

Chapter 5

Summary and Conclusions

Summary and Conclusions

(1) Purpose of the Project: Three Basic Requirements for Planning Framework

The IOPM project started in April 1995. The main purpose was to construct a suitable quantitative framework to prepare a double-track economic planning system: medium-term plan and long-term plan. When the government prepares a series of medium-term five years plan on one hand, and a long-term plan on the other, it is highly desirable to prepare figures which satisfy three conditions: feasibility, consistency and optimality. Each planned figure must be feasible so that it satisfies structural constraints. All the planned figures must be consistent, so that their implications are in harmony. Finally the planned figures must be optimal so that they achieve the development targets as closely as possible. When the Government of Indonesia (GOI) prepares a series of Five Year Plans (Replitas) and Twenty-five Year Plans (PJP II), such a quantitative framework is expected to check the consistency between targets and constraints, to confirm the feasibility of planned figures, and to show the optimality of planned figures in achieving the development targets.

(2) Proposed Framework: IOPM (National Basis and Two-Regions)

After JICA was asked to prepare such a quantitative framework, the JICA Study Team proposed, as a useful tool for this purpose, an Input-Output Multi-Periods Programming Model (IOPM). This model is based on I-O Table of 1993 with 28 sectors, and considers three main structural constraints of capital, skilled labor and foreign currency. It then calculates the optimum growth path of the Indonesian economy, which maximizes a weighted sum of consumption stream and capital stock in the final period. Actually, the Study Team constructed two versions of this IOPM: one on a national basis and another on a two-region basis. The IOPM on the national basis contains 650 variables of 5 types (output, consumption, investment, export and import for final demand), 26 sectors, and 5 periods (five consecutive periods of five years). It calculates the optimum values of these variables simultaneously. The IOPM on the two-region basis divides Indonesia into two: Java and Outside Java, so that the number of variables is about doubled, and calculates the optimum values of the variables of both regions to maximize the set target. In these exercises, the targeted questions to be answered were: what are the feasible and optimum growth paths in PJP II period on a national basis; are the planned figures consistent and feasible; what are the adequate planned figures in the coming Repelita VII period; and what is the well-balanced pattern of regional development in the PJP II period.

(3) Influence of Recent Economic Crisis

As the current economic crisis erupted in the summer of 1997, the JICA Study Team was additionally asked to take into consideration the impact of the shock, and to recalculate the future growth path. The Study Team implemented this additional information based into both the national basis and two-region basis IOPM models. The main projections are summarized below as classified into four combinations: national versus two-region basis, and with and without economic crisis.

1) Main Results (National IOPM): Development Path without Economic Crisis

It was postulated that the skilled labor could shift from the agricultural sector to the non-agricultural sector only gradually while the constraints of capital and foreign currency were levied nationwide; the foreign currency earning by export sectors could be utilized to import by other sectors or for final demand use. In the optimum growth path, limited resources such as labor, capital, and foreign currency, were found to be fully utilized based on technological changes, changes of sectoral decomposition, and intersectoral resource movements. Based on various experiments, the feasibility and optimality of a rapid development path with an average growth rate of 8.6 percent was ascertained (experiment Case 4). In that case, based on a strong industrialization trend, the per capita GDP of Indonesia will reach 3,800US\$ by year 2018 at the end of PJP II period. This is similar to the current per capita GDP of Brazil. In addition, the GDP share of the manufacturing sector will increase from 22.0% to 37.6%. As a whole, it was concluded that the development path scheduled in PJP II Plan is basically attainable, and the economy of Indonesia will successfully catch up with the middle-income group of developing countries. These results were reported at the end of 1996.

2) Main Results (National IOPM): Development Path with Economic Crisis

We considered several cases of changing future exchange rate. In Case B1-44, the rate is scheduled to change from 2,087Rp/\$ in 1993 to 5,805Rp/\$ in 2018. We revised the model in various aspects: (i) the initial conditions (the values of the first period) were adjusted under the consideration of the influence of recent economic crisis; (ii) the future export and import prices were changed based on the pass-through effects due to the change of the future exchange rate; and (iii) the nominal foreign currency constraints in future periods were revised accordingly. The loss of economic growth, or the social cost of the economic crisis due to deterioration of the exchange rate is clearly seen by lowering the overall growth rate and by slowing down the speed of

industrialization. The average growth rate decreased by 2.0% from 8.6% to 6.6% after the shock (Case B1-44). The GDP share of manufacturing decreased from 37.6% to 34.4% after the shock. The per-capita real GDP level (1993 price) in 2018 with the shock was similar to that of 2013 without the shock. This implies a delay of economic growth by 5-6 years. The loss in nominal terms would be far bigger because of the quick deterioration of the exchange rate after 1997 will persist for some years before regaining the previous level.

3) Main Results (Two-Region IOPM): Development Path without Economic Crisis

The average growth rate in PJP II period was 7.6%(Java), 10.2%(Outside Java) and 8.9%(Indonesia) when skilled labor is mobile between regions. This is roughly comparable with the average growth rate of the national IOPM. However with the limitation of interregional labor movement, the growth rate of Java increased to 9.2%, while that of Outside Java decreased to 8.5%. The overall growth rate of Indonesia remained the same. The fact that the growth rate of Outside Java is bigger (smaller) than that of the national average when the labor is (not) freely mobile implies: (i) the increase of interregional resource movement accelerates the development of the national economy; and (ii) Outside Java region has a better potential capacity of development when capital, labor and foreign currency are freely mobile. In other word, the resource allocation is over-concentrated in Java region.

4) Main Results (Two-Region IOPM): Development Path with Economic Crisis

In this model the exchange rate changes from 2,087Rp/\$ in the first period, to 7,000Rp/\$ in the third period and after. The national average growth rate decreased to 7.3% from 8.9% in the standard case without shock. The Java rate drastically decreased from 9.2% to 4.6%, while that of Outside Java slightly increased from 8.5% to 9.5%. This implies that (i) Indonesia as a whole incurred considerable damage due to the shock, but (ii) Outside Java gained while Java was damaged. In Outside Java, the manufacturing sector, especially the resource-based industries, drastically increased their share of GDP. This reflects the fact that the big depreciation of the exchange rate damages the import-dependent manufacturing sector, while it favors the exporting industries mainly based on domestic resources, which are mainly located in outer regions.

