Compilation of the 2005 Asian International Input-Output Table*

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1. Introduction

The recent large-scale opening of markets in Asian countries (e.g. China's entry into the WTO in 2001, concluding regional trade agreements between Asian countries, etc.) has promoted the relocation of production bases of multinational firms through an expansion of the mobility of labor, goods and services.[1] In addition, due to the emergence of new market economies such as the BRICs, the production networks in the Asia-Pacific region have become increasingly complex.

In order to capture the above structural changes occurring in the Asia-Pacific region, Institute of Developing Economies, Japan External Trade Organization (IDE-JETRO, hereinafter "IDE" for short) and collaborating institutions launched in 2007 a joint research project on the compilation of the 2005 Asian International Input-Output Table (Asian table). The project also aimed to develop analytical and compilation methodologies of international input-output (I-O) tables. For almost five years of the project work, IDE and collaborating institutions completed the 2005 Asian table that consists of 10 member countries and 76 industrial sectors.

This paper describes the general outline of the project for compiling the 2005 international input-output tables for the Asia-Pacific region. The paper firstly illustrates a brief history of compiling the international input-output tables by IDE and collaborating institutions. Then in Section 3, the framework of the 2005 Asian table is described followed by the outline of the 2005 Asian I-O project in Section 4. In Section 5, the compilation procedure of the 2005 Asian table is explained. Finally, some issues in compilation will be discussed. The lists of international input-output tables published by IDE, the sector classification, and other information that are considered to be useful as reference are also attached in appendices.

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* This manuscript is based on IDE [2012: 3-61].

[1] The number of regional trade agreements has rapidly increased since 1990. As of August 15, 2011, 224 regional trade agreements in force are notified to WTO. 61 of those agreements are concluded by the member countries of the Asian table. 17 out of 61 agreements are concluded between the members of the Asian table (Figures are taken from the World Trade Organization's website: http://rtais.wto.org/UI/PublicAllRTAList.aspx, accessed on February 20, 2012).

2. A brief history of the compilation of international input-output tables

2.1 Backgrounds

Since the pioneering contributions by Leontief [1951] and Isard [1951], the interregional input-output table has been one of the major tools for analyzing the spatial linkages of industries.[2] The international input-output table, an extension of the interregional input-output table to the international context, has also contributed to analyze various economic issues such as north-south trade problem, intra-industry trade and economic integration. The first international input-output table was the 1949 Canada-U.S.A. table constructed by Wonnacott [1961]. Also at IDE, it was started the investigation in the early 1960's to construct the international input-output table that connects developed and developing countries in order to provide an analytical tool for various development issues such as north-south trade problem. Based on this motivation, in 1965, IDE constructed the international input-output table for 1958 which consists of six regions (Europe, North America, Latin America, Asia, Oceania and Japan) and seven industries (Agriculture, fishery and forestry; Mining; Textile; Chemicals; Metals and metal products; Other manufacturing; Services). Although this first table consisted of very rough industrial sectors and was based on very strict assumptions due to severe data limitations (e.g. differences of reference years of national tables), this attempt was the seminal contribution to the compilation of international input-output tables at IDE in the following years.[3]

In addition to theoretical investigations on the international input-output table, the other background for the construction of input-output tables at IDE was the projects of collection and evaluation of statistical information in Asian countries conducted mainly in the 1960's. In the 1960's, IDE conducted the collection/estimation of various statistical information (e.g. trade, production, consumption) in Asian countries. However, the project encountered difficulties in the lack of information and large discrepancies of collected/estimated data. In order to evaluate and improve the quality of these statistics, IDE attempted to compile the material balance tables with local statistical/research institutions. The compilation of material balance tables became valuable experiences for constructing the input-output tables as it contributed to increase the availability of statistical information as well as to develop collaborating relationships with local institutions.

2.2 Compilation of input-output tables in Asian countries

Through the experiences to construct material balance tables, IDE and collaborating institutions recognized the necessity of more comprehensive statistics that contribute to provide statistical information of developing countries as well as to evaluate and further improve the accuracy of statistical materials in a consistent manner. For these purposes, the

[2] The interregional input-output model was further developed by Chenery [1953], Moses [1955], Leontief and Strout [1963], Polenske [1966] and others. They proposed alternative methodologies to construct interregional input-output tables from limited amount information.

[3] See Watanabe ed. [1966] and Yamashita et al. [1970] for details on the construction of IDE's first international input-output table.

construction of input-output tables in Asian countries was decided and the joint research projects were started from the early 1970's. IDE was involved in compilation of national and international input-output tables in Asian countries in various forms and by 1976, IDE and collaborating institutions compiled national tables [4] and four bilateral tables (1970 Japan-Korea, 1970 Japan-Philippines, 1970 Japan-U.S.A., 1975 Indonesia-Japan).[5]

After the preparation of national and bilateral tables described above, from 1977, IDE and collaborating institutions started to compile the multilateral table that consists of eight countries (Indonesia, Malaysia, Thailand, Philippines, Singapore, Korea, Japan and U.S.A.) and 56 industrial sectors. The table completed in 1982 and released from IDE as the *International Input-Output Table for ASEAN Countries 1975* (1975 ASEAN table).

2.3 Compilation of Asian international input-output tables

In 1987, IDE and collaborating institutions started the compilation of the Asian international input-output table for 1985 that include eight countries in 1975 ASEAN table plus China and Taiwan. The 1985 Asian table was released in 1992. Since then, the Asian tables have been compiled on regular basis (every five years). So far, four Asian tables (1985, 1990, 1995 and 2000) were released and they have contributed to analyze various issues of current concern.[6]

As discussed above, IDE has been involved in the compilation of input-output tables in Asian countries for over 40 years since the 1960's and compiled more than 40 input-output tables. The list of input-output tables published from IDE is reported in Appendix 1.

3. Framework of the 2005 Asian international input-output table

The layout of the 2005 Asian international input-output table is presented in Figure 1. As shown in Figure 1, the 2005 Asian table consists of 10 endogenous countries in the Asia-Pacific region (China, Indonesia, Korea, Malaysia, Taiwan, The Philippines, Singapore, Thailand, U.S.A. and Japan) and four exogenous countries/regions (Hong Kong, India, EU and the rest of the world).

