

# The Harmonization of Chinese and Japanese Input-Output Tables by Using PPP

By

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## Abstract

We estimated 1990 PPPs of Chinese Rmb against the Japanese Yen by sector, and the 1990 Chinese official input-output tables (extended table of 1987 table) are converted from Rmb to Yen by using the official exchange rate and this PPPs. We modified and aggregated the 1990 Japanese official input-output table (benchmark table) to the form of the 33-sector Chinese Table. We also estimated the 33-sector Chinese employment table. Our aim is to open up the possibility of comparing input-output structures between China and Japan in a precise manner. We have also calculated some indicators by using these tables to highlight their significance.

## 1. Introduction

We often use exchange rates to unify monetary units when we make international comparisons among nations. However, it is a question whether economic scales and economic standards of nations can be really measured with such methods. It is an especially important question at present when exchange rates fluctuate violently, and when they themselves are means of economic policy. Also relative prices of commodities in each country are different, as factors determining prices are different by commodity and by country. Therefore, if the same rate is used for all sectors when we unify monetary units in input-output tables, differences of relative prices are disregarded and it is possible that technical input structures cannot be compared precisely.

When we try to compare the Chinese economy with the Japanese economy, both these two problems become very serious. Currencies of underdeveloped countries are often undervalued relatively in comparison to currencies of advanced countries. Presently the Rmb of China is exactly under this condition. Moreover, relative prices of in China suffered from the aftereffects of centralized planned economy. On the other hand, the price system of Japan has also some kind of particularity from an international standpoint.

In this paper we estimate PPPs of the Chinese Rmb against the Japanese Yen by sector, and we convert the Chinese input-output tables from Rmb to Yen by using the official exchange rate and these PPPs. We try to compile the harmonized Chinese and Japanese input-output tables in which differences in absolute price level and relative prices are eliminated. Our aim is to open up the possibility of comparing technical input-output structures between the two countries with precision.

We use the 1990 official input-output tables of Japan and China (Japan: 1990 benchmark tables, China: extended tables of 1987 tables). We modify and aggregate the Japanese table to the form of the 33-sector Chinese Table and convert the Chinese tables from Rmb to Yen by using the exchange rate and PPPs. We also estimate the 33-sector Chinese employment table.

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Our work makes it possible to undertake international comparisons of gross outputs, final demands, intermediate inputs, employments and other such variables both in nominal terms and in real terms. The differences in absolute price levels and relative prices are eliminated in the tables converted by using PPPs, and hence it is possible to compare the actual input structures due to the differences in the technical levels of the two countries.

As shown in the references, several valuable studies on Chinese PPPs already exist. We think that the most outstanding work concerning the estimation of Chinese PPPs is "Dollar GNP Estimation for China" by Jeffrey R. Taylor (1991). Our estimation is different from Taylor's in certain regards. First, our aim is the harmonization of the input-output tables themselves in real terms, whereas Taylor's aim is the estimation of dollar GNP for China in real terms using the Chinese input-output tables. Second, our PPPs are the ratios of Chinese domestic prices (Rmb) to Japanese domestic prices (Yen), since our aim is the international comparison of input-output structures between China and Japan. On the other hand, Taylor's PPPs are the ratios of Chinese domestic prices (Rmb) to Dollar prices in the international market. Third, our main data are the 1990 input-output tables and the 1990 price data of China and Japan. By contrast, Taylor's main data sources are the 1981 Chinese input-output tables and price data of several years before and after 1981 and price indices of China, USA, Japan, etc.

## 2. Compilation of Data in Real Terms

### 2.1. The harmonization of sectors

The sector classification of the 1990 Japanese input-output tables is very detail (411 columns and 527 rows), whereas the classification of the 1990 Chinese input-output table is simple (33 columns and 33 rows). Therefore, we had to make common classification by aggregating the Japanese classification into the 33-sector Chinese classification. The corresponding sector code is shown in Table 1.

Table 1: Bridge Table of China and Japan (1990) I-O Classifications

China I-O Classifications (Titles)	Japan I-O Classifications (Row Code)			
1) Agriculture	111011	111012	111021	111022
	111023	111024	111031	112011
	112012	112021	112022	112029
	113001	114011	114012	114019
	115011	115021	115029	115091
	115092	116011	116021	116031
	116041	116091	116092	116093
	121011	121019	121021	121031
	121041	121051	121091	121099
	122011	211011	212011	212012
	213011	311001	311002	311041
	312001	1131021		
		711011	711012	
	2) Coal mining	721011	731011	
3) Crude petroleum & natural gas production	611011	612011	612012	612019
4) Metal ore mining	621011	621099	622011	622021
5) Other mining	629099			
6) Food	1111011	1111012	1111013	1111014
	1111015	1112011	1112021	1112031
	1112041	1112042	1113011	1113021
	1113031	1113041	1113051	1113099
	1114011	1114019	1114021	1114029
	1115011	1115021	1115031	1116011
	1116021	1117011	1117019	1117021
	1117031	1117041	1117042	1117043
	1117051	1117052	1117061	1119011
	1119021	1119031	1119099	1121011
	1121021	1121031	1121041	1121099
	1129011	1129021	1129031	1131011
	1141011			

China I-O Classifications (Titles)	Japan I-O Classifications (Row Code)			
7) Textiles	1511011	1511021	1511031	1511041
	1511099	1512011	1512021	1512031
	1512091	1512099	1513011	1514011
	1519021	1519031	1519099	1529099
8) Wearing apparel, leather and products of leather and fur	1521011	1522011	1529011	2411011
	2412011	2412021		
9) Sawmills and furniture	1519011	1611011	1611021	1611031
	1619091	1619099	1711011	1711021
	1711031	3919051		
10) Paper, cultural and educational articles	1811011	1812011	1813011	1813021
	1813031	1821011	1821099	1829011
	1829099	1911021	3911011	3911021
	3919011	3919021	3919031	8900000
11) Electricity, steam and hot water (production and supply)	5111001	5111041	5122011	
12) Petroleum refineries	2111011	2111012	2111013	2111014
	2111015	2111016	2111017	2111018
	2111019			
13) Coke and coal products	2121011	2121019	5121011	
14) Chemical products	2011011	2011021	2011029	2011031
	2021011	2021012	2021013	2021019
	2029011	2029021	2029022	2029029
	2029031	2029099	2031011	2031012
	2031019	2031021	2031022	2031023
	2031029	2032011	2032012	2032013
	2032014	2032015	2032016	2032019
	2032021	2032022	2032023	2032024
	2032029	2033011	2039011	2039021
	2039031	2039041	2039051	2039099
	2041011	2041021	2041022	2041023
	2041024	2041025	2041031	2041099
	2051011	2051021	2061011	2071011
	2071012	2071021	2072011	2072021
	2073011	2074011	2079011	2079021
	2079091	2079099	2211011	2211012
	2211013	2211014	2211015	2211016
	2211017	2211019	2311011	2319011
	2319021	2319099		
	15) Building materials and other non-metallic products	2121021	2511011	2511012
2519091		2519099	2521011	2522011
2523011		2531011	2531012	2531013
2599011		2599021	2599031	2599041
2599091		2599099		
16) Primary metal	2611011	2611021	2611031	2611041
	2612011	2621011	2621012	2621013
	2621014	2621015	2621016	2622011
	2622012	2623011	2623021	2711011
	2711021	2711031	2711041	2711099
	2712011	2722011	2722021	2722041
17) Metal products	2631021	2649011	2649099	2722031
	2722099	2811011	2812011	2891011
	2899011	2899021	2899031	2899032
	2899033	2899091	2899092	2899099
	3031011			
	2631011	2631012	2631031	2631032
	3011011	3011021	3011031	3012011
	3013011	3019011	3019021	3019031
	3019099	3021011	3022011	3023011
3024011	3024021	3029011	3029021	
3029031	3029091	3029092	3029093	
3029094	3029095	3029099	3031021	
3031099	3111011	3111091	3111092	
3111099	3112011	3112012	3112019	
3321099	3541021	3611031	3629011	
3711011	3712011	3719031	3919061	

China I-O Classifications (Titles)	Japan I-O Classifications (Row Code)			
19) Transport equipment	3511011	3521011	3531011	3541011
	3541031	3611011	3611021	3621011
	3622011	3629091	3629099	
20) Electrical machinery	2721011	2721012	2721013	3211099
	3411011	3411012	3411021	3411031
	3411099	3421011	3421021	3421031
	3421041	3421051	3421099	
21) Electronic and communication equipment	3211011	3211021	3211031	3212011
	3212099	3311011	3311021	3321011
	3321021	3331011	3332011	3341011
	3341012	3359011	3359099	
22) Meters and other measuring equipment	3711099	3719011	3719021	
23) Machinery and equipment repairing	3611101	3621101	3622101	
24) Industrial products not elsewhere classified	3919041	3919099	9000000	
25) Construction	4111011	4111021	4112011	4112021
	4121011	4131011	4131021	4131031
	4132011	4132021	4132031	4132099
	8519031	8519041		
26) Freight transport and communication	7112011	7122011	7122021	7142012
	7143011	7151013	7151014	7179011
	7179021	7179031	7179041	7179051
	7311011	7312011	7312021	7319099
27) Commerce	6111011	6112011	7161011	7171011
28) Restaurants	8612011	8612021	8612031	
29) Passenger transport	7111011	7111012	7141011	7142011
	7151011	7151012	7179099	
30) Public utilities and services	5211011	5211021	5211031	5212011
	5212021	6411011	6411021	6421011
	7121011	7121021	8613011	8619011
	8619021	8619031	8619041	8619051
	8619061	8619071	8619081	8619099
31) Education, medical and research	131011	131021	1911011	1911031
	7321011	7321021	7321031	8211011
	8211021	8213011	8213021	8213031
	8213041	8221011	8221021	8221031
	8221041	8221051	8221061	8222011
	8311011	8311021	8311031	8312031
	8313011	8313021	8313031	8313041
	8511011	8511012	8512011	8512021
	8513011	8513012	8513013	8513014
	8513015	8514011	8515101	8516101
	8519011	8519021	8519099	8611011
	8611021	8611031	8611041	8611051
	8611061	8611071	8611099	
32) Finance and insurance	6211011	6211012	6211013	6211014
	6212011	6212021		
33) Public administration	8111011	8112011	8312011	8312021
	8411011	8411021		
Total intermediate inputs	9099000			
Depreciation of fixed capital	9420000			
Compensation for employees	9311000	9313000		
Welfare expenses	9110010	9110020	9110030	9312000
Operating surplus and taxes	9412000	9430000	9440000	
Primary inputs	9500000			
Total inputs	9700000			
Total intermediate use	9099000			
Consumption of households	9121000			
Institutional consumption	9110000	9122000	9130100	9130200
Fixed capital formation	9141000	9142000		
Change in stocks	9150100	9150200	9150300	9150400
	9150500			
Net exports	9211100	9211200	9212000	9450000
Gross output	9500000			

In China, the material product system (MPS) had been used conventionally as a national account system. As the economic reform proceeded, the SNA of the United Nations was introduced. The 1987 Chinese input-output tables are mainly based on SNA, but they could be converted easily to MPS. The 1990 Chinese input-output tables are the extended tables of the 1987 tables. Therefore, in the 33-sector classification of 1990 tables material activities and non-material service activities can be separated. On the other hand, although Japanese input-output table's classification is very detail, material activities and non-material service activities cannot be completely separated even in the basic classification. In the 1990 Japanese basic tables, the row classification is more detail than the column classification. We used the Japanese row classification to aggregate the Japanese input-output tables into the 33-sector Chinese classification. In the case when we had to divide one column into two, we did it by using gross outputs in the rows, assuming that input structures of these two sectors are the same.