(4) Additional Tasks

The current exercise proved that the IOPM is a useful tool for checking feasibility, consistency and optimality of medium-term plans (such as Repelita VII) and long-term plans (such

as PJP II). There are two groups of additional tasks: 1) extension and improvement of the current IOPM, and 2) deeper and more comprehensive analysis of the current economic crisis.

1) The Extension and Improvement of Current IOPM

(i) Use of I-O Table 1995

The current IOPM was based on I-O Table of 1993, which is a tentative table, and did not divide the technical coefficients into domestic and imported components. This separation was made only in I-O Table of 1990. It has, thus, been impossible to project the changing trend of import coefficients for the future. Comparing the 1995 Table with the 1990 Table, we can adequately project the import coefficients, and assess the trend of import substitution and related matters.

(ii) Extension of Two-Region Table to Five-Region Table

The current two-region IOPM divides Indonesia into Java and Outside Java. It is highly desirable to construct a five-region IOPM, and to assess issues like Transmigration problem, and interregional equity issue.

2) Comprehensive Analysis of Current Economic Crisis

As a result of current economic crisis, proposed two additional tasks are needed to respond to the planning needs under the new environment: short-term crisis management, and medium-term and long-term debt management.

(i) Short-Term Crisis Management (Stopping Economic Free Fall)

One of the result of the social safety net needed for vulnerable groups is an addition to the acceleration of inflation, which gives pressure for further exchange rate depreciation. What measures are effective to cut such a vicious cycle, and stop the free fall of the economy? This task urges the use of various short-term models.

(ii) Medium-Term and Long-Term Debt Management

The external (official and private) and also domestic (government) debts are accumulating,

and pose a tremendous pressure of debt servicing in the future. What are the relations between short-term and long-term capital movements and the exchange rate? What is the relation between debt management and the real economy ? What measures are effective to dispose of accumulated debts? What is the long-term cost of the disbursement of current subsidies in the future?

3) Necessity of a Combined Use of IOPM and Short-Term Models and Debt Model

These discussions urge three considerations: (i) new models are necessary to assess the short-term problems and debt issues; (ii) the treatment of short-term problems needs to be assessed also from the long-term point-of-view; and (iii) an adequate combined use of these models with IOPM will be very useful to assess currently important issues (like fiscal stance, inflation, adequate level of exchange rate, social safety nets, employment creation, and others) in a comprehensive manner.

APPENDIX

LIST OF APPENDIX

Appendix 1:Relationship between 28 and 161 Sector I-O Classification	1
Appendix 2:I-O Table of 1993 by 26 Sectors at 1993 Price	3
Appendix 3:Input Coefficients for National IOPM	4
Appendix 4:Leontief Inverse Matrices for National IOPM	9
Appendix 5:Inter-Regional I-O Table of 1993 by 26 Sectors at 1993 Price	14
Appendix 6:Regional Input Coefficients of both Java and Outside Java	17
Appendix 7:Inter-Regional Input Coefficients by 2 Regions (Java and Outside Java) ...	23
Appendix 8:Leontief Inverse Matrices for Two-Region IOPM	35
Appendix 9:Optimum Solutions of National IOPM	47
Appendix 10:Optimum Solutions of Two-Region IOPM	83
Appendix 11:Optimum Solutions of National IOPM under the Current Economic Crisis	91
Appendix 12:Optimum Solutions of Two-Region IOPM under the Current Economic Crisis	97

Appendix 1

Relationship between 28 and 161 Sector I-O Classification

Table 1 The Relationship between 28 and 161 Sector I-O Classification

I-O Code	28 Sector I-O Classification	I-O Code	161 Sector I-O Classification		
1	Farm food	1	Paddy		
		2	Maize		
		3	Cassava		
		4	Other Root Crops		
		5	Groundnut		
		6	Soybeans		
		7	Other Beans		
		8	Vegetables		
		9	Fruits		
		10	Cereals and other Food Crops		
2	Estate crops	11	Rubber		
		12	Sugarcane		
		13	Coconut		
		14	Oil Palm		
		15	Fiber Crops		
		16	Tobacco		
		17	Coffee		
		18	Tea		
		19	Clove		
		20	Other Estate Crops		
		21	Other Agriculture		
3	Livestock	22	Livestock and Livestock Product Except Fresh Milk		
		23	Fresh Milk		
		24	Poultry and Its Product		
		25	Other Livestock Raising		
4	Forestry	26	Wood		
		27	Other Forest Products		
		28	Hunting Products		
5	Fishery	29	Sea Fish and Other Sea Products		
		30	Inland Water Fish and Its Product		
		31	Drying and Salting of Fish		
6	Crude Oil & Natural Gas	33	Crude Oil		
		34	Natural Gas and Geothermal		
7	Non Crude Oil & Natural Gas	32	Coal		
		35	Tine Ore		
		36	Nickel Ore		
		37	Bauxite Ore		
		38	Copper Ore		
		39	Gold and Silver Ore		
		40	Other Mining		
		41	Chemical and Fertilizer Mineral		
		42	Crude Salt		
		43	Quarrying, All Kinds		
		8	Food Processing	44	Meat and Entrails of Slaughtered Animal
				45	Processed and Preserved Meat
				46	Dairy Products
47	Canning and Preserving of Fruits and Vegetables				
48	Processed and Preserved Fish				
49	Copra, Animal oil and Vegetable Oil				
50	Rice				
51	Wheat Flour				
52	Flour except Wheat Flour, Milled Cereals and Peeled Root				
53	Bakery Product and The Like				
54	Noodle, Macaroni and The Like				
55	Sugar				
56	Peeled Grain, Chocolate and Sugar Confectionery				
57	Milled and Peeled Coffee				
58	Processed Tea				
59	Soya Bean Products				
60	Other Foods				
61	Animal Feeds				
62	Alcoholic Beverages				
63	Non-Alcoholic Beverages				
64	Tobacco Products				
65	Cigarettes				
9	Textile	66	Yarn and Cleaning Kapok		
		67	Textile		
		68	Made up Textile Goods except Wearing Apparel		
		69	Knitting Mills		
		70	Manufacture of Wearing Apparel		
		71	Manufacture of Carpet, Rope, Twine and Other Textile		
		72	Leather Tanneries and Leather Finishing		
		73	Manufacture of Footwear and Leather Products		
10	Wood Processing	74	Sawmill and Preserved Wood		
		75	Manufacture of Plywood and The Like		
		76	Wooden Building Components		
		77	Manufacture of Furniture and Fixture Mainly Made of Wood, Bamboo, Rattan and Cork		
		78	Manufacture of Other Products Mainly Made of Wood, Bamboo and Rattan		
		79	Manufacture of Non-Plastic Plait		
11	Paper & Printing	80	Pulp		
		81	Paper and Cardboard		
		82	Paper and Cardboard Products		
		83	Printing and Publishing		