The row-wise direction of the table represents the demand structure of the industrial output. A^{rs} $(r, s = I, M, P, S, T, C, N, K, J, U)$ is the 76×76 square matrix, the number of industries $(i, j = 1,2, \cdots, 76$; see Appendix 2 for sector classification).[7] The matrices locating diagonally (A^{rr}) indicate the domestic intermediate transactions that describes trades between domestic industries. Other matrices A^{rs} $(r \neq s)$ indicate the inter-industrial transactions across

[4] The reference years of national tables vary across countries and some national tables were released from IDE (see Appendix 1).
[5] IDE [1982: 2].
[6] In 1985 and 1990 Asian I-O projects, eight bilateral tables that connect Japan and other Asian countries (except U.S.A.) were also constructed.
[7] The codes $I, M, P, S, T, C, N, K, J$ and U stand for Indonesia, Malaysia, Philippines, Singapore, Thailand, China, Taiwan, Korea, Japan and The U.S.A., respectively.

countries. F^{rs} is the matrix of final demand. Each matrix consists of four final demand items, i.e. "private consumption expenditure", "government consumption expenditure", "gross fixed capital formation", and "changes in stocks". In some countries, there also exists the "adjustment item" in the final demand. This item records the statistical discrepancy in the original national table and other errors created in processing the national table to the Asian table format. As in the case of intermediate transactions, the diagonally located matrices (F^{rr}) are domestic final demands and other matrices F^{rs} ($r \neq s$) are transactions of industries with final demand sectors in other countries. The 76×1 vectors L^{rw} ($w = G, H, O, W$) are the exports to the exogenous countries/regions.[8] X^r indicates the gross outputs (control totals).[9]

The column-wise direction of the table describes the input structure of industries in order to produce the industrial output. BA^s and BF^s are vectors of international freight and insurance on country s's imports from other endogenous countries. A^{wr} and F^{wr} are matrices of country s's imports from exogenous countries/regions. DA^s and DF^s are vectors of duties and import commodity taxes levied on imports of country s. V^s is the 4×76 matrix of value added that describes the primary inputs for productive activities. The value added sector consists of four items, i.e. "compensation to employees", "operating surplus", "depreciation" and "indirect taxes less subsidies". Finally, X^s is the gross inputs (control totals).

The transactions in the Asian table are basically valued at producer's price. More specifically, transactions among endogenous countries and exports are valued at producer's price while imports from exogenous countries/regions are valued at C.I.F. price.

[8] The codes G, H, O and W indicate India, Hong Kong, EU and the rest of the world, respectively.

[9] EU (O) in the 2005 Asian table consists of the following 25 member countries in 2005: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 1 Layout of the 2005 Asian international input-output table

			Intermediate Demand (A)										Final Demand (F)										Export (L)					
			Indonesia	Malaysia	Philippines	Singapore	Thailand	China	Taiwan	Korea	Japan	U.S.A.	Indonesia	Malaysia	Philippines	Singapore	Thailand	China	Taiwan	Korea	Japan	U.S.A.	Export to H.Kong	Export to India	Export to EU	Export to R.O.W.	Discrepancy	Total Outputs
		code	(AI)	(AM)	(AP)	(AS)	(AT)	(AC)	(AN)	(AK)	(AJ)	(AU)	(FI)	(FM)	(FP)	(FS)	(FT)	(FC)	(FN)	(FK)	(FJ)	(FU)	(LH)	(LG)	(LO)	(LW)	(QX)	(XX)
	Indonesia	(AI)	A^{II}	A^{IM}	A^{IP}	A^{IS}	A^{IT}	A^{IC}	A^{IN}	A^{IK}	A^{IJ}	A^{IU}	F^{II}	F^{IM}	F^{IP}	F^{IS}	F^{IT}	F^{IC}	F^{IN}	F^{IK}	F^{IJ}	F^{IU}	L^{IH}	L^{IG}	L^{IO}	L^{IW}	Q^{I}	X^{I}
	Malaysia	(AM)	A^{MI}	A^{MM}	A^{MP}	A^{MS}	A^{MT}	A^{MC}	A^{MN}	A^{MK}	A^{MJ}	A^{MU}	F^{MI}	F^{MM}	F^{MP}	F^{MS}	F^{MT}	F^{MC}	F^{MN}	F^{MK}	F^{MJ}	F^{MU}	L^{MH}	L^{MG}	L^{MO}	L^{MW}	Q^{M}	X^{M}
	Philippines	(AP)	A^{PI}	A^{PM}	A^{PP}	A^{PS}	A^{PT}	A^{PC}	A^{PN}	A^{PK}	A^{PJ}	A^{PU}	F^{PI}	F^{PM}	F^{PP}	F^{PS}	F^{PT}	F^{PC}	F^{PN}	F^{PK}	F^{PJ}	F^{PU}	L^{PH}	L^{PG}	L^{PO}	L^{PW}	Q^{P}	X^{P}
	Singapore	(AS)	A^{SI}	A^{SM}	A^{SP}	A^{SS}	A^{ST}	A^{SC}	A^{SN}	A^{SK}	A^{SJ}	A^{SU}	F^{SI}	F^{SM}	F^{SP}	F^{SS}	F^{ST}	F^{SC}	F^{SN}	F^{SK}	F^{SJ}	F^{SU}	L^{SH}	L^{SG}	L^{SO}	L^{SW}	Q^{S}	X^{S}
	Thailand	(AT)	A^{TI}	A^{TM}	A^{TP}	A^{TS}	A^{TT}	A^{TC}	A^{TN}	A^{TK}	A^{TJ}	A^{TU}	F^{TI}	F^{TM}	F^{TP}	F^{TS}	F^{TT}	F^{TC}	F^{TN}	F^{TK}	F^{TJ}	F^{TU}	L^{TH}	L^{TG}	L^{TO}	L^{TW}	Q^{T}	X^{T}
	China	(AC)	A^{CI}	A^{CM}	A^{CP}	A^{CS}	A^{CT}	A^{CC}	A^{CN}	A^{CK}	A^{CJ}	A^{CU}	F^{CI}	F^{CM}	F^{CP}	F^{CS}	F^{CT}	F^{CC}	F^{CN}	F^{CK}	F^{CJ}	F^{CU}	L^{CH}	L^{CG}	L^{CO}	L^{CW}	Q^{C}	X^{C}
	Taiwan	(AN)	A^{NI}	A^{NM}	A^{NP}	A^{NS}	A^{NT}	A^{NC}	A^{NN}	A^{NK}	A^{NJ}	A^{NU}	F^{NI}	F^{NM}	F^{NP}	F^{NS}	F^{NT}	F^{NC}	F^{NN}	F^{NK}	F^{NJ}	F^{NU}	L^{NH}	L^{NG}	L^{NO}	L^{NW}	Q^{N}	X^{N}
	Korea	(AK)	A^{KI}	A^{KM}	A^{KP}	A^{KS}	A^{KT}	A^{KC}	A^{KN}	A^{KK}	A^{KJ}	A^{KU}	F^{KI}	F^{KM}	F^{KP}	F^{KS}	F^{KT}	F^{KC}	F^{KN}	F^{KK}	F^{KJ}	F^{KU}	L^{KH}	L^{KG}	L^{KO}	L^{KW}	Q^{K}	X^{K}
	Japan	(AJ)	A^{JI}	A^{JM}	A^{JP}	A^{JS}	A^{JT}	A^{JC}	A^{JN}	A^{JK}	A^{JJ}	A^{JU}	F^{JI}	F^{JM}	F^{JP}	F^{JS}	F^{JT}	F^{JC}	F^{JN}	F^{JK}	F^{JJ}	F^{JU}	L^{JH}	L^{JG}	L^{JO}	L^{JW}	Q^{J}	X^{J}
	U.S.A.	(AU)	A^{UI}	A^{UM}	A^{UP}	A^{US}	A^{UT}	A^{UC}	A^{UN}	A^{UK}	A^{UJ}	A^{UU}	F^{UI}	F^{UM}	F^{UP}	F^{US}	F^{UT}	F^{UC}	F^{UN}	F^{UK}	F^{UJ}	F^{UU}	L^{UH}	L^{UG}	L^{UO}	L^{UW}	Q^{U}	X^{U}
Freight and Insurance		(BF)	BA^{I}	BA^{M}	BA^{P}	BA^{S}	BA^{T}	BA^{C}	BA^{N}	BA^{K}	BA^{J}	BA^{U}	BF^{I}	BF^{M}	BF^{P}	BF^{S}	BF^{T}	BF^{C}	BF^{N}	BF^{K}	BF^{J}	BF^{U}						
Import from H. Kong		(CH)	A^{HI}	A^{HM}	A^{HP}	A^{HS}	A^{HT}	A^{HC}	A^{HN}	A^{HK}	A^{HJ}	A^{HU}	F^{HI}	F^{HM}	F^{HP}	F^{HS}	F^{HT}	F^{HC}	F^{HN}	F^{HK}	F^{HJ}	F^{HU}						
Import from India		(GH)	A^{GI}	A^{GM}	A^{GP}	A^{GS}	A^{GT}	A^{GC}	A^{GN}	A^{GK}	A^{GJ}	A^{GU}	F^{GI}	F^{GM}	F^{GP}	F^{GS}	F^{GT}	F^{GC}	F^{GN}	F^{GK}	F^{GJ}	F^{GU}						
Import from EU		(CO)	A^{OI}	A^{OM}	A^{OP}	A^{OS}	A^{OT}	A^{OC}	A^{ON}	A^{OK}	A^{OJ}	A^{OU}	F^{OI}	F^{OM}	F^{OP}	F^{OS}	F^{OT}	F^{OC}	F^{ON}	F^{OK}	F^{OJ}	F^{OU}						
Import from the R.O.W.		(CW)	A^{WI}	A^{WM}	A^{WP}	A^{WS}	A^{WT}	A^{WC}	A^{WN}	A^{WK}	A^{WJ}	A^{WU}	F^{WI}	F^{WM}	F^{WP}	F^{WS}	F^{WT}	F^{WC}	F^{WN}	F^{WK}	F^{WJ}	F^{WU}						
Duties & Import Taxes		(DT)	DA^{I}	DA^{M}	DA^{P}	DA^{S}	DA^{T}	DA^{C}	DA^{N}	DA^{K}	DA^{J}	DA^{U}	DF^{I}	DF^{M}	DF^{P}	DF^{S}	DF^{T}	DF^{C}	DF^{N}	DF^{K}	DF^{J}	DF^{U}						
Value Added		(VV)	V^{I}	V^{M}	V^{P}	V^{S}	V^{T}	V^{C}	V^{N}	V^{K}	V^{J}	V^{U}																
Total Inputs		(XX)	X^{I}	X^{M}	X^{P}	X^{S}	X^{T}	X^{C}	X^{N}	X^{K}	X^{J}	X^{U}																

