Analysis of Structural Change in the Korean Economy : 1975-1995

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Abstract

The purpose of this paper is to describe the sources of growth of the Korean economy between 1975 and 1995, using the linked Input-Output Tables. The methodology of decomposing sources of growth is based on Syrquin's model. The growth of gross domestic output is decomposed into four different sources : domestic final demand expansion, export expansion, import substitution, and technological change. The results of decomposition are as follows. First, domestic final demand expansion and export expansion made far greater contributions to the economic development of Korea. Second, import substitution and technological change showed a negative effect inducing a decrease in gross domestic output from the early 1990s. Third, the growth of manufacturing in the Korean economy showed a high dependence upon export.

Key words : structural change; decomposition; interindustry effects

Ⅰ. Introduction

From the launch of the first economic development plan in 1962, the Korean economy sustained a high annual growth rate averaging over 7% for almost forty years up to late 1997. When under the impact of the currency crisis, it shifted into negative growth. But fortunately the Korean economy has recently recovered from its economic crisis.

Looking back on the progress of Korean economy: in the 1960s the industrial structure was light industry-oriented[1] and labor-intensive, given the abundant supply of inexpensive human resources. In the 1970s, however, it transformed itself into a heavy and chemical industry-oriented[2] structure, as foreign capital and technology were combined with the domestic human resources. From the 1980s, as income rose and wealth accumulated through rapid growth, the importance of services in the Korean economy increased much faster than that of any other industry.

To analyze the sources of economic growth and structural change for the period 1975-95, the Bank of Korea compiled linked input-output tables according to the constant price criteria set in 1995. Among the many decomposition methods using input-output tables, that of Syrquin's model was applied.

The contents of this paper are as follows. Part Ⅱ introduces an outline of the compilation of linked input-output tables. Part Ⅲ analyzes the structural characteristics of the Korean economy in its various aspects such as supply and demand, industrial structure, exports, imports, employment, and interindustry effects. Part Ⅳ gives the contribution ratios to gross domestic output growth of various factors including domestic final demand expansion, export expansion, import substitution and technological change.

Ⅱ. Outline of the Compilation of Linked Input-Output Tables

This paper uses the linked Input-Output Tables of following the years: 1975, 1980, 1985, 1990, 1995. To analyze the sources of growth and structural change in Korean industries, the five tables were linked and categorized into 77 sectors. There are some definitional change in accord with the 1995 Input-Output tables, which are the latest.

The above linked tables at current prices are deflated at 1995 constant prices. The

1) Textile and leather products, food products and beverages, etc.
2) Chemical and allied products, primary metal products,
electronic and other electric equipment, transportation equipment, etc.

deflators for each product, such as domestic product, imports, and exports, are estimated separately. To estimate these deflators by sector, price indices[3] in the form of the producer price index, import price index, export price index and GDP deflator are used and averaged by output weight.

Using these deflators each sector is revalued. Intermediate demand and intermediate input are revalued by the domestic product deflator and import deflator in each industry. Final demand is also revalued using the domestic product deflator and import deflator except exports, which are deflated by a separately estimated export for deflator. However, the deflator for value added is not estimated separately, and the value added at constant prices is estimated by total output deflated less intermediate inputs deflated, using what is called double deflation method.

Ⅲ. Growth and Structural Change of the Korean Economy : 1975-95

1. The Structure of the Korean Economy

A. Supply and Demand

We are considering the supply and demand structure of Korean economy between 1975 and 1995. On the supply side, the average annual growth rate is 10.5% in domestic output and 12.1% in imports. In the case of demand, domestic demand recorded 10.5%, with 11.5% for intermediate demand and 9.6% for final demand, and exports recorded 11.8%.

Due to the increased proportion of both imports and exports, the dependence of the Korean economy upon the foreign sector[4] increased from 19.7% in 1975 to 24.9% in 1995.

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3) $I = \frac{\sum_{i=1}^{n}[(P_i^0/P_i^1) \times W_i^1]}{\sum_{i=1}^{n} W_i^1}$

P_i: price indexes of product i , 0: based year , 1: reference year

W_i: weight of product i based on output

4) dependence=(export+import)/total supply(=total demand)

<Table 1> **Total Supply and Demand**

(unit : %)

