Results that show differing price fluctuations by region are therefore not realistic. Inflow/outflow (trade coefficient) is large in the Regional Tables. Such price fluctuations must be taken into account.

The $(I-A)^{-1}$ type is therefore better than the $(I-\Gamma A)^{-1}$ type as an inverse matrix for price analysis. Of course, the $(I-A)^{-1}$ type is still localized.

When using the $(I-A)^{-1}$ type, external factors related to increases in raw materials prices of inflow products used for production of regional products subject to analysis can also be added. However, there is already a local assumption that price increases in inflow products link (compete) with increases in regional products subject to analysis. Especially in cases where there is an increase in the price of a major raw material for a product (almost) never produced in the region being analyzed, analysis will find almost no

effect on prices of in-region products. Even if the price increase provided to regional production was calculated, the impact on in-region consumer prices cannot be.
In any case, from the above perspectives, when analysis is performed using Regional Tables, the results will be narrow and invite misunderstanding. The Regional Tables are therefore not suited to price analysis.

11. Outline of Inter-regional I-O Table and how they were created

(1) Regional I-O Tables and Inter-regional I-O Table

(i) Regional I-O Tables
Regional I-O Tables are I-O Tables covering specific single regions. Anything outside the region is considered inflow/outflow if domestic and imports/exports if foreign. Because production repercussions do not reach other regions, repercussion effects inside the region can be measured, but relationships with other regions cannot be grasped. Compiling is based on in-region transactions and trade (inflow/outflow, imports/exports) sector totals, so there is no need for details on trade sectors that are difficult to estimate because of limitations on references. They are thus easier to create than Inter-regional I-O Table.

(ii) Inter-regional I-O Table
Inter-regional I-O Table are I-O Tables covering two or more regions. Their totals equal the total figures for specific regions and for the nation. The results of analysis using Inter-regional I-O Table enable measurement of inter-regional mutual repercussion effects. They enable the performance of extended analysis.

(2) Competitive type and non-competitive type tables

The ways I-O Tables show transaction amounts for products from other regions, such as imported products and inflow products can be broadly divided into two types.

(i) Competitive type
This type does not differentiate between the transaction amounts of other-region products and in-region products and places them in the same cells. One cannot grasp whether the amounts are the impact on regional products or the impact from other regions on specific industries by reading the tables and looking at the results of repercussion effect analysis. However, they can be combined with the non-competitive type by creating a matrix for transaction amounts of products from other regions by sector, or by separating row vectors by self-sufficient rate.

(ii) Non-competitive type
This type differentiates between the transaction amounts of other-region products and in-region products and separates them by production (supply) region for display. This type of table requires an enormous amount of sources and work. Because it accurately portrays the trade situation at that time, its analysis of repercussion effects and so on can be read (as current analysis) in great detail. However, the trade situation changes according to economic conditions at the time of transaction, so the inter-regional trade matrix cannot be considered stable. It is not considered very suitable for analysis such as long-term forecasting.
This type of table can be combined with the competitive type.

Through the above combinations and handling of target regions and inflows, the Regional I-O Tables include the following kinds.

- Regional competitive inflow type I-O Tables
- Regional non-competitive inflow type I-O Tables
- Inter-regional competitive inflow type I-O Tables
- Inter-regional non-competitive inflow type I-O Tables

Although imports have not been discussed here, strictly speaking they can also be divided into competitive and non-competitive types.

(Reference) Regional I-O Table types (templates; not including the non-competitive import type)

In-region competitive inflow type I-O Table

Demand / Supply		Intermediate demand				In-region final demand	Exports	Outflows, U	(Less) Imports	(Less) Inflows, N	Production amount
		Primary industries	Secondary industries	Tertiary industries	Intermediate demand total						
Intermediate input	Primary industries	405	2927	574	3906	1725	8	825	-741	-1936	3787
	Secondary industries	616	52873	28253	81742	46201	16144	35010	-13278	-37289	128530
	Tertiary industries	602	26853	64516	91972	159361	4484	28305	-4710	-20290	259123
	Intermediate input total	1623	82653	93344	177620	207287	20637	64139	-18728	-59515	391440
Used paper and ferrous metal scrap		0	178	-2	175	-145	5	16	-47	-4	0
Gross value added		2164	45699	165781	213644						
Production amount		3787	128530	259123	391440						