Source: Drawn by the authors.

4. Project outline

This section describes the general outline of the project for compiling the 2005 Asian table.

4.1 Collaborating institutions

The Asian table is being compiled in collaboration with government and research institutions in target countries. The 2005 Asian international input-output table was compiled under the cooperation of institutions as listed below (Table 2).

Table 2 Collaborating institutions for the 2005 Asian table

Country	Institution
China	State Information Center
Indonesia	Badan Pusat Statistik – Statistics Indonesia
Korea	The Bank of Korea
Malaysia	Department of Statistics
Taiwan	Taiwan Research Institute
The Philippines	National Statistics Office
Singapore	Business Research Consultants LLP
Thailand	National Economic and Social Development Board
U.S.A.	University of Maryland
Japan	Applied Research Institute, Inc.

Source: Compiled by the authors.

In each institution, around 5-10 people are officially registered as the project personnel. However, many other people such as administrative staff and survey officers are also involved in the project directly and indirectly. Therefore, the project is operated under the support of hundreds of personnel.

4.2 Schedule of the project[10]

The compilation of the 2005 Asian table takes almost six years.

In the first year of the project, the main task is to determine the basic framework of the table, i.e. determining the sector classification, definitions of sectors, construction of the concordance tables between national I-O classification, Asian I-O classification and trade classification. The other major task is to compile the trade tables that are used for splitting the export/import matrices by country of destination/origin. The national tables are also updated for countries that do not have the benchmark tables of the target year of the Asian table (see Table 3 for the reference years of benchmark tables of member countries).

In the second year of the project, the national tables are processed to the format of the Asian

[10] This section only describes the general outline of the project schedule. The working schedule differs across countries depending upon the release schedule of national input-output tables and the availability of other statistics.

table that was determined in the first year. In addition, surveys on imported commodities and international freight and insurance are conducted that are required to modify the trade coefficients and to convert the valuation of import matrices.

In the third year, the supplementary tables, i.e. the employment table and the import duty table, are compiled. These tables are prepared to serve various analytical purposes.

In the fourth year, the preliminary version of the Asian table at 26 sectors is compiled by linking national tables and other data compiled in previous years. The analytical work is also conducted in order to check the credibility of the compiled data.

In the fifth and the sixth year, balancing and final reconciliation are conducted based on the examinations of the 26-sector preliminary table compiled in the fourth year. Through the tedious adjustment work and careful checking, the final version at 76 sectors is completed (see Section 5 for details of adjustment).

5. The compilation procedure of the 2005 Asian international input-output table

In this section, the detail of compilation procedure of the 2005 Asian table is explained. The compilation process of the Asian table consists of six main stages.

(1) Preparation of national input-output tables
(2) Compilation of trade matrices by country
(3) Aggregation from national I-O classification to Asian I-O classification
(4) Changing valuation from local currencies to the U.S. dollar
(5) Collection/estimation of related data
(6) Linking and balancing

The details of each step are discussed in the following subsections.

5.1 Preparation of national input-output tables

For compiling the Asian table, non-competitive national input-output tables of the target year must be prepared. However, as shown in Table 3, national tables are different across countries in many ways.