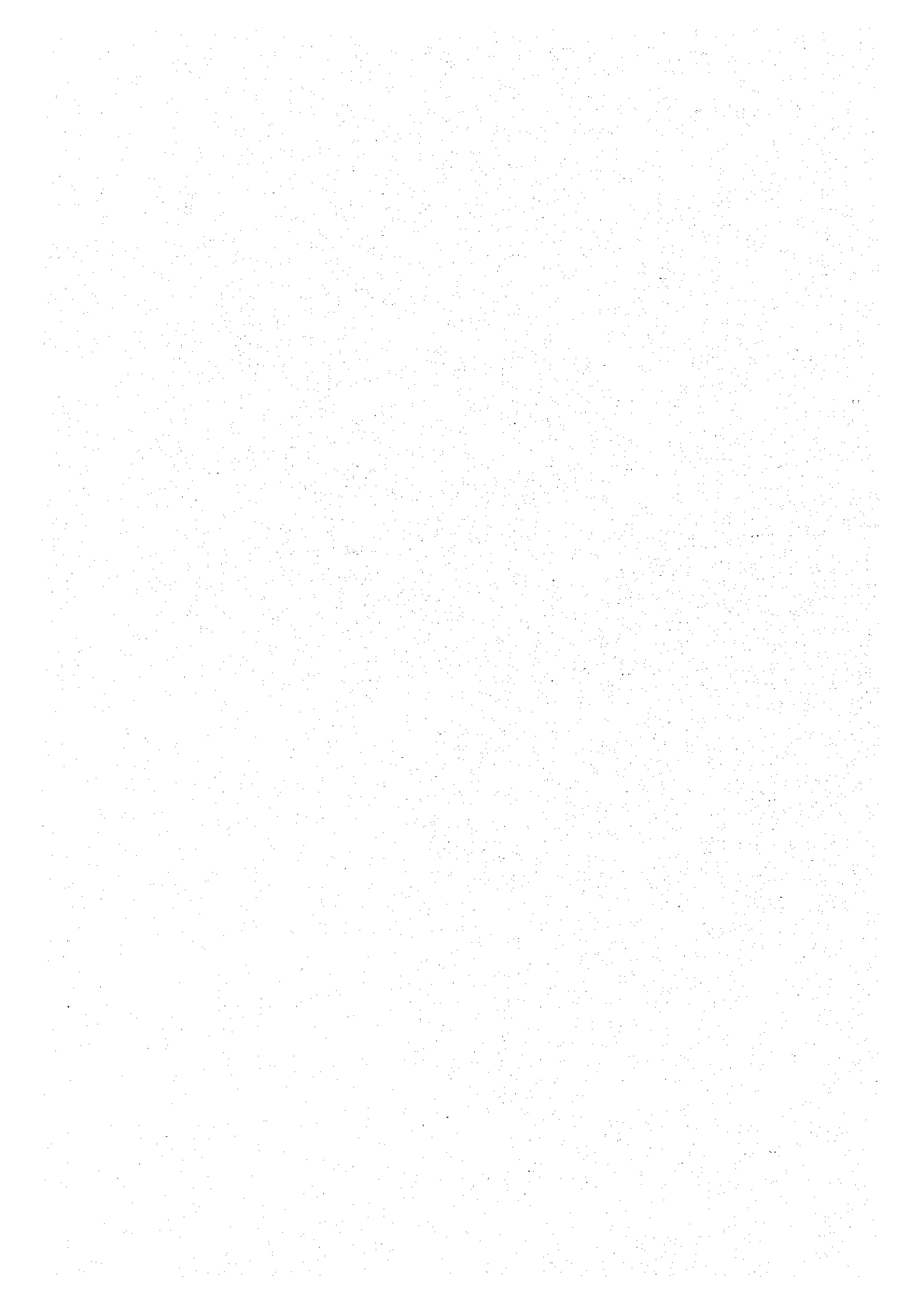
12	Chemical & Rubber	84	Basic Chemical except Fertilizer
		85	Fertilizer
		86	Pesticides
		87	Synthetic Resins, Plastic, and Fiber
		88	Paints, Varnishes and Lacquers
		89	Drugs and Medicine
		90	Native Medicine
		91	Soap and Cleaning Preparation
		92	Cosmetics
		93	Other Chemical Products
		94	Petroleum Refineries Products
13	Non Metallic Mineral	95	Liquefied of Natural Gas
		96	Smoked and Crumb Rubber
		97	Tire
		98	Other Rubber Products
		99	Plastic Products
14	Iron & steel	100	Ceramic and Earthenware
		101	Glass Products
		102	Clay and Ceramic Structural Products
		103	Cement
15	Non Ferrous Metallic Basic Products	104	Other Non-Ferrous Products
		105	Basic Iron and Steel
16	Fabricated Metal Products	106	Basic Iron and Steel Products
		107	Non-Ferrous Basic Metal
17	Machine & Electric Machine	108	Non-Ferrous Basic Products
		109	Kitchen Wares, Hand Tools and Agricultural Tools
		110	Furniture and Fixture Primarily Made of Metal
		111	Structural Metal Products
		112	Other Metal Products
18	Transport Equipment	113	Prime Movers Engine
		114	Machinery and Apparatus
		115	Electric Generator and Electrical Motor
		116	Electrical Machinery and Apparatus
		117	Communication Equipment and Apparatus
		118	Household Electronics Appliances
		119	Other Electrical Appliances
		120	Battery
19	Other Manufacturing	121	Ship and Its Repair
		122	Train and Its Repair
		123	Motor Vehicle except Motor Cycle
		124	Motor Cycle
		125	Other Transport Equipment
		126	Air craft and Its Repair
20	Electricity, Gas, Water Supply	127	Measuring, Photographic and Optical Equipment
		128	Jewelry
		129	Musicals Instruments
		130	Sporting and Athletics Goods
		131	Other Manufacturing Industries
21	Construction	132	Electricity and Gas
		133	Water Supply
		134	Residential and Non Residential Buildings
		135	Construction on Agriculture
22	Wholesale & Retail Trade	136	Public Work on Road, Bridge and Harbor
		137	Construction and Installation on Electricity, Gas, Water supply and Communication
		138	Other Construction
		139	Trade
		140	Restaurant
23	Restaurant, Hotel	141	Hotel
		142	Railway Transport
24	Transportation	143	Road Transport
		144	Sea Transport
		145	River and Lake Transport
		146	Air Transport
		147	Services Allied to Transport
		148	Communication Services
		149	Banking and Other Financial Intermediaries
		150	Insurance
25	Banking & Other Finance	151	Real Estate and Dormitory
		152	Business Services
		153	General Government
		154	Education Services
26	Public Administration, Defense	155	Health Services
		156	Other Community Services
		157	Motion picture and Its Distribution
		158	Amusement, Recreational and Culture Services
		159	Repair Shops N.E.C
		160	Personal And Household Services
		161	Other Goods and Services N.E.C
27	Other Services	161	Other Goods and Services N.E.C
28	Non specified Sector	161	Other Goods and Services N.E.C