In-region noncompetitive inflow type I-O Table

Supply \ Demand		Intermediate demand				In-region final demand	Exports	Outflows, U	(Less) Imports	(Less) Inflows, N	Production amount
		Primary industries	Secondary industries	Tertiary industries	Intermediate demand total						
In-region products	Primary industries	308	1916	368	2592	1103	8	825	-741	0	3787
	Secondary industries	449	37208	20600	58257	32397	16144	35010	-13278	0	128530
	Tertiary industries	516	23584	59599	83699	147344	4484	28305	-4710	0	259123
	Total in-region products	1273	62708	80567	144548	180845	20637	64139	-18728	0	391440
Inflows products	Primary industries	97	1011	206	1314	622	0	0	0	-1936	0
	Secondary industries	166	15666	7654	23485	13803	0	0	0	-37289	0
	Tertiary industries	86	3270	4917	8273	12017	0	0	0	-20290	0
	Total inflows products	349	19946	12777	33072	26442	0	0	0	-59515	0
Intermediate input total		1623	82653	93344	177620	207287	20637	64139	-18728	-59515	391440
Used paper and ferrous metal scrap		0	178	-2	175	-145	5	16	-47	-4	0
Gross value added		2164	45699	165781	213644						
Production amount		3787	128530	259123	391440						

(Reference) Types of Inter-regional I-O Table (templates; not including the non-competitive import type)

Inter-regional competitive inflow type I-O Table

Supply \ Demand		Kanto										
		Intermediate demand	Final demand, F	Exports	Outflows, U			Imports	Inflows, N			Production amount
					Outflows total	To Kinki	To Others		Inflows	From Kinki	From Others	
Intermediate input	Primary industries	3906	1725	8	825	235	589	-741	-1936	-91	-1844	3787
	Secondary industries	81742	46201	16144	35010	8912	26097	-13278	-37289	-10670	-26619	128530
	Tertiary industries	91972	159361	4484	28305	6018	22287	-4710	-20290	-4543	-15747	259123
	Intermediate input total	177620	207287	20637	64139	15166	48973	-18728	-59515	-15305	-44210	391440
Used paper and ferrous metal scrap		175	-145	5	16	8	8	-47	-4	0	-4	0
Gross value added		213644	0	0	10042	3089	6953	0	-4447	-1564	-2883	219240
Production amount		391440	207142	20642	74198	18263	55934	-18776	-63966	-16868	-47098	610679

Supply \ Demand		Kinki										
		Intermediate demand	Final demand, F	Exports	Outflows, U			Imports	Inflows, N			Production amount
					Outflows total	To Kanto	To Others		Inflows	From Kanto	From Others	
Intermediate input	Primary industries	1739	786	3	274	91	182	-374	-1407	-235	-1171	1021
	Secondary industries	34011	17929	5896	24844	10670	14174	-5534	-22440	-8912	-13528	54707
	Tertiary industries	36210	68587	1670	11910	4543	7367	-1688	-12136	-6018	-6118	104554
	Intermediate input total	71960	87303	7570	37028	15305	21724	-7597	-35983	-15166	-20817	160281
Used paper and ferrous metal scrap		108	-61	2	0	0	0	-32	-16	-8	-8	0
Gross value added		88214	0	0	3143	1564	1579	0	-4032	-3089	-942	87325
Production amount		160281	87241	7572	40171	16868	23303	-7629	-40031	-18263	-21767	247606

Supply \ Demand		Others										
		Intermediate demand	Final demand, F	Exports	Outflows, U			Imports	Inflows, N			Production amount
					Outflows total	To Kanto	To Kinki		Inflows	From Kanto	From Kinki	
Intermediate input	Primary industries	7645	2352	30	3016	1844	1171	-1261	-771	-589	-182	11010
	Secondary industries	85369	43859	15852	40146	26619	13528	-13626	-40272	-26097	-14174	131329
	Tertiary industries	79962	161709	2707	21865	15747	6118	-2380	-29654	-22287	-7367	234209
	Intermediate input total	172976	207920	18589	65027	44210	20817	-17267	-70697	-48973	-21724	376548
Used paper and ferrous metal scrap		185	-143	6	13	4	8	-52	-8	-8	0	0
Gross value added		203388	0	0	3826	2883	942	0	-8532	-6953	-1579	198682
Production amount		376548	207778	18595	68865	47098	21767	-17319	-79237	-55934	-23303	575230