	Domestic Output (A)	Imports (B)	Total Supply(A+B)= Total Demand(C+D)	Domestic Demand (C)			Exports (D)
				Intermediate Demand	Final Demand	Sum	
75	89.8	10.2	100.0	41.4	49.1	90.5	9.5
80	89.3	10.7	100.0	44.1	45.5	89.6	10.4
85	89.6	10.4	100.0	45.8	42.8	88.6	11.4
90	88.7	11.3	100.0	48.4	41.3	89.7	10.3
95	86.8	13.2	100.0	48.0	40.2	88.3	11.7
Average annual rate of increase	10.5	12.1	10.7	11.5	9.6	10.5	11.8

B. Industrial Structure

Viewing the composition ratio of domestic output by industry for the period 1975-95, the shares of agriculture, forestry and fisheries, and of mining and quarrying declined from 1975. However, as a whole the share of manufacturing increased owing to the sharp expansion of the share of basic material manufacturing, and assembly and processing, which more than offset the decline in the share of consumer goods. Moreover, assembly and processing recorded the highest growth rate of all industries, accounting for about 20%.

Manufacturing remained the key to the Korean economy. But, the leading industry within manufacturing changed from consumer goods to assembly and processing, showing the growing maturity of the industrial structure.

Services industry had been growing by about 10% annually. Nevertheless, the composition ratio of services did not show great alteration. But from the 1990s, it began to increase little by little, and it is expected that their weight will progressively expand.

<Table 2> **Changes in Industrial Structure**

(unit: %)

	Composition ratio					Average annual rate of increase		
	75	80	85	90	95	75/85	85/95	75/95
Agriculture, Forestry and Fisheries	16.7	11.0	9.6	5.5	3.8	3.9	1.3	2.6
Mining and Quarrying	1.1	0.8	0.6	0.5	0.4	3.9	5.7	4.8
Manufacturing	35.5	40.3	41.7	44.7	47.6	11.6	12.6	12.1
Consumer Goods	21.7	21.9	19.7	16.8	12.5	8.8	6.1	7.5
Basic Material Manufacturing	10.3	13.1	14.0	15.3	17.4	13.3	13.5	13.4
Assembly and Processing	3.5	5.2	8.0	12.6	17.7	19.2	20.3	19.7
Electricity, Gas, Water, Construction	8.1	10.4	11.7	13.3	11.6	13.9	11.0	12.4
Services	38.5	37.6	36.4	36.0	36.6	9.2	11.1	10.2
Total / Average	100.0	100.0	100.0	100.0	100.0	9.9	11.1	10.5

C. Exports

The main exports of the Korean economy have greatly changed in terms of both their scale and structure. Exports of goods and services for the period 1975-95 grew annually by 11.8% on average. Of all the sectors, assembly and processing recorded the most remarkable growth rate accounting for about 20%.

From the composition of exports by commodity, it may be seen that the weight of agriculture, forestry and fisheries showed a steady downward trend, while that of manufactured products continued to increase. Within the manufacturing sector, the share of assembly and processing increased continuously but that of consumer goods declined gradually from 1975 onwards.

<Table 3> Composition of Exports by Commodity

(unit: %)

	Composition ratio					Average annual rate of increase		
	75	80	85	90	95	75/85	85/95	75/95
Agriculture, Forestry and Fisheries	10.0	5.0	2.8	2.0	0.8	-1.5	-1.0	-1.3
Mining and Quarrying	0.7	0.3	0.2	0.1	0.1	-3.8	0.3	-1.8
Manufacturing	68.6	72.3	75.4	77.4	80.6	13.0	12.5	12.7
Consumer Goods	43.8	37.8	34.3	31.8	18.6	9.2	5.1	7.2
Basic Material Manufacturing	13.9	19.1	19.5	17.6	18.3	15.8	11.1	13.4
Assembly and Processing	10.9	15.3	21.7	28.1	43.6	19.9	19.8	19.9
Electricity, Gas, Water, Construction	0.3	0.3	0.9	0.3	0.1	24.8	-12.0	4.8
Services	20.4	22.2	20.8	20.2	18.5	12.2	10.4	11.3
Total / Average	100.0	100.0	100.0	100.0	100.0	11.9	11.7	11.8

D. Imports

Imports of goods and services for the period 1975-95 showed an average annual increase of 12.1%. Notably, the rate of increase in assembly and processing was about 20%.

The composition ratio breakdown of imported goods and services shows that manufactured products and services marked an increase over the period 1975-95 from 68.6% to 75.3% and from 3.8% to 10.2%, respectively. But the weight of agriculture, forestry and fisheries products declined over the same period. In the case of manufactured products, due to the relocation of domestic production facilities overseas, the proportion of consumer goods imports such as those of textile and leather products increased.