For example, one column sector Air Transport corresponds to four row sectors International Air Transport, Domestic Air Transport (passengers), Domestic Air Transport (freight) and Aircraft Use Business. Concerning the row, we aggregated International Air Transport and Domestic Air Transport (passengers) into Passenger Transport. Then we aggregated Domestic transport (freight) and Aircraft Use Business into Freight Transport and Communications. Concerning the column, we first divided one column into four columns according to gross outputs in the rows, assuming that input structures of these four branches were the same. Then, we aggregated the four columns into two columns, as we have done concerning the rows.

## 2.2. The estimation of PPPs by sector

The exchange rate of Rmb was about 1.5 Rmb/U.S. Dollar in 1979, as a strong Rmb policy was pursued before the economic reform. As the economic reform was carried out, the official exchange rate was drastically devalued several times for promoting exports, to 4.7 Rmb/U.S. Dollar in December 1989, and to 5.2 Rmb/U.S. Dollar in November 1989. On the other hand, the Yen grew stronger rapidly in the 1980s to 27.4 Yen/Rmb in 1990. The Yen rate against Rmb was 151.3 yen/Rmb in 1980. Therefore Rmb was reduced to one sixth of its initial value against the Yen within ten years.

The exchange rate of Rmb was greatly devalued against the Yen and the Dollar. Therefore the recent Chinese economic indicators denominated in Yen or Dollar may possibly be underestimated, if we use the official exchange rate as the conversion rate.

As China has adopted a low wage system, the prices of some commodities have been controlled at very low level until now. Relative prices among commodities in China are also very different from that in Japan.

In the case of the international comparisons of the Chinese and Japanese economies by input-output analyses, if we use the official exchange rate as the conversion rate, we cannot tell whether differences of inputs are due to price factors or material quantities. For example in the analysis of environmental problems, when we calculate direct and indirect outputs of polluted materials by sector in the two countries, it is important whether they are in terms of per price unit or per material quantity unit. In order to compare precisely per material quantity unit, we need to calculate new rates by sector, taking price levels of products into consideration. Therefore, we have to estimate new different Yen/Rmb conversion rates by 33 sectors using PPPs concerning the various commodities.

The Chinese input-output tables are valued only at producers' prices. It is said that because producers' price tables express technical structure of each sector more precisely than purchasers' price tables. As a general rule, we also estimated PPPs at producers' price to correspond to producers' price input-output tables. Details of methods and data sources to estimate PPPs by sector are shown in Table 2.

Table 2: The Estimation of Purchasing Power Parities of China and Japan in 1990

Sector	Commodity	Unit	Unit Price		Japan Domestic Product	Yen/Rmb
			Rmb	100Yen		
1) Agriculture	Rice, husked, but not further prepared (uruchi)	t	1221	2923	3068931	239.39
	Wheat	t	636	1515	144175	238.21
	Rape seeds	t	1499	1448	240	96.60
	Tomatoes	t	1690	2430	126166	143.79
	Radish	t	460	735	171696	159.78
	Hemp	t	1912	64375	155	3366.89
	Leaf tobacco	t	2490	18200	146510	730.92
	Sugar beet	t	168	177	70774	105.36
	Green tea	t	6310	2698	111481	42.76
	Cedar	m <sup>3</sup>	358	250.2	215020	69.89
	Meat of pig	t	3388	4310	670302	127.21
	Meat of bovine animals	t	5174	13620	782700	263.24
	Eggs in shell	t	4389	2160	522521	49.21
	Apples, fresh	t	1100	1722	181327	156.55
	Fresh grapes	t	881	5765	159172	654.37
	Prawns	t	27834	67280	17735	241.72
	Carp	t	5344	4940	3113	92.44
					219.59	
2) Coal mining	Coal	t	39.7	203.4	2266	512.34
3) Crude petroleum & natural gas prodn.	Crude oil	t	137	167.3	10578	122.12
4) Metal ore mining	Iron ore	content t	97	61.4	209	63.30
	Manganese ore	t	245	301.8	244	123.18
	Copper ore	t	7560	2562	2267	33.89
	Lead ore	t	1820	656.6	1230	36.08
	Zinc ore	t	2380	1353.1	17172	56.85
					54.01	
5) Other mining	Gypsum	t	26.56	34.92	12686	131.48
	Boron ore	t	611.75	564.42	37023	92.26
					102.27	
6) Food	Wheat flour	kg	0.661	2.047	632703	309.68
	Noodles	kg	1.09	4.671	1122479	428.53
	Rice, husked, milled (uruchi)	kg	0.96	4.475	3598846	466.15
	Meat of pig	kg	5.736	15.3	670302	266.74
	Meat of bovine animals	kg	6.707	36.7	782700	547.19
	Rape seed oil	kg	3.559	4.915	318722	138.10
	Bean curd	kg	0.71	2.376	543704	334.65
	Soy	kg	0.755	2.093	244861	277.22
	Refined sugar	t	1830	1811	116553	98.96
	Rice cake	kg	6.018	11.71	174000	194.58
	Green tea	kg	18.788	58.79	347900	312.91
	Powdered milk	kg	10.966	25.255	256972	230.30
					393.76	

Sector	Commodity	Unit	Unit Price		Japan Domestic Product	Yen/Rmb
			Rmb	100Yen		
7) Textiles	Cotton yarn (pure)	t	9000	5703	280094	63.37
	Cotton yarn (mixed)	t	16500	5567	37227	33.74
	Calico	1000m <sup>2</sup>	1748	1453	23559	83.12
	Polyester yarn	t	8200	6899	103345	84.13
	Silk yarn	t	150000	68108	17299	45.41
	Silk fabrics (habutae)	1000m <sup>2</sup>	15790	10967	28328	69.46
	Towels	article	1.92	2.49	185239	129.69
					83.59	
					91168	82.35
					36533	118.92
8) Wearing apparel, leather & prods. of leather & fur	Shirts	dz.	187	154		
	Undershirts of cotton	dz.	37	44		
	Men's trousers	article	46.6	94.8	76106	203.43
	Men's suits	article	273.2	522.3	176033	191.18
	Men's jackets	article	76.1	309.5	19808	466.70
	Men's cattle leather shoes	article	39.6	101	197303	255.05
	Women's cattle leather shoes	article	31.1	71.8	208153	230.87
9) Sawmills & furniture	Board	m <sup>3</sup>	434	741	1864813	207.95
	Wardrobes	article	335.5	528.3	2061845	170.74
10) Paper, cultural & educational articles	Newsprint in rolls	t	2000	1315	457507	157.47
	Albums	article	7.5	16.5	87229	163.77
	Notebook	article	0.09	1.1	35285	65.75
					1222.22	220.00
11) Electricity, steam & hot water (prodn. & supply)	Electric energy (thermal)	10000kwh	1230	1956	8019229	159.02
	Oil used as fuels for jet engines	t	500	257	114164	51.40
	Heavy fuel oils	t	270	257	672660	95.19
	Kerosene	t	455	270	623200	59.34
	Gas oil	t	460	512	1638387	111.30
	Petroleum spirits used as fuels for motor vehicle	t	660	900	3795030	136.36
	Petroleum bitumen	t	160	210	129575	131.25
					118.13	
					864901	95.04
					3239	51.50
13) Coke & coal prods.	Coke	t	242	230		
	Petroleum coke	t	200	103		
					208330	29.56
					50293	49.22
					30457	44.33
					11134	68.82
					23945	62.80
					6563	206.86
					12399	304.00
					15107	126.48
14) Chemical prods.	Basic chemical materials	t	1800	532		
	Caustic soda (96%)	t	900	443		
	Soda ash (99% or less)	t	300	133		
	Hydrochloric (synthesized 31%)	t	1100	757		
	Sodium sulphate	t				
	Chemical fertilizer	t	492	309		
	Urea	t	350	724		
	Ammonium sulphate	t	300	912		
	Lime nitrogen	t	253	320		
	Superphosphate	t	196	497		
Compound fertilizer	t					
Agricultural chemicals	t	6800	7907			
Insecticide	t	10000	9497			
Fungicide	t					
Methyl cellulose	t	16000				
				143814	116.28	
				100848	94.97	
					0.00	

Sector	Commodity	Unit	Unit Price		Japan Domestic Product	Yen/Rmb
			Rmb	100Yen		
	Daily chemicals					
	Color films	article	20.2	7.24	202959	35.84
	Cassette tape	article	3.95	2.78	680570	70.38
	Toilet soap	article	0.7	0.95	124853	135.71
	Laundry soap	Kg	3.93	2.58	342768	65.65
	Detifrices	article	1	2.16	73778	216.00
	Synthetic chemicals					
	Polyethylene (high density)	t	6800	1862	205299	27.38
	Polyvinyl chloride	t	4100	1520	272250	37.07
	Synthetic fiber					
	Continuous viscose yarn	t	24000	8674	41297	36.14
	Discontinuous viscose yarn	t	11900	2932	52495	24.64
	Rubber products					
	Rubber boots	1000art.	5290	12402	130977	234.44
	Rubber V belts	km	2320	2848	28101	122.76
	Medicine					
	Stomach medicine	100tablets	3.56	7.67	521601	215.45
						89.21
15) Building materials & other non-metallic prods.	Cement	t	108.6	93.14	785207	85.76
	Ordinary sheet and plate glass	stand. box	36	94	295240	261.11
	Toughened sheet and plate glass	km <sup>2</sup>	28900	41070	435011	142.11
	Rice bowl	article	0.966	3.02	254527	312.63
	Thermos	article	14.16	47.74	164155	337.15
	Drinking glass	article	0.774	2.04	78013	263.57
						294.82
16) Primary metal	Pig iron (for casting)	t	495	316	1926260	63.84
	Seamless tubes and pipes of steel	t	990	971	826341	98.08
	Cold-formed tubes and pipes of steel	t	1848	1175	55730	63.58
	Sheet and plate of steel	t	580	676	656269	116.55
	Hot-rolled bars and rods of steel	t	1120	649	468757	57.95
	Stainless steel (2-4Cr13)	t	3350	1415	299481	42.24
	Crude copper	t	7000	4299	12467	61.41
	Electrolytic cathode copper p335	t	7500	3920	395148	52.27
	Hydrox-aluminum	t	435	671	27614	154.25
	Alumina	t	600	747	34595	124.50
	Unwrought aluminum	t	4000	6402	32340	160.05
	Electrolytic refined lead	t	2130	1555	32681	73.00
	Crude lead	t	1800	1778	249	98.78
	Zinc	t	2550	2457	169680	96.35
	Tin	t	28500	14681	2393	51.51
						76.50
17) Metal products	Beam of iron bridge	t	1740	5329	459675	306.26
	Sheet metal used for pressure container	t	1850	2708	64246	146.38
	Pans	article	19.04	21.12	17036	110.92
	Umbrellas, folding type	article	16.3	16.9	8302	103.68
						278.44
18) Machinery	Bickles	article	260	229	443431	88.08
	Alarm clocks	article	20.2	23.6	86977	116.83
						92.79