Appendix 2

I-O Table of 1993 by 26 Sectors at 1993 Price

Appendix 3

Input Coefficients for National IOPM



Appendix 4

Leontief Inverse Matrices for National IOPM

Table 4-4 Leontief Inverse Matrix for the 4 th Period (U-A+m)⁻¹

1	0.02268	0.00124	0.04891	0.00114	0.00543	0.00027	0.00665	0.01610	0.00156	0.00211	0.00042	0.00169	0.00071	0.00073	0.00032	0.00036	0.00019	0.00034	0.00147	0.00042	0.00079	0.00128	0.00143	0.00174	0.00101	0.00648
2	0.01675	1.15620	0.02727	0.00173	0.00237	0.00029	0.00094	0.02718	0.00752	0.00130	0.00190	0.04115	0.00156	0.00027	0.00038	0.00004	0.00007	0.00063	0.00762	0.00245	0.00076	0.00086	0.01515	0.00084	0.00044	0.00148
3	0.01233	0.00306	1.05117	0.00114	0.00248	0.00028	0.00066	0.06592	0.00254	0.00158	0.00031	0.00156	0.00123	0.00095	0.00035	0.00038	0.00019	0.00039	0.01045	0.00038	0.00067	0.00109	0.05783	0.00163	0.00104	0.00396
4	0.00103	0.00399	0.00559	1.01664	0.00098	0.00019	0.00264	0.00214	0.00109	1.05752	0.00432	0.00080	0.00097	0.00027	0.00043	0.00161	0.00024	0.00314	0.00379	0.00093	0.00251	0.00083	0.00356	0.00087	0.00098	0.00142
5	0.00150	0.00146	0.01620	0.00089	1.41525	0.00081	0.00186	0.06070	0.00124	0.00372	0.00073	0.00309	0.00187	0.00305	0.00101	0.00110	0.00052	0.00101	0.00203	0.00097	0.00188	0.00310	0.17758	0.00353	0.00295	0.00665
6	0.01621	0.01046	0.00249	0.00150	0.00168	1.00017	0.00082	0.00361	0.00250	0.00074	0.00305	0.04416	0.00080	0.00365	0.00029	0.00034	0.00002	0.00030	0.00041	0.00022	0.00025	0.00050	0.00176	0.00040	0.00011	0.00007
7	0.00276	0.00146	0.00319	0.00079	0.00253	0.00065	1.02019	0.00308	0.00244	0.00274	0.00353	0.00659	0.07961	0.02889	0.13518	0.02276	0.00319	0.00578	0.02145	0.00176	0.00316	0.00467	0.23236	0.00781	0.00435	0.01401
8	0.00622	0.00541	0.26595	0.00462	0.02998	0.00114	0.00274	1.05524	0.00947	0.01123	0.00218	0.00804	0.00325	0.00390	0.00142	0.00161	0.00087	0.00157	0.00826	0.00176	0.00316	0.00467	0.23236	0.00781	0.00435	0.01401
9	0.00056	0.00055	0.00298	0.00217	0.01147	0.00277	0.00123	0.00063	1.32767	0.00572	0.00062	0.00254	0.01051	0.00027	0.00029	0.00076	0.00092	0.00224	0.00685	0.00110	0.00059	0.00308	0.00711	0.00419	0.00125	0.02326
10	0.00172	0.00119	0.00414	0.00225	0.00552	0.00053	0.00269	0.00150	0.00253	1.20826	0.00119	0.00129	0.00273	0.00051	0.00057	0.01039	0.00113	0.01223	0.01009	0.00190	0.08926	0.00253	0.00219	0.00250	0.00231	0.00276
11	0.00850	0.01172	0.02103	0.02656	0.01015	0.00334	0.00827	0.06002	0.00915	0.01409	1.42310	0.01549	0.07623	0.00077	0.00558	0.01096	0.00566	0.00428	0.00813	0.01265	0.01399	0.06884	0.02462	0.02750	0.07096	0.17578
12	0.41154	0.26608	0.06445	0.03943	0.04384	0.00590	0.02145	0.09344	0.06430	0.02000	0.05459	1.12101	0.03796	0.01314	0.00822	0.00379	0.00055	0.01394	0.00916	0.06469	0.01585	0.01587	0.04745	0.01211	0.00502	0.00689
13	0.00088	0.00083	0.00057	0.00081	0.00057	0.00001	0.00033	0.00081	0.00109	0.00055	0.00021	0.00238	1.06627	0.00457	0.00033	0.00074	0.00241	0.00756	0.00374	0.00067	0.00517	0.00026	0.00038	0.00023	0.00014	0.00058
14	0.00126	0.00364	0.00178	0.00611	0.00345	0.00109	0.00274	0.00139	0.00073	0.00250	0.00044	0.00201	0.00168	1.34098	0.00103	0.06291	0.01023	0.08910	0.01015	0.00396	0.15520	0.00236	0.00233	0.00608	0.00417	0.00891
15	0.00117	0.00244	0.00096	0.00719	0.00183	0.00038	0.00236	0.00116	0.00076	0.00211	0.00071	0.00144	0.00087	0.00192	1.23031	0.17376	0.02013	0.01500	0.18374	0.00342	0.03163	0.00090	0.00131	0.00198	0.00169	0.00764
16	0.00424	0.00938	0.00276	0.01205	0.00425	0.00083	0.00263	0.00264	0.00136	0.00459	0.00221	0.00290	0.00131	0.00545	0.00070	0.99520	0.00411	0.02324	0.01256	0.00290	0.08854	0.00162	0.00333	0.00030	0.00417	0.00891
17	0.00898	0.01292	0.00812	0.19822	0.00905	0.00523	0.07955	0.01055	0.00840	0.04344	0.00270	0.02167	0.01820	0.03031	0.01566	0.00832	0.94933	0.03817	0.00695	0.12414	0.05483	0.00792	0.01167	0.01487	0.02097	0.03720
18	0.00176	0.00261	0.00211	0.00421	0.02788	0.00068	0.00238	0.00341	0.00086	0.00432	0.00074	0.00364	0.00191	0.00083	0.00073	0.00119	0.00097	1.03506	0.00102	0.00256	0.00194	0.00287	0.00574	0.03351	0.00216	0.06178
19	0.00042	0.00079	0.00043	0.00245	0.00075	0.00011	0.00020	0.00037	0.00138	0.00069	0.00035	0.00093	0.00038	0.00020	0.00049	0.00079	0.00039	0.00327	0.99925	0.00026	0.00042	0.00088	0.00073	0.00161	0.00159	0.00613
20	0.01024	0.00998	0.01593	0.01082	0.00648	0.00137	0.00498	0.01508	0.01423	0.01343	0.01410	0.02498	0.05239	0.12569	0.01566	0.02256	0.00457	0.02212	0.01141	1.24540	0.02304	0.03759	0.04322	0.02081	0.01773	0.03222
21	0.00475	0.01783	0.00890	0.01957	0.00629	0.00652	0.01039	0.00588	0.00298	0.00627	0.00125	0.00788	0.00767	0.00407	0.00331	0.00424	0.00143	0.00313	0.00184	0.01529	1.00610	0.01296	0.01007	0.01910	0.02594	0.00930
22	0.02140	0.02961	0.04816	0.02946	0.03864	0.00350	0.02411	0.02978	0.01268	0.04536	0.01030	0.03037	0.02509	0.02653	0.01443	0.01946	0.01501	0.02037	0.01284	0.04024	1.04604	0.01247	0.03926	0.02737	0.01006	0.02611
23	0.00660	0.00635	0.00463	0.01602	0.00680	0.00440	0.00989	0.00758	0.00412	0.01800	0.00350	0.01537	0.00999	0.01829	0.00559	0.00660	0.00276	0.00549	0.00653	0.00479	0.01016	0.01679	1.00570	0.01553	0.01589	0.00584
24	0.03441	0.04865	0.04706	0.06870	0.05188	0.00623	0.05351	0.05655	0.01987	0.11282	0.01554	0.07183	0.05146	0.05140	0.02371	0.03697	0.02491	0.03459	0.02041	0.06180	0.06482	0.06418	1.20731	0.03521	0.04398	0.03146
25	0.04360	0.04354	0.03237	0.07145	0.03898	0.03271	0.02524	0.06150	0.01594	0.04743	0.01167	0.05867	0.03099	0.03060	0.01210	0.02202	0.01136	0.02176	0.01677	0.02915	0.02476	0.05566	0.04638	1.08820	1.08820	0.03146
27	0.01134	0.02036	0.01109	0.04048	0.01101	0.00483	0.01323	0.01405	0.00509	0.03345	0.00602	0.02125	0.00943	0.03608	0.00168	0.00409	0.00255	0.00324	0.00785	0.01550	0.00452	0.01663	0.01253	0.05429	0.02022	1.00733