Inter-regional noncompetitive inflow type I-O Table

Supply \ Demand		Kanto		Kinki		Others		National total				
		Intermediate demand	Final demand, F	Intermediate demand	Final demand, F	Intermediate demand	Final demand, F	Intermediate demand	Final demand, F	Exports	Imports	Regional production (gross outputs)
Kanto	Primary industries	2592	1103	138	98	351	238	3081	1438	8	-741	3787
	Secondary industries	58257	32397	5173	3739	15075	11023	78505	47159	16144	-13278	128530
	Tertiary industries	83699	147344	2576	3442	11186	11101	97461	161887	4484	-4710	259123
	Intermediate input total	144548	180845	7888	7278	26612	22362	179047	210484	20637	-18728	391440
	Used paper and ferrous metal scrap	171	-145	8	0	8	0	187	-145	5	-47	0
	Gross value added	209197	0	3089	0	6953	0	219240	0	0	0	219240
	Total	353916	180699	10985	7278	33573	22362	398474	210339	20642	-18776	610679
Kinki	Primary industries	59	33	819	299	135	48	1012	380	3	-374	1021
	Secondary industries	6734	3936	20026	9474	9165	5010	35925	18420	5896	-5534	54707
	Tertiary industries	1796	2747	31269	61392	3209	4158	36274	68298	1670	-1688	104554
	Intermediate input total	8589	6716	52114	71166	12508	9216	73211	87097	7570	-7597	160281
	Used paper and ferrous metal scrap	0	0	91	-61	0	0	91	-61	2	-32	0
	Gross value added	1564	0	84182	0	1579	0	87325	0	0	0	87325
	Total	10153	6716	136387	71104	14087	9216	160627	87036	7572	-7629	247606
Others	Primary industries	1255	589	782	389	7159	2067	9196	3046	30	-1261	11010
	Secondary industries	16751	9867	8812	4716	61130	27826	86693	42410	15852	-13626	131329
	Tertiary industries	6477	9270	2365	3753	65568	146450	74409	159473	2707	-2380	234209
	Intermediate input total	24483	19727	11958	8859	133856	176343	170297	204928	18589	-17267	376548
	Used paper and ferrous metal scrap	4	0	8	0	177	-143	189	-143	6	-52	0
	Gross value added	2883	0	942	0	194856	0	198682	0	0	0	198682
	Total	27371	19727	12909	8859	328888	176200	369168	204786	18595	-17319	575230
National total	Primary industries	3906	1725	1739	786	7645	2352	13289	4864	41	-2376	15818
	Secondary industries	81742	46201	34011	17929	85369	43859	201123	107988	37893	-32438	314566
	Tertiary industries	91972	159361	36210	68587	79962	161709	208144	389658	8862	-8778	597886
	Intermediate input total	177620	207287	71960	87303	172976	207920	422555	502510	46796	-43592	928269
	Used paper and ferrous metal scrap	175	-145	108	-61	185	-143	468	-349	13	-132	0
	Gross value added	213644	0	88214	0	203388	0	505246	0	0	0	505246
	Regional production (gross outputs)	391440	207142	160281	87241	376548	207778	928269	502161	46809	-43724	1433515

Inter-regional competitive inflow type tables horizontally link the "regional competitive inflow type I-O Tables" on the previous page with three regions. Their points of difference are that their inflows/outflows by region are divided by partner region, and their outflows and inflows mutually correspond. In other words, outflows form Kanto to Kinki match inflows to Kinki from Kanto. The Regional I-O Tables created at the Ministry of Economy, Trade and Industry are the inter-regional competitive inflow type, and are called "Regional Tables" to distinguish them from the inter-regional non-competitive inflow type.

Inter-regional non-competitive inflow type tables display the most basic idea of Inter-regional I-O Table. These are the Inter-regional I-O Table created at the Ministry of Economy, Trade and Industry.