Looking at imports by use, from 1985, we note a reversal of the trends. Specifically, imports for intermediate demand began to decrease, whereas those for final demand such as investment and consumption began to expand in contrast to the

pattern in the earlier period. As a result, it can be said that the import structure of the Korean economy gradually shifted from one which was from production-oriented to one which was final demand-oriented.

<Table 4> Composition of Imports by Commodity

(unit : %)

	Composition ratio					Average annual rate of increase		
	75	80	85	90	95	75/85	85/95	75/95
Agriculture, Forestry and Fisheries	15.1	13.7	10.4	7.3	4.3	6.0	4.4	5.2
Mining and Quarrying	12.5	12.6	13.0	9.9	10.1	10.5	11.4	10.9
Manufacturing	68.6	66.7	68.5	75.8	75.3	10.1	15.2	12.6
Consumer Goods	9.7	10.8	11.4	13.6	13.0	11.8	15.7	13.7
Basic Material Manufacturing	21.1	20.6	24.0	26.5	24.5	11.5	13.5	13.4
Assembly and Processing	37.7	35.3	33.1	35.6	37.8	8.6	20.3	19.7
Electricity, Gas, Water, Construction	0.0	0.0	0.0	0.0	0.0	-	-	-
Services	3.8	6.9	8.1	7.0	10.2	18.9	16.8	17.8
Total / Average	100.0	100.0	100.0	100.0	100.0	10.1	14.1	12.1

<Table 5> Components of Imports by Use

(unit: %)

	Intermediate Demand	Final Demand		
			Investment	Consumption
75	67.0	33.0	28.6	4.4
80	76.4	23.6	19.5	4.1
85	80.5	19.5	15.1	4.4
90	76.4	23.6	15.9	7.7
95	71.6	28.4	17.9	10.5

E. Employment

The composition ratio of employment by industry between 1975 and 1995 shows that in agriculture, forestry and fisheries declined continuously from 41.4% to 14.4%, but that in services increased sharply from 34.5% to 53.0%. It appears that half of those employed were working in services. On the other hand, the proportion of manufacturing employment had been on the rise until 1990, but had decreased a little by 1995. Within the manufacturing sectors, the proportion of employment revealed by consumer goods decreased because of the reduction of employment in textile and leather, but those in basic materials manufacturing, and assembly and processing rose due to the expanded weight of these industries in the Korean economy. For the period 1975-95 the number of persons in employment grew annually by 2.3% on average, but in agriculture, forestry and fisheries, and in mining and quarrying they fell somewhat.

<Table 6> Composition of Employment by Industry

(unit : %)

	Composition ratio					Average annual rate of increase		
	75	80	85	90	95	75/85	85/95	75/95
Agriculture, Forestry and Fisheries	41.1	31.6	25.1	18.2	14.4	-3.1	-2.8	-2.9
Mining and Quarrying	1.1	1.1	1.1	0.5	0.3	1.8	-11.0	-4.8
Manufacturing	19.1	21.7	22.6	27.1	24.0	3.5	3.4	3.4
Consumer Goods	12.8	13.3	12.4	12.8	9.4	1.5	-0.1	0.7
Basic Material Manufacturing	3.6	4.4	5.1	6.3	6.1	5.4	4.7	5.0
Assembly and Processing	2.7	4.0	5.1	7.9	8.5	8.6	8.1	8.3
Electricity, Gas, Water, Construction	4.2	5.7	6.5	7.9	8.4	6.2	5.5	5.8
Services	34.5	39.9	44.7	46.4	53.0	4.5	4.5	4.5
Total / Average	100.0	100.0	100.0	100.0	100.0	1.8	2.8	2.3

2. Interindustry Effects

A. Effects on Production

While the contribution ratio of consumption decreased steadily from 65.0% in 1975 to 44.8% in 1995, those of investment and exports rosed respectively from 16.2% to 30.3% and from 18.8% to 24.9% over the same period. Also, the induced production coefficient, which shows the units of production induced by one unit of final demand, increased until 1990, but fell in 1995 because of the decline in the coefficients of consumption and exports.

As a whole the all-industry induced production coefficients rose until 1990, but decreased in 1995. This was mainly due to manufacturing industry such as basic material manufacturing and assembly and processing, in which the size of intermediate input was brought down by technical progress. On the other hand, the induced production coefficient for services increased from 1.373 in 1975 to 1.601 in 1995.