Sector	Commodity	Unit	Unit Price		Japan Domestic Product	Yen/Rmb
			Rmb	100Yen		
19)Transport equipment	Ordinary trucks (5t)	article	39072	37080	576116	94.9
	Motorcycles	article	5205	3032	518710	58.25
20)Electrical machinery	Houshold refrigerators	article	1795.1	1394.3	457673	77.67
	Houshold washing mahines	article	529.4	226	190283	42.69
	Fluorescent lamps	article	6.05	8.72	128198	144.13
	Electric wire	t	71100	10144	272726	14.27
	Generators (small type)	article	2000000	3090749	115252	154.54
21)Electronic and communication equip.	Colour television(21model)	article	2506	759		72.03
22)Meters & other measuring equip.	The average of the manufactures					30.29
23)Machinery & equip. repairing	The average of the service industries					165.50
24)Industrial prods. n.e.c.	The average of the manufactures					381.04
25)Construction	The average of the manufactures					165.50
26)Freight transport & communication	Railway freight transport	t/1000km	26	76.3	207529	293.49
	Inland water transport	t/1000km	14	41.7	1019344	297.74
	Road freight transport	t/1000km	270	350.7	9616953	129.88
	Letter (ordinary rate, within the city)	20g	0.1	0.62	329954	620.00
	Letter (ordinary rate, city to city)		0.2	0.62	329954	310.00
	Book percel (within the city)	250g	0.12	2.1	329954	1750.00
	Book percel (city to city)		0.24	2.1	329954	875.00
	Registered mail	letter	0.3	3.6	329954	1200.00
	Local call	3 minutes	0.1	0.1	664723	100.00
27) Commerce	The average of the service industries					381.04
28)Restaurants	The average of the service industries					381.04
29)Passenger transport	Railroad	pers. 1000km	38	117.4	5679027	308.95
	Airline, within the country	pers. 1000km	240.83	232.7	1116510	96.61
						274.06
30)Public utilities and services	Movies admission fee	person	0.8	15.6	171910	1950.00
	Bathing fee, adult	person	0.84	2.67	377691	317.86
	Barber's fee for men	person	1.35	28.75	717679	2129.63
	Permanent wave	person	8	58.03	1365104	725.38
	Bus service	pers./dist.	0.1	1.25	1952078	1250.00
						1180.94
31)Education, medical & research	The average of the total industries					251.44
32)Finance and insurance	The average of the total industries					251.44
33)Public administration	The average of the total industries					251.44

We used producers prices data as a general rule, but in the case that there are no producers prices data, we used retail prices data.

We try to use similar data as much as possible between China and Japan.

\*: retail prices

\*\* : retail prices in the large cities

There are limitations in such estimating work, because ordinary prices statistics are concerning purchasers' prices of personal consumptions and price data of production materials are scarce. There are some cases where the coverage of sample commodities are not sufficient in the sectors of production materials. These are important problems to be improved in the future. There are a few sectors where there is no price data. In such case, we had to apply the average price of the similar sector. In the very few case where there is no similar sector, we had to apply the average price of the total of the other sectors.

When we calculate the average within each sector, as a general rule, we used domestic products by sector and commodity in supporting tables of the 1990 Japanese input-output tables as weights. In the case in which we convert Rmb to Yen, it is better to adapt Chinese quantities as weights than Japanese quantities. However we could not do this, because we did not have Chinese quantity data by sector and by commodity.

As shown in Table 2, we can see that the absolute level of Rmb against Yen is 8 times higher in PPPs than in official exchange rate. Also we can see that relative prices among sectors are very different in the two countries. Prices of coal, foods and services are very low in China.

### **2.3. The conversion of Chinese input-output tables from Rmb to Yen by using PPPs**

We converted the 1990 33-sector Chinese input-output tables from Rmb to Yen by using PPPs. We applied the above PPPs by sector to each row, assuming that prices are the same within each row according to the law of one price. We applied the actual exchange rate only for net exports. We obtained the converted gross outputs by calculating the total of converted row. The above method premises that all transactions except net exports are domestic products. If possible, we should use actual exchange rate for imports. However, as imports matrix or even imports vector are not published in Chinese input-output tables, it is difficult to separate intermediate sector into domestic products and imports. Therefore we had to treat all as domestic products. This results in the overestimation of imports.

We did not directly convert gross value added by adding each converted item. We obtained indirectly the converted gross value added by subtracting the totals of the converted intermediate inputs from the converted gross outputs. This method is called double deflation.

In the Chinese input-output tables evaluated in Yen, there are some sectors having minus values of gross value added. In the Chinese price system, prices of basic materials are maintained low in many cases. If prices of basic materials (basic intermediate inputs) are converted from the low Chinese prices to the high Japanese prices without accompanying alternation of input technical structure, minus values of gross value added can possibly arise.

In the future, we may also obtain each item of the gross value added converted by PPP. However, in this case, the row totals (output totals) may possibly be different from the column totals (input totals) due to the difficulties in estimating accurately the deflator for the operating surplus.

### **2.4. The estimation of the Chinese employment table**

Potential and actual unemployment are high in China, which is a highly populated country. Although analyses using employment coefficients are important in order to generate reasonable labor distributions, employment tables supporting input-output tables are not published in China.

Hence, we tried to estimate the 1990 33-sector Chinese employment table. The main data source is "Social Labor Force by Sector" in the "Statistical Yearbook of China". However, there are only 13 sectors including 'the other' sector in this table and its classification is different from that of the input-output tables. We aggregated this table, except 'the other' sector, into

8 sectors and we did a proportional allocation from 8 sectors to 33 sectors by using the labour income row of the input-output table, assuming the labour income per capita is the same within each of the 8 sectors. We allocated 'the other' sector to all the 33 sectors proportionally to the original employment of each sector.

### **3. Applications and Limitations of Data in Real Terms**

#### **3.1. Applications of Data**

Through the above process, we compiled the Yen-denominated Chinese input-output table in real terms (converted by using PPPs), the Yen-denominated Chinese input-output table in nominal terms (converted by using official exchange rate) and the Japanese input-output table aggregated into 33 sectors of the Chinese type. The results are shown in the supporting tables. We calculated some indicators by using these three tables in order to discuss the significance of the data in real terms and the results are shown in Table 3.

As shown in Table 3, Chinese gross output converted by PPPs is 7.9 times as large as the one converted by official exchange rate. It is also larger than the Japanese gross output. However we must keep in mind that this is the quantity of goods and services, of which the differences in qualities are not completely taken into consideration. By sector, agricultural production is about 18% of the total, just as the one converted by official exchange rate. This amounts to one third of the total if food is added to it. This is in sharp contrast to the 6% in Japan.

Employment problems are very important in China, since its population is ten times greater than Japan and its employed persons are a little over eight and a half times as large.

On the one hand, based on calculation using the Chinese input-output tables denominated in Yen by official exchange rate, Chinese labor input coefficients and labor inducement coefficients are on average more than sixty times larger than the Japanese ones. According to this table, even in agriculture where we cannot imagine that the Japanese productivity is particularly high, one Japanese farmer produces more than fifty Chinese farmers. In manufacturing, one Japanese worker produces about sixty times as much as a Chinese worker.

On the other hand, based on calculation using the Chinese input-output tables denominated in Yen by PPP, the Chinese labor input coefficients are on average 8.2 times as large as the Japanese ones and the Chinese labor inducement coefficients are on average 9.1 times as large as the Japanese ones. By sector, Chinese labor input coefficient and labor inducement coefficient in agriculture are about 6.5 times as large as the Japanese ones. In manufacture, the deviation is large. In the manufacture of electronic and communication equipment and in petroleum and coal, even in real terms, they are more than 30 times as large as the corresponding Japanese figure. These show that Chinese techniques are underdeveloped and Chinese productivity is very low in these sectors, compared with Japan.

Data in real terms show the differences in industrial techniques and productivities in the two countries more precisely than the data in nominal terms. Data in real terms compiled have many problems including their accuracy, nevertheless, we believe that they are more useful in some analyses than the data in nominal terms.