Note: U=Identity Matrix, A=Input Coefficient, m=Import Coefficient Matrix

Table 4-5 Leontief Inverse Matrix for the 5 th Period $(U - A + m)^{-1}$

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	27
1	1.02550	0.00113	0.04559	0.00085	0.00402	0.00021	0.00050	0.13007	0.00102	0.00159	0.00030	0.00136	0.00049	0.00042	0.00022	0.00013	0.00023	0.00103	0.00039	0.00038	0.00059	0.00082	0.04129	0.00137	0.00077	0.00554
2	0.01635	1.17174	0.02403	0.00083	0.00132	0.00021	0.00041	0.01907	0.00590	0.00052	-0.00159	0.03450	0.00067	-0.00064	0.00014	-0.00009	0.00030	0.00030	0.00544	0.00119	0.00017	0.00052	0.01211	0.00008	0.00026	0.00094
3	0.01419	0.00317	1.06015	0.00094	0.00204	0.00025	0.00055	0.05954	0.00221	0.00129	0.00023	0.00122	0.00107	0.00065	0.00025	0.00014	0.00029	0.00083	0.00030	0.00030	0.00052	0.00090	0.05071	0.00144	0.00007	0.00370
4	0.00099	0.00391	0.00345	1.01453	0.00999	0.00014	0.00242	0.00204	0.00069	0.11506	0.00372	0.00067	0.00785	0.00017	0.00031	0.00010	0.00244	0.00298	0.00075	0.00075	0.00030	0.00052	0.00064	0.00066	0.00074	0.00127
5	0.00235	0.00215	0.02299	0.00396	1.57413	0.00109	0.00242	0.07639	0.00136	0.00456	0.00083	0.00423	0.00219	0.00351	0.00112	0.00061	0.00118	0.00220	0.00115	0.00232	0.00032	0.00097	0.24293	0.00456	0.00382	0.00745
6	-0.02314	-0.01452	-0.00266	-0.00092	-0.00126	1.00006	-0.00044	-0.00379	-0.00246	-0.00069	-0.00334	-0.05439	-0.00041	-0.00048	-0.00012	-0.00048	-0.00023	-0.00023	0.00132	-0.00023	0.00021	-0.00037	-0.00179	0.00043	-0.00001	-0.00319
7	0.00337	0.00375	0.00323	0.00342	0.00244	0.00057	1.02365	0.00295	0.00201	0.00232	0.00307	0.00709	0.00470	0.02464	0.00161	0.00201	0.00790	0.00493	0.01360	0.00142	0.00267	0.00422	0.22360	0.00734	0.00398	0.01199
8	0.00738	0.00570	0.29854	0.00410	0.02506	0.00108	0.00248	1.04122	0.00748	0.01034	0.00185	0.00765	0.00271	0.00395	0.00114	0.00114	0.00072	0.00127	0.00706	0.00142	0.00267	0.00422	0.22360	0.00734	0.00398	0.01199
9	-0.00038	-0.00021	0.00379	0.00229	0.01492	0.00282	0.00130	0.01104	1.26854	0.00596	0.00054	-0.00188	0.00101	-0.00068	0.00024	0.00073	0.00086	0.00211	0.07745	0.00122	0.00044	0.00323	0.00823	0.00437	0.00129	0.02862
10	0.00179	0.00278	0.00429	0.00192	0.00612	0.00046	0.00238	0.00141	0.00246	1.24730	0.00110	0.00119	0.00252	0.00036	0.00043	0.00076	0.00112	0.01176	0.00866	0.00167	0.07987	0.00234	0.00235	0.00228	0.00178	0.00253
11	0.01200	0.01538	0.02691	0.02784	0.01095	0.00425	0.00889	0.07018	0.00821	0.01307	1.32883	0.01867	-0.00075	-0.00075	0.00504	0.01018	0.00522	0.00395	-0.08696	-0.01303	-0.01335	-0.08602	-0.02687	0.03123	0.00435	0.21381
12	0.43745	0.27475	0.05091	0.01811	0.02415	0.00457	0.00861	0.07263	0.04680	0.00211	-0.01956	1.02800	0.01641	-0.02301	0.00259	-0.00091	-0.00362	0.00565	-0.02450	0.03364	0.00097	0.00887	0.03522	-0.00711	0.00166	-0.00438