Table 3 Benchmark national input-output tables

Country	Reference Year	Number of Sectors		Valuation
		(Row)	(Column)	
China	2002	122	122	producer's price
Indonesia	2005	175	175	producer's price
Korea	2005	403	403	producer's price
Malaysia	2005	120	120	basic price
Taiwan	2004	161	161	producer's price
Philippines	2000	240	240	producer's price
Singapore	2000	152	152	basic price
Thailand	2005	180	180	producer's price
U.S.A.	2002	428	426	producer's price
Japan	2005	520	407	producer's price
(Asian table)	**(2005)**	**(76)**	**(76)**	**(producer's price)**

Source: Compiled by the authors.

Note: The benchmark tables used for compiling the 2005 Asian table are reported.

5.1.1 Updating of the national I-O table to 2005

As seen in Table 3, the biggest difference is target years of benchmark national input-output tables. The national table is compiled from various statistics and its target year heavily depends upon the timing of the compilation of other statistics such as economic census. In case of the 2005 Asian table, updating exercise is required for five member countries, i.e. China, Singapore, the Philippines, Taiwan and the U.S.A. For these countries, the benchmark tables are updated by collecting/estimating the basic 2005 data such as production, income and trade.

5.1.2 Sector split for the Asian I-O classification

Even if the 2005 national input-output tables are available, the sector classification and the valuation also vary across countries. The disaggregation of sectors is required if the benchmark national input-output table has small number of sectors or a national I-O code is associated with more than two Asian I-O codes. In such cases, sectors have to be split by using the information such as production statistics.

5.1.3 Conversion of valuation

Also, the conversion of valuation from the basic price to the producer's price by adding commodity taxes should be made for countries like Malaysia and Singapore.

5.2 Compilation of trade matrices by country

After the national input-output tables of the target year are prepared for all member countries, export/import tables by country of destination/origin are compiled in the next step.

5.2.1 Compilation of export vectors

The export of goods by country of destination and by sector is compiled from the foreign trade statistics of each member country. The vectors compiled from the trade statistics are valued at the F.O.B. price and they must be converted into the producer's price. The conversion from the F.O.B. price to the producer's price can be made by deducting the trade margins and the domestic transport costs (TTM) from each transaction. TTM data are obtained from each country's national input-output tables.

As for the export of services, the data of service exports are obtained from the Balance of Payments (BOP) statistics. However, no information to specify the destinations of service exports is available from BOP and any other sources. All the service exports are thus recorded in the Rest of the World (R.O.W.).

Since the export vectors for the Asian table are compiled independently from the foreign trade statistics, there is no guarantee that the total export values of each sector are consistent with the values of the export vector in the national input-output table. To keep balances in the row-wise direction of the national input-output table, the export vector is split by using the country share in total exports calculated from the foreign trade statistics.[11] Specifically, each element of the export vector is calculated by applying the following formula.

$$(5.1)\quad e_i^{rs} = t_i^{rs} e_i^r$$

e_i^{rs} is the export value of sector i in country r to country s, e_i^r is country r's total value of export of sector i recorded in the national input-output table. t_i^{rs} represents the share of country s in sector i's exports of country r calculated from the foreign trade statistics.

5.2.2 Compilation of import matrices

The import matrices are one of the most important components of the international input-output table. The import matrices by country of origin are compiled from the non-competitive type national input-output table. Since only one import matrix is available from the national input-output table, it must be separated by country of origin. Import matrices by country are compiled in the following two steps.

5.2.2.1 Splitting import matrix by country

First, the single import matrix is split into 13 countries of origin by using the share of imports of each origin country calculated from the foreign trade statistics. Specifically, each element of import matrices is calculated by applying the following formula.

[11] An alternative way to keep balances in the row-wise direction of the national input-output table is to use the export to the rest of the world in the Asian table as the residual after deducting the export values to 13 countries that are taken from foreign trade statistics from the total exports in the national input-output table. This methodology has an advantage in the sense that actual export values in the export statistics are recorded for 13 destination countries. However, it sometimes yields negative values in exports to the rest of the world if export values in export statistics are much larger than those in the national input-output table.

(5.2) $m_{ij}^{rs} = c_i^{rs} m_{ij}^{s}$

m_{ij}^{rs} is the import value of sector j in country s from sector i in country r, m_{ij}^{s} is the import value of sector j in country s from sector i that can be taken from the original import matrix. c_i^{rs} represents the share of country r in sector i's imports of country s calculated from the foreign trade statistics.

5.2.2.2 Modifying import structures through special surveys

The distribution structures of imported commodities obtained by applying the above mechanical method are identical across countries. However, the assumption of homogeneity of demand may be unrealistic. As Isard [1951] and Armington [1969] pointed out, the commodities produced by the same industry in different regions should be treated as different commodities since the producers in a country have a market area different in shape and extent from those of other countries and thus their demand structures are also different.[12] Therefore, in the second step, the special survey on imported commodities should be carried out in order to reflect the actual demand structures of imported commodities.[13] Import matrices are modified by incorporating the results of the special survey.[14]

5.2.2.3 Treatment of service imports

As the case of exports, the data of service imports are obtained from the Balance of Payments (BOP) statistics. However, no information to specify the origins of service imports is available from BOP and any other sources. All the service imports are thus recorded in the Rest of the World (R.O.W.).

5.3 Aggregation from national I-O classification to Asian I-O classification

The next step of compilation is to aggregate industrial sectors from the national I-O classification to the Asian I-O classification. Following the sector concordance tables, the number of sectors of national input-output tables should be converted to 76 sectors.

5.4 Changing the valuation from local currencies to U.S. dollar

Since all the transactions of the 2005 Asian table are valued at US$1,000, the valuation should be converted from local currencies to the U.S. dollar at this stage. The period average (rf) in 2005 reported in the *International Financial Statistics* of IMF and the *Key Indicators* of ADB (for Taiwan) are employed as exchange rates from the local currencies to the US dollar. Specifically, for compiling the 2005 Asian table, the following rates are used (Table 4).

[12] Isard [1951: 320].

[13] Polenske [1970] evaluated the accuracy of the tables compiled under the homogeneity assumption of supply and/or demand structures of traded commodities. Polenske [1970] evaluated the accuracy of the tables estimated by Chenery-Moses (column coefficient) model, the row coefficient model, and the Leontief-Strout model using Japan's interregional input-output tables for the years of 1960 and 1963. The overall percentage errors of the tables estimated by Polenske [1970] showed 3.3% to 3.6 % larger than the actual data. However, at regional and industry levels, the deviations from the actual data are much larger. For instance, the row coefficient model overestimated the output of the mining sector in Tohoku and Hokuriku by 1,090.1 % and 1,032.0 % respectively and many other sectors presents more than 100 % of deviations from actual values.

[14] For detailed discussion on the special survey on imported commodities, see IDE [2012:34-37].