Table 3: Comparison between China and Japan

Sector	Yen/Rmb	Gross output ( ) Distribution by sector			Influencing Power C.		
		China (a)	China (b)	Japan	China (a)	China (b)	Japan
1) Agriculture	219.59	21028653 ( 0.18 )	163752022 ( 0.18 )	17248947 ( 0.02 )	0.68	0.36	0.87
2) Coal mining	512.34	1458537 ( 0.01 )	26196047 ( 0.03 )	121895 ( 0.00 )	0.96	0.42	0.87
3) Crude petroleum & natural gas prodn.	122.12	996309 ( 0.01 )	3988099 ( 0.00 )	87212 ( 0.00 )	0.78	0.70	0.75
4) Metal ore mining	54.01	466215 ( 0.00 )	1029545 ( 0.00 )	40207 ( 0.00 )	0.97	1.41	0.81
5) Other mining	102.27	1145519 ( 0.01 )	4463073 ( 0.00 )	1907038 ( 0.00 )	0.90	1.52	0.90
6) Food	393.76	8110958 ( 0.07 )	111134542 ( 0.12 )	38844317 ( 0.04 )	0.95	0.48	1.10
7) Textiles	83.59	7654126 ( 0.07 )	21596956 ( 0.02 )	7953445 ( 0.01 )	1.16	1.40	1.19
8) Wearing apparel, leather & prods. of leather & fur	207.95	2442572 ( 0.02 )	14091376 ( 0.02 )	7452967 ( 0.01 )	1.17	0.88	1.12
9) Sawmills & furniture	163.77	895070 ( 0.01 )	5816838 ( 0.01 )	9555380 ( 0.01 )	1.13	0.80	1.10
10) Paper, cultural & educational articles	159.30	3277361 ( 0.03 )	17152459 ( 0.02 )	21368899 ( 0.02 )	1.10	0.89	1.11
11) Electricity, steam & hot water (prodn. & supply)	159.02	1990921 ( 0.02 )	11584093 ( 0.01 )	13620976 ( 0.02 )	0.90	0.80	0.84
12) Petroleum refineries	90.84	1673296 ( 0.01 )	5476656 ( 0.01 )	9255534 ( 0.01 )	0.92	1.00	0.93
13) Coke & coal products	94.88	328763 ( 0.00 )	1122073 ( 0.00 )	3130465 ( 0.00 )	1.13	1.64	0.99
14) Chemical products	89.21	9010254 ( 0.08 )	29430755 ( 0.03 )	40050115 ( 0.05 )	1.09	1.24	1.16
15) Building materials & other non-metallic prods.	294.82	4327117 ( 0.04 )	45762899 ( 0.05 )	10592234 ( 0.01 )	1.06	0.59	1.02
16) Primary metal	76.50	5246281 ( 0.05 )	15994078 ( 0.02 )	25910717 ( 0.03 )	1.19	1.36	1.45
17) Metal products	278.44	2477349 ( 0.02 )	24058576 ( 0.03 )	23010320 ( 0.03 )	1.18	0.62	1.16
18) Machinery	92.79	5732019 ( 0.05 )	21291309 ( 0.02 )	41260228 ( 0.05 )	1.16	1.12	1.14
19) Transport equipment	77.54	1826365 ( 0.02 )	5629704 ( 0.01 )	38413654 ( 0.04 )	1.20	4.50	1.43
20) Electrical machinery	72.03	2639760 ( 0.02 )	7122788 ( 0.01 )	18406136 ( 0.02 )	1.20	1.47	1.16
21) Electronic and communication equip.	30.29	1867079 ( 0.02 )	2068561 ( 0.00 )	33856927 ( 0.04 )	1.25	2.89	1.19
22) Meters & other measuring equip.	161.36	465941 ( 0.00 )	3068928 ( 0.00 )	2370841 ( 0.00 )	1.13	0.71	1.01
23) Machinery & equip. repairing	531.04	557718 ( 0.00 )	10791309 ( 0.01 )	867879 ( 0.00 )	1.12	0.56	1.22
24) Industrial prods. n.e.c.	161.36	1070766 ( 0.01 )	6297015 ( 0.01 )	8435384 ( 0.01 )	1.21	0.87	1.08
25) Construction	161.36	8351630 ( 0.07 )	49102123 ( 0.05 )	93770916 ( 0.11 )	1.16	0.92	1.01
26) Freight transport & communication	246.90	4212866 ( 0.04 )	33601703 ( 0.04 )	26668946 ( 0.03 )	0.82	0.57	0.75
27) Commerce	531.04	3598913 ( 0.03 )	82805976 ( 0.09 )	85370059 ( 0.10 )	0.84	0.43	0.74
28) Restaurants	531.04	1104952 ( 0.01 )	20871622 ( 0.02 )	18273178 ( 0.02 )	0.98	0.54	0.96
29) Passenger transport	274.06	965309 ( 0.01 )	9147421 ( 0.01 )	8937883 ( 0.01 )	0.85	0.57	0.92
30) Public utilities & services	1180.94	2242430 ( 0.02 )	94749185 ( 0.10 )	75628987 ( 0.09 )	0.70	0.31	0.67
31) Education, medical & research	219.99	4811165 ( 0.04 )	38572577 ( 0.04 )	125591423 ( 0.15 )	0.94	0.61	0.85
32) Finance and insurance	219.99	2113295 ( 0.02 )	16332014 ( 0.02 )	31251543 ( 0.04 )	0.46	0.32	0.73
33) Public administration	219.99	1719197 ( 0.01 )	13780180 ( 0.02 )	24901624 ( 0.03 )	0.74	0.50	0.77
Total or average	219.99	115856381 ( 1.00 )	918513124 ( 1.00 )	864156276 ( 1.00 )			

Sector	Sensitivity C.		Employed persons		Labor Input C.		Labor Inducement C.	
	China(a)	China(b)	China*	Japan	China(a)	China(b)	China(a)	China(b)
1)Agriculture	2.35	2.43	352953549	5655034	16.78	2.16	0.33	22.18
2)Coal mining	0.95	2.17	9224722	7902	6.32	0.35	0.06	10.43
3)Crude petroleum & natural gas prodn.	0.88	0.68	592859	2305	0.60	0.15	0.03	3.00
4)Metal ore mining	0.70	0.40	1211414	2855	2.60	1.18	0.07	6.64
5)Other mining	0.70	0.47	3496849	85233	3.05	0.78	0.04	7.88
6)Food	0.85	0.97	6361313	1736003	0.78	0.06	0.04	13.63
7)Textiles	1.94	1.18	10239867	726222	1.34	0.47	0.09	11.41
8)Wearing apparel, leather & prods. of leather & fur	0.58	0.52	4419265	860121	1.81	0.31	0.12	10.81
9)Sawmills & furniture	0.61	0.48	1962152	751254	2.19	0.34	0.08	8.40
10)Paper, cultural & educational articles	1.09	0.93	5747294	1146178	1.75	0.34	0.05	9.49
11)Electricity, steam & hot water (prodn. & supply)	1.10	1.08	1850140	162941	0.93	0.16	0.01	4.92
12)Petroleum refineries	0.96	0.61	609866	27148	0.36	0.11	0.00	2.99
13)Coke & coal products	0.51	0.35	607245	55351	1.85	0.54	0.02	8.03
14)Chemical products	2.80	1.89	9785066	1160523	1.09	0.33	0.03	7.84
15)Building materials & other non-metallic prods.	1.14	1.77	11350251	496877	2.62	0.25	0.05	7.53
16)Primary metal	2.21	1.36	5449496	285614	1.04	0.34	0.01	5.95
17)Metal products	0.93	1.31	4289841	1508951	1.73	0.18	0.07	6.82
18)Machinery	1.62	1.24	11334854	1663786	1.98	0.50	0.04	6.71
19)Transport equipment	0.91	0.86	2800951	853669	1.53	0.50	0.02	6.41
20)Electrical machinery	1.01	0.66	3453886	841009	1.31	0.48	0.05	6.35
21)Electronic and communication equip.	0.87	0.50	2294286	1185451	1.23	1.11	0.04	6.01
22)Meters & other measuring equip.	0.53	0.41	967379	143733	2.08	0.32	0.06	6.54
23)Machinery & equip. repairing	0.42	0.33	1364097	42568	2.45	0.13	0.05	7.03
24)Industrial prods. n.e.c.	0.86	0.73	1762725	247417	1.65	0.28	0.03	7.81
25)Construction	0.40	0.27	25415299	7140416	3.04	0.52	0.08	8.21
26)Freight transport & communication	1.23	1.64	13171563	2127867	3.13	0.39	0.08	5.80
27)Commerce	1.27	3.67	25519982	13748301	7.09	0.31	0.16	10.56
28)Restaurants	0.40	0.27	4811076	3011144	4.35	0.23	0.16	15.47
29)Passenger transport	0.53	0.47	1999130	416188	2.07	0.22	0.05	5.03
30)Public utilities & services	0.53	1.09	6578442	4488829	2.93	0.07	0.06	5.45
31)Education, medical & research	0.72	0.67	22430731	10507573	4.66	0.58	0.08	9.00
32)Finance and insurance	1.04	1.31	2251335	2180700	1.07	0.14	0.07	1.49
33)Public administration	0.40	0.27	11143075	2952109	6.48	0.81	0.10	9.04
Total or average	0.40	0.27	567450000	65821272	4.90	0.62	0.08	1.13

Notes: China(a) is converted by the exchange rate (1 Rmb = 27.445 Yen).

China(b) is converted by PPP.

\*: Employed persons of China are estimated figures.

### 3.2. Limitations

The first problem concerns the accuracy of the data. This problem is mainly caused by the lack of released data. In particular, price data on production materials are rare. Even if there may be price data for industrial machinery, for instance, if the detailed specification of the machinery are not known, these data cannot be used. Also it is very difficult to evaluate services, and in some cases it is impossible to compare service prices between the two countries.

Since the Chinese price reforms in 1984, the dual price system for many commodities (the coexistence of planned price and free market price) has been introduced. Due to the lack of data on free market prices, we had to use data on planned prices in almost all cases to estimate PPPs. We expect that the average of actual free market prices are higher than planned prices. Therefore, there is the possibility of overestimation in the conversion by using our PPPs.

As stated above, we treated all, except the net export column, as domestic products in the conversion from Rmb-denominated I-O table to Yen-denominated I-O table, because there are no data on imports matrix or imports vector in the Chinese input-output tables. If possible, we should use actual exchange rate for imports. The actual exchange rate is lower than PPPs. Hence, there is another possibility of overestimation in our conversion.

These problems caused by the lack of data will possibly be improved in the future, when data become more readily available. The question of how to evaluate the differences in product qualities and technique levels of the two countries is more difficult to improve. This problem is particularly significant in the case of comparison between a developed country like Japan and a developing country like China. In this paper, we neglected completely the differences in product qualities, because the main aim of this study at this stage was to compare the actual volumes of goods and services which were produced and consumed in China and in Japan. PPPs are fundamentally concerning prices of commodities having the same quality. In this content, our estimation is a little far from PPP in the literal sense of the word. The neglect of the differences in product quality is the largest factor of overestimation in our conversion.

According to Anne Marie Gulde and Marianne Schulze-Ghattas (1993), there are already some PPP-adjusted estimates of China's GDP and they are considerably different from each other. The 1991 estimate made by Field (1993) is 1278 billion current US dollars, which is 3.37 times as large as the one converted by the official exchange rate. The figure in Penn World Table Mark 5.5 is 3439 billions of current US dollars and it is 9.07 times as large as the one converted by official exchange rate. While, according to Summers R., Heston A., Nuxoll D.A. and Aten B. (1994), Penn World Table Mark 5.6 estimates of the same year (1991) is 1907 billions of current US dollars. Our estimate of Yen-denominated China's final demand total (=gross value added total) by PPPs is 9.24 times as large as the one by official exchange rate. Notice that ours is in Japanese Yen and theirs are in US dollars. Japanese price levels are much higher than US price levels, especially with regard to agricultural products and foods. As stated above, agricultural outputs and food are one third of the total gross outputs in China. Ours are surely overestimates, but the magnitude of our overestimation is not larger than those made by our predecessors. Anyway we must continue to make efforts to improve the accuracy of the data.

Product qualities and technological levels are important standards to evaluate the economic powers of nations. The economic gap between Japan and China is expressed more in technological levels than in the quantities of goods and services. Therefore the limitation in the application of these data in real terms depends on the purpose of analysis.

## Appendix

We used producers prices data as a general rule, but in the case that there are no producers prices data, we used retail prices data. We try to use similar data as much as possible between China and Japan.

\* retail prices

\*\* retail prices in the large cities

### Chinese Data:

We have used purchasing prices in agriculture, forestry and fisheries, shipping prices in the other primary and second-ary industries, and retail prices in the case when the above data are not available. We used retail prices in the tertiary industries.

The main data sources are as follows. However, some prices data in the service industries are based on our own survey.