13	0.00087	0.00072	0.00050	0.00074	0.00052	-0.00002	0.00025	0.00072	0.00095	0.00044	-0.00001	0.00205	-0.00366	0.00395	0.00027	0.00044	0.00194	0.00197	0.00457	0.00060	-0.01037	0.00018	0.00025	0.00014	0.00004	0.00040
14	0.00132	0.00424	0.00204	0.00629	0.00372	0.00127	0.00302	0.00132	0.00066	0.00211	0.00025	0.00220	0.00166	1.32747	0.00099	-0.01377	0.00941	0.07954	0.00804	0.00435	0.20343	0.00264	0.00552	0.00760	0.00440	0.00777
15	0.00152	0.00316	0.00120	0.01043	0.00222	0.00045	0.00316	0.00126	0.00071	0.00222	0.00071	0.00188	0.00087	0.00209	1.21697	0.20746	0.02438	0.01661	0.14190	0.00435	0.04136	0.00098	0.00154	0.00226	0.00180	0.00750
16	0.00461	0.01124	0.00293	0.01294	0.00664	0.00087	0.00270	0.00253	0.00124	0.00409	0.00200	0.00290	0.00117	0.00521	0.00061	0.99830	0.00387	0.02207	0.00990	0.00296	-0.10189	0.00164	0.00046	0.00030	0.00283	0.00541
17	0.01075	0.01424	0.00842	0.02634	0.00921	0.00500	0.00916	0.00985	0.00698	0.03975	0.00234	0.02268	0.01515	0.02628	0.01381	0.00611	0.90974	0.02810	0.00535	0.12985	0.04748	0.00070	0.01166	0.01368	0.01991	0.02550
18	0.00243	0.00342	0.00266	0.00394	0.03129	0.00068	0.00252	0.00378	0.00079	0.00402	0.00037	0.00458	0.00166	-0.00100	0.00062	0.00103	0.00092	1.01539	0.00075	0.00268	0.00174	0.00270	0.00709	0.04172	0.00021	0.05603
19	0.00046	0.00082	0.00042	0.00279	0.00075	0.00010	0.00015	0.00033	0.00127	0.00049	0.00030	0.00089	0.00032	0.00016	0.00045	0.00025	0.00050	0.00237	0.99499	0.00020	0.00036	0.00083	0.00070	0.00151	0.00154	0.00526
20	0.01344	0.01230	0.01767	0.01059	0.00628	0.00143	0.00481	0.01529	0.01213	0.01266	0.01212	0.02863	0.04975	0.10675	0.01341	0.01456	0.00406	0.01968	0.00921	1.28500	0.02426	0.04196	0.04614	0.02211	0.01875	0.03138
21	0.00508	0.01933	0.00870	0.01704	0.00607	0.00526	0.00945	0.00462	0.00249	0.00627	0.00096	0.00753	0.00633	0.00319	0.00265	0.00345	0.00114	0.00259	0.00123	0.01409	1.00504	0.01151	0.00921	0.01756	0.01985	0.00801
22	0.02223	0.02083	0.04317	0.02376	0.02873	0.00321	0.01953	0.02366	0.00918	0.01019	0.00745	0.03305	0.01710	0.01365	0.01026	0.01244	0.01079	0.01452	0.00838	0.03032	0.09316	1.01066	0.02967	0.02280	0.00846	0.01813
23	0.00770	0.00710	0.00460	0.01538	0.00674	0.00437	0.00954	0.00709	0.00354	0.01639	0.00296	0.01569	0.00863	0.01553	0.00478	0.00447	0.00542	0.00474	0.00506	0.00425	0.00998	0.01586	1.00540	0.01536	0.01518	0.00525
24	0.04671	0.06254	0.03030	0.06263	0.04847	0.00608	0.05085	0.05216	0.01594	0.09090	0.01064	0.08964	0.03769	0.03791	0.01778	0.02378	0.01958	0.02722	0.01312	0.05725	0.05255	0.05637	0.06093	1.21481	0.03288	0.05404
25	0.05630	0.05483	0.02296	0.06637	0.08699	0.03283	0.02390	0.05527	0.01260	0.03960	0.00832	0.06911	0.02471	0.02421	0.00785	0.01549	0.00942	0.01722	0.01095	0.02705	0.02861	0.04687	0.04223	0.13171	1.07093	0.02537
27	0.01260	0.02232	0.01061	0.03281	0.01030	0.00462	0.01372	0.01190	0.00415	0.01828	0.00421	0.02119	0.00722	-0.04187	0.00033	0.00091	0.00190	0.00216	0.00535	0.01396	-0.00013	0.01459	-0.01111	0.04609	0.01780	1.00345