(3) How the Inter-regional I-O Table were created

As discussed above, the Inter-regional I-O Table (non-competitive inflow type) must clearly distinguish which industries and which final demand in which region consumed the goods and services produced in each region, so they require an enormous amount of references and work for compiling. The Inter-regional I-O Table created by the Ministry of Economy, Trade and Industry do not actually carry out individual customer estimates by sector for products from other regions. Looking at basic sectors, it was assumed that input-side industries use averaged inflow products (constant ratio of inflow to the total demand within one region).

The Regional I-O Tables (inter-regional competitive inflow and import type table: basic sectors) was created through the following process of arrangement and aggregation.

1) Transaction amounts related to scrap and by-products were subtracted from the Basic Sector Classification Table, and the column sectors were aggregated into 53 sectors.
2) For each row sector, inflows by region were divided by (intermediate demand + regional total final demand − increase in product stocks − increase in semi-finished goods and work in progress) to find the inter-regional trade coefficient.
3) Intermediate demand and regional final demand (except increase in product stocks, increase in semi-finished goods and work in progress) were multiplied by the inter-regional trade coefficient, divided into regions, and combined with the non-competitive type.
   Increase in product stocks, increase in semi-finished goods and work in progress, and exports were thought not to be met by products from other regions and were therefore excluded from the division into regions.
4) After the completion of 3), the row sectors were aggregated into 53 sectors.
5) The amount generated by scrap and by-products (in-region share not including inflows + import share), which were excluded from the Basic Sector Classification Table in 1), was all handled as in-region transactions. For the input amounts, the same work as in 2) and 3) was performed and they were combined with the non-competitive type tables.
6) The data processed in 4) and 5) were aggregated on a 53 sector classification basis, 4) and a non-competitive inflow type table was created in addition to 4).
7) The 53 sectors created in 6) were balanced by row and column (complete matching with the 53 sector Regional I-O Tables).
8) They were aggregated into 29 sectors and 12 sectors for analysis and calculation.

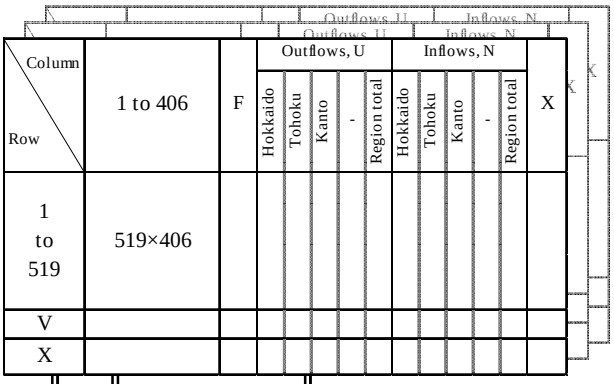
As with the 1995 tables, for the 2005 tables, the totals for the nine regions in all transaction amount cells were completely matched to the Nationwide I-O Tables (balanced for intermediate products and other sectors and concepts unique to the Regional Tables). The 2000 tables were not completely matched at the Regional I-O Table stage, so there were some disparities between those all-region totals and the nationwide figures, but no special balancing was performed for this. (However, the errors were trivial, and the accuracy is easily adequate for analysis and other uses.)

The **Inter-regional I-O Table creation process**

(i) Regional competitive inflow type I-O Tables (before division by inflow/outflow region)

Row \ Column	1 to 406	F	Outflows, U	Inflows, N	X
1 to 519	519×406				
V					
X					

(ii) Inter-regional competitive inflow type I-O Tables (division by inflow/outflow complete)



Sector consolidation

Extraction and combination

Combination and aggregation

(iii) Regional I-O Tables (53-sector tables)

Row \ Column	1 to 52	F	Outflows, U					Inflows, N					X
			Hokkaido	Tohoku	Kanto	-	Region total	Hokkaido	Tohoku	Kanto	-	Region total	
1 to 52	52×52												
V													
X													

Inverse matrix calculation

$$[I-(I-\hat{M}-\hat{N})A]^{-1}$$

(iv) Inter-regional non-competitive inflow type I-O Tables (519 sectors × 53 sectors) (except scrap and by-products)

