1990 Input-Output Tables for Japan

Summary in English

Joint Compilation

Management and Coordination Agency
Economic Planning Agency
Ministry of Finance
Ministry of Education, Science and Culture
Ministry of Health and Welfare
Ministry of Agriculture, Forestry and Fisheries
Ministry of International Trade and Industry
Ministry of Transport
Ministry of Posts and Telecommunications
Ministry of Labour
Ministry of Construction

March 1995

Management and Coordination Agency

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PREFACE

Input-output tables for Japan have been compiled every five years since 1955 jointly by several ministries and agencies under the coordinaton of the Management and Coordination Agency (prior to July 1984, the Administrative Management Agency). The present issue of input-output tables for 1990 is the result of the seventh joint work in a series, for which the following eleven ministries and agencies have cooperated: Management and Coordination Agency, Economic Planning Agency, Ministry of Finance, Ministry of Education, Science and Culture, Ministry of Health and Welfare, Ministry of Agriculture, Forestry and Fisheries, Ministry of International Trade and Industry, Ministry of Transport, Ministry of Posts and Telecommunications, Ministry of labour and Ministry of Construction.

The 1990 Input-Output Tables are commodity-by-commodity transaction tables as were their predecessors and are valued both at producers' and purchsers' prices. They are recorded in the 527 ×411 matrix form based on the most detailed classification. In this report, however, included are more aggregated tables classified according to the 91 Major Groups and 187 Minor Groups together with their associate input coefficients and inverse matrix coefficients. Also incorporated are the tables on trade margins, domestic freight, imports, persons and employees engaged in production activities, fixed capital formation and others.

On behalf of the Directors-General of the Bureaux and Departments in charge of input-output tables compilation, I sincerely hope this edition will be extensively utilized abroad in the studies of Japanese economy and statistics and will be of effectual assistance toward mutual understanding in international society.

March 1995

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CONTENTS

III. 91×91 SECTOR TABLES

Total Import Coefficients and Total Value Added Coefficients)

IV. SUPPORTING TABLES

INTRODUCTION

JAPANESE ECONOMY INFERRED FROM THE 1990 INPUT-OUTPUT TABLES

Input-output tables grasp the situation of various industries producing goods and services and the consumption of these produced goods and services by industries, households and exports during one year in a certain country. Input-output tables show such an interindustrial relation in the form of a matrix. Table 1-1 is a model (13 sector table) which shows the structure of the 1990 Input-Output Tables.

Japanese economy inferred from the 1990 Input-Output Tables is shown in Chart A.

The total supply of goods and services in 1990 was 918.0 trillion-yen, of which the domestic production was 872.2 trillion-yen (95.0 per cent of total supply), and the amount of import was 45.8 trillion-yen (5.0 per cent of total supply). The total supply, domestic production and the amount of import rose 28.2 per cent, 28.5 per cent and 21.8 per cent respectively over 1985.

The growth of domestic production was due to the large increase in output of business services, construction, electric equipment, real estate and others which resulted from the development of service industries and the increase in domestic demand. On the other hand, relative low growth of imports has resulted from the high yen value and the decline of crude oil price.

The breakdown of domestic production indicates that intermediate input of goods and services such as materials and fuels for production was 426.0 trillion-yen, and the intermediate input rate representing the ratio of intermediate input to the domestic production was 48.8 per cent.

On the other hand, the amount of gross value added was 446.1 trillion-yen, and gross value added rate which shows the rate of gross value added in the domestic production was 51.2 per cent.

At the demand side, the total amount of demand of goods and services was 918.0 trillion-yen. The amount of intermediate demand such as materials and fuels for production was 426 trillion-yen (46.4 per cent of the total amount of demand), and the amount of final demand was 491.9 trillion yen (53.6 per cent of the total amount of demand).

The total amount of demand, the amount of intermediate demand and the amount of final demand rose 28.2, 22.3 and 33.8 per cent respectively over 1985.

Table 1-1. Input-Output Table Valued at Producers' Prices (13 Sectors)

		Intermediate Demand											
		1	2	3	4	5	6	7	8	9	10	11	12
Intermediate Inputs	01 Agriculture, Forestry and Fishery	23019	15	123278	1623	0	84	0	1	19	0	15	10671
	02 Mining	0	48	77121	10702	18908	0	0	0	1	0	7	54
	03 Manufacturing	29194	1236	1413704	274589	14814	35826	11150	1570	50867	3157	20907	252910
	04 Constraction	501	134	13246	3485	6728	5001	1015	21185	4139	276	3320	9283
	05 Electric Power, Gas and Water Supply	638	610	63156	6061	5393	9842	1291	1975	7344	1333	5805	35098
	06 Commerce	5433	255	155680	47114	2593	9239	1057	592	14071	453	2596	52371
	07 Financing and Insurance	5979	945	45169	11670	5518	34347	26947	33480	28455	1257	536	33831
	08 Real Estate	46	211	12742	3171	1766	39648	7745	4669	7626	948	416	25953
	09 Transport	7314	5423	85716	36627	4896	42920	4744	1248	46284	2384	7110	30426
	10 Communication and Broadcasting	123	74	7583	3578	897	16020	5322	248	2437	4352	2483	31755
	11 Public Administration	0	0	0	0	0	0	0	0	0	0	0	0
	12 Services	2087	835	206729	66469	22561	52708	32217	9171	54967	15013	15768	125105
	13 Others	620	324	20247	15590	1740	3703	1400	6589	2295	441	276	12030
	Sub-total	74954	10109	2224370	480681	85815	249337	92887	80726	218505	29613	59239	619487
Gross Value Added	Consumption Expenditure Outside Households	1537	1000	63940	16800	4392	22155	10020	2704	8686	2827	4110	36050
	Compensation of Employees	16180	4466	525709	236458	41455	400738	131265	27498	136571	43711	135781	620832
	Operating Surplus	61836	3146	292911	113900	30565	96278	55708	233671	28228	9365	0	163389
	Depreciation of Fixed Capital	19616	2322	156631	33935	44817	36658	18155	124089	34952	21009	4454	123948
	Indirect Taxes	5617	738	120426	11713	9857	24623	20200	34243	8446	3255	511	40475
	(Less) Subsidies	-1786	-218	-4841	-1498	-1762	-5645	-15721	-1770	-9583	-34	0	-3445
	Sub-total	102999	11454	1154776	411309	129324	574807	219628	420435	207299	80133	144856	981249
Domestic Production		177953	21564	3379146	891989	215139	824144	312515	501161	425804	109746	204095	1600736
(Ref.)	Gross Domestic Product	101462	10455	1090836	394509	124932	552651	209608	417731	198613	77307	140746	945199
	Net Domestic Product at Factor Cost	78015	7613	818620	350358	72020	497016	186974	261169	164799	53076	135781	784221

(unit : 100 million yen)

		Final Demand										(Ref.)
13	Sub-total	a	b	c	d	e	f	Sub-total	g	h	k	l
133	158858	1155	44056	0	2825	205	478	48720	207578	-29625	177953	17940
52	106892	0	3	0	-95	-305	148	-249	106643	-85079	21564	-85328
15512	2125437	32878	623580	0	431876	24582	391817	1504734	3630171	-251025	3379146	1220831
86	68398	0	0	0	823592	0	0	823592	891989	0	891989	823592
1761	140307	41	61109	13478	0	0	243	74872	215178	-39	215139	74792
2637	294092	18452	388426	0	104250	1418	20781	533326	827418	-3274	824144	511599
1692	229824	2	85929	0	0	0	4314	90246	320070	-7554	312515	82689
1017	105959	0	395239	0	0	0	41	395280	501238	-77	501161	395202
1699	276790	3358	124700	-697	7104	302	38986	173754	450544	-24740	425804	145656
473	75345	1078	33476	0	0	0	391	34944	110289	-543	109746	33324
2832	2832	0	4856	196407	0	0	0	201263	204095	0	204095	201263
6935	610566	118518	707479	173832	17717	0	9222	1026768	1637333	-36597	1600736	871653
0	65255	0	258	0	0	0	12396	12654	77909	-19780	58129	-7126
34829	4260553	175482	2469111	383021	1387270	26202	478818	4919903	9180455	-458333	8722122	4286087
1262	175482											
2165	2322830											
11910	1100907											
7613	628199											
353	280457											
-4	-46306											
23300	4461570											
58129	8722122											
22038	4286087											
14076	3423737											

Column Codes are:

a : Consumption expenditure outside households
b : Consumption expenditure (private)
c : Consumption expenditure of general government
d : Gross domestic fixed capital formation
e : Increase in stocks
f : Exports
g : Total demand
h : (Less) Imports
k : Domestic production
l : Gross domestic expenditure

Notes:

1. Component figures may not add up to the total because of rounding.
2. The values of intermediate transactions include consumption tax.
   Treatment of consumption tax in final demand and gross value added is as follows:
   * Gross domestic fixed capital formation and increase in stocks include consumption tax concerned with buying, which is to be deducted essentially. Exports includes consumption tax on exports, which is concerned with domestic transactions through exporters.
   * Operating surplus includes consumption tax regarding gross value added.
   * Indirect taxes do not include customs duties, commodity taxes on imported goods and consumption tax. But, indirect taxes for Producers of Government Services and Producers of Private Non-Profit Services to Households include consumption tax.
3. Gross domestic product, net domestic product at factor cost and gross domestic expenditure are calculated for the I-O table, and do not agree with the final figures of the System of National Accounts.

Table 1-2. Input-Output Table Valued at Purchasers' Prices (13 Sectors)

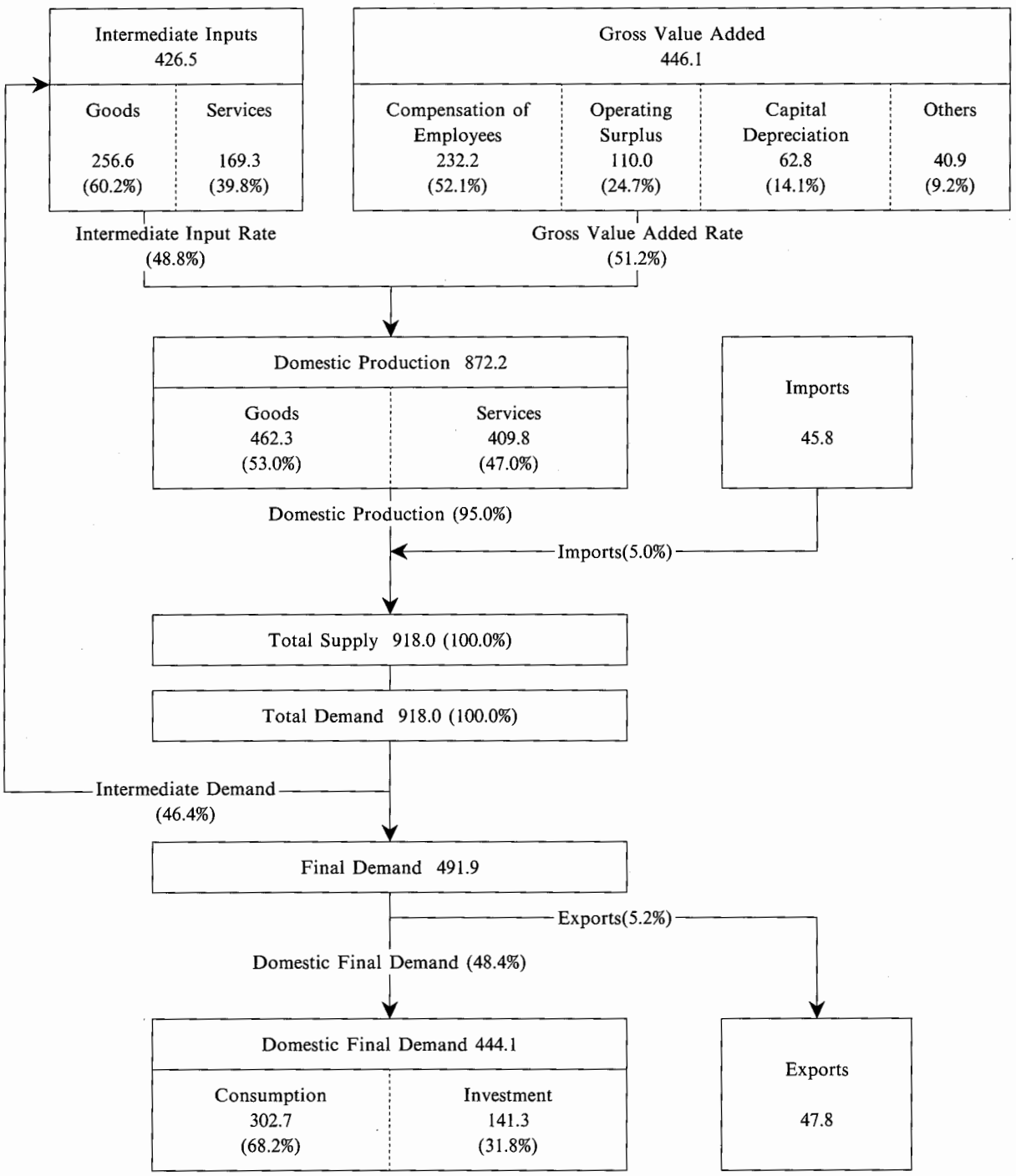
		Intermediate Demand											
		1	2	3	4	5	6	7	8	9	10	11	12
Intermediate Input	01 Agriculture, Forestry and Fishery	24154	18	146149	2159	0	129	0	1	26	0	21	15065
	02 Mining	0	58	85489	12156	21270	0	0	0	1	0	9	72
	03 Manufacturing	36863	1534	1591563	333186	17196	42771	12361	2093	66689	3667	23853	307668
	04Constraction	501	134	13246	3485	6728	5001	1015	21185	4139	276	3320	9283
	05 Electric Power, Gas and Water Supply	638	610	63156	6061	5393	9842	1291	1975	7344	1333	5805	35098
	06 Commerce	0	0	0	0	0	3274	0	0	0	0	0	0
	07 Financing and Insurance	5979	945	45169	11670	5518	34347	26947	33480	28455	1257	536	33831
	08 Real Estate	46	211	12742	3171	1766	39648	7745	4669	7626	948	416	25953
	09 Transport	3919	5355	31549	22627	2684	41701	4536	1115	44434	2311	6745	23197
	10 Communication and Broadcasting	123	74	7583	3578	897	16020	5322	248	2437	4352	2483	31755
	11 Public Administration	0	0	0	0	0	0	0	0	0	0	0	0
	12 Services	2087	835	206729	66469	22561	52708	32217	9171	54967	15013	15768	125105
	13 others	643	335	20997	16118	1802	3896	1453	6791	2387	457	283	12461
	Sub-total	74954	10109	2224370	480681	85815	249337	92887	80726	218505	29613	59239	619487
Gross Value Added	Consumption Expenditure Outside Households	1537	1000	63940	16800	4392	22155	10020	2704	8686	2827	4110	36050
	Compensation of Employees	16180	4466	525709	236458	41455	400738	131265	27498	136571	43711	135781	620832
	Operating Surplus	61836	3146	292911	113900	30565	96278	55708	233671	28228	9365	0	163389
	Depreciation of Fixed Capital	19616	2322	156631	33935	44817	36658	18155	124089	34952	21009	4454	123948
	Indirect Taxes	5617	738	120426	11713	9857	24623	20200	34243	8446	3255	511	40475
	(Less) Subsidies	-1786	-218	-4841	-1498	-1762	-5645	-15721	-1770	-9583	-34	0	-3445
	Sub-total	102999	11454	1154776	411309	129324	574807	219628	420435	207299	80133	144856	981249
Domestic Production		177953	21564	3379146	891989	215139	824144	312515	501161	425804	109746	204095	1600736

(unit : 100 million yen)

		Final Demand											
13	Sub-total	a	b	c	d	e	f	Sub-total	g	h	i	j	k
133	187854	2061	74054	0	2825	280	531	79751	267605	-29625	-50706	-9321	237980
62	119117	0	5	0	-95	-240	181	-149	118968	-85079	-3747	-8579	33889
18822	2458264	51649	998624	0	539512	26162	415726	2031674	4489938	-251025	-759310	-100457	4238913
86	68398	0	0	0	823592	0	0	823592	891989	0	0	0	891989
1761	140307	41	61109	13478	0	0	243	74872	215178	-39	0	0	215139
0	3274	0	3824	0	3718	0	894	8436	11711	-3274	815708	0	8436
1692	229824	2	85929	0	0	0	4314	90246	320070	-7554	0	0	312515
1017	105959	0	395239	0	0	0	41	395280	501238	-77	0	0	501161
1016	191191	2134	104257	-697	0	0	34435	140129	331320	-24740	0	119224	306580
473	75345	1078	33476	0	0	0	391	34944	110289	-543	0	0	109746
2832	2832	0	4856	196407	0	0	0	201263	204095	0	0	0	204095
6935	610566	118518	707479	173832	17717	0	9222	1026768	1637333	-36597	0	0	1600736
0	67622	0	258	0	0	0	12841	13099	80720	-19780	-1945	-867	60941
34829	4260553	175482	2469111	383021	1387270	26202	478818	4919903	9180455	458333	0	0	8722122
1262	175482												
2165	2322830												
11910	1100907												
7613	628199												
353	280457												
-4	-46306												
23300	4461570												
58129	8722122												

Column Codes are:
- a : Consumption expenditure outside households
- b : Consumption expenditure (private)
- c : Consumption expenditure of general government
- d : Gross domestic fixed capital formation
- e : Increase in stocks
- f : Exports
- g : Total demand
- h : (Less) Imports
- i : (Less) Trade margin
- j : (Less) Transportation fee
- k : Domestic production

Chart A. Flow of Goods and Services According to the 1990 Input-Output Tables



Notes: 1. Unit : trillion-yen

2. Component figures may not add up to the total, because of rounding.

3. Goods refer to agriculture, mining, manufacturing, construction, electricity, gas and water (sewage disposal and other sanitary services included), while services refer to the remainder.

4. Consumption refers to consumption expenditure outside households, consumption expenditure of households and consumption expenditure of general government, while investment refers to gross domestic fixed capital formation and increase in stocks.

EXPLANATORY NOTES

CHAPTER I

COMPILATION WORK FOR THE 1990 INPUT-OUTPUT TABLES

§1. Joint Work System

Input-output tables for Japan have been compiled since the first governmental first compilation for the year 1955, as the joint work by eleven ministries and agencies related with the input-output tables.

The 1990 input-output tables have been compiled as a joint work of eleven ministries and agencies: Management and Coordination Agency, Economic Planning Agency, Ministry of Education, Science and Culture, Ministry of Health and Welfare, Ministry of Agriculture, Forestry and Fisheries, Ministry of International Trade and Industry, Ministry of Transport, Ministry of Posts and Telecommunications, Ministry of Labour, and Ministry of Construction.

In order to make the compilation harmoniously, the Committee of Related Department Heads, the Committee of Related Division Heads and other Committiees have been set up.

The functions of these committees are as follows:

(1) Committee of Related Department Heads

The committee is composed of the heads of bureaux or departments of ministries and agencies in charge of input-output tables to decide the fundamental matters relating to the tables.

(2) Committee of Related Division Heads

The committiee is composed of the heads of divisions of the central government agencies in charge of input-output tables to decide the important matters relating to the tables.

(3) Technical Committee

The committee is composed of scholars and persons of experience to make advice on technical matters to the Committee referred to in (1) above.

(4) Committee of Managing Officials in Charge

The committee is composed of the managing officials of the related government offices to discuss various matters incidental to the compilation of input-output tables and to solve common problems.