1. "Purchasing Prices of Principal Farm and Sideline Products for Various Provinces," *Zhongguo Wujia Tongji Nianjian 1992*, (Chinese Statistical Yearbook of Prices 1992), pp.302-365.
2. "Shipping Prices after Adjustment of Principal Manufacture Products 1989," *Zhongguo Wujia Nianjian 1990*, (Chineses Yearbook of Prices 1990), pp398.
3. "Prices of Various Commodities and Expenses of Various Services," *Zhongguo Wujia Nianjian 1991*, (Chinese Yearbook of Prices 1991), pp.31-66.
4. "Selected Official Document of Prices," *Zhongguo Wujia Nianjian 1991*, (Chinese Yearbook of Prices 1991), pp.283-399.
5. "Retail Prices of Principal Commodities," *Zhongguo Wujia Tongji Nianjian 1992*, (Chinese Statistical Yearbook of Prices 1992), pp.141-145.
6. "Retail Prices of Principal Commodities for 29 Major Cities," *Zhongguo Wujia Tongji Nianjian 1992*, (Chinese Statistical Yearbook of Prices 1992), pp.150-301.
7. "100 Kinds of Retail Prices of Commodities and Expenses of Services in 35 Cities," *Zhongguo Wujia Nianjian 1991*, (Chinese Yearbook of Prices 1991), pp.467-470.
8. *Quanguo Tielu Lieche Shikebiao*, (Timetables for Railroad in China).
9. *Zhongguo Minhang Guonei Yingjia*, (Domestic Airline Fares of C.A.) (effective since September 5, 1989).
10. *Zhonghuarengmingongheguo Jiaotongbu Zhishu Shueiyuen Qiye Luenchun Kepiao Piaojiabiao*, (Fare Tables of Water-borne Traffic Enterprises Controlled by Transportation Department of the People's Republic of China), (effective since September 5, 1989) People's Traffic Publisher.

### Japanese Data:

We have mainly used unit price in 1990 *Input-Output Table's* Supporting Table "Domestic Output by Sector and by Commodity." Supplementarily, we used 1992 *National Survey of Prices (Vol.2): Retail Price Data*, which we converted 1992 prices to 1990 prices using "1992 Consumer Price Index." Besides, we also used 1990 *Census of Manufactures (Commodities)*(for

example, cement), Research and Data Processing Department, Transport Policy Bureau, Ministry of Transport, *Statistical Handbook of Transports and Economies* (calculated unit price by transport distance (km) and transports volume (ton)), postage table in *Postal Guide* and normal fares of railroads and airplanes in *JTB Time Tables*. As weight, we used data mainly from “Domestic Output by Sector and by Commodity,” and partially from *1990 Census of Manufactures Commodities*.



Table A: 1990 Input-Output Table of China in Nominal Terms (Unit: Million Yen)

Sector	1	2	3	4	5	6	7	8	9	10	11
1) Agriculture	3760385	27417	110	6155	88983	3826765	1442127	269331	40802	386744	1623
2) Coal mining	7178	10380	798	1606	7451	10432	11190	1295	9078	17163	351872
3) Crude petroleum & natural gas prodn.	0	24	1196	0	206	49	0	0	2	200	60364
4) Metal ore mining	0	0	0	59513	0	0	0	0	0	0	0
5) Other mining	6706	16728	2993	2336	20961	7418	3790	1576	41634	15819	22177
6) Food	815773	3222	627	432	3020	768995	7220	78824	1888	8420	3457
7) Textiles	47353	18416	6651	4957	23148	14909	3021558	845785	59681	307928	13990
8) Wearing apparel, leather & prods. of leather & fur	7155	14172	4736	3403	10492	2997	9909	179611	11126	10502	7810
9) Sawmills & furniture	26809	6374	2214	1025	2689	3009	2882	2921	120898	17043	2254
10) Paper, cultural & educational articles	14725	14135	3244	1784	8933	91831	17799	19604	15994	726527	12739
11) Electricity, steam & hot water (prodn. & supply)	81581	71570	14899	25493	75538	27641	52483	6501	25208	58096	47758
12) Petroleum refineries	95568	17022	13402	9036	29214	8620	11285	3699	15814	13265	102559
13) Coke & coal products	757	18	105	27	220	476	811	76	253	1889	1586
14) Chemical products	1376592	100114	30969	36317	77938	76216	594643	106684	81085	256206	33046
15) Building materials & other non-metallic prods.	18763	48752	27560	8502	32014	85010	5175	1600	9926	18067	26942
16) Primary metal	5237	35050	24132	9693	10058	7627	4169	3204	41663	104389	11707
17) Metal products	38296	78452	9470	10324	27408	23269	8718	19557	47409	24628	16851
18) Machinery	72000	127137	116737	26335	53218	10949	52440	4124	16055	24634	50845
19) Transport equipment	22174	9177	12120	5647	15849	1208	1664	594	2996	2091	9359
20) Electrical machinery	6096	51391	18046	8219	14446	4168	9122	2078	6629	10949	54623
21) Electronic and communication equip.	242	3119	2564	534	1205	227	625	159	394	4724	4752
22) Meters & other measuring equip.	646	4662	10328	860	2289	616	1008	80	704	1477	11259
23) Machinery & equip. repairing	5096	1515	214	414	1119	325	469	129	232	403	868
24) Industrial prods. n. e. c.	37616	20177	1098	7375	9564	7946	12870	75808	10950	33978	10353
25) Construction	0	0	0	0	0	0	0	0	0	0	0
26) Freight transport & communication	313606	24994	12921	9299	19870	491001	141715	30807	18933	66766	110845
27) Commerce	129103	39704	14319	11306	29673	228672	299494	102877	31201	110479	54384
28) Restaurants	0	0	0	0	0	0	0	0	0	0	0
29) Passenger transport	60151	6262	2151	1329	4909	14558	12783	2969	2104	6945	4138
30) Public utilities & services	59848	5055	1660	919	3565	7081	9098	4144	1574	5038	3110
31) Education, medical & research	110462	17875	8890	3465	9139	30744	21606	4690	4038	20129	6894
32) Finance and insurance	90640	13670	5590	7739	10752	109187	112321	47597	13893	48567	3407
33) Public administration	0	0	0	0	0	0	0	0	0	0	0
Total intermediate inputs	7210559	784583	349742	264051	593869	5861947	5868974	1816326	632162	2303067	1041270
34) Depreciation of fixed capital	340323	150168	111369	45587	74821	201128	229002	55725	33123	112856	237225
35) Compensation for employees	11305604	455983	29305	59881	172851	314443	508163	218447	96990	284092	91454
36) Welfare expenses	984825	116741	476105	27332	101055	436258	415444	147752	64400	219774	83866
37) Operating surplus and taxes	1187342	-48938	29787	69365	202922	1297181	634544	204322	68395	357572	537107
Primary inputs	13818094	673954	646567	202164	551649	2249011	1785152	626246	262908	974294	949651
Total inputs	21028653	1458537	996309	466215	1145519	8110958	7654126	2442572	895070	3277361	1990921

	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1)	192	420	802256	54005	9146	8567	12982	2878	13929	389	479	2633	26189	44566	819	71489
2)	655	106101	110338	109736	117231	8068	21662	4817	6812	1373	932	3129	3092	7718	27184	9800
3)	726891	5995	52545	1016	4518	529	1208	142	100	53	5	50	24	29	721	68
4)	0	0	16915	0	448493	35022	10602	481	0	0	0	0	0	0	0	0
5)	1086	1875	359370	123587	20086	15179	14581	3110	3582	1373	826	2531	2297	435303	32312	9986
6)	247	1495	257970	7331	7789	4949	6797	1823	5505	1148	845	432	1283	6036	2409	39239
7)	1811	2541	316060	84735	27549	107167	60994	16786	16124	6534	3580	13793	96663	37477	30296	115709
8)	2158	2722	24182	22681	24984	13946	29084	7008	7016	3368	2219	3838	12595	27561	25419	19916
9)	412	1074	11520	15009	5480	22308	56750	10916	14432	3885	4056	2762	7843	178789	32947	35350
10)	1664	2018	115323	277954	19382	65004	52914	6835	65664	19486	6605	3825	24115	20661	46727	129660
11)	8426	8120	447085	194181	251521	49016	110249	19958	30920	12303	5105	13749	12539	45382	30789	32623
12)	30594	15288	143099	107233	84613	18629	69450	19033	28959	5993	2501	12353	8318	123440	348214	37260
13)	21	9075	4049	14002	172241	10634	22292	2108	2607	401	124	1124	1032	998	324	1568
14)	50884	10998	2424919	318791	146093	176326	336120	154521	308989	136090	29576	36614	98804	182566	216747	55963
15)	11335	5606	96678	487602	239952	58536	94200	31220	94176	52686	12324	16373	9213	2268424	29914	76414
16)	3846	6024	259359	229116	1383006	570875	656811	159671	465298	70113	47739	38231	98076	961794	71246	24158
17)	4696	4929	82121	89438	62632	189676	178276	30134	81777	28323	13746	16879	18658	428992	31376	43175
18)	16574	10772	101038	134904	264695	76614	1221887	196280	132623	22114	25822	51295	16135	263743	45324	22732
19)	2168	1964	8586	20032	28598	11786	58364	423017	4104	1931	1234	64771	12877	44870	267488	21984
20)	4553	4291	34925	53979	68426	34375	365703	61908	361758	94213	28401	30725	9319	198813	30289	19868
21)	962	310	3422	3217	6798	4667	35236	10851	20160	760095	39298	2940	3902	6293	19876	8729
22)	6158	1463	14316	6468	15976	4741	30212	6656	19208	8194	35315	4002	4133	15531	5108	1718
23)	452	403	1509	2180	3355	1637	2192	505	526	341	120	1343	177	1906	11353	4532
24)	274	2461	27545	55351	60698	63497	46602	9942	27011	12505	6843	1921	237130	80801	72215	75921
25)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26)	140438	26544	188756	126147	184305	63867	121595	39694	46676	17460	6519	12264	18633	276533	85042	29836
27)	37024	9966	247824	116448	139301	83289	177950	52570	85046	63144	13010	16107	36405	201883	85438	124330
28)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29)	1062	430	14978	11043	3813	6044	19410	3773	6250	3408	2900	1478	3053	13970	6198	56510
30)	750	300	11247	7841	3122	4168	13777	2652	4595	2486	2133	1044	2141	17463	5224	54032
31)	2479	1166	40055	26248	9401	12149	35946	7254	13120	5899	4558	3020	6677	41485	120340	122960
32)	4354	1589	130891	79392	59239	40215	114674	32740	52593	43657	11991	8836	24138	35770	12336	740129
33)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1062170	245940	6348879	2779668	3872444	1761479	3978523	1319282	1919557	1378965	308805	368066	795215	5968795	1693675	1985660
34)	91391	17265	401318	258502	210265	82698	238780	69322	75604	54070	16522	26945	33262	175650	485783	178395
35)	30146	30016	483682	561050	269372	212049	560288	138453	170728	113408	47818	67428	87133	1493172	937412	883439
36)	166119	18010	511404	301099	265798	163367	407903	116179	161185	103933	32725	40779	62359	327247	274974	409824
37)	323470	17532	1264972	426799	628402	257757	546524	183129	312686	216703	60070	54499	92797	386765	821022	141595
	611127	82824	2661375	1547450	1373837	715871	1753496	507083	720203	488114	157136	189652	275551	2382835	2519192	1613254
	1673296	328763	9010254	4327117	5246281	2477349	5732019	1826365	2639760	1867079	465941	557718	1070766	8351630	4212866	3598913