<Table 7> Effects of Components of Final Demand on Production

	1975	1980	1985	1990	1995
	Coefficient				
Consumption	1.560	1.560	1.592	1.635	1.566
Investment	1.249	1.460	1.574	1.664	1.712
Exports	1.784	1.873	1.909	2.010	1.839
Average	1.534	1.598	1.654	1.719	1.671
	Degree of Contribution(%)				
Consumption	65.0	59.5	52.9	48.2	44.8
Investment	16.2	18.7	22.8	28.4	30.3
Exports	18.8	21.9	24.3	23.4	24.9
Total	100.0	100.0	100.0	100.0	100.0

<Table 8> Induced Production Coefficients by Industry

	75	80	85	90	95
Agriculture, Forestry and Fisheries	1,268	1,344	1,420	1,549	1,580
Mining and Quarrying	1,346	1,507	1,639	1,595	1,542
Manufacturing	2,001	1,999	2,023	2,084	1,933
Consumer Goods	2,074	2,048	2,102	2,126	1,971
Basic Material Manufacturing	1,851	1,924	1,903	1,955	1,909
Assembly and Processing	1,843	1,917	1,965	2,117	1,921
Electricity, Gas, Water, Construction	1,752	1,739	1,712	1,782	1,959
Services	1,373	1,414	1,483	1,578	1,601
Average	1,613	1,679	1,733	1,833	1,800

B. Effects on Imports

Viewing the trend of the degree of contribution by component, that of consumption rose steadily from 31.3% in 1975 to 36.2% in 1995. On the other hand, from 1985, the contribution ratios of investment and exports shifted an upward trend and a downward trend, respectively. The induced import coefficients by final demand increased persistently from 0.174 in 1975 to 0.254 in 1995. Of the final demand, the coefficients for exports and consumption showed an upward trend.

The all-industry induced import coefficient of total industry recorded a steady increase from 0.122 in 1975 to 0.203 in 1995. This rising trend is due to both the increase of manufacturing until 1990 and the increase of services in 1995. From the early 1990s, induced import coefficient of manufacturing turned downwards on line with the import substitution taking place in primary metal products, chemicals and allied products, electronic and other electric equipment, general machinery and equipment. For services the induced import coefficient rose steeply between 1990 and 1995 as the services sector induced a large increase in imports by way of the major expansion of overseas travel.

<Table 9> Effects of Components of Final Demand on Import

	1975	1980	1985	1990	1995
Coefficient					
Consumption	0.085	0.111	0.120	0.159	0.192
Investment	0.372	0.333	0.256	0.257	0.309
Exports	0.280	0.295	0.304	0.318	0.312
Average	0.174	0.191	0.191	0.220	0.254
Degree of Contribution(%)					
Consumption	31.3	35.4	34.4	36.7	36.2
Investment	42.6	35.7	32.1	34.3	36.0
Exports	26.1	28.9	33.5	29.0	27.8
Total	100.0	100.0	100.0	100.0	100.0

<Table 10> Induced Import Coefficients by Commodity

	75	80	85	90	95
Agriculture, Forestry and Fisheries	0.027	0.035	0.049	0.074	0.093
Mining and Quarrying	0.054	0.047	0.070	0.066	0.063
Manufacturing	0.257	0.273	0.292	0.306	0.300
Consumer Goods	0.177	0.203	0.221	0.255	0.253
Basic Material Manufacturing	0.410	0.392	0.375	0.356	0.344
Assembly and Processing	0.449	0.375	0.373	0.339	0.307
Electricity, Gas, Water, Construction	0.114	0.116	0.112	0.127	0.167
Services	0.042	0.079	0.078	0.087	0.102
Average	0.122	0.156	0.169	0.189	0.203

C. Effects on Employment

The contribution ratio of consumption decreased continuously from 70.7% in 1975 to 56.8% in 1995, whereas that of investment increased steadily from 11.5% to 23.7% over the same period. In the case of exports, the ratio rose for the period 1975-90, but declined in 1995 because the structure of Korean exports changed from a light and labor-intensive product orientation to a concentration on capital and technology-intensive products. The induced employment coefficient, which is defined as the units of employment induced by one billion won of final demand, decreased sharply from 146.1 in 1975 to 34.2 in 1995. What is more, all the coefficients of final demand components registered downward trends.

The all-industry induced employment coefficient fell from 165.4 to 36.8 for the period 1975-95. This trend reflected the change of the industrial structure -from light industry to heavy and chemical industry- and a consequent lowering of the capacity for job creation. The coefficient of consumption on employment showed a similar downward trend, because of the shift in consumer spending patterns in response to increased real income.