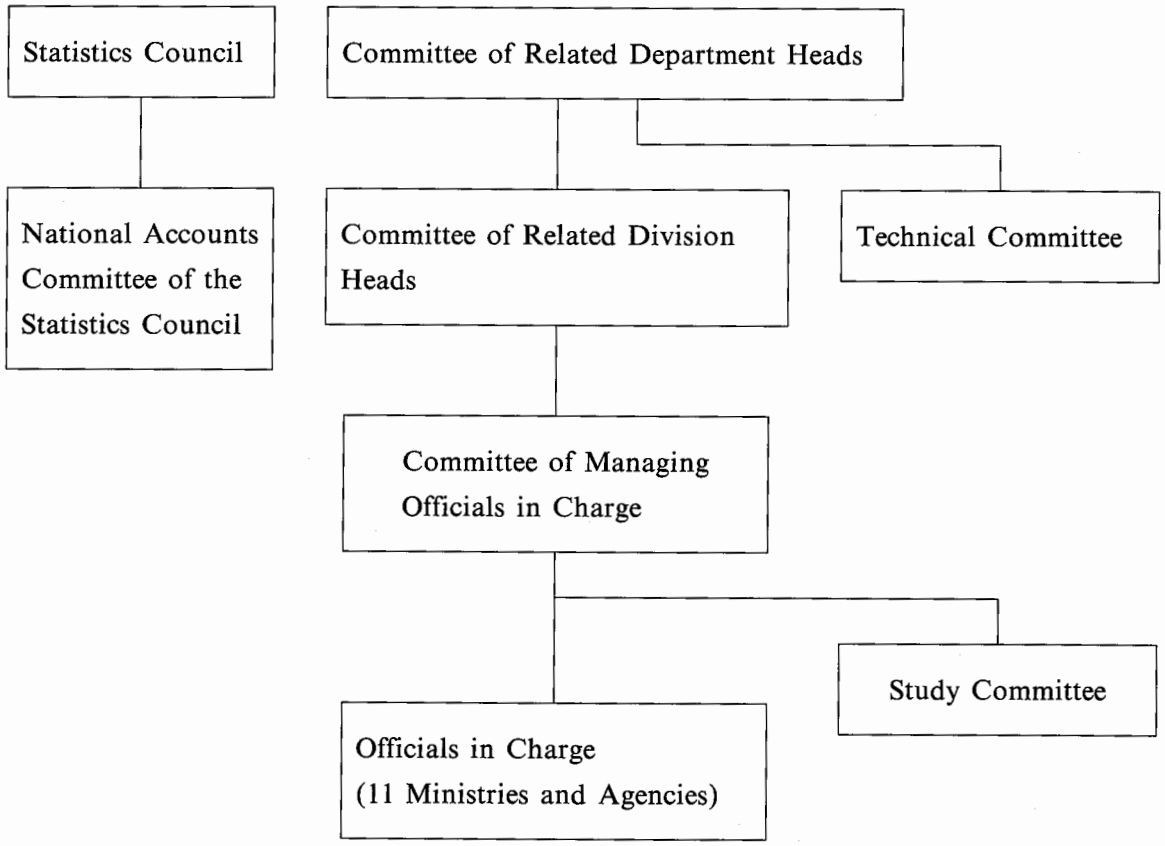
(5) Study Committee

The committee is composed of officials directly involved in the compilation of input-output tables in order to discuss concrete matters about basic guideline of the compilation, sector classification, concepts and definitions of sectors, methodology of estimation and content of the final report.

(6) National Accounts Committee of the Statistics Council

The committee, as one of the special Committees of the Statistics Council, Government of Japan, examines and discusses matters concerned with the compilation of the input-output tables from the point of view of the System of National Accounts.

Chart B. Joint Work System



Assignment of operations to each ministry or agency is as follows:

Management and Coordination Agency (Statistical Standards Department of Statistics Bureau)

(1) Planning, liaison, coordination and publication
(2) Tabulation and analysis by using computers
(3) Sectors of exports and imports (excl. direct purchases)
(4) Treatment of consumption tax

Economic Planning Agency (National Income Department of Economic Research Institute)

(1) Sectors of services (excl. those covered by other ministries and agencies)
(2) Sectors of final demand and direct purchases
(3) Sectors of gross value added (excl. compensation of employees)

Ministry of Finance (Research and Planning Division of Minisrer's Secretariat)
Sectors of salt, alcohol, tobacco, finance and insurance

Ministry of Education, Science and Culture (Research, Statistics and Planning Division Minister's Secretariat)

Sectors of education and research

Ministry of Health and Welfare (Statistics and Information Department, Minister's Secretariat)

Sectors of medical supplies, medical treatment, health, social security and environmental hygienic services

Ministry of Agriculture, Forestry and Fisheries (Research Department of Minister's Secretariat)

Sectors of agriculture, forestry, fishery and food industry (excl. salt, alcoholic drinks and tobacco)

Ministry of International Trade and Industry (Research and Statistics Department of Minister's Secretariat)

(1) Sectors of mining and manufacturing industries (excl. those covered by other ministries and agencies), electricity, gas supply, wholesale and retail trade, and related services
(2) Sector of office supplies

Ministry of Transport (Transport Policy Bureau Information and Research Department)

Sectors of transport and transport equipment (excl.motorcars and others)

Ministry of Posts and Telecommunications (Finance Department of Minister's Secretariat)

Sectors of communications and broadcasting

Ministry of Labour (Policy Planning and Research Department of Minister's Secretariat)

Sectors of worker dispatching services and compensation of employees

Ministry of Construction (Research and Information Department of Economic Affairs Bureau)

Sectors of construction, civil engineering, real estate and related services

§2. Process of the Compilation Work

The compilation work of the input-output tables is started with setting up the fundamental guideline first, then followed by collecting and arranging the data, estimating and reconciliating the estimated values and, after that, publishing the result. The data used is so huge and the content of

the work is wide-ranging that the compilation work has to be carried out as a joint work by eleven ministries and agencies concerned.

Compilation of the input-output tables for Japan is carrid out for the years whose tail end is 0 or 5, and the work extends over five years.

There are various methods for compiling the input-output tables. For example, the 1968 United Nations System of National Accounts (1968 SNA) recommended that the use table and the make table should be first prepared and the commodity-by-commodity table should be compiled indirectly by using these two tables. On the other hand, for Japan the commodity-by-commodity table is directry compiled, then the use table and the make table are compiled on the basis of the input-output tables.

Arrangements for the compilation of the input-output tables:

1. Decision of the Fundamental Guideline on the Tables
2. Decision of the Guideline on the Compilation Work
3. Collecting and Arranging the Data
4. Estimation and Reconciliation of the Input and Output Values
5. Compiling Various Coefficients Tables
6. Compiling Various Supporting Tables
7. Publication of the Results

1. Decision of the Fundamental Guideline on the Tables

Input-output tables for Japan have been compiled every five years since 1955 as a joint work by eleven ministries and agencies concerned. Each time the input-output tables are compiled, a fundamental guideline on basic matters of the tables is decided by the committee of related department heads. In case of the 1990 Input-Output tables, "The Fundamental Guideline on the 1990 Input-Output Tables" was dedcided by the committee in August 1990. It recommended the fundamental frame used before should be followed and the work with the same content as in the case of the 1985 tables should be carried out as a joint work by eleven ministries and agencies. Because the past experience in compiling the input-output tables has proved improvements in consistency with the 1968 SNA and conformity with the ISIC and the almost complete form of the input-output tables has been accomplished. In addition, in order to meet the rapid structural change of economy in Japan and to obtain a higher accuracy of the table, further development of estimates in service sectors and others was suggested.

2. Decision of the Guideline on the Compilation Work

To compile the input-output tables, a definite principle should be established beforehand with regard to the kind, concept, and grasp of the transactions to be covered and how the results should be expressed. After deciding a fundamental guideline, the kinds, forms and basic structure of the tables are designed. For the 1990 tables, the Committee of Managing Officials in Charge of the tables mainly discussed these matters, receiving advice about technical matters from the Technical Committee. In June 1992, "The Basic Guideline on the Compilation Work" was decided by the Committee of Related Department Heads.

In the guideline, following matters were described:

(1) Procedure of the work which extends for five years;
(2) Concepts and Definitions of the tables, basic theory of the compilation and kinds of tables to be compiled;
(3) Basic sector classification, aggregated sector classification, codes for these classifications and work allotment for ministries and agencies;
(4) Concept, definition and coverage of every sector.

3. Collecting and Arranging the Data

For the 1990 Input-Output Tables, whole goods and services produced by all industries in the reference year have been arranged into 5,200 detailed items, then further classified into 527 row sectors and 411 column sectors. For each of these sectors, the value of domestic production and its breakdown into input and output were estimated by using data available, such as various governmental statistics, governmental records relating to permits and approvals, as well as data compiled by business circles. For several sectors and fields for which existing statistics were not enough for estimation, special surveys for the compilation of the input-output table were conducted. Interview surveys with the industries concerned were also conducted. In addition, data from the Census of Manufacture and Foreign Trade Satistics were rearranged to meet the sector classification of the input-output tables and to get basic data on manufacturing products and exports and imports required for the estimation by ministries and agencies. As regards service activities, results of the "Survey on Service Industry" which was newly conducted in 1989 were rearranged according to the sector classification of the input-output tables to get domestic production data of the service sectors.

Data Sources Used for the Compilation of the 1990 Input-Output Tables

National Personnel Authority

Survey on Wages of National Public Service Personnel

Management and Coordination Agency

Population Census

Establishment Census

Basic Survey on Service Industry

Survey of Research and Development

Family Income and Expenditure Survey

National Survey of Family Income and Expenditure
Employment Status Survey
Labour Force Survey
Housing Survey
Linked Indexes of the 1990-base Consumer Price Indexes
Consumer Price Indexes Annual

Economic Planning Agency
Survey on Non-profit Private Organizations

Ministry of Finance
Financial Statements of Incorporated Businesses
Foreign Trade Statistics
Tax Statistics
Report of Securities
Annual Report of National Public Service Mutual Aid Association
Annual Report on Settled Accounts of Ministries and Agencies
Report on Closing Accounts of Special Budget
Report on Closing Accounts of Central Government Sponsord Institutions
Handbook of Subsidies
Situation of Corporated Enterprises based on Tax Statistics
Annual Statistical Report of Tax Administration Agency

Ministry of Education, Science and Culture
School Basic Survey
Social Education Survey
Survey on Financial Affairs of Private Schools
Survey of Educational Expenditures in Local Areas

Ministry of Health and Welfare
Vital Statistics
Annual Report on Medical Services for Aged
Survey of Medical Care Facilities
Patient Survey
Report on Survey of Social Welfare Institutions
Annual Report on Revenue and Expenditure for Hospital Management
Annual Report on Survey of Pharmaceutical Industry productions
Report on Special Survey of Social Medical Care Services
Annual Report of National Health Insurance Services
Water Works Statistics

Ministry of Agriculture, Forestry and Fisheries
Crop Statistics
Statistics of Agricultural Income
Food Balance Sheet
Statistics of Prices and Wages in Rural Areas

Farm Household Economy Survey
Economic Relation Tables on Agriculrure and Food Industries
Index Numbers of Agricultural, Forestry and Fishery Production
Statistics of Synthetic Agricultural Cooperatives
Standard Value of Agricultural Fixed Assets
Survey on Production Cost of Agricultural Products
Statistics on Production and Shipment of Vegetables
Statistics on Production and Shipment of Fruits and Nuts
Survey on Production Flower Plants
Statistical Tables of Agricultural Mutual Relief
Statistics on Marketing Meat
Report of Livestock
Statistics of Hen Eggs and Poultry Marketing
Survey on Production Cost of Livestock Products
Statistics of Sericulture
Survey on Production Cost of Cocoon
Statistics of National Forest Operation
Statistics of Forestry Income Produced
Report on Supply and Demand of Timber
Statistics on Fisheries and Culture Production
Statistics on Marketing of Fishery Products
Report on Fishery Economy - Fishery Household
Report on Fishery Economy - Fishery Company
Oils and Fats Situation in Japan
Annual Statistics on Food Administration
Census of Agriculture and Forestry
Census of Fishery
Statistics of Movement in Fishery Structure

Ministry of International Trade and Industry

Census of Commerce
Current Survey of Commerce
Basic Survey of Commercial Structure and Activity
Census of Manufactures
Current Survey of Production
Survey of Selected Service Industries
Current Survey of Oil Consumption in Commerce, Mining and Manufacturing
Current Survey of Coal Demand and Supply
Current Survey of Non-Ferrous Metals Demand and Supply
Current Survey of petroleum products Demand and Supply
Survey of Mining Trend of Japan
Current Survey of Iron and Steel Demand and Supply

Statistical Survey of Distribution of Concrete Not Hardended
Current Survey of Cement Demand and Supply
Survey of Textile Distribution
Survey of Paper Distribution
Current Survey of Crushed Stone
Report on Quarriers' Activities
Annual Report of Electric Utilities
Current Survey of Production in the Gas Utility Industry
Heat Supply Facilities and Its Demand and Supply
Survey on Management of Small and Medium Enterprise

Ministry of Transport

Survey on Port and Harbour
Japan port Statistics
Survey on Vessels and Seamen
Survey on Seamen's Labour
Survey on Shipbuilding and Engineering
Survey on Current Rolling Stock Production
Survey on Motor Vehicle Transport
Survey on Coastwise Vessel Transport
Land Transportation Summary
Annual Railroad Statistics
Air Transport Statistics
Monthly Statistics of Transport by Private Railways
Quarterly Statistics on Warehouse Services
Final Report of Revenue and Expenditure of Special Account to Maintain Airports
Collection of Business Reports of Travel Agencies

Ministry of Posts and Telecommunications

Report on Revenue and Expenditure of Special Account for Posts and Telecommunications
Annual Statistical Report on Posts and Telecommunications

Ministry of Labour

Monthly Labour Survey
General Survey on Wages and Working Hours System
Wage Survey of Forestry Workers by Occupation

Ministry of Construction

Survey of Building Construction Started
Survey on Buildings and Structures
General Construction Statistics
Estimates for Construction Investment
Annual Statistics on Roads
Coast Statistics

Ministry of Home Affairs

Survey on Wages of Local Public Service Personnel
Yearbook of Local Finances

Bank of Japan

International Balance-of-Payments Statistics
Annual Report on Price Indexes
Analysis of Main Enterprises' Business Management

Other Reports

Statements of Account of NTT (Nippon Telegraph and Telephone Corporation)
Statements of Account of KDD (Kokusai Denshin Denwa Co.,Ltd)
Statements of Account of NHK (Japan Broadcasting Corporation)
Business Report of Public Corporations
Statement of Profit and Loss of Public Corporations
Annual Report on Central Wholesale Markets
Confectionery Industry Statistics
Sugar Statistical Yearbook
Can Packing Review
Gravel Review
Handbook of Chemistry
Shipment Details of Rubber
Survey of Iron and Steel Orders
Shipment Details of Vinyl Chloride Film
Shipment Details of Vinyl Chloride Plate
Yearbook of Motor Vehicle Statistics
Summary of Industrial Machinery Orders
Summary of Machine Tool Orders
Survey on Heavy Machinery and Equipment Orders
Analysis of Financial Reports of Banks
Insurance Yearbook
Water Supply Statistics
Annual Report on Health Insurance Society Business

Special Surveys Conducted for the Compilation of the 1990 Input-Output Tables

Management and Coordination Agency

Input Survey of Service Industries
Survey of Head Offices' Activities
Survey of Consumption Tax for the Compilation of the 1990 Input-Output Tables

Economic Planning Agency

Survey on Local Public Industries' Financial Expenditure

Ministry of Finance

Survey of Alcoholic Liquor Production Industries

Ministry of Health and Welfare

Basic Survey for Compilation of the Input-Output Tables

Ministry of Agriculture, Forestry and Fisheries

Input Survey of Agricultural Service

Input Survey of Log Production (Non-national forest)

Input Survey of Marine Culture

Input Survey of Inland Water Culture

Input Survey of Food Industry

Input Survey of Agricultural Construction

Input Survey of Seed and Seeding

Input Survey of Forestry Construction Ordered by Government

Ministry of International Trade and Industry

Input Survey of Mining and Manufacturing Industries

Commodity Distribution Survey

Survey on Capital Goods Demand Structure

Survey of Commercial Margins

Ministry of Transport

Input Survey on Undertakings Concerned with Transportation

Survey on Parking Area Utilization

Survey on Freight Income of Coastal Ships

Survey on Prefectural and Local Government Transportation Facilities

Ministry of Posts and Telecommunications

Input Survey of Communication and Broadcasting

Ministry of Labour

Survey of Service Industry Labour Expense

Survey of Worker Dispatching Undertaking

Ministry of Construction

Input Survey of Building Expenses

Input Survey of Construction Ordered by Government

Input Survey of Construction Ordered by Public Corporation

4. Estimation and Reconciliation of the Input and Output Values

After collecting basic data such as various statistics and others, the value of domestic production and its breakdown into input and output for every sector are estimated successively. This is the main part of the compilation work for the input-output tables and takes a lot of time and labour.

(1) Estimation of Domestic Production

In estimation work for the input-output tables domestic production is first estimated, and the values of input and output are estimated as a breakdown of the determined domestic production.

Regarding the concrete method of estimation, whole goods and services produced by every industry are arranged into around 5,200 detailed items, and these items are further classified

according to the 527 row sectors and 411 column sectors of the Basic Sector Clasification for the 1990 Input-Output Tables. At that time, the domestic production for every detailed item of goods is estimated in principle in the form of quantity by price. On the other hand, the domestic production for every detailed item of services is directly estimated based on the sales value by item, because no unit of quantity is usually available for the items of services.

Domestic production of Producers of Government Services or Producers of Private Non-profit Services to Households is estimated on the basis of the cost of the activities.

(2) Estimation of Input

The value of input is obtained by estimating for every column sector the values of input from row sectors. Column data show the column sector's cost composition of intermediate trade and gross value added.

(3) Estimation of Output

The value of Output is obtained by estimating for every row sector the sales to the demand sectors such as intermediate and final demand sectors.

The fundamental method of output estimation is as follows:for every row sector, total domestic supply which refers to total supply (domestic product plus imports) minus exports is first estimated. Next, this total domestic supply is distributed to the demand sectors according to the commodity characteristics of detailed items or by the use of various statistics of supply and demand.

Since there are not enough data for estimation of output, estimation of input is first carried out.

(4) Estimation of Consumption Tax

Consumption tax was introduced beginning in April 1990. It is the system of taxation imposed on every process of transactions without accumulating consumption taxes levied in intermediate transactions, which differs from the former commodity tax system. For this reason, the method of estimation of the value of consumption tax according to sectors and the form of its presentation in the 1990 Input-Output Tables raised an issue. The issue was discussed at the National Accounts Committee of the Statistics Council, as well as the Technical Committee and Study Committee for the compilation of the input-output tables.

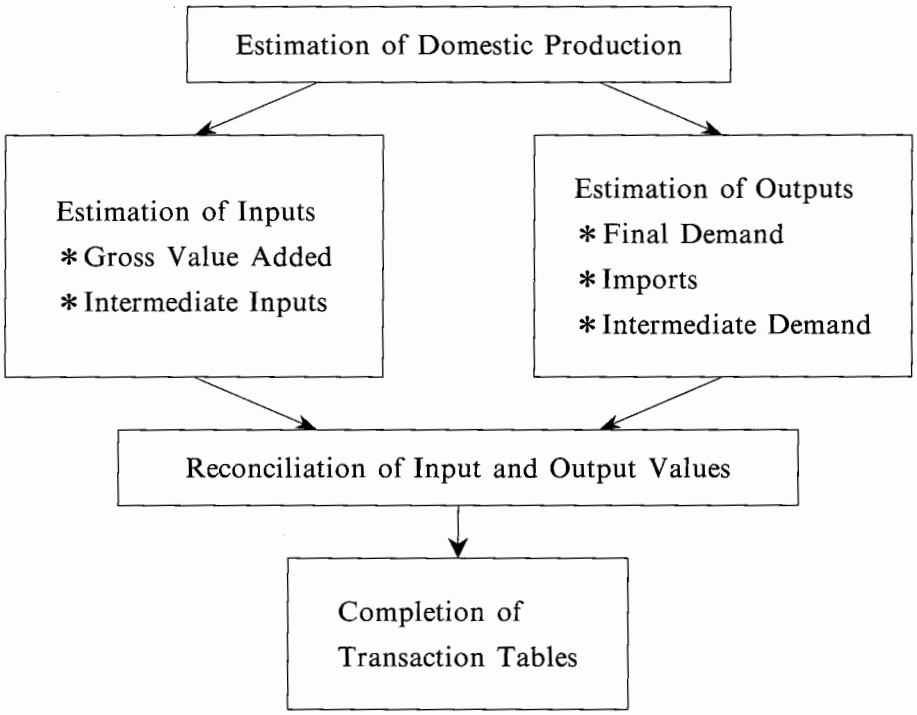
As a result, the value of consumption tax has not been specified as an indipendent sector in the 1990 Input-Output Tables for the reasons shown bellow:

a. Consumption tax system is considered to be very complicated one from the technical point of view for the compilation of the input-output tables.
b. This is the first time for the government to take consumption tax into consideration for the compilation of the input-output tables.
c. There are not enough data available for the estimation of the value of consumption tax.