	28	29	30	31	32	33	Total inter-mediate use	Consumption of households	Institutional consumption	Fixed capital formation	Change in stocks	Net exports	Total of final use	Gross output
1)	297645	23	28654	65874	5374	5374	11298757	8069845	41561	345592	630441	642458	9729897	21028655
2)	1699	11553	14678	18539	335	6856	1020750	191107	0	0	186297	58383	437786	1458537
3)	31	0	386	1351	0	16	857734	418	0	0	9172	128984	138575	996309
4)	0	0	0	787	0	0	571812	0	0	0	10230	-115827	-105597	468215
5)	2572	3404	9706	20738	254	5402	1211297	30593	200235	0	-25054	-71318	-85778	1148519
6)	338265	6247	40759	16609	97	2661	2441814	4649977	0	0	426860	392071	5689144	8110958
7)	4550	10365	26001	46244	1722	7881	5398960	1103617	25623	0	286966	838960	2255166	7654126
8)	1303	3447	8966	16520	973	10187	522007	937249	97370	0	204536	671410	1910585	2442572
9)	3468	4961	21800	28663	1846	5015	657403	197399	4858	39775	91442	-95806	237667	895070
10)	3175	7204	22875	397659	11089	110772	2337928	318953	137860	0	93335	389285	939433	3277361
11)	7219	6938	32964	66449	619	9381	1882308	118749	0	0	0	-10135	108614	1990921
12)	3319	103410	39167	30990	984	37050	1589384	9053	0	0	48149	26711	83913	1673296
13)	1379	172	1043	3031	177	1022	255939	64863	0	0	2368	5892	73124	328763
14)	3574	22278	61034	564737	1609	6981	8114021	568566	100771	0	290583	-63687	896233	9010254
15)	7816	4165	69758	81537	2254	17089	4044583	19912	700	0	189051	73872	282535	4327117
16)	543	8027	17442	27079	149	2017	5357546	0	0	0	655782	-767048	-111266	5248281
17)	3957	4909	22609	43849	2631	12601	1717366	316300	21953	68642	235552	117536	759983	2477349
18)	1887	7906	28608	76016	1607	59844	3322592	343650	21121	2402708	434768	-802820	2399427	5732019
19)	276	79250	15910	15568	1515	20575	1189750	52650	0	616343	224995	-257374	636615	1826365
20)	3373	4823	20371	46107	821	4217	1667023	501738	66076	355018	169879	-119975	972737	2639760
21)	148	4424	3621	65839	866	5611	1025812	606584	19532	185612	106390	-76852	841267	1867079
22)	9	2196	2512	67730	187	431	286194	0	0	67694	179582	-67529	179747	465941
23)	165	2508	1958	4729	193	2729	55598	0	0	502120	0	0	502120	557118
24)	1071	8421	27734	13915	353	5809	1065756	899	798	0	3644	-330	5010	1070766
25)	0	0	0	0	0	0	0	0	0	8351630	0	0	8351630	8351630
26)	30999	11751	30165	121857	25206	86342	2930887	558367	22258	74555	89283	537515	1281979	4212866
27)	44421	21398	44855	147954	2845	31269	2833890	958660	71371	179127	272842	-717775	785224	3598913
28)	0	0	0	0	0	0	0	758378	318882	0	0	27692	1104952	1104952
29)	220	5739	10367	158356	10452	47047	504799	400471	0	0	0	107711	508182	1012981
30)	315	4810	7092	219124	28313	45584	539305	1216372	445360	0	0	41396	1703125	2242430
31)	2996	72807	31288	222617	24156	49011	1093565	1525540	2193315	0	0	-1255	3717600	4811165
32)	3815	1862	17946	14041	24904	1788	1920261	106504	0	0	0	86529	193033	2113295
33)	769911	425011	679868	2604310	146210	595560	67734543	23821607	1719197	12765650	4670285	1609299	48121839	115856381
34)	27445	59639	791991	311066	53766	88410	5384090	0	0	0	0	0	0	0
35)	166548	142277	393464	1346048	85602	728059	22482805	0	0	0	0	0	0	0
36)	51192	60114	151088	488183	153905	309398	7650338	0	0	0	0	0	0	0
37)	89856	278269	276019	61558	1673812	770	12604605	0	0	0	0	0	0	0
	335041	540298	1562562	2206855	1967085	1123637	48121839	0	0	0	0	0	0	0
	1104952	965309	2242430	4811165	2113295	1719197	115856381	0	0	0	0	0	0	0

Note: Converted by the exchange rate (1 Rmb = 27.445384 Yen).

Table B: 1990 Input-Output Table of China in Real Terms (Unit: Million Yen)

Sector	1	2	3	4	5	6	7	8	9	10	11
1)Agriculture	30086773	219362	876	49247	711948	30617873	11538433	2154909	326456	3094333	12987
2)Coal mining	134003	193778	14899	29982	139096	194747	208897	24167	169457	320399	6568636
3)Crude petroleum & natural gas prodn.	0	105	5321	0	918	216	0	0	9	890	268586
4)Metal ore mining	0	0	0	117112	0	0	0	0	0	0	0
5)Other mining	24989	62335	11154	8706	78107	27643	14122	5872	155142	58948	82641
6)Food	11703851	46223	8993	6202	43333	11032734	103582	1130887	27087	120801	49602
7)Textiles	144231	56091	20257	15099	70505	45409	9203224	2576139	181780	937904	42612
8)Wearing apparel, leather & prods. of leather & fur	54211	107382	35886	25786	79494	22710	75077	1360896	84297	79571	59179
9)Sawmills & furniture	159973	38032	13211	6117	16043	17957	17197	17432	721407	101696	13447
10)Paper, cultural & educational articles	85468	82043	18828	10358	51849	533014	103311	113788	92835	4216959	73939
11)Electricity, steam & hot water (prodn. & supply)	472682	414680	86327	147734	437672	160152	304089	37667	146055	336612	276714
12)Petroleum refineries	316316	56341	44358	29908	96695	28532	37352	12244	52343	43906	339455
13)Coke & coal products	2619	62	362	92	760	1644	2803	262	875	6532	5482
14)Chemical products	4474551	325415	100663	118048	253335	247736	1932860	346773	263564	832785	107413
15)Building materials & other non-metallic prods.	201555	523699	296052	91330	343902	913192	55589	17191	106623	194076	289419
16)Primary metal	14598	97695	67264	27019	28034	21258	11619	8931	116127	290967	32631
17)Metal products	388530	775631	96079	104736	278058	236069	88450	198409	480981	249860	170955
18)Machinery	243431	429847	394684	89038	179928	37018	177299	13943	54282	83287	170893
19)Transport equipment	62648	25929	34242	15954	44778	3414	4700	1680	8465	5907	26441
20)Electrical machinery	15998	134874	47361	21570	37912	10940	23939	5453	17398	28734	143354
21)Electronic and communication equip.	267	3443	2830	589	1330	250	690	176	435	5214	5245
22)Meters & other measuring equip.	3797	27412	60720	5059	13456	3624	5927	471	4137	8683	66193
23)Machinery & equip. repairing	98593	29319	4142	8008	21651	6282	9076	2501	4482	7806	16792
24)Industrial prods. n.e.c.	221155	118629	6454	43363	56231	46719	75665	445700	64380	199766	60867
25)Construction	0	0	0	0	0	0	0	0	0	0	0
26)Freight transport & communication	2821262	224851	116240	83659	178759	4417144	1274899	277150	170324	600644	997182
27)Commerce	2498009	768226	277055	218763	574146	4424592	5794929	1990567	603704	2137666	1052286
28)Restaurants	0	0	0	0	0	0	0	0	0	0	0
29)Passenger transport	600652	62527	21484	13275	49016	145367	127646	29645	21009	69348	41317
30)Public utilities & services	2575181	217494	71411	39538	153380	304683	391493	178322	67715	216773	133801
31)Education, medical & research	885405	143274	71256	27773	73256	246428	173185	37589	32365	161346	55261
32)Finance and insurance	726521	109569	44807	62028	86180	875188	900302	381516	111362	389288	27307
33)Public administration	0	0	0	0	0	0	0	0	0	0	0
Total intermediate inputs	59017268	5294265	1973217	1416092	4099771	54622537	32656357	11370282	4085096	14800699	11190634
34)Depreciation of fixed capital	340323	150168	111369	45587	74821	201128	229002	55725	33123	112856	237225
35)Compensation for Employees	11305604	455983	29305	59881	172851	314443	506163	218447	96990	284092	91454
36)Welfare expenses	984825	116741	476105	27332	101055	436258	415444	147752	64400	219774	83866
37)Operating surplus and taxes	1187342	-48938	29787	69365	202922	1297181	634544	204322	68395	357572	537107
38)Value of double inflation	90916660	20227828	1368315	-588712	-188348	54262994	-12844553	2094848	1468834	1377465	-556192
Primary inputs	104734754	20901782	2014882	-386547	363302	56512005	-11059401	2721094	1731742	2351759	393459
Total inputs	163752022	26196047	3988099	1029545	4463073	111134542	21596956	14091376	5816838	17152459	11584093