Table 4 Exchange rates from local currencies to the U.S. dollar

Country	Conversion	Exchange Rate	Note
China	Yuan/US$	8.1943	Market Rate (rf)
Indonesia	Rupiah/US$	9,704.7	Market Rate (rf)
Japan	Yen/US$	110.22	Market Rate (rf)
Korea	Won/US$	1,024.12	Market Rate (rf)
Malaysia	Ringgit/US$	3.7871	Official Rate (rf)
Taiwan	NT$/US$	32.2	Average of Period
Philippines	Pesos/US$	55.085	Market Rate (rf)
Singapore	S$/US$	1.6644	Market Rate (rf)
Thailand	Baht/US$	40.220	Official rate (rf)

Source: International Monetary Fund, *International Financial Statistics*, December 2006
Asian Development Bank, *Key Indicators 2005*, 2006 (For Taiwan)

5.5 Collection/Estimation of related data

For compiling the export vectors by country of destination and the import matrices by country of origin, both valued at the producer's price, the following data must be prepared.

(1) Domestic trade margins and domestic transport costs (TTM) on exported goods by sector
(2) Import duties and import commodity taxes (DT) by sector
(3) International freight and insurance (FI) by sector and by country of origin

These are used for converting the valuation of F.O.B. exports and C.I.F. imports to the producer's price.

5.5.1 Estimation of TTM and DT

The data of domestic trade margins and domestic transport costs (TTM) and import duties and import commodity taxes (DT) are obtained from the national input-output tables.

5.5.2 Estimation of international freight and insurance

Among the data necessary to compile the Asian table, international freight and insurance is the information that is one of the most difficult pieces to obtain. They can be collected from the foreign trade statistics, where available. However, countries that the data is available are quite limited. In addition, even if the data is obtained, their quality varies across countries and there exist missing data for many transactions. In which case, it is necessary to apply some estimation methods to make up for the missing information. The estimation is conducted in two steps. The first step is to obtain the parameter values by estimating transport cost equations for each Asian I-O sector using the available data. The second step is to project the missing values based on the parameter estimates obtained in the first step. In what follows, the detailed estimation procedure is illustrated.

5.5.2.1 Estimating transport cost equations

In most of the empirical literature in international trade that use the gravity equations, it is a common exercise to use the geographic distance between countries as the proxy of transport costs due to the limited availability of the direct transport cost data.[15] This treatment assumes that the transport cost is a function of geographic distance.

(5.3) $C_i^{rs} = f(D^{rs})$

C_i^{rs} represents transport costs on country s's imports from country r for sector i and D^{rs} is the distance between them. The rationale of using distance is that given the transportation mode is same, the longer the distance, the more time and energy are consumed and hence the transport cost rises.

However, several studies that investigated the appropriateness of the relationship between transport costs and the distance found that using the distance alone is insufficient as a proxy of the transport costs though it plays a certain role as a determinant.[16] Based on previous studies such as Radelet and Sachs [1998], Bougheas et al. [1999], Limão and Venables [2001], Micco and Pérez [2002] and Martínez-Zarzoso and Suárez-Burguet [2005] and Martínez et al. [2008], the infrastructure variables are also included in the regression to estimate transport cost equation.

(5.4) $C_i^{rs} = f(D^{rs}, F^r, F^s)$

F^r and F^s are variables that represents the level of infrastructure in country r and country s, respectively. Specifically, the following variation of transport-cost equation is estimated.

(5.5) $\ln(C_i^{rs}) = \alpha_i + \beta_i \ln(D^{rs}) + \gamma_i \ln(F^r) + \delta_i \ln(F^s) + u_i^{rs}$

u_i^{rs} is the disturbance term that is normally distributed with zero mean. The signs of parameter values are expected to become as follows.

(5.6) $\beta_i > 0;\ \gamma_i < 0;\ \delta_i < 0$

Therefore, it is expected that the longer the distance between countries, the transport cost rises and the higher the level of transport infrastructure in each country, the transport cost decreases.

In compiling the 2005 Asian table, the direct data of international freight and insurance (C_i^{rs}) are available only for six countries (China, Indonesia, Taiwan, The Philippines, Singapore and Thailand). Unfortunately, no information is available for other member countries (Korea, Malaysia, U.S.A. and Japan) and even for countries that the transport cost data is available, however, the quality of data varies across countries and there exists missing data in many transactions. As the distance variable (D^{rs}), the shipping route distance between major ports is

[15] Refer to, for example, Anderson [1979].
[16] For example, see Geraci and Prewo [1977], Limão and Venables [2001].

employed. As the infrastructure variable (F^r and F^s), per capita GDP is selected as the proxy of transport infrastructure of a country, following previous studies such as Radelet and Sachs [1998] and Micco and Pérez [2002]. This assumes that higher income countries are likely to have better transport infrastructure than lower income countries.[17] The data of per capita GDP (PPP) data is taken from the *Penn World Table*.

By running regressions of equation (5.5), the parameter estimates $\hat{\alpha}_i, \hat{\beta}_i, \hat{\gamma}_i$ and $\hat{\delta}_i$ for each Asian I-O sector i are obtained. If signs of parameter estimates are inconsistent with (5.6), they are replaced by the estimates that are obtained from the regressions in more aggregated classifications, i.e. 26 sectors or seven sectors. When expected signs of estimates even at aggregated classifications are not obtained, the consistent estimates of related industries are used for projection (e.g. estimates of '050 Electronic computing equipment' are used for that of '051 semiconductors and integrated circuits').

5.5.2.2 Projecting missing values

Using the parameter estimates $\hat{\alpha}_i, \hat{\beta}_i, \hat{\gamma}_i$ and $\hat{\delta}_i$, projection of the missing values of international freight and insurance ($\hat{C}_i^{rs}$) can be made by stacking the values of variables of country concerned (D^{rs}, F^r and F^s) into the following transport cost equation.

$$(5.7)\quad \hat{C}_i^{rs} = e^{\hat{\alpha}_i}(D^{rs})^{\hat{\beta}_i}(F^r)^{\hat{\gamma}_i}(F^s)^{\hat{\delta}_i}$$