(5) Reconciliation of the Input and Output Values

Since the input value and output value are estimated independently, and data and method used for the estimation differ, some difference may be produced between the estimates of input and output even though these estimates relate each other to corresponding sectors of transactions. This necessitates the reconciliation to harmonize the both estimates. For the 1990 Input-Output Tables, meetings for this purpose were held several times in 1993 with a large attendance of officers in charge of the input-output tables.

Chart C. Procedure of estimation and reconciliation



5. Compiling Various Coefficients Tables

After making the transaction tables, various coefficients tables such as input coefficient tables and inverse matrix coefficient tables required for the input-output analysis are compiled.

In the 1990 Input-output Tables, following coefficient tables have been published :

(1) Input Coefficients
(2) Inverse Matrix Coefficients
(3) Production Inducement Coefficients
(4) Import Inducement Coefficients
(5) Gross Value Added Inducement Coefficients

6. Compiling Various Supporting Tables

Various supporting tables are compiled to support the transaction table and to promote possible use of the input-output tables.

For the 1990 Input-output Tables, following supporting tables have been compiled :

(1) Table on Domestic Freight
(2) Table on Trade Margins
(3) Table on Imports
(4) Table on Scrap and By-products
(5) Table on Value and Quantity (selected goods)
(6) Tables on Persons Engaged in Production Activities (by employment status)
(7) Tables on Employees Engaged in Production Activities (by occupation)
(8) Tables on Fixed Capital Formation
(9) Table on Commodity Output by Industry (Make Matrix)
(10) Tables on Self-Transport

7. Publication of Results

Having completed transaction tables, various coefficient tables and supporting tables, final report of the results are published.

The final report of the 1990 Input-Output Tables was published in July 1994 in three volumes : Explanatory Report (one vol.) and Data Report (two vols.). The data were also released on magnetic tape for computer processing in April 1994. Prior to the publication of these reports, released was a preliminary report which contained 13, 32 and 91 sector tables at producers' prices with coefficients and explanatory note in October 1993.

CHAPTER II

OUTLINE OF THE 1990 INPUT-OUTPUT TABLES

§1. Basic Theory of the 1990 Input-Output Tables

1. Structure of Tables

The input-output tables for Japan are so-called commodity-by-commodity tables. "Commodity" means a homogenous group of goods and services which constitute the characteristic products of corresponding industry or group of industries. Production activites are conducted by industries, producers of government services and producers of private non-profit services to households. In the input-output tables for Japan, sometimes they and their characteristic products i.e. commodities are called "industries" in the lump.

Moreover, "sector" is often used to refer to each commody, final demand and vlaue added. Imports used for production are treated in the competitive manner in principle.

There are three standard tables comprising the basic set of the input-output table for Japan. These are [1] Transaction Tables, [2] Input Coefficients Tables(direct requirements table), [3] Inverse Matrix Coefficients Tables(total requirements table).

Several derived tables and supporting tables are also compiled at the same time.

2. Coverage of the Input-Output Tables

Input-output tables record production activities and transactions of goods and services conducted in a certain area during the reference year. The input-output tables for Japan cover production activities and transactions conducted in the Japanese territory.

3. Timing for Recording

Domestic production of goods is recorded at the time they are produced, and that of services at the time they are provided. Intermediate consumption of goods and services is recorded at the time they are actually put in for production. Final consumption of goods and services by households, general government and private non-profit institutions serving households is recorded at the time they are purchased irrespective of their delivery in general. Goods for fixed capital formation are recorded at the time they are delivered, and changes in stocks are recorded at the time legal proprietary rights are transferred. Imports and exports are recorded at the time of customs clearance.

4. Sector Classification System

4.1 Rule for Sector Classification

(1) Classification according to "Production Activity Unit"

Sector classification is generally formulated according to goods, services and production activity units producing goods and services.

In the application of the classification to the input-output tables, in case a certain establishment holds several production activities of goods and services, these activities are classified into separate appropriate groupings in principle. This concept is similar to that of commodity classification, so to speak, activity-base classification. For example, as for the production activity of manufacturing-retail industry, manufacturing and retail activities are separated and classified in the corresponding sectors respectively. Thus, the input-output tables for Japan are compiled according to activity-base classification, and are called commodity-by-commodity tables.

(2) Relationship between Row and Column Sectors

Row and column sectors are established as a rule to be interrelated. But, in case one manufacturing process such as petroleum refining produces several goods which differ in price and use, row sectors representing the output structure are divided by commodity. On the other hand, if different types of manufacturing equipment or processes produce the same commodity, such as electric power generation, the input structure is divided and the output structure is aggregated. As a result, the basic transaction table has a rectangular form with more row sectors than column sectors.

4.2 Endogenous Sectors (commodities or industries)

The input-output tables for Japan are prepared both at the basic sector level and at four aggregated levels which are obtained by aggregating the basic sectors.

Aggregation	Number of sectors
Basic sectors	527 ×411
Minor Groups	187
Major Groups	91
13 Sectors	13

Besides the sector classification, there is more detailed classification, which constitutes the basic sectors and forms the basis of the estimation of domestic production for every basic sector.

In this volume, the tables at the Minor Group level and the Major Group level are pres ented.

(1) Basic Sector Classification

The Basic Sector Classification (527 row sectors and 411 column sectors)is so established as to be comparable with the United Nations International Standard Industrial Classification (ISIC) and with the Standard Industrial Classification for Japan.

Commodities in the Basic Sector Classification are established with consideration of input structure, import rate, availability of source data and others.

This classification provides a frame for the estimation of domestic production, input and output, that is to say, approximately 5,000 detailed goods and services are classified according to the Basic Sector Classification and utilized to obtain domestic production for each basic sector (commodity).

The row sector of the Basic Sector Classification has a 7-digit coding system (527 sectors) and the column sector 6-digit one (411 sectors).

Special codes are used to express several special commodities such as scrap and by-products, trade margins and domestic transportation fees.

《Special Codes》

Scrap inputs (use)	2
Scrap outputs (generation)	3
By-product inputs (use)	4
By-product outputs (generation)	5
Trade margins	6
Domestic transportation fees	7

These are placed next to the last digit of the Basic Sector Classification Code.

(2) Aggregated Sector Classification

Minor Groups, Major Groups and Divisions are established according to the sectors of the Basic Sector Classification. Such classification is used for the input-output analysis using input coefficients or inverse matrix coefficients. The Minor Groups consist of 187 sectors with which the 4-digit ISIC items are comparable in principle, but some sectors are divided or integrated with due regard to the economic situation in Japan. The upper 4-digit code of the Basic Sector Classification composes the code for the Minor Groups. The Major Groups have 91 sectors, and the sectors include a large number of sectors of the Basic Sector Classification in themselves for the purpose of the input-output analysis of Japanese economy. Divisions of the Classification are applied to a simple inter-industry analysis.

(3) Transactor Classification

Since the 1975 tables, a transactor classification has been introduced to the Basic Sector Classification. Transactor classification is to classify the Basic Sector Classification by subject of activity such as industry, Producers of Private Non-Profit Services to households and Producers of Government Services from the view point of the subject of production and supply of goods and services.

4.3 Exogenous Sectors

Components of final demand (including imports) and gross value added are established in every classification mentioned above as the endogenous sectors.

5. Method of Valuation

In the transaction tables, the actual transactions of goods and services conducted in a year are recorded. Valuation of every transaction is shown by the amount of money. To supplement the transaction table thus valued in money, a Table on Value and Quantity of Selected Goods is prepared as one of supporting tables.

(1) Purchasers' Prices and Producers' Prices

Transactions can be valued at either the price producers recieve or the price purchasers pay. Difference between them is that the purchasers' price includes trade margins and domestic transportation fees in itself and the producers' price does not. The flows in the tables for Japan are valued in both prices.

However, since the values of transactions of service do not include domestic transportation fees and trade margins, the values of them at purchasers' prices are equivalent to those at producers' prices.

The amount of domestic transportation fees and trade margins differs not only by goods and services, but also, for the same goods or services, according to the transaction forms. For the input-output analysis, stable input coefficients are necessary in general, so the transaction tables presented at producers' prices are better for the analysis.

(2) Uniform Price and Actual Price

Prices of commodities in actual economy vary according to the various factors such as regional or seasonal factors and the difference in the situation of demand and supply or the transaction form. A commodity may be valued at either the "uniform price" irrespective of customers and transaction forms or the "actual price" which reflects the real price differing by transaction. In the input-output tables for Japan, the actual price is adopted for the valuation.

(3) Basic Value

Producers' price minus commodity taxes such as consumption tax, tabacco tax, liquor tax and other indirect taxes is called "Basic Value". It is recommended in the 1968 SNA to value transactions in the basic value. In case commodity taxes are included in the value of transactions, input coefficients may be influenced by an artificial factor because tax rates are not necessarily stable and may vary according to kinds of customers.

In Japan, the treatment of indirect taxes in the basic value had not been seriously discussed, except for the compilation of the 1970 tables. As the comsumption tax system was introduced in 1989, a discussion into how to present the consumption tax was made in compiling the 1990 Input-Output Tables for Japan.

(4) Valuation of Exports and Imports

In the tables at producers' prices, exports as well as goods for domestic demand are valued at producers' prices. In the tables at purchasers' prices, exports are valued at FOB(Free on

Board) prices. Since goods in the external trade statistics are valued at FOB prices, the external trade statistics are applicable directly to the tables valued at purchasers' prices. But, in compiling the tables at producers' prices, transportation fees and trade margins from producers to ports which are included in the FOB prices have to be excluded.

Imports are valued at CIF(Cost, Insurance and Freight) prices in both tables valued at producers' and purchasers' prices. Import duties paid are recorded in the column sector next to the sector of imports. Tonnage dues and special tonnage dues are not separated but included as a part of transportation costs in CIF prices. Though domestic commodity taxes levied on imported goods are paid by importers or trading companies together with customs duties, a column sector for commodity taxes on imported goods is set up for competing commodities. This is to attain consistency concerning the valuation of domestic products for which commodity taxes levied on shipment are included in producers' prices.

Thus, import prices in the tables are CIF prices plus customs duties and commodity taxes. Commodity taxes imposed on domestic and imported goods in the process of distribution are to be included in the domestic production of commerce sectors and recorded in the row sector of indirect taxes.

(5) Valuation of Consumption Tax

Consumption tax is different from the individual indirect taxes such as former commodity taxes which are imposed on specific goods and services. Consumption tax is an indirect tax which is imposed in principle on every process of a transaction of goods and services. In addition, the value of the tax imposed on buying materials is deducted in order that the tax may not be accumulated in the intermediate transaction stages.

In the input-output tables, former indirect taxes had been indicated as they were as the input cost, because the amount of taxes was imputed on prices of commodities and commodities were traded at the prices including taxes irrespective of intermediate and final demand. On the other hand, the consumption tax imposed on materials in the trade for the intermediate demand sector is deducted in principle for the purchaser side (input side). Ideally, in the input-output tables, the value of intermediate input should be indicated in the net price which means a price not including taxes to be possibly excluded. But, in the 1990 Input-output Tables, consumption tax is not indicated as an established sector for the reason of difficulty in estimation.

6. Domestic Production

(1) Contents of Domestic Production

Coverage of the domestic production is all the goods and services produced in Japanese territory including Japanese embassies and consulates in foreign lands and excluding foreign embassies, consulates and U.S. Forces in Japan.

Though domestic production for every sector according to the Basic Sector Classification is given by adding up the values of production of the most detailed items (approx. 5,200

items), double counting occurs in case that one of these component items in a sector is also used as the material for production of another item in the same sector.

Goods for own-account consumption which are intermediate products in an integrated production process and are consumed completely in the corresponding sector are in principle not recorded in domestic production. But, commodities such as pig iron and crude steel, which are going to be consumed at once in the next production process, are separated and recorded by commodity for domestic production if they have different structures of input or output. In case the estimation of domestic production of the most detailed items is based on shipment statistics, there is no method of estimation of domestic production of own-account consumption goods. As a result, such own-account consumption goods are not contained in the estimation of domestic production. Thus, as for own-account consumption, treatments differ according to the basic statistics used. Own-account consumption goods of households, except stock farm products and agricultural processed goods of farm households, are not included either.

Domestic production of services in the intermediate sectors is defined as their revenues in general, while that of government service or private non-profit service is valued by the cost necessary for its production.

(2) Method of Estimation

a. Domestic production of approximately 5,200 types of goods and services are estimated, and added up according to the Basic Sector Classification for the input-output tables.
b. Domestic production of goods is estimated by " quantity-by-unit value" in principle and that of services is valued by the volume of sales.
c. As for most of manufactured commodities, estimation is made by taking into account the stocks (producers' finished product stocks and semi-product stocks), by-products and scrap, receipts from processing and others for every commodity. Results of the Census of Manufactures are re-arrenged for this purpose.
d. For other commodities, utilized are various statistics, government administrative records and data processed by private enterprises' associations. These statistics include Current Production Statistics, the Survey of Mining Trend of Japan, the Establishment Census and Statistics of Construction Work Started.

(3) Valuation of Products at Actual Producers' Prices

Domestic production is valued at producers' market shipment prices. The producers' market shipment price is the selling price which includes the current cost and profit of headquarters or controlling offices. Such indirect taxes as commodity shipment taxes which increase the selling price are included and current subsidies from government which decrease the selling price are entered as negative values. Trade and transport margins are not included. Such industries as forestry, stone quarrying and others whose places of work are not specified are valued at the price of the nearest market to the producing districts. Transportation fees from the producer to the market is treated as the production cost.

Indirect taxes imposed in the process of production of commodities are included in the domestic production of sectors which pay them, and those levied in the process of distribution are included in the domestic production of sectors of commerce.

Increase or decrease in stocks of semi-finished goods and work-in-process is valued at the average of the prices at the beginning and at the end of a year.

Domestic production of services is valued at the prices paid by those recieve the services. Domestic production for the service sectors covering finance, insurance, dwelling rent and others are based on imputed values. Domestic production of producers of government services and that of private non-profit services to households are estimated as the total costs incurred.

7. Intermediate Transactions

In endogenous sectors of the input-output tables, column data show cost composition and row data demand composition. To be exact, however, changes in stocks and fixed capital formation are placed not in endogenous sectors but in exogenous column sectors of final demand. In this connection, the consumption of fixed capital (capital depreciation) is placed in exogenous row sectors of gross value added.

(1) Estimation of Inputs

The estimation of inputs (cost component) for the production of commodities starts with the value added items (primary input) such as compensation of employees and goes to intermediate inputs. Precisely speaking, for manufactured goods, raw material cost, fuel expenses, personnel expenses, capital depreciation and domestic consumption taxes are grasped by using the Census of Manufactures, and then more detailed cost components in the endogenous sectors are determined according to information on production technologies and data from special surveys on inputs conducted for the input-output tables. Inputs for other commodities are estimated in the manner mentioned above, in which data from Current Production Statistics, the Production Cost Survey of Agricultural Products and others are used as well as input surveys and data obtained from private enterprises' associations.

(2) Estimation of Outputs

For the estimation of outputs (use of commodities), gross output and the amount of imports are added up to get total supply for every 527 row sector. By substracting the amount of exports from these total supplies, total domestic demand for every row sector is given, and then the value of every column sector's demand which means the row sector's sales to the column sectors are decided by using various demand and supply statistics and information on characters of each commodity.

(3) Reconciliation of the Input and Output Values

Reconciliation work is carried out on the estimated values of input and output to obtain a single value for every 250,000 cells of the input-output table.

In most cases, the input side plays a leading part in this reconciliation for the reason of utilizing more precise input parameters than the output side.

8. Special Treatment

There are several sectors treated specially in the transaction tables according to the concept of the 1968 System of National Accounts, and for the interindustrial analysis and convenience of compilation of the tables.

8.1 Transport and Commerce

(1) Domestic Production

For the sectors of commerce, only trade margins are recorded in the table valued at producers' prices. On the other hand, in the table valued at purchasers' prices trade margins are recorded as a part of purchasers' prices. For this reason, domestic production valued at purchasers' prices is larger than that valued at producers' prices.

As for the transport sectors, transportation fees are recorded likewise.

(2) Cost Transportation Margins and Cost Trade Margins

Cost transportation margins and cost trade margins defined below are not associated with usual distribution of goods, and therefore recorded both in producers' and purchasers' prices in the same way: recorded in the row sector of transport or commerce.

a. Cost Transportation Margins:

(a) Transportation fee in the process of production

- Transportation fee for commodities such as log, fish and others to the wholesale market or the collecting place at which the producers' price is set up.
- Transportation fee for raw materials and semi-finished goods such as iron and steel within a processing factory. Transportation fee for construction equipment and others.

(b) Transportation fee for goods such as furniture, parcel, mail, wastes and others.

b. Cost Trade Margins

(a) Services supplied by the foreign trading companies which are not directly related to imported goods (charges of agencies in the balance-of-payments statistics) are recorded as the import of commercial services in the column sector of special trade, and are treated as cost trade margins of wholesaler. Likewise, services supplied by Japanese trading companies for export are treated as cost trade margins in the column sector of special trade.

(b) For transactions of second-hand goods within a sector, only trade margins are recorded and treated as cost trade margins.

8.2 Imports

There are two methods of treating imports in the input-output tables. One is so-called the "non-competitive type" which regards imports as non-competing and treats imports and domestically produced goods as different goods because they are produced in different economic regions, even if they are of similar quality. The other is the "competitive import type" in which imports are regarded as competing. According to this type, imports and domestically produced goods are treated in the same way and classified in the same sector if they are similar.

Basic structure of the input-output tables for Japan is of competitive type. However, in the Basic Sector Classification table, several important competing imports are recorded separately from corresponding domestically produced commodities. Therefore, there are both competing and non-competing imports in the Basic Sector Classification table.

In addition, since the matrix table of imports has been compiled, the transaction table of domestically produced commodities can be derived.

8.3 Scrap and By-products

Secondary products of an economic activity are separated from the activity itself and recorded in the sectors in which they are primarily produced. But, for scrap there are no sectors to produce them mainly, so dummy row sectors for scrap have been established in the tables.

For scrap and by-products, there are four ways of treatment:

(1) Lump Method
(2) Transfer Method
(3) Stone's Method (Negative Input Method)
(4) Separation Method

For the input-output tables for Japan, the Stone's method is applied in most cases.
Exceptions are as follows:

- Lump method: droppings of poultry in the sector of poultry farm.
- Transfer method: advertisement through newspapers, magazines and broadcasting.

8.4 Imputation

In case transactions are not actually conducted, but utilities are essentially produced and there are those who receive these utilities, imputation is conducted.

Imputation means to value the utilities at the market price and to regard such value as domestic production for the sectors producing the utilities.