Note: Identity Matrix, A,input Coefficient, m,output Coefficient Matrix

Appendix 5

Inter-Regional I-O Table of 1993 by 26 Sectors at 1993 Price

Table 5-1 Inter-Regional I-O Table of 1993 by 26 Sectors at 1993 Price (Intermediate Demand (1))

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	27		
1	149,251	431	3,007	0	98	0	0	0	0	111,446	289	107	0	0	0	0	0	0	0	0	0	376	38	217,840	80	0	6,982	
2	1,080	121,070	5,229	0	0	0	0	2,468,468	72,947	9	0	33,224	0	0	0	0	0	0	0	0	708	0	101,471	161	0	639		
3	10,175	515	62,241	0	35	0	0	2,447,717	23,226	0	0	33	85	0	0	0	0	0	0	0	1,236	0	718,150	544	0	3,780		
4	415	499	16,377	2,898	5,855	0	210	24,740	4,004	324,170	10,363	214	10,349	0	0	0	101	4,643	1,157	0	614,762	9	13,671	151	0	2,172		
5	6	0	54	0	40,332	0	0	371,882	0	0	0	1	0	0	0	0	0	0	0	0	0	0	297,264	129	0	2,502		
6	0	0	0	0	648	0	0	0	0	0	1,765	1,861,457	8,323	36,660	0	0	0	0	0	0	0	0	0	0	0	0		
7	0	0	16	0	63	3	9,896	3,087	2	2	247	18,688	221,733	32,715	150,919	155	222	3	55	173,188	1,321,230	1	71	9	0	5,791		
8	0	628	675,613	0	7,206	0	0	5,915,553	245,244	1,607	568	4,710	65	0	0	0	0	939	0	0	0	0	493	3,611,418	5,575	401	62,921	
9	794	333	1,081	26	1,550	334	131	386,917	7,949,318	494	155	103	103	143	0	0	126	11,246	2,216	3,333	144	1,381	4,612	3,299	3,094	18,980		
10	363	90	291	0	182	0	65	4,070	9,780	21,924	69	91	84	6	0	0	5,643	29,519	16,462	1,610	0	703,618	573	1,212	88	4,481		
11	2,040	11,398	3,075	9,748	5,074	742	9,998	983,129	61,427	5,012	2,471,654	133,034	81,950	1,033	24	19,385	29,954	609	3,028	17,015	123,527	448,469	74,288	156,389	530,590	687,845		
12	1,292,155	241,400	283,698	1,699	194,185	1,301	31,625	1,780,387	2,514,923	7,650	248,469	2,111,836	160,300	428,919	2,413	232,529	400,936	233,197	113,931	888,187	2,281,042	133,093	249,203	1,643,643	25,379	1,242,106		
13	0	98	2,180	13	69	0	23	36,340	14,944	48	25	3,097	29,747	16,093	15	2,234	43,502	24,565	6,494	100	2,666,468	439	29,001	295	337	13,990		
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
16	26,514	9,394	8,846	481	617	38	278	90,927	17,769	332	9,917	9,023	861	22,589	12	183,252	87,374	191,893	25,839	3,681	4,642,772	245	26,231	580	572	13,223		
17	1,085	22,978	13,688	2,743	17,026	1,030	136,850	337,644	111,509	1,479	3,123	285,455	181,134	81,548	3,865	10,983	6,069,359	444,842	2,450	526,207	2,272,018	5,439	53,377	143,742	374,678	1,285,433		
18	0	9	0	0	0	0	0	0	0	0	0	777	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
19	33	152	1,614	120	100	4	6,446	4,174	22,759	3	110	931	30	1,895	32	550	66,977	99,815	41,862	31	74,321	1,666	8,837	1,991	3,368	335,343		
20	0	10,686	51,396	220	6,752	29	6,446	432,313	234,151	14,937	79,151	332,704	136,760	338,004	28,135	49,251	22,522	68,119	6,308	837,970	45,478	655,726	477,138	267,916	284,151	503,102		
21	35,031	101,949	32,047	1,419	24,951	93,437	29,170	508	3,077	129,929	23,225	5,233	2,263	14,310	7,883	11,474	216	95,982	100,658	418,962	150,561	486,700	1,252,658	238,546	0	0		
22	52,758	3,348	317,248	1,048	90,861	452	6,021	1,833,738	699,021	84,706	331,222	45,628	236,918	3,075	242,430	485,190	281,783	39,810	257,484	4,872,147	135,320	1,264,724	345,213	10,607	1,294,943	0		
23	11,732	12,105	6,866	783	23,027	1,105	32,373	265,035	45,317	10,427	18,153	309,387	32,648	81,882	7,459	13,939	24,692	22,093	5,910	3,635	198,364	504,620	33,160	336,919	430,987	87,232		
24	60,979	42,331	127,984	1,350	79,116	842	34,628	1,977,741	521,201	175,800	253,688	526,597	115,443	237,149	4,538	23,662	384,225	222,218	33,470	172,232	1,742,008	994,317	623,561	2,703,149	441,542	908,936		
25	388,645	137,414	66,155	67,083	135,861	173,341	135,753	2,704,563	370,674	134,519	136,312	1,035,101	145,004	137,896	49,491	86,211	390,988	213,088	37,235	220,513	3,017,693	1,432,691	2,495,398	3,907,010	871,620	0		
26	79,586	91,005	35,491	60,666	37,478	1,115	60,941	299,544	43,991	36,448	77,227	417,123	17,937	243,456	8,322	13,387	18,063	24,430	17,541	63,413	317,220	437,302	96,853	2,273,091	638,893	669,020		
27	9,985	3	201	0	7	0	0	761,127	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	14,273	5	0	487	
28	0	314	34,817	1,504	0	0	0	769,848	20,977	3	0	9,554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	184	
29	631	32	3,883	0	2	0	0	152,231	1,574	2	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	236	
30	508	645	21,199	3,752	7,380	0	271	32,023	5,182	419,618	13,673	277	13,306	0	0	0	15	6,011	1,497	0	793,749	11	17,686	20	0	2,811		
31	0	0	13	0	9,374	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	381	
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
33	0	0	23	0	103	4	3,674	8,028	4	2	391	29,602	331,257	51,921	239,035	243	352	4	86	274,259	2,093,624	2	11	15	0	9,172		
34	0	22	23,417	0	250	0	0	201,171	8,300	35	20	163	2	0	0	0	0	0	0	0	0	19	0	17	123,171	193	14	2,157
35	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
36	833	208	670	0	418	0	151	9,354	22,460	55,010	137	208	192	14	0	15,971	5,760	37,838	3,702	0	1,617,231	1,317	3,018	202	9	809		
37	35	193	52	165	86	13	169	16,885	1,640	85	41,852	2,254	1,388	18	0	337	507	307	10	51	2,861	2,092	7,596	1,258	2,849	8,995	11,650	
38	220,124	41,123	48,670	289	33,080	223	8,794	303,382	428,428	1,300	42,326	35,974	27,819	73,668	411	39,749	68,812	39,726	19,409	151,306	398,385	31,191	42,453	280,002	4,324	296,275		
39	0	5	113	0	0	0	0	1,386	776	3	1	161	15,041	833	1	116	2,258	1,273	337	5	130,955	24	1,505	151	17	226		
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
46	1,136	402	379	21	26	2	12	3,895	761	14	425	366	37	968	1	2,850	3,743	8,219	1,107	158	198,875	11	1,124	25	42	5,707		
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
54	684	766	401	46	1,243	64	3,655	15,461																				