5.6 Linking and balancing

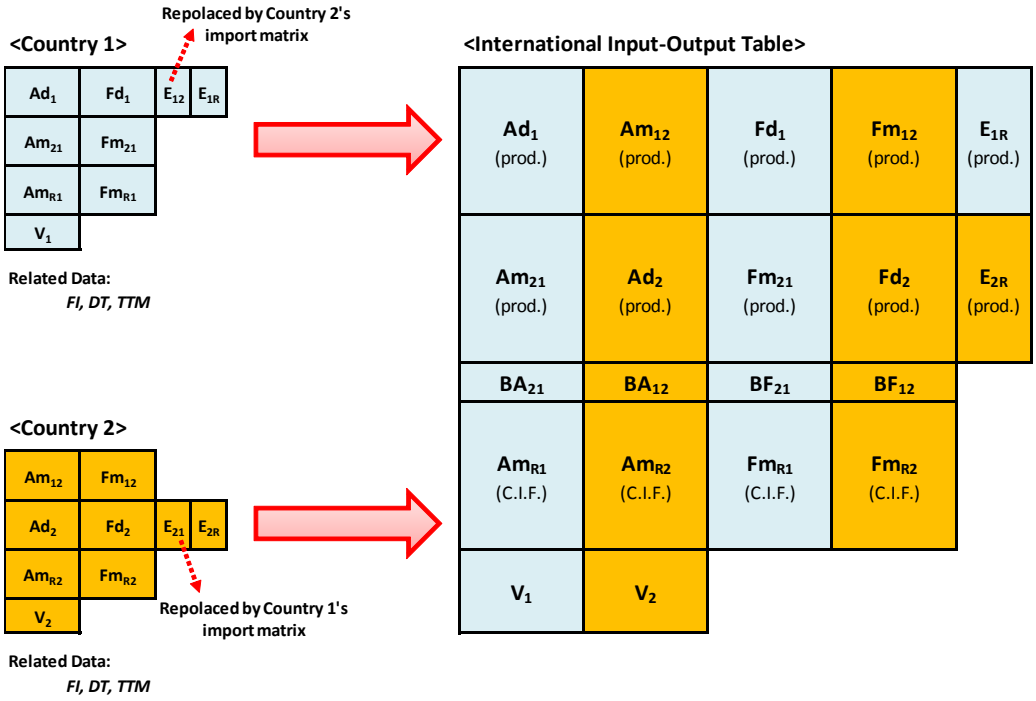
All the pieces of each member country prepared in the previous steps are linked together to the one big table as shown in Figure 1.

5.6.1 Methodology of linking

Figure 2 illustrates the simplest image on the process of linking. In this example, the linking of input-output tables for countries 1 and 2 is illustrated. As shown in this example, the basic idea of linking is to replace the export vector by the import matrix of the trading partner. At this stage (just before linking), the valuation of imports in each country's national input-output table is also converted from the C.I.F. price to the producer's price by using the data of international freight and insurance (FI), and domestic transport costs and trade margins (TTM) compiled in the previous steps.

[17] Radelet and Sachs [1998: 5].

Figure 2 Linking of national I-O tables (two-country case)



Source: Drawn by the authors.

5.6.2 The result of initial link and the sources of discrepancy

The table created through the above procedure is balanced in column-wise directions, but imbalances normally occur between the gross output (control totals) and the total values of all elements in the row-wise direction because there is no guarantee that the export statistics of exporting countries and the import statistics of importing countries are consistent. In case of the 2005 Asian table, more than one-third of sectors out of 760 sectors (76 sectors for each country) showed larger than 5% of discrepancies relative to control totals as a result of initial link. Even if the threshold is relaxed to 10%, there still exist nearly 200 sectors that do not satisfy this threshold.

As is obvious from the methodology of linking described in Figure 2, discrepancies arise from the inconsistency of trade matrices between countries. The following can be considered as major causes of inconsistency of trade values.

(1) The inconsistency between each country's sector classifications. Different commodities may be included across countries even in same sectors. Though the sector concordance between national I-O classification and the Asian I-O classification are compiled and some sectors of the national input-output tables are split so as to be consistent with the definitions of Asian I-O sectors, it is difficult to harmonize the concepts of sectors completely across all member countries.

(2) Entrepôt trade is treated in different ways by country. For example, China's export through Hong Kong to the U.S.A. may be recorded by the U.S.A. as import from China. Similarly, most of Philippines' indirect export to China through Hong Kong is recorded as

China's direct import from the Philippines in China's customs statistics while it is recorded as export to Hong Kong in the Philippines' trade statistics.[18]

(3) Other statistical reasons. One intuitive example is the problem of the record of timing. A commodity shipped from the exporting port in December 2011 may arrive at the destination port in January 2012. In such a case, it is recorded in exporting country as exports in 2011 while it is recorded as imports in 2012 in the importing country. Other possible sources of discrepancy is the differences of statistical systems across countries such as the pricing (valuation) methods, methodologies on the rules of origin, etc.

5.6.3 Reconciliation of discrepancy

If the values of statistical discrepancies are very large relative to the gross output, the compiled Asian table does not provide any useful information because errors account for most of the output values. Thus, balancing or reconciliation work should be carried out to eliminate or decrease the discrepancies to the appropriate level relative to gross output. In order to keep the credibility as an economic statistics and for analytical purposes (and considering other limitations such as available information, burden of work, etc.), 5% of discrepancy at sectoral level is determined as the tolerable limit. The following is the rough procedure of reconciliation.

(1) To identify the sources and magnitudes of discrepancies, the commodities included in each sector were investigated by comparing the concordance table between trade classification (HS or SITC) and Asian I-O classification of the exporting country and the importing country.

(2) If difference of classifications is found, commodities are re-classified and respective values based on trade statistics are moved so as to be consistent between countries.

(3) If discrepancies are not reduced sufficiently by the above treatment, further adjustment is made by exchanging values with the rest of the world (R.O.W.). Also, Hong Kong is sometimes used for adjustment when China is the target of adjustment as it is the place for entrepôt/indirect trade with China.

(4) The remaining discrepancies left even after the above treatments are recorded in sector QX001 as the fundamental statistical discrepancy (see Figure 1).

One important principle we must keep in mind when conducting the reconciliation work is that merely eliminating the discrepancy is not our primary objective and thus the adjustments without reasonable grounds should not be made because the moving values (without any grounds) just to reduce discrepancy may distort the actual picture of international transactions. As a result of tedious adjustment work, the 2005 Asian table is completed.

[18] National Statistics Office of the Philippines [2011: 200-201].

6. Concluding Remark

This paper discussed the structure and the compilation procedure of the 2005 Asian international input-output table. It is revealed that the compilation of the Asian table is a complicated process and it requires patient efforts of project members. As a final note, some future considerations are briefly discussed.

6.1 Determining sector classification

The sector classification of the Asian table is determined so as to reflect the economic structures of target countries as well as to meet various analytical purposes. However, it is highly constrained by the following factors: (1) Sector classification/data availability in member countries (see Table 3); (2) Comparability with previous Asian tables (1975, 1985, 1990, 1995 and 2000); (3) Difference of industrial structures (development stages) among member countries. Determining the sector classification of the Asian table by considering these trade-offs is an important task.

6.2 Treatment of service trade

As explained in Section 5.2, in the Asian table, the trade of services is treated as exogenous (export to/imports from the rest of the world) due to the lack of information to identify destination/origin of service trade. However, the trade of services accounts for large portion in international transactions.