Domestic production for the following sectors is estimated by imputing the utilities which are not actually transacted in the market, but are received by users:

(1) Financial Imputed Interests:
financial services in the strict sense, which means the control of deposits and loans
(2) Insurance Services:
services of life and casualty insurance
(3) Depreciation of Fixed Capital for the Governmental Buildings:
depreciation of fixed capital for the governmental buildings of public administration and

public education, which is presented in the row sector of Depreciation of Fixed Capital

(4) House Renting:

not only dwellings supplied by employers but also the owner-occupied dwellings

8.5 Dummy Sector

Though each sector of endogenous sectors in the input-output tables is based on activities, several sectors are not considered as indipendent industry sectors. These are established for the convenience of the compilation of table, and are expressed as dummy sectors in the table.

Following dummy sectors are provided in the 1990 Input-output Tables:

(1) Office Supplies

(2) Self-Transport

(3) Iron Scrap and Non-Ferrous Metal Scrap

8.6 Renting and Leasing

In the 1990 Input-Output Tables for Japan, costs of renting and leasing for the use of machines and equipment including maintenance fees, depreciation of fixed capital and net rent (operating surplus) have been recorded in the sector of owners. This method of recording is called the "principle of owners". In this method, every producing sector (column sector) pays the cost to the renting and leasing sectors. On the other hand, there is the "principle of users" in which the cost should be recorded in the sector of users. Prior to the 1990 Input-Output tables for Japan, renting and leasing had been recorded principally on the basis of the "principle of users" except some sectors of renting and leasing. But, with the increasing weight of renting and leasing and with the difficulty of estimation under the "principle of users" due to the availability of basic statistics, the "principle of owners" has been adopted entirely in the 1990 Input-Output Tables.

Following renting and leasing sectors are provided in the 1990 Input-Output Tables:

(1) Industrial equipment and machinery renting and leasing

(2) Construction machines renting and leasing

(3) Electronic computing equipment renting and leasing

(4) Office machines renting and leasing

(5) Sports goods, recreation goods and similar goods renting and leasing

(6) Car renting

Real estate rent and worker dispatching services are also estimated on the basis of "the principle of owners".

8.7 Government Activities

Government activities are classified into three types of activities provided by industries, producers of government services and producers of private non-profit services to households.

The government activities categorized as industries are treated in the same way as private industries. The activities of producers of government services are further divided into public and non-public services. The public service is considered to produce the same amount as the cost for

the activity, and the domestic production minus sales which they receive is considered to be consumed by the government consumption expenditure. The same treatment is applied for the domestic production of non-public services and private non-profit services to households.

§2. History of Compilation of the Input-Output Tables

The first compilation of the input-outputs table for Japan dates back to 1955 for the year 1951, when the Ministry of International Trade and Industry (MITI) and the Economic Planning Agency (EPA) compiled tables respectively. The tables of the Ministry of International Trade and Industry consisted of 182 sectors while those of the Economic Planning Agency consisted of 9 sectors. Inevitable differences in figures between them resulted in the Statistics Council's recommendation that the compilation of the input-output tables for Japan should be made as a joint work of the related governmental organizations under the coordination of the Bureau of Statistical Standards, Administrative Management Agency (the Statistical Standards Department, Statistics Bureau, Management and Coordination Agency since 1984).

Thus, the 1955 input-output tables were compiled jointly by six ministries and agencies, namely Administrative Management Agency, Statistics Bureau of Prime Minister's Office, Economic Planning Agency, Ministry of Agriculture and Forestry, Ministry of International Trade and Industry and Ministry of Construction and published in June 1961.

Since this joint work, the input-output tables for Japan have been compiled every five years, namely 1960, 1965, 1970, 1975, 1980, 1985 and 1990. They are the rusults of the joint work of several ministries and agencies coordinated by the Management and Coordination Agency. Similar methodological concepts have been adopted for these tables except for the 1955 Tables.

Differences between the Japanese input-output tables and the SNA recommendations on input-output were reduced considerably in the compilation process of the 1975 tables.

In the 1985 Tables, sector classifications were extensively revised to reflect the 1984 revision in the Standard Industrial Classification for Japan.

As for the 1990 Input-Output Tables, several minor changes have been made and the treatment of consumption tax was carefully discussed.

Main features of the 1990 Input-Output Table are as follows:

a) Method of estimation of renting and leasing has been changed from recording the cost in the sector of users to the sector of owners.
b) Sectors of own-account activity are only "Self-passenger transport by private motor cars" and "Self-freight transport by private motor cars".
c) Service activities have been estimated by kind of service activities according to the "Survey on Service Industry" which was newly conducted in 1989.
d) Treatment of consumption tax has been considered for the first time.

As for the treatment of consumption tax, every estimated trade value of domestic production, intermediate sectors, final demand sectors and gross value added sectors includes in principle consumption tax, that is to say, the trade value is presented in "gross valuation". In this connection, consumption tax in gross value added (for example, payment of consumption tax or consumption tax to be excluded for investment) is not specified as an independent sector but included in the operating surplus.

Table Development of the Input-Output Tables for Japan

Subject	Development
1. Number of sectors (Basic Sector Classification)	1951 : 182 rows × 182 columns (MITI) 9 × 9 (EPA) 1955 : 310 × 278 1960 : 453 × 339 1965 : 467 × 339 1970 : 541 × 405 1975 : 554 × 405 1980 : 541 × 406 1985 : 529 × 408 1990 : 527 × 411
2. Transactions within a sector	1951 : Included in principle. 1955 : Included in principle, except for the case all the parts and semi-finished goods are consumed in the sector. 1960-1990 : Same as for 1955.
3. Scrap and By-products	1951 : Scrap and by-products are dealt with by "Transfer method" in principle. In the MITI table, scrap is put in "scrap sector". 1955 : Transfer method. 1960 : Scrap and by-products are dealt with by "Stone's method" in principle. 1965-1990 : Same as for 1960.
4. Valuation	1951 : Actual producers' prices. 1955 : Uniform producers' prices. 1960 : Actual producers' prices (Also, compiled are tables valued at actual purchasers' prices). 1965-1990 : Same as for 1960.

5. Treatment of imports	1951 : Mixed method. 1955 : Mixed method. Non-competitive type tables are estimated in a simplified way. 1960 : Competitive type. Also, compiled are tables of non-competitive type and tables on imports. 1965-1990 : Same as for 1960.
6. Consumption outside households	1951 : Treated as an intermediate sector. 1955 : Same as for 1951. 1960 : Treated as a final demand and a primary input (value added) item. 1965-1990 : Same as for 1960.
7. Services in public schools, hospitals, etc.	1951 : Treated as intermediate sectors and totally consumed by the government consumption expenditures. 1955 : Treated as intermediate sectors and totally consumed by the households consumption expenditures. 1960-1970 : Same as for 1955. 1975 : Treated as intermediate sectors and consumed both by the households consumption expenditures (payments by households) and by the government consumption expenditures (the balance). 1980-1990 : Same as for 1975.
8. Public administration and defense	1951 : Included in the government consumption expenditures. 1955 : Same as for 1951. 1960 : Intermediate sectors for public administration and defense are set up, but only value added items are estimated. The output are consumed by the government consumption expenditures. 1965, 1970 : Same as for 1960. 1975 : Same as for 1960, but, for these sectors intermediate input, were estimated in addition to primary inputs. 1980-1990 : Same as for 1975.

9. Imputed services of financial institutions	1951 : All charged to households for the sake of convenience. 1955 : Same as for 1951. 1960 : Charged to the depositors which receive the services. 1965 : Same as for 1960, but are not shown at the intersections of the sectors of financial institutions. 1970 : Charged to both borrowers and depositors which receive the services, but are not shown at the intersections of these sectors. 1975 : Same as for 1970, but are not shown in the final demand sectors of private financial institutions. 1980, 1985 : Same as for 1975.
10. Re-exports and re-imports	1951 : Included in exports and imports. 1955 : Same as for 1951. 1960 : Excluded from exports and imports. 1965 : Included in exports and imports because breakdowns of re-exports or re-imports for individual commodities are impossible. 1970 : Re-imports of vessels are excluded from exports, because they can be distinguished from other re-imports. Other re-imports and re-exports are included and shown in "not elsewhere classified" sector. 1975-1990 : Same as for 1970.
11. Customs duties	1951 : Included in indirect taxes and therefore consumed by the households. 1955 : Same as for 1951. 1960 : Charged to the sectors which purchase the commodities. A column is set up to record customs duties. They have minus signs like imports. 1965-1990 : Same as for 1960.

12. Renting and leasing	~1985 : Estimated mainly on the basis of the method of the "principle of users", which means that costs for renting and leasing are recorded at the users side. 1990 : Entirely changed to the method based on the "principle of owners", which means that costs for renting and leasing are recorded at the owners side.
13. Treatment of consumption tax	1990 : Consumption tax is not expressed as an independent sector in the I-O tables for the reason of difficulty in estimation. As a result, consumption tax is included in the value of intermediate transactions and final demand. In addition, payment of the tax is included in the item of operating surplus of gross value added.

§3. Other Input-Output Tables in Japan

(1) Updated Input-Output Tables

The Ministry of International Trade and Industry compiles up-to-date input-output tables annually for its own use by updating the input-output tables for the bench-mark year.

(2) Use Tables

The Economic Planning Agency presents annual use tables as a part of their compilation of the national accounts statistics for Japan. In accordance with the recommendations on the SNA, the Commodity Flow Method has been adopted for the compilation which inevitably requires the use matrix. The bench-mark year's use matrix is converted from the aggregated commodity-by-commodity table by using the make matrix which is compiled as a supporting table derived from the joint work for the national tables.

(3) Regional and Inter-regional Tables

Regional Tables for nine regions of Japan and their inter-regional tables are compiled by the Ministry of International Trade and Industry with the collaboration of its regional offices.

(4) Tables for Prefectures

Prefectural governments compile thier own input-output tables for their prefectures. The joint work system for the national tables assists them by preparing guiding manuals, organizing workshops and providing them with the data of the national tables and of the Census of Manufactures.

CHAPTER III

DERIVED TABLES

An impact analysis under an input-output system is usually carried out with the aid of a set of derived tables, which can be obtained from transaction tables. One is a matrix of input coefficients and the other is a table of inverse matrix coefficients, which is obtained by using the matrix of input coefficients.

In addition, domestic production, gross value added and imports induced by final demand items are calculated by using inverse matrix coefficients.

§1. Input-Output Model

Basic Structure of the transaction table is shown below.

	Intermediate Demand	Final Demand	Domestic Production
Intermediate Inputs	x_{11} ····· x_{1n} ⋮ ⋮ x_{n1} ····· x_{nn}	F_1 ⋮ F_n	X_1 ⋮ X_n
Value Added	V_1 ····· V_n		
Domestic Production	X_1 ····· X_n		

Explanation of the elements:

* x_{ij} is a quantity of output of sector 'i' absorbed as an input by sector 'j'.
* X_i is a total output of sector 'i'.
* F_i is a quantity of output of sector 'i' absorbed by final demand.
* V_j is a quantity of primary factor absorbed as an input to sector 'j'.

Given an economy divided into n sectors, then the mathematical expression of balance for every row is described by the following set of n equations.

$$\begin{cases} x_{11}+\cdots\cdots+x_{1n}+F_1=X_1 \\ \quad\vdots\quad\vdots\quad\vdots \\ x_{n1}+\cdots\cdots+x_{nn}+F_n=X_n \end{cases} \tag{1}$$

§2. Input Coefficients

It is the specific assumption of the input-output system that the input from production sector '*i*' to production sector '*j*' is directly proportional to the output of sector '*j*'. This assumption can be expressed in the following equation.

$$x_{ij}=a_{ij}X_j \quad (i,j=1,2,\cdots,n) \tag{2}$$

which defines the "input coefficient" as:

$$a_{ij}=\frac{x_{ij}}{X_j} \tag{3}$$

a_{ij} represents the input from sector '*i*' to sector '*j*' per unit of sector '*j*"s output.

(1) then becomes:

$$\begin{cases} a_{11}X_{11}+\cdots\cdots+a_{1n}X_{1n}+F_1=X_1 \\ \quad\vdots\quad\vdots\quad\vdots \\ a_{n1}X_{n1}+\cdots\cdots+a_{nn}X_{nn}+F_n=X_n \end{cases} \tag{4}$$

(4) can be written:

$$AX+F=X \tag{5}$$

where

A is a matrix of input coefficients.

X is a vector of the values of domestic production.

F is a vector of the values of final demand.

Input coefficients are sometimes known as direct requirement coefficients or technical coefficients.

Following assumptions are made in order to obtain the stability of input coefficients:

(a) Change in the output of an industry leads to proportional changes in the quantities of its intermediate and primary inputs, as mentioned above.

(b) Changes in relative prices, technology, and the composition of sector output are slow enough to be ignored.

§3. Inverse Matrix Coefficients

3.1 Meaning and Caluculation of Inverse Matrix Coefficients

Transferring the AX to the right side, (5) becomes:

$$(I-A)X=F \tag{6}$$

General solution for the unknown X can be written by inverting the matrix $(I-A)$:

$$X=(I-A)^{-1}F \tag{7}$$

where

I denotes a unit matrix.

$(I-A)^{-1}$ is known as the "inverse matrix" of which elements are referred to as inverse matrix coefficients. Each inverse matrix coefficient b_{ij} at the intersection of raw i and column j represents the amount of output of sector 'i' required directly and indirectly to satisfy one unit of final demand for sector 'j'.

Inverse matrix coefficients are also called total requirement coefficients.

The treatment of imports in the transaction table has an important effect on the input-output model, and according to the way adopted several inverse matrixes are calculated.

Type of the inverse matrix

a. $(I-A)^{-1}$

A simplified balancing equation in which imports are regarded as independent and determined by factors outside is:

$$AX+F-M=X \tag{8}$$

M is a vector whose elements are the value of imports of every row sector.

Then, solution for the X is:

$$X=(I-A)^{-1}(F-M) \tag{9}$$

b. $[I-(I-\hat{M})A]^{-1}$

Dividing F into domestic final demand Y and exports E gives:

$$F=Y+E \tag{10}$$

Substituting (10) into (8) gives:

$$AX+Y+E-M=X \tag{11}$$

Should imports be proportional to domestic demand $(AX+Y)$, then

$$M=\hat{M}(AX+Y) \tag{12}$$

where $\hat{M}$ indicates the diagonal matrix in which elements are defined as:

$$m_i=\frac{M_i}{\sum_j a_{ij}X_j+Y_i} \tag{13}$$

Substituting (12) into (11) gives:

$$[I-(I-\hat{M})A]X=(I-\hat{M})Y+E \tag{14}$$

Solution for the X is:

$$X=[I-(I-\hat{M})A]^{-1}[(I-\hat{M})Y+E] \tag{15}$$

c. $(I-A^d)^{-1}$

Using the matrix on imports, the model regarding imports as non-competing is derived. Balance for domestic production is :

$$A^d+F^d=X \tag{16}$$

Solution for the X is:

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

3.2 Power of Dispersion and Sensibilities of Dispersion

The vertical sum of every column sector of the inverse matrix coefficient tables divided by the mean value of vertical sum is called "Power of Dispersion by Sector", and the horizontal sum of every row sector of the inverse matrix coefficients divided by the mean value of horizontal sum is called "Sensibilities of Dispersion by sector".

Power of Dispersion by Sector gives the multiplicative effect of unit final demand of every column sector on all industries. The "Sensibilities of Dispersion by Sector" gives the multiplicative effect of unit demand about all column sectros on every row sector.

§4. Relations between Final Demand and Domestic Production

4.1 Domestic Production Induced by Individual Final Demand Items

Every industry in intermediate sectors supplies goods and services to production sectors and final demand sectors, while, in another sense production activities in intermediate sectors are conducted to satisfy final demand just sufficiently, and the production level is decided according to the size of final demand.

In the input-output table treating imports by the competing type, following equation is given:

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

here

X	:	domestic production
$[I-(I-\hat{M})A]^{-1}$	:	inverse matrix
$(I-\hat{M})Y+E$	:	amount of final demand

Domestic Production Induced by Individual Final Demand Items is defined as domestic production of every industry induced by individual final demand items which are consumption expenditures outside households, consumption ewpenditures of households, consumption expenditures of general government, gross domestic fixed capital formation, increase in stocks and exports.

These are indexes for analyzing by what items of final demand changes in domestic production are caused.

Calculation is shown below:

A vector of the values of final demand, F is divided into domestic final demand Y and exports E:

$$F=Y+E$$

moreover, Y is divided according to final demand items:

$$Y=Y_1+Y_2+\cdots+Y_N \qquad ②$$

substituting ② into ① gives

$$X=[I-(I-\hat{M})A]^{-1}[(I-\hat{M})(Y_1+Y_2+\cdots+Y_N)+E] \qquad ③$$

then a vector, X_k (k=1,2$\cdots$N), which is induced by final demand Y_k, is:

$$X_k=[I-(I-\hat{M})A]^{-1}(I-\hat{M})Y_k \quad (k=1,2\cdots N) \qquad ④$$

and a vector, X_E which is induced by exports is:

$$X_E=[I-(I-\hat{M})A]^{-1}E \qquad ⑤$$

by using ④ and ⑤, ③ is:

$$X=\sum_{k=1}^{N} X_k+X_E \qquad ⑥$$

4.2 Production Inducement Coefficients

Production Inducement Coefficients are defined as domestic production induced by individual final demand items devided by the amount of the corresponding final demand andshow how much every industry's domestic production will increase when the amount of a final demand item totally increases by one unit.

That is to say, let vector Y_k, X_k, E and X_E as follows:

$$Y_k=\begin{Bmatrix} Y_{1k} \\ \vdots \\ Y_{nk} \end{Bmatrix}, \qquad X_k=\begin{Bmatrix} X_{1k} \\ \vdots \\ X_{nk} \end{Bmatrix}, \qquad k=1,2,\cdots N \text{ (domestic final demand items)}$$

$$E=\begin{Bmatrix} E_1 \\ \vdots \\ E_n \end{Bmatrix}, \qquad X_E=\begin{Bmatrix} X_{1,N+1} \\ \vdots \\ X_{n,N+1} \end{Bmatrix}$$

then, domestic production of industry 'i' induced by final demand item 'k' (k=1,2$\cdots$,N) and exports '$N+1$' are X_{ik} (k=1,2,$\cdots$,N) and $X_{i,N+1}$ respectively.

then, Production Inducement Coefficients are :

$$\begin{cases} \dfrac{X_{ik}}{\sum_{i=1}^{n} Y_{ik}} \ (k=1,2,\cdots,N) & \text{(domestic final demand)} \\ \dfrac{X_{i,N+1}}{\sum_{i=1}^{n} E_i} & \text{(exports)} \end{cases}$$

4.3 Distribution Ratios

Distribution Ratios are defined as domestic production induced by a final demand item divided by the amount of the corresponding industry's domestic production and show for every industry the ratios of domestic production induced by final demand items to the domestic production of the industry.

According to the equation ⑥, X_i, which is the domestic production of industry 'i', is described as :

$$X_i=\sum_{k=1}^{N} X_{ik}+X_{iE}$$

then, Distribution Ratios are:

$$\begin{cases} \dfrac{X_{ik}}{X_i} \ (k=1,2,\cdots,N) & \text{(domestic final demand)} \\ \dfrac{X_{i,N+1}}{X_i} & \text{(exports)} \end{cases}$$

Relation between final demand and gross value added as well as relation between final demand and imports are defined likewise.

let $B=[I-(I-\hat{M})A]^{-1}$, then

Induced Value Added:

$\hat{V}B(I-\hat{M})Y_k$ ·····induced by Y_k

Here, $\hat{V}$ is a diagonal matrix whose elements are defined as:

V_i/X_i $(i=1,2,\cdots,n)$

$\hat{V}BE$ ·····induced by E

Induced Imports:

$(\hat{M}AB(I-\hat{M})+\hat{M})Y_k$ ·····induced by Y_k

$\hat{M}ABE$ ·····induced by E

CHAPTER IV

SUPPORTING TABLES

Input-output tables described in the preceding chapters are constructed by mobilizing all the statistics and administrative records available. However, the information contained in all these tables is not sufficient for an interindustry analysis. Consequently, the supporting tables are compiled to complement the basic tables and used for a variety of analytical purposes.