	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1)	1537	3358	6418835	432096	73178	68541	103866	23024	111442	3114	3834	21070	209542	356575	6550	571984
2)	12230	1980660	2059761	2048525	2188430	150608	404371	89926	127158	25638	17404	58407	57721	144071	507465	182937
3)	3234263	26675	233796	4521	20103	2353	5377	631	447	237	24	225	106	131	3208	302
4)	0	0	33287	0	882567	68918	20864	946	0	0	0	0	0	0	0	0
5)	4046	6987	1339147	460533	74850	58562	54336	11587	13347	5118	3077	9430	8558	1622101	120406	37213
6)	3544	21448	3701076	105181	111752	71006	97518	26153	78980	16475	12120	6202	18408	86599	34560	562955
7)	5517	7740	962672	258089	83909	326414	185779	51128	49113	19903	10905	42012	294421	114151	92278	352434
8)	16353	20623	183228	171851	189305	105667	220369	53159	53159	25516	16813	29082	95431	208827	192601	150900
9)	2460	6412	68739	89559	32700	133113	336360	65139	86115	23181	24200	16478	46802	1066847	196600	210938
10)	9680	11713	669364	1613321	112498	377303	307128	39674	381131	113103	36336	22203	139969	119920	1721214	752881
11)	48821	47049	2590436	1457324	284002	638791	115636	179154	17284	17284	29578	79664	72650	262944	178393	189021
12)	101263	50601	473636	354924	280057	129870	62998	96580	19835	96580	8276	40886	27533	408567	1152533	123323
13)	73	13171	13998	48405	595446	36761	77065	7287	9012	1386	427	3886	3567	3449	1121	5420
14)	165395	35747	7882091	1036216	474870	573139	1092544	502262	1004354	442353	96134	119013	321160	593421	704525	181905
15)	121762	60223	1038533	5237898	2577599	628804	1011914	335375	1011648	565958	132381	175876	98972	24367764	321842	820851
16)	10719	16792	722919	638621	3854893	1591216	1830747	445057	1298837	195428	133084	106564	273369	2880836	198567	67337
17)	47641	50003	833143	907381	635419	1924318	1808664	305721	829657	287349	139458	171247	189296	4352260	318318	438020
18)	56036	36419	341606	456107	894926	259031	4131170	663616	448395	74768	87303	173429	54551	891710	153238	76856
19)	6126	5550	24258	56596	80796	33297	164893	1195128	11595	5456	3487	182994	36379	126769	755721	62110
20)	11950	11260	91657	141664	179581	90214	959766	162473	949413	247256	74537	80637	24458	521774	79491	52143
21)	1082	343	3776	3551	7603	5151	39888	11975	22250	838876	43371	3245	4306	6945	21936	9633
22)	36206	8604	84166	38025	93930	27873	177629	39133	112930	48176	207628	23530	24298	91311	30034	10103
23)	8752	7801	29197	42186	64915	31682	42420	9771	10175	6596	2331	25994	3431	36870	219665	87680
24)	1614	14471	161945	325426	356866	373320	273988	58453	158805	73524	40232	11295	1394171	475059	424576	446368
25)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26)	1263408	238793	1698091	1134848	1658045	574561	1093896	357092	419902	157073	58645	110327	167628	2487742	765055	268409
27)	716381	192827	4795147	2253162	2695339	1615568	3443158	1017184	1645550	1221768	251730	311658	704406	3906242	1653143	2405667
28)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29)	10601	4289	149563	110274	38072	60353	193823	37675	62412	34030	28960	14764	30486	139497	61894	564290
30)	32287	12919	483961	337371	134356	179338	592796	114114	197713	106981	91783	44911	92137	751409	224792	2324940
31)	19869	9347	321059	210390	75357	97380	288127	58141	105161	47280	36538	24210	53523	332525	964580	965585
32)	34903	12735	1049150	636363	474826	322342	919168	262428	421560	349928	96115	70823	193475	286717	98878	5932488
33)	5984480	2932759	38458237	20278176	20399410	10126495	20747556	6122831	9893363	5027587	1686691	1980063	4640752	46443029	9752703	17874393
34)	91391	17265	401318	258502	210265	82988	238780	69322	75604	54070	16522	26945	32762	175650	485763	178395
35)	30146	30016	483682	561050	269372	121049	560288	139463	170728	113408	47818	67428	87133	1493172	937412	863439
36)	168119	18010	514404	301099	285798	163367	407903	118179	161185	103933	32725	40779	62359	327247	274974	409824
37)	323470	17532	1264972	426799	628402	297757	546524	183129	312686	216703	60070	54499	92797	386765	821022	141595
38)	-1119951	-1893510	-11688857	23937273	-5779169	13216710	-1209743	-1000210	-3490778	-3447141	1223101	8621594	1380712	276259	21329806	63318329
39)	-507824	-1810686	-9027482	25484723	-4405332	13952081	543753	-493127	-2770576	-2959027	380237	8811246	1856263	2659094	23848997	64931582
40)	5476656	1122073	29430755	45762899	15994078	24058576	21291309	5623704	7122788	2068561	3068928	10791309	6297015	49102123	33601703	82805976

	28	29	30	31	32	33	Total inter-mediate use	Consumption of institutional households	consumption of institutional formation	Change in Net capital stocks	Total of final use	Gross output	
1)	2381454	184	229261	527058	424	42994	90401138	64566676	332527	2765074	5044150	642458	163752022
2)	31724	215660	274006	346072	6261	127978	19055076	3567522	0	3515087	58383	7140972	26196047
3)	137	61	1718	6012	0	71	3816443	1860	0	40812	128984	171657	3988099
4)	0	0	0	1548	0	0	1125242	0	0	20130	-95896	-50675	1029545
5)	9583	12685	36169	77277	946	20129	4513747	114003	0	0	-71318	76101958	4463073
6)	4853069	89623	584765	238286	1394	38175	35032584	66712982	2872764	0	6124141	392071	111134542
7)	13859	31570	79195	140852	5246	24003	16444441	3361454	78043	0	874057	838960	5152515
8)	9874	26121	67934	125172	7372	71188	4030975	7101468	737766	0	1549756	671410	10960400
9)	20894	29601	30083	171034	11017	29927	3922779	1177897	28990	237338	0	1894059	5618838
10)	18429	41815	132772	2308121	64364	642952	13569965	1851286	800179	0	541744	369285	17152459
11)	41825	40199	190994	385010	3584	54351	10906190	6880339	0	0	-10135	677904	11584093
12)	10986	342271	129638	102573	3258	122629	5260616	29964	0	0	159365	216039	5476656
13)	4769	593	3605	10478	613	3532	883757	224236	0	0	8187	5692	1120703
14)	11617	72414	198388	1835652	5229	22692	26374265	1846097	327553	0	944528	-63887	29430755
15)	83960	44745	749354	875883	24208	129866	43447542	213901	7515	0	2020089	73872	45762899
16)	1512	22374	48615	75479	415	5621	14933245	0	0	0	1827881	1060833	15994078
17)	40146	49802	428224	444858	26691	127841	17423215	3208962	222717	696396	2389750	117536	24058576
18)	6379	26730	96723	257007	5435	202331	11267411	1161872	71408	8123498	1469940	-802820	21291309
19)	780	223900	44950	43984	4279	58130	3361338	148751	0	1741323	635667	-257374	5629704
20)	8852	12657	53462	121004	2154	11067	4375005	1316782	173413	931725	445837	-119975	7122788
21)	163	4883	3996	72663	956	6192	1132134	669455	21557	204850	117417	-76852	2068561
22)	55	12912	14766	398210	1102	2537	1682636	0	0	0	9715541	0	3068928
23)	3202	48527	37890	91504	3728	52801	1075768	0	0	0	1055823	-67529	10791309
24)	6300	49507	163060	81813	2075	34150	6265947	5285	4691	0	21423	-330	6297015
25)	0	0	0	0	0	0	0	0	0	49102123	0	0	49102123
26)	276175	105714	271367	1094454	226754	776750	26366844	5023178	200240	670714	803211	537515	33601703
27)	859507	414037	867908	2862766	55048	605021	54829157	18568490	1380951	3465926	5279227	-717775	82805976
28)	0	0	0	0	0	0	0	14673873	6170057	0	27692	20871622	20871622
29)	2192	57311	103521	1581288	104373	469796	5040750	3998960	0	0	107711	4106672	9147421
30)	13557	209848	305143	9428649	1218270	1961423	23205589	52338942	19163258	0	0	41396	71543586
31)	24016	583579	250786	1784385	193624	392848	8765442	12227929	17580461	0	0	-1255	38572577
32)	30576	14928	143843	112546	199615	14330	15391806	853678	0	0	86529	940208	16332014
33)	0	0	0	0	0	0	0	0	0	0	0	0	13780180
34)	8765391	2781352	5642137	25601636	2178434	6057324	473901047	265855541	63954270	78052506	35340461	1609299	918513124
35)	27445	59639	791991	311066	53766	85410	5384090	22482805	0	0	0	0	0
36)	166548	142277	334664	1346048	85602	728059	22482805	0	0	0	0	0	0
37)	51192	60114	151088	488183	153905	308398	7650338	0	0	0	0	0	0
38)	89856	278269	226019	61558	1673812	770	12604605	0	0	0	0	0	0
39)	1177190	5825771	87544485	10764086	12186495	6599219	396490238	0	0	0	0	0	0
40)	12106231	6366070	89107048	12970941	14153580	7722856	444612077	0	0	0	0	0	0
41)	20871622	9147421	94749185	38572577	16332014	13780180	918513124	0	0	0	0	0	0

Table C: 1990 Input-Output Table of Japan (Unit: Million Yen)

Sector	1	2	3	4	5	6	7	8	9	10	11
1)Agriculture	1842781	948	7	413	150	10254210	296374	35932	1457431	16435	0
2)Coal mining	0	80	0	0	0	1391	48	2	2	12324	270510
3)Crude petroleum & natural gas prodn.	0	0	21	0	0	0	0	0	0	60	1346358
4)Metal ore mining	0	0	0	0	0	0	0	0	0	0	0
5)Other mining	0	0	0	0	4654	0	28	41	0	19147	-87
6)Food	1324453	0	0	0	0	5650803	168	156971	1844	25133	0
7)Textiles	26927	8	0	0	84	2882	2371729	2013914	83300	126211	2
8)Wearing apparel, leather & prods. of leather & fur	28938	398	79	20	10572	32608	13670	305439	17247	25182	3468
9)Sawmills & furniture	59160	504	52	26	3739	49898	5433	12452	1511789	454323	10045
10)Paper, cultural & educational articles	167772	594	181	113	4470	1113069	116093	179624	192285	6419545	48853
11)Electricity, steam & hot water (prodn. & supply)	33887	10432	4559	2963	37557	372803	162516	62396	101160	435816	21556
12)Petroleum refineries	300332	1455	983	1113	140815	159015	52788	20204	41862	153761	748879
13)Coke & coal prods.	66	-119	1	1	828	46365	7549	464	1326	19782	192757
14)Chemical products	800499	1375	198	964	26668	864337	997900	191849	428286	1371751	6670
15)Building materials & other non-metallic prods.	20446	136	90	112	86	278746	6077	65	111581	31663	669
16)Primary metal	565	1916	173	0	2138	43903	553	31	61198	26602	214
17)Metal products	26185	3587	1329	119	31851	857807	3693	38973	439602	71239	14393
18)Machinery	999	73	104	119	9957	70	176	199	49929	104022	0
19)Transport equipment	0	0	0	0	0	0	0	0	0	0	0
20)Electrical machinery	5332	92	0	147	905	159	0	0	3729	16332	71
21)Electronic and communication equip.	120	0	0	0	0	167	0	44	18	179524	186
22)Meters & other measuring equip.	202	0	0	0	0	93	0	0	0	0	0
23)Machinery & equip. repairing	76496	0	0	0	59	0	0	0	0	0	0
24)Industrial prods. n.e.c.	61364	2736	1663	479	34048	115719	81065	170121	90905	231313	83685
25)Construction	49543	1063	581	268	13467	94431	30158	23289	31113	102431	450379
26)Freight transport & communication	408589	2744	1268	724	58872	840672	88913	109038	233696	493256	188440
27)Commerce	585154	2548	724	932	79518	2687127	497463	824211	671134	1470548	235164
28)Restaurants	0	0	0	0	0	0	0	0	0	0	0
29)Passenger transport	9577	1579	582	742	5898	69187	38675	31669	14780	81035	11503
30)Public utilities & services	28295	2319	3222	783	34401	262355	88269	53779	63944	155761	209714
31)Education, medical & research	840821	11107	7226	3728	284839	1470438	229157	229523	292520	835519	1556339
32)Finance and insurance	597453	7069	3229	756	129049	322545	248159	177018	175935	339684	448309
33)Public administration	3535	478	312	48	2021	31485	7493	7669	8011	16536	13125
Total intermediate inputs	7299491	53122	26584	14570	916646	25622285	5344147	4644917	6084627	13234935	5861202
34)Depreciation of fixed capital	1868526	12110	13480	3068	203507	1055243	263459	236106	259600	1074095	3057535
35)Compensation for employees	1356257	47550	14328	14634	327097	4308374	1569272	1508746	1889101	3970271	1263932
36)Welfare expenses	200963	16420	3372	2685	120489	1071241	204333	227234	299814	793418	360017
37)Operating surplus and taxes	6523710	-7307	29448	5250	339299	6787174	572234	835964	1022238	2296180	3078290
Primary inputs	9949456	68773	60628	25637	990392	13222032	2609298	2808050	3470753	8133964	7759774
Total inputs	17248947	121895	87212	40207	1907038	38844317	7953445	7452967	9555380	21368899	13620976