6.3 Estimation of international transport costs

As discussed in Section 5.5.2, international freight and insurance is the information that is one of the most difficult pieces to obtain. Though it is thus estimated from available information, the data constraint is quite severe and it is difficult to secure the credibility of data. However, data quality of trade matrices is vital to secure the accuracy of the Asian table. Therefore, further refinement of estimation method of international transport costs should be explored.

References

Anderson, J. E. [1979], "A Theoretical Foundation for the Gravity Equation," *American Economic Review*, Vol. 69, No. 1, March, pp. 106-116.

Armington, P. S. [1969], "A Theory of Demand for Products Distinguished by Place of Production," *IMF Staff Papers*, Vol. 16, No. 1, March, pp. 159-176.

Bougheas, S., P. O. Demetriades and E. L. W. Morgenroth [1999], "Infrastructure, transport costs and trade," *Journal of International Economics*, Vol. 47, Issue 1, February, pp. 169-189.

Chenery, H. B. [1953], "Regional Analysis," in H. B. Chenery, P. G. Clark and V. Cao-Pinna eds., *The Structure and Growth of the Italian Economy*, Rome: U.S. Mutual Security

Agency, pp. 97-116.

Geraci, V. J. and W. Prewo [197], "Bilateral Trade Flows and Transport Costs," *Review of Economics and Statistics*, Vol. 59, No. 1, February, pp. 67-74.

Institute of Developing Economies (IDE) [1982], *International Input-Output Table for ASEAN Countries 1975*, Statistical Data Series, No. 39, Tokyo: Institute of Developing Economies.

Institute of Developing Economies (IDE) [2006], JETRO, *Asian International Input-Output Table 2000*, Statistical Data Series, No. 89&90, Chiba: Institute of Developing Economies.

Institute of Developing Economies (IDE) [2012], JETRO, *Asian International Input-Output Table 2005: Explanatory Notes*, Asian International Input-Output Series, No. 78, Chiba: Institute of Developing Economies.

Isard, W. [1951], "Interregional Input-Output Analysis: A Model of a Space-economy," *Review of Economics and Statistics*, Vol.33, No. 4, November, pp. 318-328.

Leontief, W. W. [1951], *The Structure of American Economy 1919-1939*, 2nd Edition Enlarged, New York: International Arts and Sciences Press, Inc.

Leontief, W. W. and A. Strout [1963], "Multiregional Input-Output Analysis," in T. Barna ed., *Structural Interdependence and Economic Development*, New York: St. Martin's Press, pp. 119-150.

Limão, N. and A. J. Venables [2001], "Infrastructure, Geographical Disadvantage, Transport Costs, and Trade," *The World Bank Economic Review*, Vol. 15, No. 3, October, pp. 451-479.

Martínez-Zarzoso, I. and C. Suárez-Burget [2005], "Transport Costs and Trade: Empirical Evidence for Latin American Imports from the European Union," *Journal of International Trade and Development*, Vol. 14, No. 3, September, pp. 353-371.

Martínez-Zarzoso, I., E. M. Pérez-García and C. Suárez-Burget [2008], "Do transport costs have a differential effect on trade at the sectoral level?," *Applied Economics*, Vol. 40, Issue 24, pp. 3145-3157.

Micco, A. and N. Pérez [2002], "Maritime Transport Costs and Port Efficiency," Paper prepared for the Seminar "Towards Competitiveness: The Institutional Path," Inter-American Development Bank.

Moses, L. N. [1955], "The Stability of Interregional Trading Patterns and Input-Output Analysis," *American Economic Review*, Vol. 45, No. 5, December, pp. 803-826.

National Statistics Office of the Philippines [2009], "2007 Special Survey on Imported Commodities in the Philippines," in H. Kuwamori, Y. Uchida and S. Inomata eds., *Compilation of the 2005 International Input-Output Tables*, Asian International Input-Output Series, No. 72, March, pp.79-105.

National Statistics Office of the Philippines [2011], "Philippines – China Industrial and External Trade Linkages: An Input-Output Analysis," in S. Inomata and H. Kuwamori eds., *Compilation of the 2005 Asian International Input-Output Table*, Asian International Input-Output Series, No. 76, March, pp.165-205.

Polenske, K. R. [1966], *A Case Study of Transportation Models Used in Multiregional Analysis*, Ph.D. Dissertation, Harvard University.

Polenske, K. R. [1970], "An Empirical Test of Interregional Input-Output Models: Estimation of 1963 Japanese Production," *American Economic Review*, Vol. 60, No. 1, March, pp. 76-82.

Radelet, S. and J. Sachs [1998], "Shipping Costs, Manufactured Exports, and Economic Growth," mimeo, Harvard Institute for International Development.

Watanabe, T. ed. [1966], *International Input-Output Table - Its Structure and Possibility of Analyses* -, Tokyo: Institute of Developing Economies (in Japanese).

Wonnacott, R. J. [1961], *Canadian-American Dependence: An Interindustry Analysis of Production and Prices*, Amsterdam: North Holland Publishing Company.

Yamashita, S., H. Sakai and M. Kagami [1970], "International Input-Output Analysis (II)," *Ajia Keizai*, Vol. 11, No. 5, May, pp. 49-78 (in Japanese).

Appendix 1
List of input-output tables published by IDE

Title	Ref. Year	No. of Sectors	Target countries/regions	Publication		
				(Series)	(No.)	(Year)
Japan-Korea	1970	267	Korea, Japan	SDS[*1]	18	1976
Indonesia	1971	175	Indonesia	SDS	22	1977
Japan-Philippines	1970	200&110	Philippines, Japan	SDS	23	1977
Japan-U.S.A.	1970	216	U.S.A., Japan	SDS	24	1977
Singapore	1972	123	Singapore	SDS	27	1979
Thailand	1975	180	Thailand	SDS	30	1980
Indonesia-Japan	1975	146	Indonesia, Japan	SDS	33	1981
Japan-Korea	1975	172	Korea, Japan	SDS	34	1981
Thailand-Japan	1975	172	Thailand, Japan	SDS	35	1981
Peninsular Malaysia	1975	105	Malaysia	SDS	37	1982
Singapore	1975	155	Singapore	SDS	38	1982
ASEAN Countries	1975	56	Indonesia, Malaysia, Philippines, Singapore, Thailand, Korea, Japan, U.S.A.	SDS	39	1982
Updated U.S.A.	1975	56	U.S.A.	SDS	40	1982
The Philippines	1975	121	Philippines	SDS	41	1983
Thailand	1982	180	Thailand	SDS	53	1989
Singapore	1985	176	Singapore	AIO[*2]	18	1991
Taiwan	1985	123	Taiwan	AIO	19	1991
Malaysia	1985	105	Malaysia	AIO	23	1991
China	1985	106	China	AIO	24	1991
Indonesia-Japan	1985	128	Indonesia, Japan	SDS	57	1991
Korea-Japan	1985	274	Korea, Japan	SDS	58	1991
Thailand-Japan	1985	155	Thailand, Japan	SDS	59	1991
China-Japan	1985	89	China, Japan	SDS	60	1992
Singapore-Japan	1985	127	Singapore, Japan	SDS	61	1992
Malaysia-Japan	1985	100	Malaysia, Japan	SDS	62	1992
Philippines-Japan	1985	188	Philippines, Japan	SDS	63	1992
Taiwan-Japan	1985	117	Taiwan, Japan	SDS	64	1992
Asian	1985	78[*3]	Indonesia, Malaysia, Philippines, Singapore, Thailand, China, Taiwan, Korea, Japan, U.S.A.	SDS	65	1992

*1 SDS: Statistical Data Series

*2 AIO: Asian International Input-Output Series

*3 Compiled at 78 sectors. However, it is released only at 24 sectors.