In case of the 1990 Input-Output Tables, following supporting tables have been compiled:

(1) Table on Trade Margins
(2) Table on Domestic Freight
(3) Table on Imports
(4) Tables on Persons Engaged in Production Activities (by Employment Status)
(5) Tables on Employees Engaged in Production Activities (by Occupation)
-Employment Matrix-
(6) Tables on Fixed Capital Formation
(7) Table on Commodity Output by Industry -Make Matrix-
(8) Table on Scrap and By-products
(9) Table on Value and Quantity of Selected Goods
(10) Tables on Self-Transport

This publication contains 7 supporting tables from 1) to 7).

1. Table on Trade Margins

For the amount of trade margins by individual trade, the table shows the distributive trade margins paid by the column sectors for the purchase of commodities of row sectors. Trade margins are included in the values of purchsers' price table, while these margins are recorded in the rows of commerce in the producers' price table.

The figures are estimated through the work of compilation of purchsers' price tables and producers' price tables.

2. Table on Domestic Freight

For the amount of domestic freight by individual trade, the table shows the domestic freight paid by the column sectors for the purchase of commodities of row sectors. The freight is included in the values of purchasers' price table, while it is recorded in the rows of transport in the producers' price table.

The figures are estimated through the work of compilation of purchasers' price table and

producers' price tables.

3. Table on Imports

In the transaction tables for Japan, imports are treated on the basis of the "competitive import type". Accordingly, the amount of every trade includes imports, and it is impossible to pick up merely trades of imports.

For this reason, the table on imports has been prepared to record the amount of individual imported goods and services purchased by the column sectors for their production. The table shows in the form of a matrix the amount of imports, which indicates the total amount of ordinary trade, special trade, direct purchase, customs duties and commodity taxes on imported goods, according to each transaction.

4. Tables on Persons Engaged in Production Activities (by Employment Status)

The tables show, for each column sector, the annual average numbers of employees and paid directors, which serve as the base for estimation of employees, compensation in the transaction table, as well as those of self-employed workers and unpaid family workers. From these tables, labour input coefficients, total labour requirements (labour induced by final demand) and others are calculated. A dispersion analysis on labour is conducted by the use of these coefficients.

The estimation of the numbers of regular employees, temporary or day employees and paid directors is mainly based on the Population Census, the Establishment Census and the Census of Manufactures. The numbers of self-employed workers and unpaid family workers are estimated from the Population Census and the Employment Status Survey in most cases.

5. Tables on Employees Engaged in Production Activities (by Occupation) -Employment Matrix-

The tables give, for each of 91-column sectors, breakdowns of employees including paid directors into occupational categories. As in the case of the Tables on Persons Engaged in Production Activities, the employment matrix is utilized to measure impacts of possible changes in the final demand on employees to be needed by occupational category.

These tables are compiled from the occupational distribution ratios for each column sectors obtained from the Population Census and the corresponding numbers of employees obtained from the Tables on Persons Engaged in Production Activities. It should be noted that the conversion of the Population Census data to the input-output sector concepts is not straightforward and some problems still remain at the most detailed level.

6. Tables on Fixed Capital Formation

The tables show the sales amount of fixed capital goods, which are presented in row sectors in

this tables, to column sectors during the reference year. The fixed capital goods include those reproducible tangible assets such as buildings, machines, equipment and others, whose unit values are one hundred thousand yen or more and whose duration is one year or more, as well as the livestock and plants which provide capital services. The column sectors are grouped according to the production sectors which form fixed capital and are based on Major Group Classification (91 sectors).

There are two sub-tables for the two types of users: public and private sectors, which correspond to the two final demand items: public and private gross fixed capital formation.

These tables are compiled separately for each user of public and private sectors; the figures are estimated from output side data and reconciled with input side data. The statistics utilized include the Census of Manufactures, the Survey of Orders Received for Machinery, the Survey of Construction Work Started and others.

7. Table on Commodity Output by Industry -Make Matrix-

The make matrix presents the amount of goods and services produced by industry in the form of industry-by-commodity matrix.

In the make matrix, the industries (production activities) on the table-stub are grouped into three categories of industries, producers of government services and producers of private non-profit services to households and correspond to the Major Group Classification (91 sectors) in principle. In addition, these correspond to the commodities on the table-head.

The figures for manufacturing industries are estimated by re-arranging the results of the Census of Manufactures. In the 1990 Input-Output Tables, information on the production of service industry has been obtained from the results of the 'Survey on Service Industry ', which was conducted in 1989 for the first time. Other figures are estimated similarly by re-compiling various statistics. Scraps and by-products are recorded as positive output in the make matrix, and therefore the total product of each commodity is equal to the sum of the gross output in the transaction table and the output of scraps and by-products.

8. Table on Scrap and By-products

The transaction tables for Japan has adopted in principle the transfer method.

Table on scrap and by-products shows the amount of individual scrap and by-products produced and purchased by column sectors.

The table is compiled for the purpose of making it possible to distinguish input or output of main products from those of scrap and by-products.

9. Table on Value and Quantity of Selected Goods

The table complements the transaction tables in that it facilitates accurate quantity analysis. It is desirable for stability of input coefficients in input-output analysis that transaction tables should

be prepared in quantity units, not in money values.

The 1990 table has been tentatively compiled, including the selected goods of which components are estimated in a single quantity unit and with similar prices.

10. Table on Self-transport

In the transaction table, self-transport activities are treated as dummy sectors in order to get stable input coefficients. They are, in fact, transportation activities in the strict sense. In this table, the amount of input for the column sector of self-transport, which is a dummy sector, is disaggregated into the corresponding sectors.

The tables on self-transport are recorded separately for passengers and freight, each in two forms: output table and input table.

CHAPTER V

STRUCTURE OF JAPANESE ECONOMY INFERRED FROM THE 1990 INPUT-OUTPUT TABLES

1. Composition and Growth of Total Supply

The total amount of goods and services supplied, which consists of domestic production plus imports, i.e. "total supply", is 918,045 billion yen for 1990. Of the "total supply", domestic production and imports are 872,212 billion yen (95.0%) and 45,833 billion yen (5.0%), respectively. In comparing the composition of the total supply for 1990 with that for 1985, domestic production has risen by 0.3 point and imports have decreased by 0.3 point. The ratio of imports to the "total supply" has decreased for 1980,1985 and 1990 due to the decline of import prices and other factors.

As regards the growth over 1985, the total supply, domestic production and imports have increased by 28.2%, 28.5% and 21.8%, respectively.

Chart 1-1 Composition of Total Supply

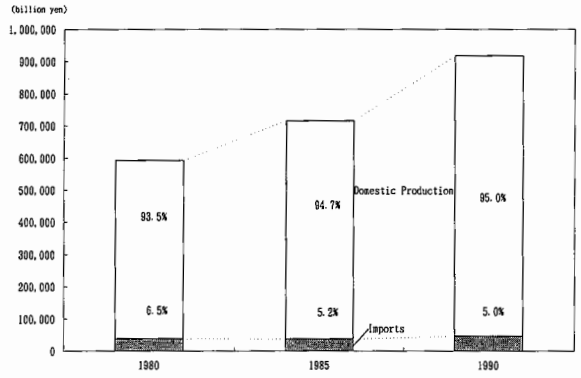


Chart 1-2 Growth of Total Supply

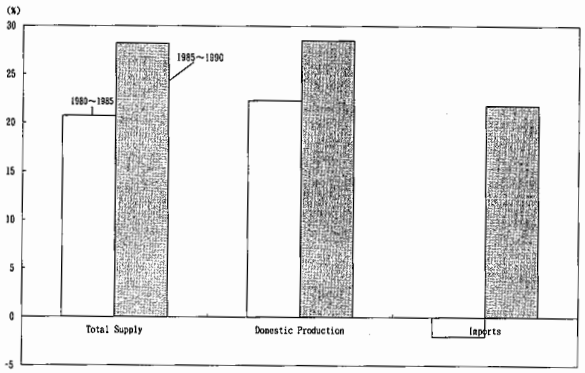


Table 1-1 Composition and Growth of Total Supply

	Value (billion yen)			Distribution Ratio (%)			Growth (%)	
	1980	1985	1990	1980	1985	1990	1980~1985	1985~1990
Total Supply	593,410.1	716,156.4	918,045.5	100.0	100.0	100.0	20.7	28.2
Domestic Production	555,038.3	678,538.2	872,212.2	93.5	94.7	95.0	22.3	28.5
Imports	38,371.8	37,618.2	45,833.3	6.5	5.3	5.0	−2.0	21.8

2. Change of Domestic Production (Average Annual Rate of Increase)

"Domestic production" in the input-output tables represents the total amount of goods and services produced by economic activities of all establishments located in the governmental territory of Japan. It includes intermediate products.

The output of overseas activities of Japanese firms is not included in it, but the output of activities of foregin firms in Japan is included. The amount of domestic production is estimated in principle by summing up production amounts for around 5,200 items of goods and services classified by kind.

Japanese domestic production for 1990 thus estimated was 872,212 billion yen, which has increased by 28.5% over 1985. Average annual rate of increase over the five years from 1986 to 1990 is 5.2%.

Chart 2-1 Change of Domestic Production

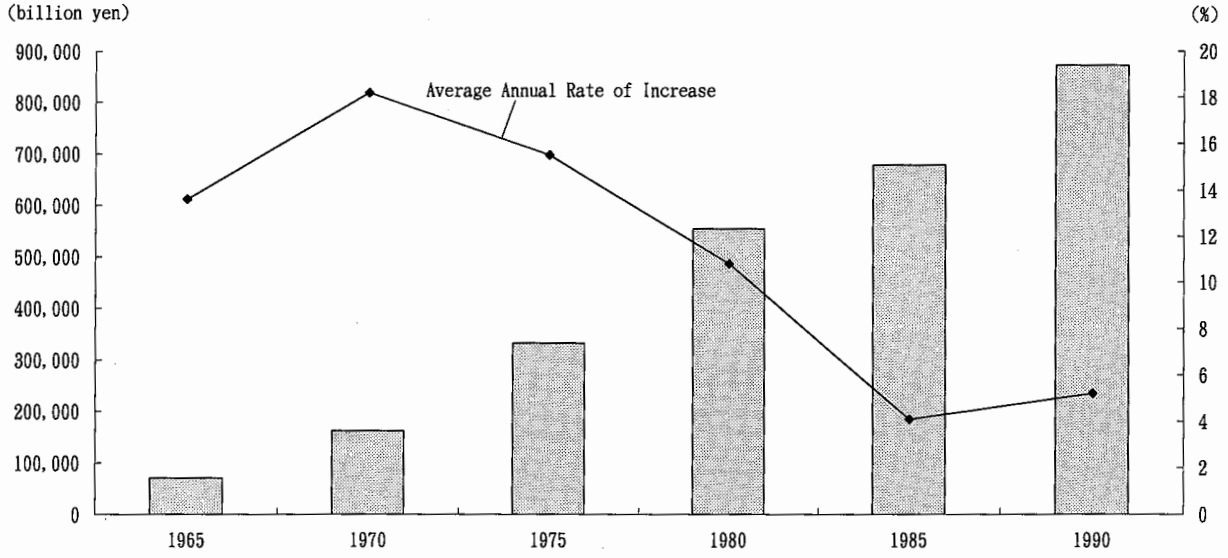


Table 2-1 Change of Domestic Production

Domestic Production (billion yen)					
1965	1970	1975	1980	1985	1990
70,031.5	161,517.7	332,230.5	555,038.3	678,538.2	872,212.2

Table 2-2 Average Annual Rate of Increase

Average Annual Rate of Increase (%)					
1960～1965	1965～1970	1970～1975	1975～1980	1980～1985	1985～1990
13.6	18.2	15.5	10.8	4.1	5.2

3. Industry-wise Composition of Domestic Production

Regarding the industry-wise composition of domestic production according to the 13 sector clasification, manufacturing has the highest ratio (38.7%), followed by services (18.4%), construction (10.2%), commerce (9.4%) and real estate (5.7%). Especially, the ratio of tertiary industry exclusive of agriculture, forestry and fishery, mining, manufacturing and construction has increased from 47.1% in 1985 to 48.7% in 1990.

In comparison of 1990 data with 1985 data, the following is observed:in the tertiary industry, the ratio for services has risen by 2.0 points (from 16.4% to 18.4%), and that for real estate by 0. 4 point (from 5.3% to 5.7%). In the primary and secondary industries, although the ratio for construction has risen by 1.9 point (from 8.3% to 10.2%), the ratios for manufacturing and agriculture, forestry and fishery have decreased by 3.1 points (from 41.8% to 38.7%) and 0.6 point (from 2.6% to 2.0%), respectively.

Chart 3-1 Industry-wise Composition of Domestic Production

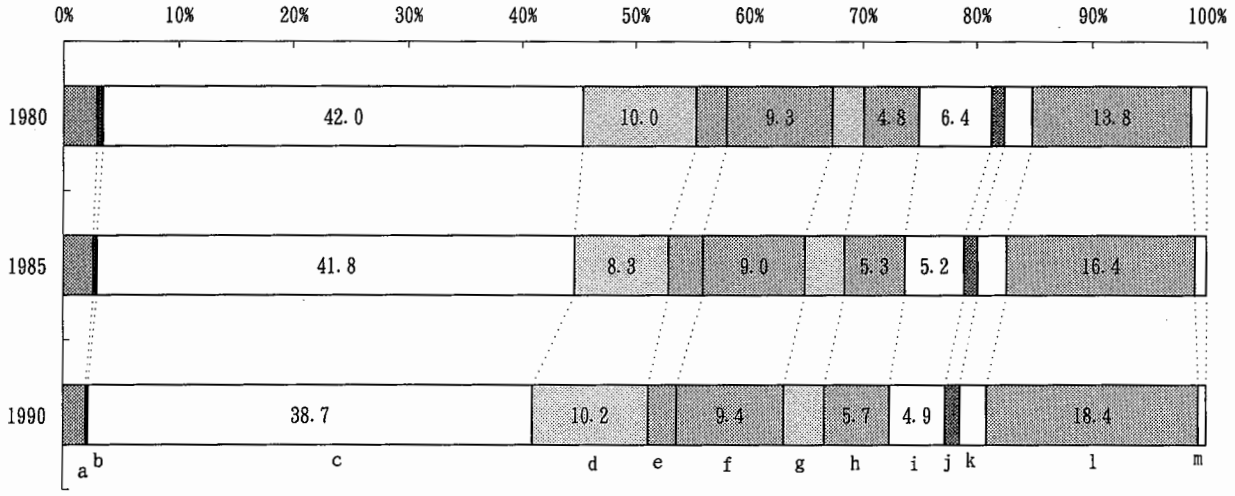


Table 3-1 Industry-wise Composition of Domestic Production

	Domestic Production (billion yen)			Distribution Ratio (%)		
	1980	1985	1990	1980	1985	1990
T o t a l	555,038.3	678,538.2	872,212.2	100.0	100.0	100.0
a) Agriculture, Forestry and Fishery	16,111.4	17,745.7	17,795.3	2.9	2.6	2.0
b) Mining	2,601.2	1,925.1	2,156.4	0.5	0.3	0.2
c) Manufacturing	233,365.3	283,320.3	337,914.6	42.0	41.8	38.7
d) Construction	55,257.4	56,018.3	89,198.9	10.0	8.3	10.2
e) Electric Power, Gas and Water Supply	14,750.5	20,484.2	21,513.9	2.7	3.0	2.5
f) Commerce	51,517.8	61,147.5	82,414.4	9.3	9.0	9.4
g) Financing and Insurance	15,804.1	24,049.2	31,251.5	2.8	3.5	3.6
h) Real Estate	26,627.0	35,807.4	50,116.1	4.8	5.3	5.7
i) Transport	35,250.1	35,114.4	42,580.4	6.4	5.2	4.9
j) Communication and Broadcasting	6,158.5	8,265.4	10,974.6	1.1	1.2	1.3
k) Public Administration	13,275.2	17,057.4	20,409.5	2.4	2.5	2.3
l) Services	76,809.3	111,001.4	160,073.6	13.8	16.4	18.4
m) Others	7,510.4	6,601.8	5,812.9	1.4	1.0	0.7

4. Growth of Domestic Production by Industry

The growth rate of domestic production from 1985 to 1990 shows 28.5%, exceeding that of 22.3% from 1980 to 1985. The 32 sector classification table indicates that industries of high growth rate are business services (by 67.8%), education and research (by 59.4%), construction (by 59.2%) and metal products (by 44.5%). Especially, business services showed again high growth after the high growth of 53.7% from 1980 to 1985.

On the other hand, petroleum and coal products, other public service, iron and steeland electric power, gas and heat supply showed minus growth of 31.1%, 17.0%, 2.3 % and 0.7%, respectively.

Chart 4-1 Growth of Domestic Production by Industry

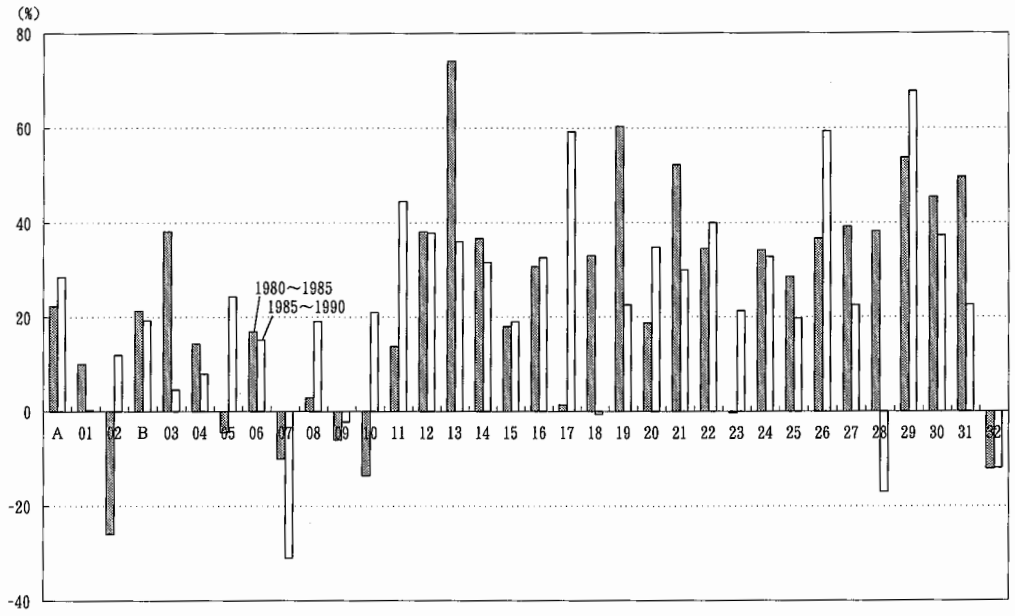


Table 4-1 Growth of Domestic Production by Industry

	Domestic Production (billion yen)			Growth (%)	
	1980	1985	1990	1980~1985	1985~1990
A Total	555,038.3	678,538.2	872,212.2	22.3	28.5
01 Agriculture, Forestry and Fishery	16,111.4	17,745.7	17,795.3	10.1	0.3
02 Mining	2,601.2	1,925.1	2,156.4	−26.0	12.0
B Manufacturing	232,321.6	281,758.7	336,000.1	21.3	19.3
03 Food Products	26,954.1	37,226.8	38,940.6	38.1	4.6
04 Textile Products	11,606.2	13,268.6	14,333.7	14.3	8.0
05 Pulp, Paper and Wooden Products	16,056.3	15,332.4	19,062.7	−4.5	24.3
06 Chemical Products	19,563.0	22,867.9	26,348.5	16.9	15.2
07 Petroleum and Coal Products	17,884.9	16,084.7	11,087.6	−10.1	−31.1
08 Ceramic, Stone and Clay Products	8,305.3	8,556.4	10,193.6	3.0	19.1
09 Iron and Steel	29,087.7	27,314.3	26,679.2	−6.1	−2.3
10 Non-ferrous Metals and Metal Products	7,286.0	6,295.1	7,614.6	−13.6	21.0
11 Fabricated Metal Products	10,183.7	11,587.8	16,748.0	13.8	44.5
12 General Mechanery	16,725.6	23,101.4	31,839.0	38.1	37.8
13 Electrical Machinery	21,477.6	37,381.8	50,826.5	74.1	36.0
14 Transportation Equipment	25,123.2	34,341.8	45,195.9	36.7	31.6
15 Precision Instruments	3,340.0	3,941.5	4,692.0	18.0	19.0
16 Other Industrial Products	18,728.0	24,458.3	32,438.3	30.6	32.6
17 Construction	55,257.4	56,018.3	89,198.9	1.4	59.2
18 Electric Power, Gas and Heat Supply	11,597.7	15,426.5	15,318.0	33.0	−0.7
19 Water Supply and Sanitary Services	3,152.9	5,057.8	6,195.9	60.4	22.5
20 Commerce	51,517.8	61,147.5	82,414.4	18.7	34.8
21 Financing and Insurance	15,804.1	24,049.2	31,251.5	52.2	29.9
22 Real Estate	26,627.0	35,807.4	50,116.1	34.5	40.0
23 Transport	35,250.1	35,114.4	42,580.4	−0.4	21.3
24 Communication and Broadcasting	6,158.5	8,265.4	10,974.6	34.2	32.8
25 Public Administration	13,275.2	17,057.4	20,409.5	28.5	19.7
26 Education and Research	13,187.7	18,023.2	28,727.1	36.7	59.4
27 Medical Service, Health and Social Insurance	15,624.0	21,751.4	26,641.3	39.2	22.5
28 Other Public Services	3,504.0	4,842.4	4,017.7	38.2	−17.0
29 Business Services	20,355.1	31,291.1	52,503.7	53.7	67.8
30 Personal Services	24,138.5	35,093.3	48,183.8	45.4	37.3
31 Office Supplies	1,043.7	1,561.6	1,914.6	49.6	22.6
32 Others	7,510.4	6,601.8	5,812.9	−12.1	−12.0

5. Intermediate Inputs and Gross Value Added

"Intermediate inputs" in the input-output tables represents the purchase cost of goods and services such as raw materials, fuels and others which are required for production activities of each industry sector. Amount of intermediate inputs divided by domestic production of a certain sector is called "intermediate input ratio". Purchase cost of equipment and facilities for production is considered to be capital formation and is not included in intermediate input. "Gross value added" represents the value newly added by production activities. It equals domestic production minus intermediate input and consists of consumption expenditure outside households, compensation of employees, operating surplus, depreciation of fixed capital, indirect taxes and (less) current subsidies.