Row \ Column		1					to 52	F					X
		Hokkaido	Tohoku	Kanto	-	Region total	……..	Hokkaido	Tohoku	Kanto	-	Region total	
1	Hokkaido												
	Tohoku												
	Kanto												
	Region total												
to 519	⋮ ⋮												
V	Hokkaido												
	Region total												
X													

Aggregation

(v) Inter-regional non-competitive inflow type I-O Tables (excluding competitive sectors × 53 sector) (scrap and by-products output)

Row \ Column		1					to 52	F					X
		Hokkaido	Tohoku	Kanto	-	Region total	……..	Hokkaido	Tohoku	Kanto	-	Region total	
Scrap and by-products	Hokkaido												
	Tohoku												
	Kanto												
	Region total												
to Same 2010	⋮ ⋮	Share generated: All same-region											
Scrap and by-products competitive sector 1	Hokkaido												
	Tohoku												
	Kanto												
	Region total												
to Same 22	⋮ ⋮	Input share: same distribution as (iv)											
Reuse and recycling	Hokkaido												
	Tohoku												
	Kanto												
	Region total												

Aggregation (all 3 tables to left)

(vi)-i Inter-regional non-competitive inflow type I-O Tables (53-sector tables—by industry and region)

Row \ Column		1					to 52	F					X
		Hokkaido	Tohoku	Kanto	-	Region total	……..	Hokkaido	Tohoku	Kanto	-	Region total	
1	Hokkaido												
	Tohoku												
	Kanto												
	Region total												
to 52	⋮ ⋮												
V	Hokkaido												
	Region total												
X													

Combining

To (vi)-ii

Sector aggregation

To (vii)-i

(vi)-ii Inter-regional non-competitive inflow type I-O Tables (53-sector tables—by region and industry)

Row \ Column		Hokkaido			Tohoku			-	Region total		
		1 - 52	F	Total	1 - 52	F	Total	…	1 - 52	F	X
Hokkaido	1 to 52										
	V										
	Total										
Tohoku	1 to 52										
	V										
	Total										
to	⋮										
Region total	1 to 52										
	V										
	X										

Inverse matrix Calculation $[I-(A-\hat{M}A^{*})]^{-1}$

(vii)-i Inter-regional non-competitive inflow type I-O Tables (29 sector table— by industry and region)

Row \ Column		1					to 27	F					X
		Hokkaido	Tohoku	Kanto	-	Region total	……..	Hokkaido	Tohoku	Kanto	-	Region total	
1	Hokkaido												
	Tohoku												
	Kanto												
	Region total												
to 27	⋮ ⋮												
V	Hokkaido												
	Region total												
X													

Combining

Sector aggregation

(vii)-ii Inter-regional non-competitive inflow type I-O Tables (29-sector table—by region and industry)

Row \ Column		Hokkaido			Tohoku			-	Region total		
		1 to 27	F	Total	1 to 27	F	Total	…	1 to 27	F	X
Hokkaido	1 to 27										
	V										
	Total										
Tohoku	1 to 27										
	V										
	Total										
to	⋮										
Region total	1 to 27										
	V										
	X										

Inverse matrix Calculation $[I-(A-\hat{M}A^{*})]^{-1}$

(viii)-i Inter-regional non-competitive inflow type I-O Tables (12 sector table—by industry and region)

Row \ Column		1					to 12	F					X
		Hokkaido	Tohoku	Kanto	-	Region total	……..	Hokkaido	Tohoku	Kanto	-	Region total	
1	Hokkaido												
	Tohoku												
	Kanto												
	Region total												
to 12	⋮ ⋮												
V	Hokkaido												
	Region total												
X													

Combining

Row \ Column		Hokkaido			Tohoku			-	Region total		
		1 to 12	F	Total	1 to 12	F	Total	…	1 to 12	F	X
Hokkaido	1 to 12										
	V										
	Total										
Tohoku	1 to 12										
	V										
	Total										
to	⋮										
Region total	1 to 12										
	V										
	X										

Note: Tables (i)-(iii) are examples showing only one region. There are actually 10 regional tables nine for the regions and one for the total.

⇒ Inverse matrix Calculation $[I-(A-\hat{M}A^{*})]^{-1}$