	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1)	0	0	144697	1027	0	0	18	309	192	0	0	0	123840	162323	1875	8437
2)	354	678238	17235	60921	27093	132	28	0	0	0	0	0	892	16	0	0
3)	4589146	249536	15871	473	5338	155	318	240	54	32	0	0	0	0	0	0
4)	0	0	25963	4314	1169997	0	0	0	0	0	0	0	0	0	0	0
5)	-23368	189	44580	956450	31508	3288	3700	0	0	0	46	0	95421	1070225	0	0
6)	102	0	166171	4238	0	0	33	0	0	19	0	0	1145	0	6720	14900
7)	1	2	139788	13016	1	3261	2370	94129	19178	8307	398	935	149613	179228	16555	118776
8)	256	2562	23912	20546	10158	29075	58450	21278	29048	52823	27096	1046	118870	74985	43159	206198
9)	174	1369	37117	66712	11944	53278	113623	52503	41042	95461	3050	3903	167408	4295753	34904	371906
10)	2061	24255	615394	194542	19402	175374	253392	107765	252199	420957	25354	1971	300733	665273	236399	2076852
11)	54667	46779	1114631	306759	961733	327762	457317	283067	181038	334867	19416	9724	127419	420965	224528	831077
12)	188155	96536	1141314	341720	95876	95990	102471	50553	76803	40210	5440	5246	149777	775041	966218	740779
13)	2	123712	121416	41062	876096	24490	127665	19482	9417	9135	797	1016	27089	44504	10060	32130
14)	28231	4980	14255983	281278	179349	263093	1280764	2010979	994322	1382376	51776	47185	802116	1817294	36828	300068
15)	388	510	212383	1132996	150643	91130	205438	289706	156997	364580	75887	4191	77539	6333396	2059	61740
16)	0	0	148397	161754	13352286	5557163	1994489	843898	1531529	404513	51126	42421	217946	2253454	0	33009
17)	18333	8635	402169	104808	17173	2527709	2239645	1065593	967695	851084	88264	48550	246721	8871913	25704	312821
18)	51	190	51766	26908	603	422680	9333931	3916131	483091	175858	37396	59937	32601	874283	2916	3735
19)	0	0	0	0	0	0	0	14044342	0	0	0	183220	0	0	55	24
20)	0	0	1112	54	335	27737	1444570	1437081	3034308	1357648	24952	16470	73631	1666329	2346	21612
21)	24	24	375	16	137	48700	746873	427950	447974	9687781	91865	2622	76329	82744	636	12407
22)	0	0	0	0	0	352	198133	22826	17927	26551	263514	114	761	0	316	156340
23)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162897	0
24)	1486	31225	366337	240018	176521	210717	316026	79225	113581	204068	21493	10740	150238	1859659	144651	483201
25)	13782	45807	229638	136955	182613	142802	152554	71276	73825	152601	15489	7557	23192	3640507	215143	598141
26)	90337	103596	752810	465370	378422	428343	512050	402583	205500	281959	24161	10102	161482	2071394	2843502	2101000
27)	184494	102613	1381054	478915	1040573	1004285	1993173	1854295	942181	1451627	101487	39691	475928	5048047	424511	1816338
28)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29)	8935	9064	123713	42082	28238	127301	100645	33350	38268	144946	8165	1101	30816	207471	126653	1060695
30)	23717	51969	428270	144021	137169	195715	359935	127925	165752	237416	26221	6441	245400	705433	658627	4881503
31)	115557	231175	3439953	621710	699357	1063577	2700951	2278133	1474526	4670048	251162	17561	833854	4402604	1838888	6200914
32)	160596	58581	724293	265814	348765	367626	552588	286057	158374	263391	47965	16396	227238	1513772	742349	3657822
33)	4136	6975	48209	11200	17109	35175	56207	10297	10098	23505	945	380	287024	102108	31590	60217
	5461617	1878522	26174451	6125679	19918439	13226910	25307357	29830973	11424919	22641763	1263465	538520	5225023	49138721	8800088	26162642
34)	166611	339254	2702491	614454	1087041	1197174	2181119	1194524	971354	2229813	95105	44099	842100	3533611	3158758	3862308
35)	204107	358944	4973279	1960691	1870730	5121808	7453384	4115951	3103078	4128762	556054	212770	724056	23559740	10254011	38503798
36)	78658	82751	1332135	432034	406208	960431	1424382	732472	630055	1259742	100400	32214	247299	4393708	1317320	4967705
37)	3344541	470994	4867759	1459376	2628299	2503997	4893986	2539734	2276730	3596847	355817	40276	1396906	13145136	3137305	11873606
	3793917	1251943	13875664	4466555	5992278	9783410	15952871	8582681	6981217	11215164	1107376	329359	3210361	44632195	17867394	59207417
	9255534	3130465	40050115	10592234	25910717	23010320	41260228	38413654	18406136	33856927	2370841	867879	8435384	93770916	26667482	85370059



	28	29	30	31	32	33	Total inter- mediate use	Consumption of households	Institutional consumption	Fixed capita formation	Change in stocks	Net exports	Total of final use	Gross output
1)	639050	0	173953	264969	0	1506	15426877	4318998	115510	282510	20547	-2916812	1822070	17248947
2)	115	11	853	4329	0	88	1074662	300	0	0	-25136	-927932	-952767	121895
3)	0	0	0	0	0	252	2207602	0	0	0	12717	-6132107	-6120390	87212
4)	0	0	0	0	0	414	1200526	0	0	0	-21759	-1138591	-1160319	40207
5)	0	0	0	124	0	7555	13619094	27950056	0	-9452	3630	-293762	-299322	1907038
6)	4342769	0	705765	1210305	0	14850	5545562	2847393	117566	121429	-28371	-4170680	25225223	38844317
7)	3162	3763	49538	103634	0	140366	1662700	2789748	176754	200043	3376	-500233	2407883	7953445
8)	5018	28788	61147	233643	36655	140366	1662700	6758748	176754	200043	72404	-1419825	5790267	7452967
9)	72568	7914	94511	304307	63553	125441	8125862	712902	89438	1577604	107350	-1059341	1429518	9555380
10)	87649	64504	224960	3867267	898750	564707	19322359	1600899	363207	287421	17822	-234288	2046540	21368899
11)	181273	299907	731676	1571747	74631	259927	10068555	3535343	1068	0	0	18010	3554421	13620976
12)	56826	259741	468957	670532	22097	200106	8171595	2796911	23440	0	81477	-1821195	1083939	9255534
13)	83805	6632	75869	115985	11106	15029	2045719	1054972	1661	0	18480	9078	1084746	3130465
14)	45623	4808	549866	5974370	50637	100756	35153179	3782636	311471	0	131388	613273	4896936	4050115
15)	90866	284	62920	172283	0	13511	9949118	365993	53653	0	90815	124936	643116	10050234
16)	0	0	522	9826	0	68	26739694	154281	2133	-192722	164961	-1006378	-828977	25910717
17)	63009	2691	62673	212419	763	123720	19750870	426590	59162	2154389	274332	328281	3259450	23010320
18)	891	1194	26919	1923100	900	456595	17997324	772634	45667	15812237	751044	5798594	23262904	41260228
19)	0	0	0	1608839	0	458301	16294781	5746453	0	7658342	266034	8273973	22118873	38413654
20)	860	2224	3116	539521	0	26126	9706799	2884350	143327	3848765	101911	1695841	8699337	18406136
21)	0	321	368	920357	4941	204064	12336567	2828420	151113	10210890	300470	7329127	20820360	33856827
22)	0	89	2667	21381	0	7881	719127	302317	657	976482	46521	320551	1651714	2370841
23)	0	449408	0	1199	0	95357	785416	0	0	0	0	82463	82463	867879
24)	259661	48739	929170	1072243	140048	161216	7893361	1356623	188777	532757	30508	-1568788	542023	8455384
25)	62823	197687	2527722	1151999	501706	508994	11450236	2146	0	82359177	0	-40643	82320680	93770916
26)	286533	486541	488026	1901287	565737	428290	17413237	6329037	158877	640366	25816	2101612	9253708	26666945
27)	1420739	55456	656616	3670180	114209	421954	31732889	39381475	1863650	10495040	146160	1750845	53637170	85370059
28)	0	0	0	0	0	0	0	11162230	7804579	0	0	-693631	18273178	8727178
29)	43132	340990	291880	574522	290923	204546	4102663	5391140	31284	0	0	-585203	483721	7952988
30)	607836	210784	1660569	3170308	921518	744089	16613460	56388825	3973105	0	0	-1346403	59015527	86939847
31)	654271	644397	2323275	14692585	2820493	2015012	59751100	44254445	20582396	1771722	27662	-796366	65840323	125591423
32)	156309	1407470	3929472	2783184	2699304	165799	22982371	8592910	245	0	0	-323983	8269172	31251543
33)	28779	5347	109427	341034	70750	433	1351658	2276934	21261337	0	0	11695	23549966	24901624
34)	9193367	4529971	16212437	49087459	9288721	7465853	417993323	243775951	58985426	138727000	2620159	1481128	446156953	864156276
35)	706914	1882400	14942725	10492101	1813543	713704	62819932	15316998	215973607	0	0	0	0	0
36)	5314329	2062652	12295782	45374292	12233943	15316998	215973607	1275554	33857595	0	0	0	0	0
37)	753056	381944	1932498	5927604	1889439	1275554	33857595	129815	133505819	0	0	0	0	0
38)	2305512	82480	30245545	14709967	6018711	129815	133505819	17435771	446156953	0	0	0	0	0
39)	9079811	4409476	59416550	76503964	21962822	17435771	446156953	24901624	864156276	0	0	0	0	0
40)	18273178	8939347	75628987	125591423	31251543	24901624	864156276	0	0	0	0	0	0	0

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