Gross value added exclusive of consumption expenditure outside households approximately corresponds to the GDP (gross domestic product) in the SNA.

The domestic production, 872,212 billion yen, for 1990 is composed of 426,0553 billion yen (48.8%) for intermediate input of goods and services such as raw materials, fuels and others which were required for production, and 446,157 billion yen (51.2%) for gross value added which was newly added by production activities.

Intermediate input ratios for 1980, 1985 and 1990 have consecutively decreased. In comparison with the 1985 data, intermediate input ratio for 1990 has decreased by 2.5 points, and gross value added ratio for 1990 has increased by 2.5 points. As a result, gross value added ratio has exceeded intermediate input ratio.

Chart 5-1 Intermediate Inputs and Gross Value Added

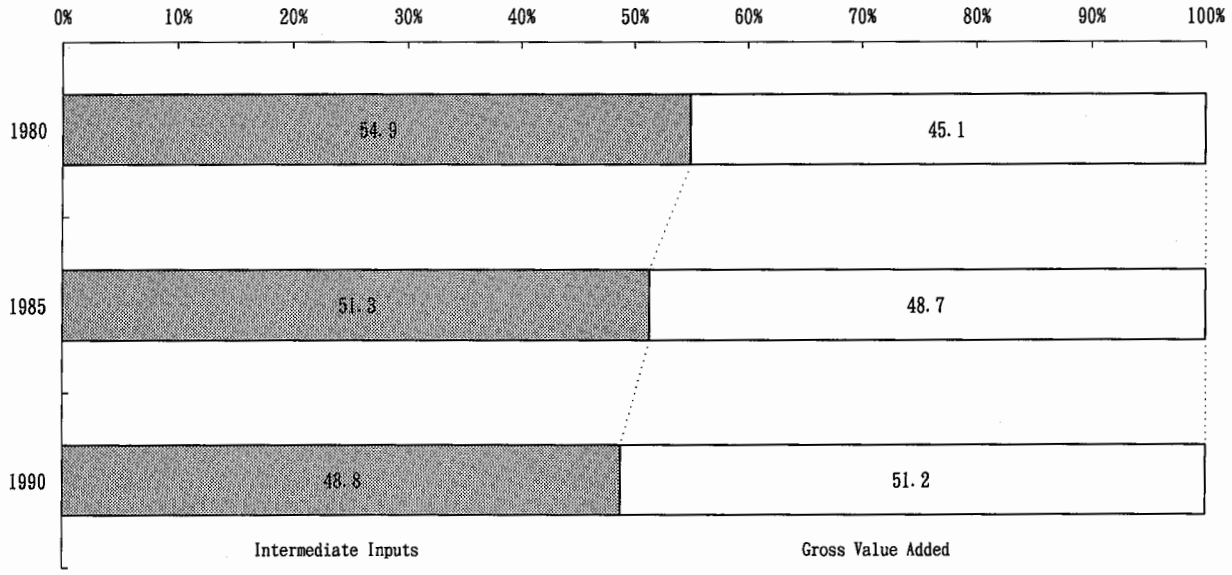


Table 5-1 Intermediate Imputs and Gross Value Added

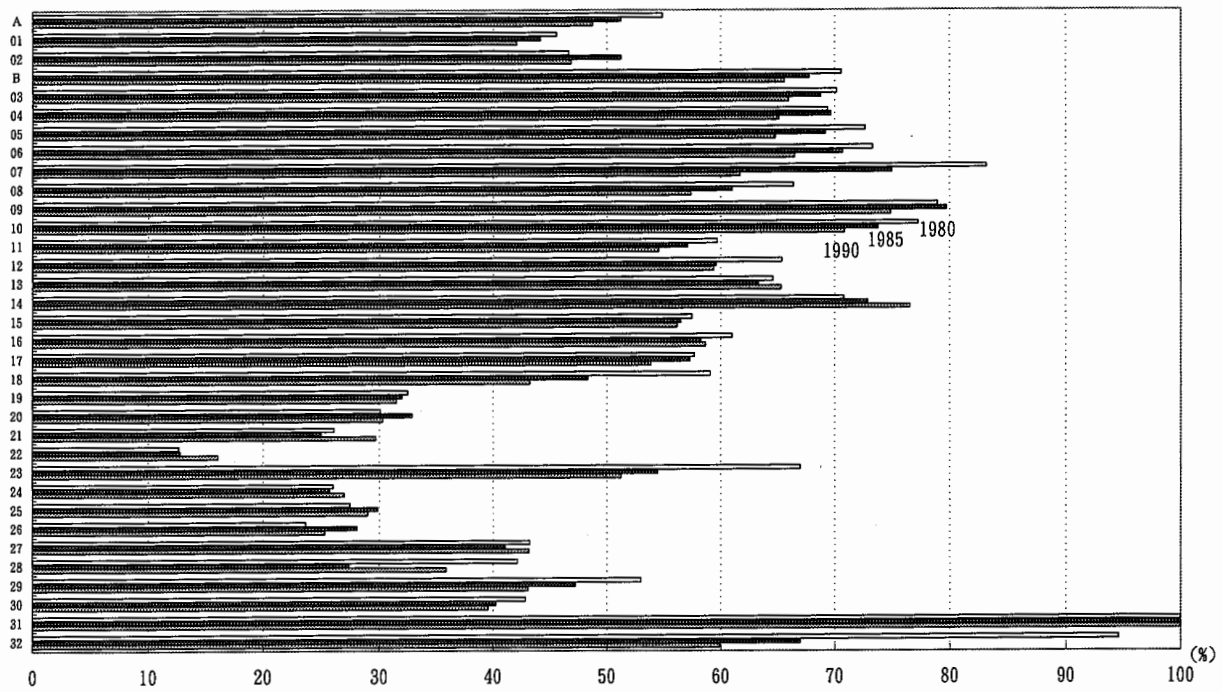
	Value (billion yen)			Distribution Ratio (%)			Growth (%)	
	1980	1985	1990	1980	1985	1990	1980～1985	1985～1990
Domestic Production	555,038.3	678,538.2	872,212.2	100.0	100.0	100.0	22.3	28.5
Intermediate Inputs	304,910.8	348,332.2	426,055.3	54.9	51.3	48.8	14.2	22.3
Gross Value Added	250,127.5	330,205.9	446,157.0	45.1	48.7	51.2	32.0	35.1

6. Intermediate Input Ratio by Industry

The intermediate input ratio by industry in 1990 according to the 32 sector classification indicates that manufacturing such as transportation equipment (76.6%), iron and steel (74.9%), non-ferrous metals (70.9%) show high ratios. Besides manufacturing, construction (53.9%), transport (51.3%) and mining (46.9%) also show high ratios. On the other hand, real estate (16.1%), and education and research (25.3%) show low ratios.

Regarding the changes of intermediate input ratio by major commodity group from 1985 to 1990, large decreases are observed for petroleum and coal products (from 75.0% to 61.7%), electric power, gas and heat supply (from 48.4% to 43.3%) and iron and steel (79.8% to 74.9%).

Chart 6-1 Intermediate Input Ratio by Industry



Notes: Names for codes are as follows:

A T o t a l
01 Agriculture, Forestry and Fishery
02 Mining
B Manufacturing
03 Food Products
04 Textile Products
05 Pulp, Paper and Wooden Products
06 Chemical Products
07 Petroleum and Coal Products
08 Ceramic, Stone and Clay Products
09 Iron and Steel
10 Non-ferrous metals and metal products
11 Fabricated Metal Products
12 General Machinery
13 Electrical Machinery
14 Transportation Equipment
15 Precision Instruments
16 Other Industrial Products
17 Construction
18 Electric Power, Gas and Heat Supply
19 Water Supply and Sanitary Services
20 Commerce
21 Financing and Insurance
22 Real Estate
23 Transport
24 Communication and Broadcasting
25 Public Administration
26 Education and Research
27 Medical Service, Health and Social Insurance
28 Other Public Services
29 Business Services
30 Personal Services
31 Office Supplies
32 Others

7. Composition of Intermediate Input

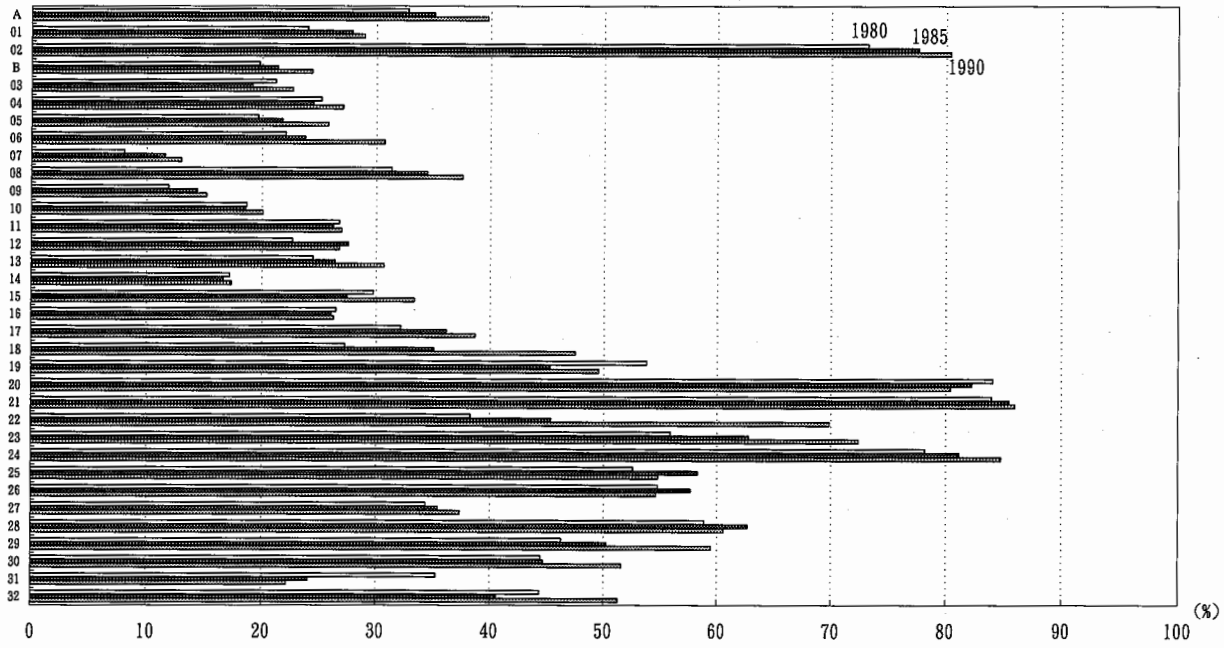
The 1990 intermediate input, 426,055 billion yen, for all industries is composed of 256,669 billion yen (60.2%) for goods and 169,385 billion yen (39.8%) for services. The input ratio of goods is higher than that of services.

As compared with 1980 and 1985, the input ratio of services for 1990 has increased.

According to the 32 sector classification by industry, high ratios of service input are observed in case of financing and insurance, communication and broadcasting, commerce, and mining. The ratios of service input have increased in many industry sectors.

Notes:Input of "goods" described here indicates the inputs to agriculture, forestry and fishery, mining, manufacturing, construction and electric power, gas and heat supply, and other inputs are regarded as the "service" input. But, office supplies are included in "goods", and inputs, n.e.c. are included in "services."

Chart 7-1 Input Ratio of Services



Notes: Names for Codes are same as those of Chart 6-1.

8. Composition of Gross value Added

The amount of gross value added for 1990 was 446,157 billion yen. It is broken down into compensation of employees, operating surplus, capital depreciation, indirect taxes, consumption outside households and (less) subsidies which occupy 52.1%, 24.7%, 14.1%,6.3%, 3.9% and -1.0%, respectively.

Regarding the growth over 1985, the amount of gross value added has increased by 35.1%. Among gross value added items, those exceeding 35.1% are capital depreciation (44.5%), compensation of employees (35.5%) and operating surplus (35.4%), while items being lower than 35.1% are (less) subsidies (28.6%), consumption outside households (26.0%) and indirect taxes (18.7%).

Chart 8-1 Composition of Gross Value Added

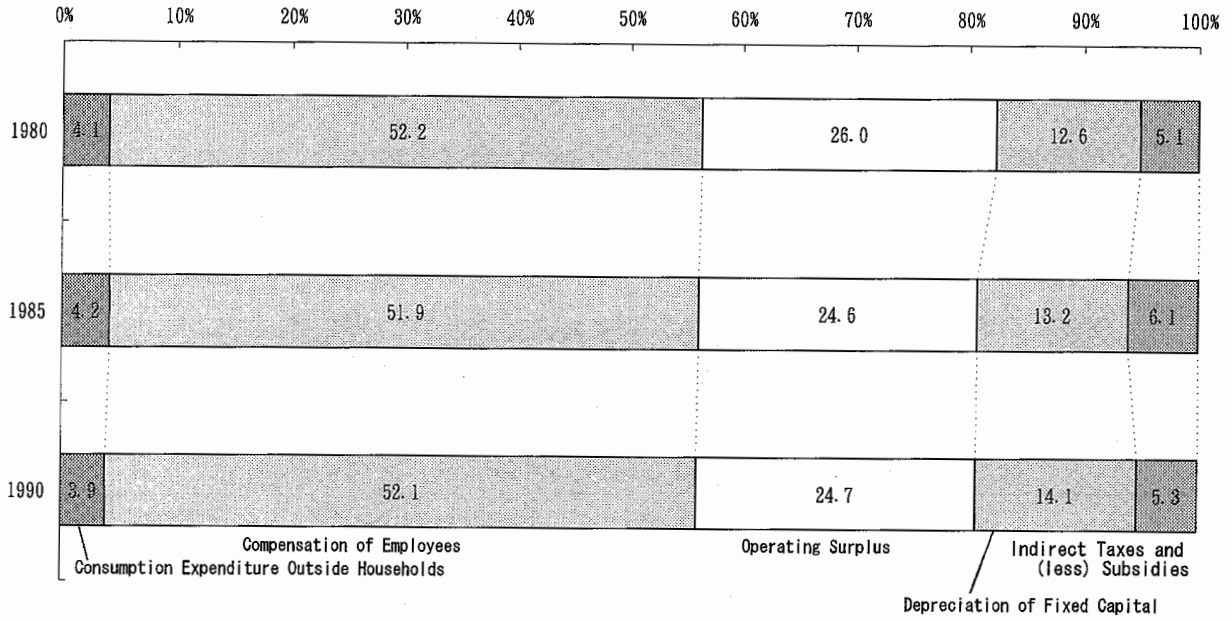


Table 8-1 Composition and Growth of Gross Value Added

	Value (billion yen)			Distribution Ratio (%)			Growth (%)	
	1980	1985	1990	1980	1985	1990	1980～1985	1985～1990
Gross Value Added	250,127.5	330,205.9	446.157.0	100.0	100.0	100.0	32.0	35.1
Consumption Expenditures outside Households	10,186.3	13,930.5	17,548.2	4.1	4.2	3.9	36.8	26.0
Compensation of Employees	130,541.7	171,446.8	232,283.0	52.2	51.9	52.1	31.3	35.5
Operating Surplus	64,953.9	81,320.5	110,090.7	26.0	24.6	24.7	25.2	35.4
Depreciation of Fixed Capital	31,640.9	43,478.2	62,819.9	12.6	13.2	14.1	37.4	44.5
Indirect Taxes	16,375.7	23,631.6	28,045.7	6.5	7.2	6.3	44.3	18.7
(Less) Current Subsidies	△3,571.0	△3,601.7	△4,630.6	△1.4	△1.1	△1.0	0.9	28.6

9. Composition of Imports by Commodity

The amount of imports for 1990 is 45,833 billion yen, whose ratio to the total supply bears 5. 0%. Regarding the composition of imports by commodity according to the 32 sector classification, imports of mining products are the largest (18.6%), followed by food products (9.6%), agriculture, forestry and fishery products (6.5%), electrical machinery (5.6%) and non-ferrous metals and metal products (5.4%). In comparing these ratios with 1985 ratios, a decline is observed for mining products, agriculture, forestry and fishery products, petroleum and coal products, while a rise observed for manufacturing products except petroleum and coal products.