Table 5-3 Inter-Regional I-O Table of 1993 by 26 Sectors at 1993 Price (Final Demand)

	Consumption		Investment		Export	Import	Output
	Java	Outside Java	Java	Outside Java			
1	9,367,240	931,747	276,687	46,004	52,776	1,302,916	22,622,942
2	1,114,443	26,274	90,999	6,232	439,439	237,386	4,321,662
3	1,968,212	2,333	152,978	336	11,645	79,938	5,323,280
4	59,385	1,618	4,591	4,470	79,185	22,603	1,293,211
5	1,756,041	5	41,890	0	223,989	6,136	2,931,985
6	0	0	211,931	74,656	1,394,111	315,780	3,334,300
7	6	1	8,624	6,631	65,768	444,633	1,829,581
8	34,215,778	11,938,095	802,443	545,971	2,000,974	2,914,177	58,928,379
9	2,403,723	1,084,798	538,532	223,768	11,993,662	5,322,600	20,057,900
10	110,300	2,004	34,655	530	1,197,476	91,933	2,028,742
11	701,284	44,961	148,468	15,934	709,650	1,391,499	6,133,063
12	7,094,046	373,765	971,726	70,278	3,239,655	11,908,834	18,150,339
13	233,180	20,448	51,303	3,684	370,946	908,180	2,803,688
14	0	0	79,929	20,034	43,104	2,691,512	5,273,783
15	8	0	139,466	42,395	424,305	1,216,524	801,203
16	142,867	21,796	63,845	17,755	489,882	2,361,233	4,062,227
17	5,695,985	1,110,568	8,196,649	2,239,922	2,748,364	19,942,228	13,137,415
18	3,014,695	727,153	2,697,671	1,032,692	1,193,846	5,985,943	7,764,518
19	697,792	25,629	306,973	16,743	534,472	1,381,703	822,063
20	1,796,316	30	0	0	0	38	6,686,492
21	632,718	0	42,945,218	0	0	0	46,901,081
22	8,752,054	398,661	3,493,131	114,064	3,462,552	0	3,174,603
23	11,682,377	3,516,749	0	0	2,383,381	1,373,153	19,378,795
24	10,641,219	507,371	1,224,443	108,295	2,639,699	1,993,163	26,912,436
25	8,628,128	240,962	0	0	2,269,391	3,086,814	29,835,320
27	16,079,762	3,657,132	212,141	147,424	602,203	3,795,074	24,320,668
1	627,670	5,842,633	18,510	282,413	68,902	177,729	13,802,379
2	370,681	794,303	26,169	189,017	342,738	45,013	7,332,216
3	122,773	1,152,399	9,543	173,888	25,339	8,362	4,115,609
4	76,870	60,049	8,532	163,848	50,088	36,797	6,854,389
5	407,944	2,774,297	9,731	80,884	164,232	667	5,802,323
6	0	0	376,257	1,200,803	10,818,304	709,054	21,513,384
7	9	4	19,639	37,264	2,839,095	83,600	9,072,594
8	1,206,239	9,771,539	29,892	446,888	3,029,887	320,970	16,202,732
9	2,230	275,966	500	36,923	99,665	107,454	925,762
10	253,520	233,470	79,653	61,815	7,570,288	15,469	12,825,450
11	11,878	171,358	2,513	60,808	275,060	120,529	648,956
12	1,208,502	3,264,877	165,538	617,647	10,943,564	3,721,785	30,814,798
13	12,208	119,421	2,767	21,514	128,166	75,701	1,775,971
14	0	0	63	35,298	62,089	456,194	291,491
15	0	0	0	0	853,907	66,793	1,647,071
16	6,120	71,552	2,820	38,286	54,539	1,027,936	627,911
17	0	1,463,563	0	2,953,918	87,073	5,041,518	325,468
18	46,070	372,956	41,225	539,926	112,885	1,048,327	390,174
19	1,895	259,377	912	169,454	144,671	529,802	222,516
20	36,560	803,251	0	0	0	0	1,609,387
21	0	0	493,271	0	0	0	20,572,465
22	0	6,248,520	0	1,787,816	4,188,923	0	18,251,896
23	681,509	1,289,418	0	0	1,427,298	3,561,111	3,448,003
24	1,199,815	3,794,087	138,038	809,507	2,303,106	473,356	15,113,464
25	560,404	3,623,468	0	0	0	783,101	8,415,340
27	783,440	3,181,543	10,336	128,253	376,422	904,748	4,942,706
Total	134,807,902	20,735,462	63,662,736	33,530,139	88,230,948	84,775,124	574,980,313

Appendix 6

Regional Input Coefficients of both Java and Outside Java