Appendix 1 (Continued)

Title	Ref. Year	No. of Sectors	Target countries/regions	Publication		
				(Series)	(No.)	(Year)
Philippines	1990	177	Philippines	AIO	35	1995
Taiwan	1990	150	Taiwan	AIO	44	1996
China	1990	106	China	AIO	46	1996
Singapore	1990	174	Singapore	AIO	47	1997
Malaysia	1990	96	Malaysia	AIO	48	1997
Indonesia-Japan	1990	141	Indonesia, Japan	SDS	70	1996
Korea-Japan	1990	274	Korea, Japan	SDS	71	1996
Philippine-Japan	1990	137	Philippines, Japan	SDS	72	1996
Thailand-Japan	1990	118	Thailand, Japan	SDS	73	1996
China-Japan	1990	89	China, Japan	SDS	76	1997
Singapore-Japan	1990	107	Singapore, Japan	SDS	77	1997
Taiwan-Japan	1990	133	Taiwan, Japan	SDS	78	1997
Malaysia-Japan	1990	78	Malaysia, Japan	SDS	79	1997
Asian	1990	78	Indonesia, Malaysia, Philippines, Singapore, Thailand, China, Taiwan, Korea, Japan, U.S.A.	SDS	81	1998
Asian	1995	78	Indonesia, Malaysia, Philippines, Singapore, Thailand, China, Taiwan, Korea, Japan, U.S.A.	SDS	82	2001
Asian	2000	76	Indonesia, Malaysia, Philippines, Singapore, Thailand, China, Taiwan, Korea, Japan, U.S.A.	SDS	89 90[*4]	2006

*4 2000 Asian table consists of two volumes, i.e. “Explanatory Notes” (No. 89) and “Data” (No. 90).

Appendix 2
Sector classification of the 2005 Asian international input-output table

7 Sectors		26 Sectors		76 Sectors	
Code	**Description**	**Code**	**Description**	**Code**	**Description**
<Intermediate Transaction>					
001	Agriculture, livestock, forestry and fishery	001	Paddy	001	Paddy
		002	Other agricultural products	002	Other grain
				003	Food crops
				004	Non-food crops
		003	Livestock and poultry	005	Livestock and poultry
		004	Forestry	006	Forestry
		005	Fishery	007	Fishery
002	Mining and quarrying	006	Crude petroleum and natural gas	008	Crude petroleum and natural gas
		007	Other mining	009	Iron ore
				010	Other metallic ore
				011	Non-metallic ore and mining
003	Manufacturing	008	Food, beverage and tobacco	012	Milled grain and flour
				013	Fish products
				014	Slaughtering, meat and dairy products
				015	Other food products
				016	Beverage
				017	Tobacco
		009	Textile, leather, and the products thereof	018	Spinning
				019	Weaving and dyeing
				020	Knitting
				021	Wearing apparel
				022	Other made-up textile products
				023	Leather and leather products
		010	Wooden furniture and other wooden products	024	Timber
				025	Wooden furniture
				026	Other wooden products
		011	Pulp, paper and printing	027	Pulp and paper
				028	Printing and publishing
		012	Chemical products	029	Synthetic resins and fiber
				030	Other basic industrial chemicals
				031	Chemical fertilizers and pesticides
				032	Drugs and medicine
				033	Other chemical products
		013	Petroleum and petrol products	034	Petroleum and petrol products
		014	Rubber products	036	Tires and tubes
				037	Other rubber products
		015	Non-metallic mineral products	038	Cement and cement products
				039	Glass and glass products
				040	Other non-metallic mineral products

Appendix 2 (Continued)

7 Sectors		26 Sectors		76 Sectors	
Code	**Description**	**Code**	**Description**	**Code**	**Description**
<Intermediate Transaction>					
003	Manufacturing	016	Metals and metal products	041	Iron and steel
				042	Non-ferrous metal
				043	Metal products
		017	Industrial machinery	044	Boilers, engines and turbines
				045	General machinery
				046	Metal working machinery
				047	Specialized machinery
		018	Computers and electronic equipment	050	Electronic computing equipment
				051	Semiconductors and integrated circuits
				052	Other electronics and electronic products
		019	Other electrical equipment	048	Heavy electrical equipment
				049	Television sets, radios, audios and communication equipment
				053	Household electrical equipment
				054	Lighting fixtures, batteries, wiring and others
				059	Precision machines
		020	Transport equipment	055	Motor vehicles
				056	Motor cycles
				057	Shipbuilding
				058	Other transport equipment
		021	Other manufacturing products	035	Plastic products
				060	Other manufacturing products
004	Electricity, gas and water supply	022	Electricity, gas and water supply	061	Electricity and gas
				062	Water supply
005	Construction	023	Construction	063	Building construction
				064	Other construction
006	Trade and transport	024	Trade and transport	065	Wholesale and retail trade
				066	Transportation
007	Services	025	Other services	067	Telephone and telecommunication
				068	Finance and insurance
				069	Real estate
				070	Education and research
				071	Medical and health service
				072	Restaurants
				073	Hotel
				074	Other service
				076	Unclassified
		026	Public administration	075	Public administration

Appendix 2 (Continued)

7 Sectors		26 Sectors		76 Sectors	
Code	**Description**	**Code**	**Description**	**Code**	**Description**
<Final Demands>					
001	Private consumption expenditure	001	Private consumption expenditure	001	Private consumption expenditure
002	Government consumption expenditure	002	Government consumption expenditure	002	Government consumption expenditure
003	Gross fixed capital formation	003	Gross fixed capital formation	003	Gross fixed capital formation
004	Changes in stocks	004	Changes in stocks	004	Changes in stocks
005	Adjustment item	005	Adjustment item	005	Adjustment item
<Value Added>					
001	Wages and salaries	001	Wages and salaries	001	Wages and salaries
002	Operating surplus	002	Operating surplus	002	Operating surplus
003	Depreciation	003	Depreciation	003	Depreciation
004	Indirect taxes less subsidies	004	Indirect taxes less subsidies	004	Indirect taxes less subsidies