Chart 9-1 Composition of Imports by Commodity

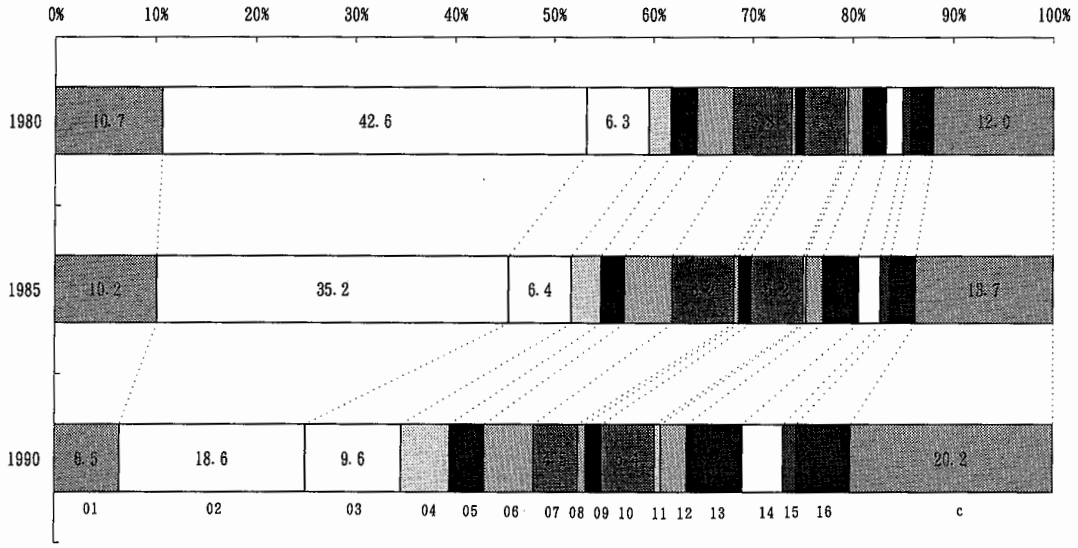


Table 9-1 Composition and Growth of Imports by Commodity

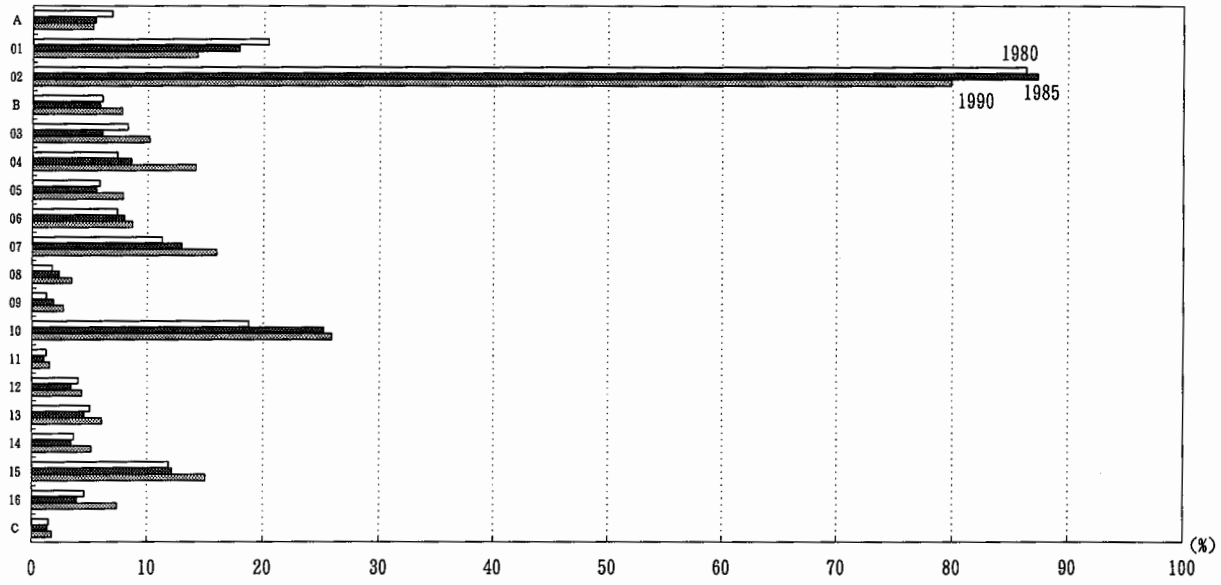
	Value (billion yen)			Distribution Ratio (%)			Growth (%)	
	1980	1985	1990	1980	1985	1990	1980~1985	1985~1990
A Total	38,371.8	37,618.2	45,833.3	100.0	100.0	100.0	−2.0	21.8
01 Agriculture, Forestry and Fishery	4,109.6	3,852.0	2,962.5	10.7	10.2	6.5	−6.3	−23.1
02 Mining	16,363.7	13,243.9	8,507.9	42.6	35.2	18.6	−19.1	−35.8
B Manufacturing	13,277.5	15,372.2	25,102.5	34.6	40.9	54.8	15.8	63.3
03 Food Products	2,410.2	2,392.1	4,409.3	6.3	6.4	9.6	−0.8	84.3
04 Textile Products	841.1	1,137.6	2,248.5	2.2	3.0	4.9	35.3	97.7
05 Pulp, Paper and Wooden Products	998.3	889.7	1,597.9	2.6	2.4	3.5	−10.9	79.6
06 Chemical Products	1,419.7	1,796.7	2,274.5	3.7	4.8	5.0	26.6	26.6
07 Petroleum and Coal Products	2,220.7	2,350.5	2,068.0	5.8	6.2	4.5	5.8	−12.0
08 Ceramic, Stone and Clay Products	146.4	197.6	355.3	0.4	0.5	0.8	35.0	79.8
09 Iron and Steel	327.8	457.8	727.7	0.9	1.2	1.6	39.7	58.9
10 Non-ferrous Metals and Metal Products	1,526.3	1,938.2	2,475.1	4.0	5.2	5.4	27.0	27.7
11 Fabricated Metal Products	119.3	117.0	261.8	0.3	0.3	0.6	−1.9	123.8
12 General Machinery	565.0	646.9	1,203.2	1.5	1.7	2.6	14.5	86.0
13 Electrical Machinery	887.3	1,317.6	2,567.4	2.3	3.5	5.6	48.5	94.9
14 Transportation Equipment	667.2	814.6	1,865.1	1.7	2.2	4.1	22.1	129.0
15 Precision Instruments	301.7	359.2	589.4	0.8	1.0	1.3	19.1	64.1
16 Other Industrial Products	846.6	956.8	2,459.1	2.2	2.5	5.4	13.0	157.0
C Others	4,621.0	5,150.1	9,260.5	12.0	13.7	20.2	11.4	79.8

10. Import Ratio to Commodity-wise Domestic Demand

Regarding the import ratio to commodity-wise domestic demand, the 32 sector classification indicates that the ratio for mining products is the largest (79.9%), followed by non-ferrous metals and metal products (25.9%), petroleum and coal products (16.0%) and precision instruments (15. 1%).

In comparing with 1985 ratios, mining products and agriculture, forestry and fishery products have fallen from 87.4% to 79.9% and from 17.9% to 14.3%, respectively. On the other hand, import ratios have risen for manufacturing products. Especially, high rises are observed for textile products (from 8.6% to 14.2%) and for food products (from 6.1% to 10.2%).

Chart 10-1 Import Ratio to Commodity-wise Domestic Demand



Notes: Names for Codes are same as those of Table 9-1.

11. Composition and Growth of Total Demand

"Total demand", which consists of intermediate demand plus domestic final demand andexports , corresponds to the "total supply".

Total demand for 1990 is 918,045 billion yen, of which intermediate demand, domestic demand and exports are 426,055 billion yen (46.4%), 444,108 billion yen (48.4%) and 47,881 billion yen (5.2%), respectively. In comparison of the total demand with that for 1985, intermediate demand and exports have fallen by 2.2 points and 1.4 point, respectively while, domestic final demand has risen by 3.7 points.

Regarding the growth over 1985, total demand, intermediate demand, domestic final demand and exports have risen by 28.2%, 22.3%, 38.7% and 0.7%, respectively.

Chart 11-1 Composition of Total Demand

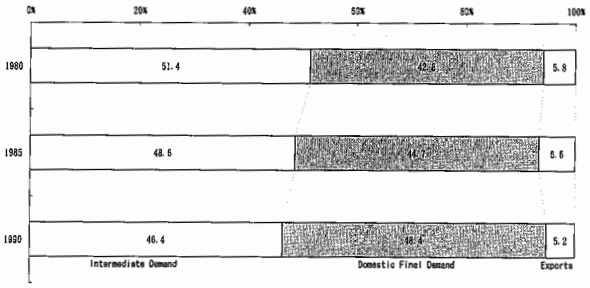


Chart 11-2 Growth of Total Demand

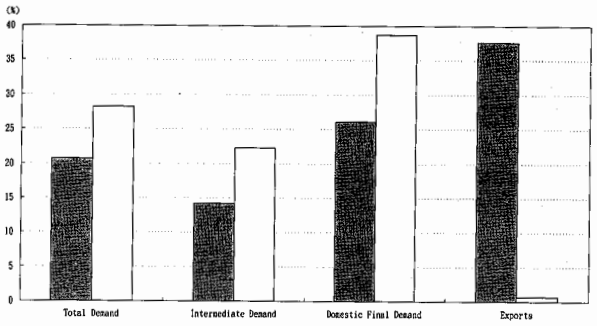


Table 11-1 Composition and Growth of Total Supply

	Value (billion yen)			Distribution Ratio (%)			Growth (%)	
	1980	1985	1990	1980	1985	1990	1980～1985	1985～1990
Total Demand	593,410.1	716,156.4	918,045.5	100.0	100.0	100.0	20.7	28.2
Intermediate Demand	304,910.8	348,332.2	426,055.3	51.4	48.6	46.4	14.2	22.3
Final Demand	288,499.3	367,824.1	491,990.3	48.6	51.4	53.6	27.5	33.8
Domestic Final Demand	253,955.9	320,279.5	444,108.5	42.8	44.7	48.4	26.1	38.7
Exports	34,543.4	47,544.7	47,881.8	5.8	6.6	5.2	37.6	0.7
Domestic Demand	558,866.8	668,611.7	870,163.8	94.2	93.4	94.8	19.6	30.1

Notes: 1. Domestic demand is intermediate demand plus domestic final demand.
2. Component figures may not add up to the total because of rounding.

12. Composition and Growth of Final Demand

"Final demand" consists of consumption expenditure outside households, consumption expenditure of households, consumption expenditure of general government, gross domestic fixed capital formation, increase in stocks and exports. It equals the amount of gross value added plus imports. Final demand minus consumption expenditure outside households and imports is apporoximately equal to the Gross Domestic Expenditure (GDE) in SNA.

The amount of final demand for 1990 is 491,990 billion yen, of which consumption expenditure of households, gross domestic fixed capital formation, exports, consumption expenditure of general government, consumption expenditure outside households and increase in stocks were 50.2%, 28.2%, 9.7%, 7.8%, 3.6% and 0.5%, respectively.

In comparison of final demand between 1990 and 1985, gross domestic fixed capital formation has risen by 4.8 points (from 23.4% to 28.2%), while, consumption expenditure of households and exports have declined by 1.0 point (from 51.2% to 50.2%) and by 3.2 points (from 12.9% to 9.7%), respectively.

Regarding the growth over 1985, the amount of final demand, consumption expenditure of households and gross domestic fixed capital formation increased by 33.8%, 31.1% and 61.5%, respectively. On the other hand, there was a slight increase (by 0.7%) is observed for exports.

Chart 12-1 Composition of Final Demand

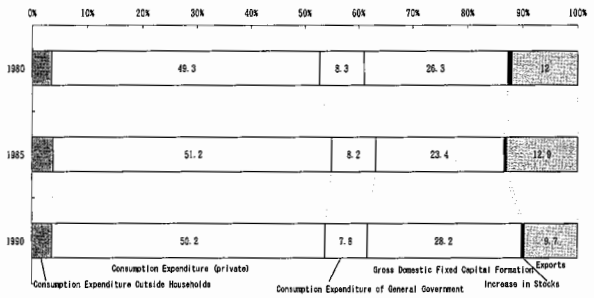


Chart 12-2 Growth of Final Demand

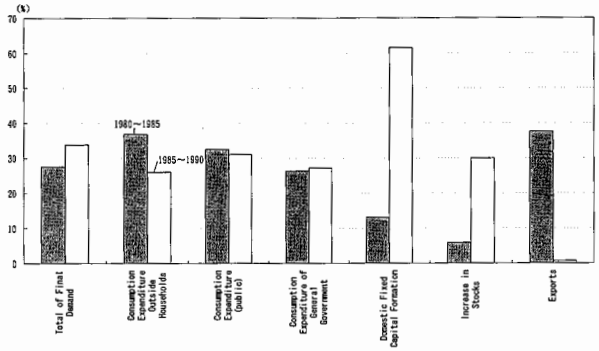


Table 12-1 Composition and Growth of Final Demand

	Value (billion yen)			Distribution Ratio (%)			Growth (%)	
	1980	1985	1990	1980	1985	1990	1980～1985	1985～1990
T o t a l	288,499.3	387,824.1	491,990.3	100.0	100.0	100.0	27.5	33.8
Consumption Expenditure outside Households	10,186.3	13,930.5	17,548.2	3.5	3.8	3.6	36.8	26.0
Consumption Expenditure (private)	142,094.4	188,313.4	246,911.1	49.3	51.2	50.2	32.5	31.1
Consumption Expenditure of Genaral Government	23,828.4	30,106.0	38,302.1	8.3	8.2	7.8	26.3	27.2
Gross Domestic Fixed Capital Formation	75,943.5	85,914.4	138,727.0	26.3	23.4	28.2	13.1	61.5
Increase in Stocks	1,903.2	2,015.3	2,620.2	0.7	0.5	0.5	5.9	30.0
Exports	34,543.4	47,544.7	47,881.8	12.0	12.9	9.7	37.6	0.7

13. Composition and Growth of Exports by Commodity

As far as the 1990 composition of exports by commodity according to the 32 sector classification is concerned, electric machinery has occupied 24.3%, followed by transportation equipment (23.5%) and general machinery (12.3%). These three industries accounts for 60.0% of the whole.

A comparison of exports by commodity between 1990 and 1985 shows that exports of electric machinery, general machinery and chemical products have increased by 3.7 points (from 20.6% to 24.3%), 1.1 point (from 11.1% to 12.2%) and 0.8 point (from 4.6% to 5.4%), respectively.

Regarding the growth of exports over 1985, the overall growth rate indicates 0.7%, which is much lower than the growth rate of 37.6% recorded for 1985. In particular, iron and steel and oil (42.7% decrease) and coal products (30.0% decrease) show a considerable decline.

Chart 13-1 Growth of Exports by Commodity

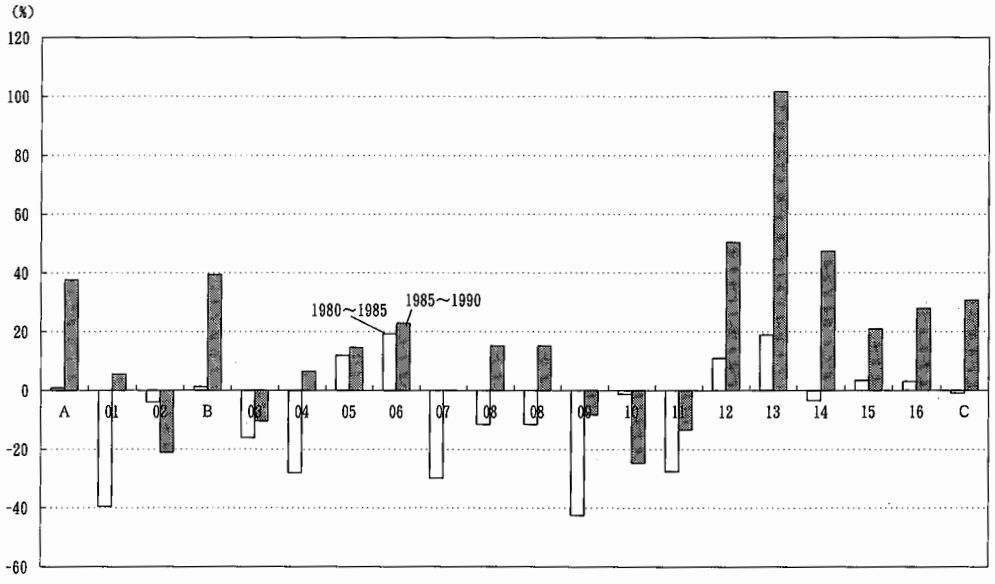


Table 13-1 Composition and Growth of Exports by Commodity

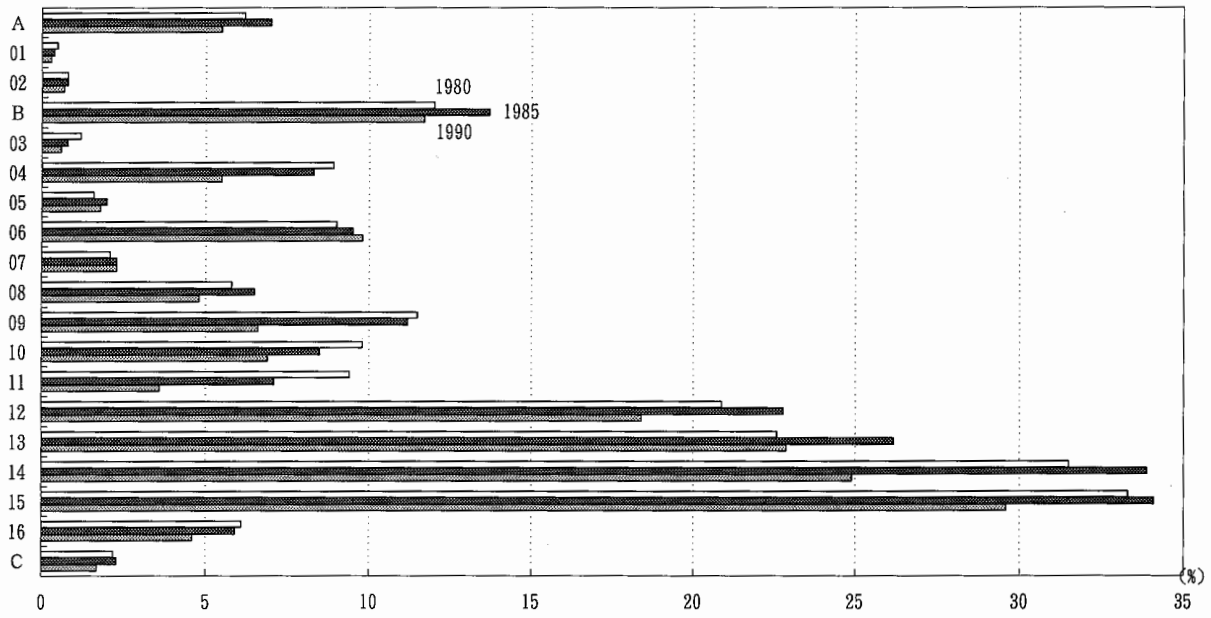
	Value (billion yen)			Distribution Ratio (%)			Growth (%)	
	1980	1985	1990	1980	1985	1990	1980～1985	1985～1990
A Total	34,543.4	47,544.7	47,881.8	100.0	100.0	100.0	37.6	0.7
01 Agriculture, Forestry and Fishery	75.3	79.4	47.8	0.2	0.2	0.1	5.5	−39.7
02 Mining	19.6	15.5	14.8	0.1	0.0	0.0	−21.1	−4.1
B Manufacturing	27,763.1	38,713.4	39,181.7	80.4	81.4	81.8	39.4	1.2
03 Food Products	325.7	291.5	244.6	0.9	0.6	0.5	−10.5	−16.1
04 Textile Products	1,033.4	1,099.6	789.2	3.0	2.3	1.6	6.4	−28.2
05 Pulp, Paper and Wooden Products	262.2	300.5	336.2	0.8	0.6	0.7	14.6	11.9
06 Chemical Products	1,766.1	2,170.5	2,587.7	5.1	4.6	5.4	22.9	19.2
07 Petroleum and Coal Products	369.9	370.1	259.0	1.1	0.8	0.5	0.1	−30.0
08 Ceramic, Stone and Clay Products	480.8	553.5	489.1	1.4	1.2	1.0	15.1	−11.6
09 Iron and Steel	3,347.9	3,071.2	1,760.8	9.7	6.5	3.7	−8.3	−42.7
10 Non-ferrous Metals and Metal Products	712.3	535.4	527.7	2.1	1.1	1.1	−24.8	−1.4
11 Fabricated Metal Products	955.1	827.1	598.3	2.8	1.7	1.2	−13.4	−27.7
12 General Machinery	3,498.3	5,261.7	5,842.6	10.1	11.1	12.2	50.4	11.0
13 Electrical Machinery	4,852.4	9,780.5	11,626.9	14.0	20.6	24.3	101.6	18.9
14 Transportation Equipment	7,909.9	11,652.6	11,231.8	22.9	24.5	23.5	47.3	−3.6
15 Precision Instruments	1,112.7	1,345.6	1,390.8	3.2	2.8	2.9	20.9	3.4
16 Other Industrial Products	1,136.4	1,453.7	1,497.1	3.3	3.1	3.1	27.9	3.0
C Others	6,685.4	8,736.4	8,637.4	19.4	18.4	18.0	30.7	−1.1

14. Export Ratio to Commodity-wise Domestic Production

The export ratios to commodity-wise domestic production for 1990, according to the 32 sector classification, indicate that the largest is given to precision instruments (29.6%), followed by transportation equipment (24.9%), electric machinery (22.9%) and general machinery (18.4%).

In comparing with 1985, these ratios have declined in most commodities. A 9.0 point decline is observed for transportation equipment (from 33.9% to 24.9%) and a 4.6 point decline for iron and steel (from 11.2% to 6.6%).

Chart 14-1 Export Ratio to Commodity-wise Domestic Production



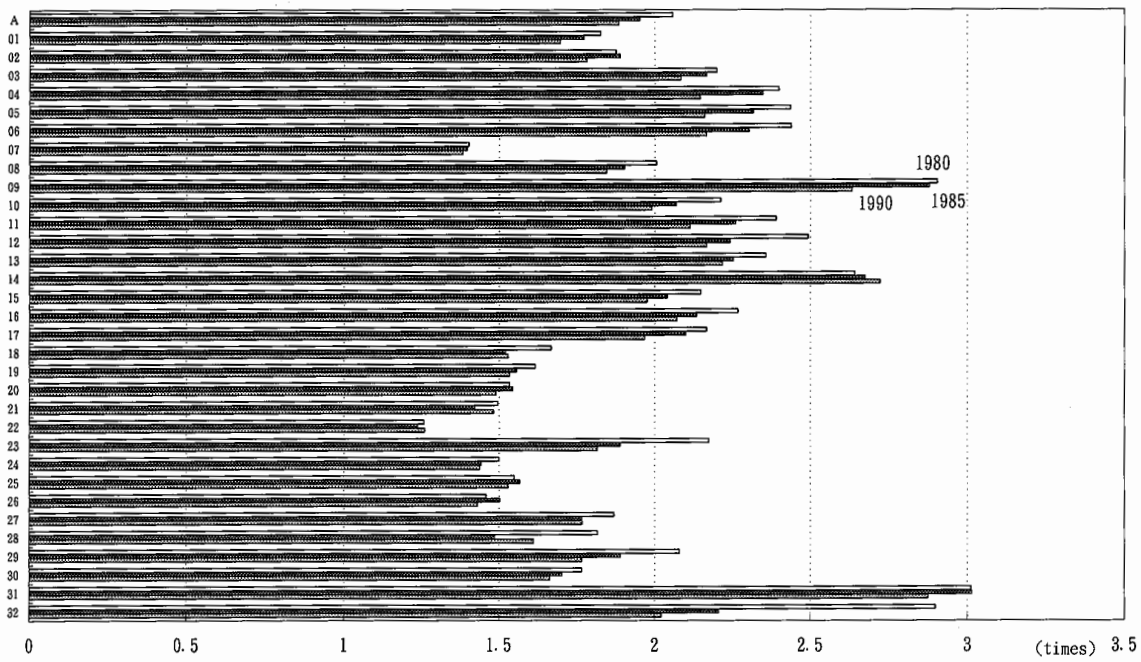
Notes: Names for Codes are same as those of Table 9-1.

15. Power of Dispersion on Production

The "inverse matrix coefficient" represents the power of dispersion on production which indicates, when one unit of final demand is created for a certain industry, how much production will be of ultimate necessity for its relevant sectors. The vertical sum of inverse matrix coefficients for columns equals the total of powers of dispersion on production affected on related industrial sectors when one unit of demand is created for the related column sector. It also shows how large the power of dispersion on production is for the industry as a whole.

The power of dispersion on production for demand per unit estimated from the inverse matrix coefficients of the 32 sector table points out that the average magnification for all industry for 1990 is 1.8861. The industry-wise power of dispersion on production for 1990 indicates that the powers of dispersion for manufacturing and construction are larger than the average. Among manufacturing industries, large powers of dispersion on production are observed for transportation equipment (2.7248), iron and steel (2.6346) and electric machinery (2.2177). As compared with 1985, powers of dispersion on production for 1990 have declined for many industrial sectors.

Chart 15-1 Power of Dispersion on Production



Notes: Names for codes are as follows:

A Average of All Industry
01 Agriculture, Forestry and Fishery
02 Mining
B Manufacturing
03 Food Products
04 Textile Products
05 Pulp, Paper and Wooden Products
06 Chemical Products
07 Petroleum and Coal Products
08 Ceramic, Stone and Clay Products
09 Iron and Steel
10 Non-ferrous metals and metal products
11 Fabricated Metal Products
12 General Machinery
13 Electrical Machinery
14 Transportation Equipment
15 Precision Instruments
16 Other Industrial Products
17 Construction
18 Electric Power, Gas and Heat Supply
19 Water Supply and Sanitary Services
20 Commerce
21 Financing and Insurance
22 Real Estate
23 Transport
24 Communication and Broadcasting
25 Public Administration
26 Education and Research
27 Medical Service, Health and Social Insurance
28 Other Public Services
29 Business Services
30 Personal Services
31 Office Supplies
32 Others

16. Final Demand and Induced Production

In input-output tables, domestic production is considered to be induced by final demand. By caluculating inducement coefficients, the impact of changes in final demand given on production is analyzed for each sector.

For example, when 100 million yen of final demand is created for autmobiles, the direct effect is the production of 100 million yen in the autmobile industry. Moreover, the increase in automobile production brings forth the production of iron, steel, glass, tyres and others, which furthermore brings forth the production of pig iron, crude steel and others. Such chain reaction of dispersion on production is caused. As a result, for the autmobile industry itself and for the steel-material industry, the production of goods and services equivalent to 284.39 million yen and 6.33 million yen is induced, respectively.

Analyses of such relations are expressed by "induced production", "distribution ratio" and "production inducement coefficient". "Induced production" is domestic production induced by each final demand item. "Distribution ratio" is the component ratio of induced production by final demand items.

Domestic production 872,212 billion yen in 1990 is the amount needed directly or indirectly for providing final demand 491,990 billion yen in 1990. The "Distribution ratios", according to the 13 sector classification table, indicate that consumption expenditure of households, gross domestic capital formation and exports are 46.5%, 31.0% and 11.6%, respectively. As compared with 1985, the distribution ratio of gross domestic capital formation has risen, however, the ratios for consumption expenditure of households and exports have declined.

The "production inducement coefficient", which expresses how much domestic production is induced for every sector by one unit of each final demand item, indicates that the largest magnification (2.1169) is given to exports followed by increase in stocks (2.0079) and gross domestic capital formation (1.9476). As compared with 1985, "production inducement coefficients" by every final demand item except increase in stocks have declined.

Chart 16-1 Distribution Ratio

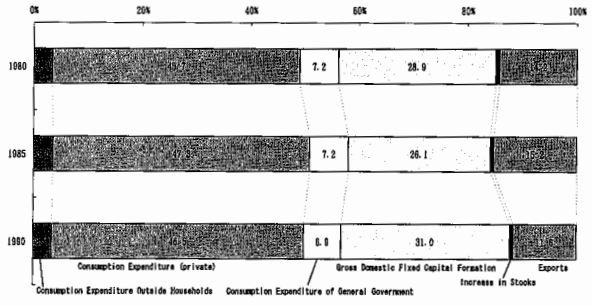


Chart 16-2 Production Inducement Coefficients

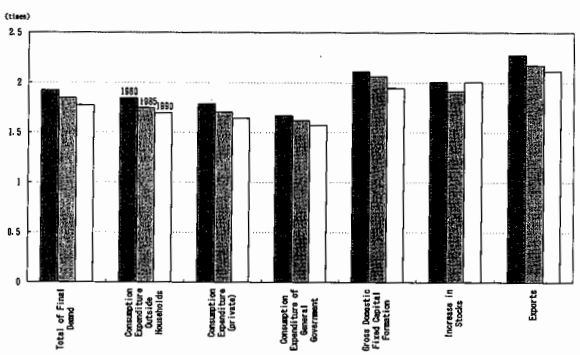


Table 16-1 Induced Production, Distribution Ratio and Production Inducement Coefficients

	Induced Production (billion yen)			Distribution Ratio (%)			Inducement Coefficients (times)		
	1980	1985	1990	1980	1985	1990	1980	1985	1990
T o t a l	555,038.3	678,538.2	872,212.2	100.0	100.0	100.0	1.9239	1.8447	1.7728
Consumption Expenditure outside Households	18,764.0	24,322.6	29,727.4	3.4	3.6	3.4	1.8421	1.7460	1.6940
Consumption Expenditure (private)	253,738.9	320,910.8	405,434.5	45.7	47.3	46.5	1.7857	1.7041	1.6420
Consumption Expenditure of Genaral Government	39,743.3	48,749.8	60,251.7	7.2	7.2	6.9	1.6679	1.6193	1.5731
Gross Domestic Fixed Capital Formation	160,390.5	177,349.8	270,178.9	26.1	26.1	31.0	2.1120	2.0643	1.9476
Increase in Stocks	3,819.9	3,859.3	5,260.9	0.6	0.6	0.6	2.0071	1.9150	2.0079
Exports	78,581.7	103,345.9	101,358.8	15.2	15.2	11.6	2.2749	2.1737	2.1169

17. Final Demand and Induced Gross Value Added

Gross value added is also induced as domestic production is induced by final demand. The "Induced gross value added", "distribution ratios" and "gross value added inducement coefficients" according to final demand items represent the relationship between final demand and gross value added induced by it. "Induced gross value added" is calculated by multiplying induced domestic production by gross value added ratio.

Distribution ratios have been computed for the 13 sector table to find out what final demand items have contributed most to induce the gross value added (446,157 billion yen) estimated from the 1990 domestic production. As far as the ratios are concerned, 50.6% is attributable to consumption expenditure of households, 27.6% to gross domestic capital formation, 9.6% to exports and 8.1% to consumption expenditure of general government.

As compared with 1985, distribution ratio of gross domestic capital formation has risen, and those ratios of consumption expenditure of households, consumption expenditure of general government and exports have declined.

Concerning the "gross value added inducement coefficients", which represent how much gross value added is induced by one unit of final demand, the coefficient for consumption expenditure of general government is the largest (0.9487), followed by consumption expenditure of households (0.9136) and consumption expenditure outside households (0.9132). Thus, high ratios are observed for consumption related items. As compared with 1985, "gross value added inducement coefficients" for all items except for consumption expenditure outside households have risen.

Chart 17-1 Distribution Ratio

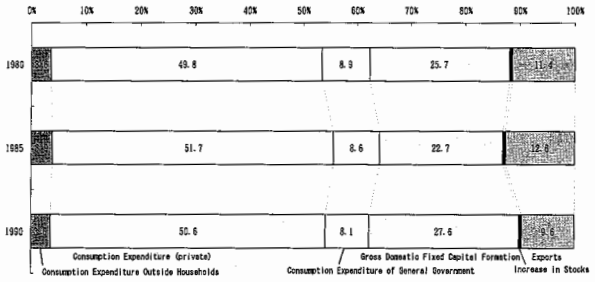


Chart 17-2 Gross Value Added Inducement Coefficients

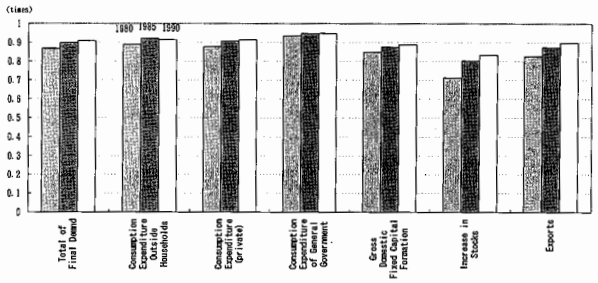


Table 17-1 Induced Gross Value Added, Distribution Ratio and Gross Value Added Inducement Coefficients

	Induced Gross Value Added (billion yen)			Distribution Ratio (%)			Inducement Coefficients (times)		
	1980	1985	1990	1980	1985	1990	1980	1985	1990
T o t a l	250,127.5	330,205.9	446,157.0	100.0	100.0	100.0	0.8670	0.8977	0.9068
Consumption Expenditure outside Households	9,059.4	12,810.9	16,025.8	3.6	3.9	3.6	0.8894	0.9196	0.9132
Consumption Expenditure (private)	124,618.1	170,628.3	225,569.1	49.8	51.7	50.6	0.8770	0.9061	0.9136
Consumption Expenditure of Genaral Government	22,258.3	28,523.2	36,338.2	8.9	8.6	8.1	0.9341	0.9474	0.9487
Gross Domestic Fixed Capital Formation	64,340.0	75,103.4	123,121.9	25.7	22.7	27.6	0.8472	0.8742	0.8875
Increase in Stocks	1,355.1	1,616.2	2,179.0	0.5	0.5	0.5	0.7120	0.8020	0.8316
Exports	28,496.6	41,524.0	42,923.1	11.4	12.6	9.6	0.8250	0.8734	0.8964

18. Final Demand and Induced Imports

In input-output tables, imports are considered to be induced by final demand. "Induced imports", "distribution ratios" and "import inducement coefficients" are calculated to annotate the relation between final demand and imports.

Distribution ratios have been computed for the 13 sector table to find out what final demand items have contributed most to inducement of imports for 1990 (45,833 billion yen). As far as the ratios are concerned, 46.6%, 34.0% and 10.8% are attributable to consumption expenditure of households, gross domestic capital formation and exports, respectively.

As compared with 1985, distribution ratio of gross domestic capital formation has risen, and those ratios of consumption expenditure of households and exports have declined.

Concerning the "import inducement coefficients", which represent how much imports are induced by one unit of final demand, the coefficients for consumption expenditure of households and gross domestic capital formation are 0.0864 and 0.1125, respectively.

Chart 18-1 Distribution Ratio

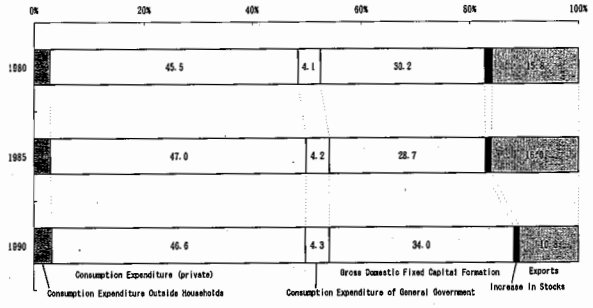


Chart 18-2 Imports Inducement Coefficients

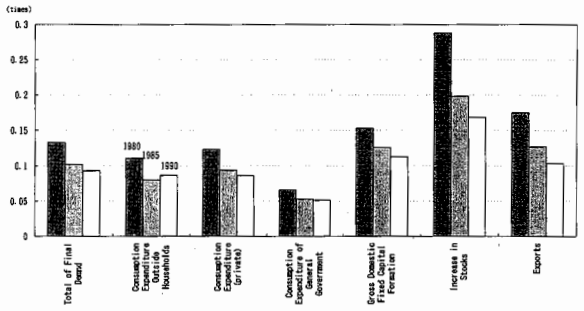


Table 18-1 Induced Imports, Distribution Ratio and Imports Inducement Coefficients

	Induced Imports (billion yen)			Distribution Ratio (%)			Inducement Coefficients (times)		
	1980	1985	1990	1980	1985	1990	1980	1985	1990
T o t a l	38,371.8	37,618.2	45,833.3	100.0	100.0	100.0	0.1330	0.1023	0.0932
Consumption Expenditure outside Households	1,126.9	1,119.6	1,522.5	2.9	3.0	3.3	0.1106	0.0804	0.0868
Consumption Expenditure (private)	17,476.4	17,635.1	21,342.0	45.5	47.0	46.6	0.1230	0.0939	0.0864
Consumption Expenditure of Genaral Government	1,570.1	1,582.8	1,963.9	4.1	4.2	4.3	0.0659	0.0526	0.0513
Gross Domestic Fixed Capital Formation	11,603.5	10,810.9	15,605.1	30.2	28.7	34.0	0.1528	0.1258	0.1125
Increase in Stocks	548.2	399.1	411.2	1.4	1.1	1.0	0.2880	0.1980	0.1684
Exports	6,046.7	6,020.6	4,958.6	15.8	16.0	10.8	0.1750	0.1266	0.1036

APPENDIX 1.

CONTENTS OF THE REPORTS PUBLISHED IN JAPAN

For the 1990 Input-Output Tables for Japan, reports have been published in three volumes. Contents of the reports are as follows:

Data Report (1)

Part I. Transaction Tables (according to the Basic Sector Classification)

1. Output Table
2. Input Table

PartII. Table on Domestic Production by Sector and Commodity

[Appendix] Table of Basic Sector Classification

Data Report (2)

Part I. Transaction Tables and Derived Tables

1. 187-sector Tables (accoroding to the Minor Group Classification)
   1) Output Table
   2) Input Table
   3) Input Coefficients
   4) Inverse Matrix Coefficients
   5) Domestic Production Induced by Individual Final Demand Items, Production Inducement Coefficients and Distribution Ratios
   6) Gross Value Added Induced by Individual Final Demand Items, Gross Value Added Inducement Coefficients and Distribution Ratios
   7) Imports Induced by Individual Final Demand Items, Imports Inducement Coefficients and Distribution Ratios
   8) Other Coefficients

2. 91-sector Tables (accoroding to the Major Group Classification)
   1) Table on Transactions Valued at Producers' Prices
   2) Table on Transactions Valued at Purchasers' Prices
   3) Input Coefficients
   4) Inverse Matrix Coefficients
   5) Domestic Production Induced by Individual Final Demand Items, Production Inducement Coefficients and Distribution Ratios
   6) Gross Value Added Induced by Individual Final Demand Items, Gross Value Added Inducement Coefficients and Distribution Ratios
   7) Imports Induced by Individual Final Demand Items, Imports Inducement Coefficients and Distribution Ratios

Explanatory Report

3. History of the Input-Output Tables for Japan
4. Register of Organizations and Officials Engaged in Compilation of the 1990 Input-Output Tables

APPENDIX 2.

RELEASE OF DATA ON MAGNETIC TAPE

Data for the 1990 Input-Output Tables are available on magnetic tapes as follows:

1. Data Available

Following four volumes have been prepared for users. Each volume is recorded on one tape reel.

(1) Transaction Tables (527 rows×411 columns)

(2) Aggregated Transaction Tables: 187, 91, 32 sectors

(3) Inverse Matrix Coefficients

(4) Supporting Tables

① Table on Value and Quantity of Selected Goods

② Table on Persons Engaged in Production Activities (by Employment Status)

③ Table on Employees Engaged in Production Activities (by Occupation)
-Employment Matrtix-

④ Table on Fixed Capital Formation

⑤ Table on Commodity Output by Industry -Make Matrix-

⑥ Table on Self-Transport

2. Tape Recording

The standard recording is:

9-track
Odd parity
6250 BPI
Standard label
Fixed block
EBCDIC code

3. Correspondence

For inquiries about the data on magnetic tape files, the contact is:

Statistical Standards Department
Statistics Bureau
Management and Coordination Agency

19-1 Wakamatsu-cho, Shinjuku-ku
Tokyo, 162 Japan

For orders, the contact is:

National Federation of Statistical Associations
Sunshine 60, 3-1-1 Higashi-ikebukuro, Toshima-ku
Tokyo, 170 JAPAN

International Trade and Industry Research Institute
2-8-9 Ginza, Chuo-ku
Tokyo, 104 Japan