<Table 11> Effects of Components of Final Demand on Employment

	1975	1980	1985	1990	1995
Coefficient (number per billion won)					
Consumption	161.5	110.8	82.6	58.8	40.6
Investment	84.9	51.6	53.4	37.2	27.3
Exports	160.1	98.0	73.0	54.6	29.5
Average	146.1	96.3	73.6	51.6	34.2
Degree of Contribution(%)					
Consumption	70.7	70.1	61.7	57.6	56.8
Investment	11.5	10.9	17.4	21.2	23.7
Exports	17.7	19.0	20.9	21.2	19.5
Total	100.0	100.0	100.0	100.0	100.0

<Table 12> Induced Employment Coefficients by Industry

	75	80	85	90	95
Agriculture, Forestry and Fisheries	273.1	204.4	142.2	120.1	90.6
Mining and Quarrying	130.6	123.4	104.7	45.7	25.0
Manufacturing	177.4	107.5	75.1	53.0	28.8
Consumer Goods	212.6	131.3	94.2	68.8	42.9
Basic Material Manufacturing	89.0	58.3	45.3	34.1	20.3
Assembly and Processing	129.5	87.0	61.7	45.5	23.9
Electricity, Gas, Water, Construction	119.8	76.4	55.1	40.4	32.5
Services	118.2	88.3	76.1	56.6	43.1
Average	165.4	107.9	79.7	56.3	36.8

Ⅳ. Decomposition of the Sources of Growth

1. Methodology

We seek to analyze changes in the output of the individual sector which took place for the period 1975-95 by decomposing the total change in production in each sector into four component changes:

(ⅰ) changes in the volume of domestic final demand,
(ⅱ) changes in the volume of exports,
(ⅲ) changes in the volume of imports, and
(ⅳ) changes in technology[5)]

As is well known, the methodology of decomposing sources of growth was propounded by Chenery(1960), and by Chenery-Syrquin-Watanabe(1962), being later elaborated by Syrquin(1976). This paper follows, in principle, Syrquin's methodology.

The starting point in analyzing sources of growth is the balance equation of the input-output framework. In the input-output accounts, total supply is composed of gross domestic output and imports, and total demand is composed of intermediate demand and final demand. Here, final demand can also be divided into domestic final demand and exports. Therefore, the balance equation of supply and demand in the input-output framework can be expressed as follows:

Total Supply = Gross domestic output + Imports
||
Total Demand = Intermediate Demand + Domestic final demand + Exports

5) Indicates the change of Input-Output coefficients.

Also, we can rewrite the above balance equation as a matrix formulation, as follows:

$$X = W + D + E - M \quad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots(1)$$

X : gross domestic output vector
W : intermediate demand vector
D : domestic final demand vector
E : exports vector
M : total imports vector

If the input-output tables are explicitly divided into a domestic transactions table and the imported transaction table, equation (1) can be reformulated as follows.

$$X = A^d X + A^m X + D + E - M^w - M^f \quad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots(2)$$

A^d : domestic input-output coefficients matrix
A^m : imported input-output coefficients matrix
M^w : intermediate demand vector for imports of products
M^f : final demand vector for imports of products

In equation (2), as the intermediate input for imports of products ($A^m X$) is equal to the intermediate demand for imports of products(M^w), they are both deleted. Let $\hat{m}$ be the diagonal matrix of the ratio of imports for final demand to domestic final demand, and equation (2) can be expressed as follows.

$$X = A^d X + (I - \hat{m})D + E \quad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots(3)$$

Let the inverse matrix of the domestic transaction table, $[I - A^d]^{-1}$, be R^d. Then,

$$X = R^d[(I - \hat{m})D + E] \quad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots(4)$$

From equation (4), we can derive the first difference equation relating output growth to its sources as follows.

		effects due to
ΔX [6] =	$R_2^d(I - \hat{m}_2)\Delta D$	(domestic final demand expansion)

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6) $\Delta X = X_2 - X_1 = R_2^d[(I - \hat{m}_2)D_2 + E_2] - R_1^d[(I - \hat{m}_1)D_1 + E_1]$

$= R_2^d(I - \hat{m}_2)\Delta D + R_2^d\Delta E + R_2^d(\hat{m}_1 - \hat{m}_2)D_1 + R_2^d(A_2^d - A_1^d)X_1$

where: $A_2^d - A_1^d = \Delta A - (A_2^m - \tilde{A}_2^m) - (\tilde{A}_2^m - A_1^m)$

$\tilde{A}_2^m = \frac{A_2^m}{A_2} A_1$

(*Subscripts refer to periods.)

$$+ \; R_2^d \Delta E \qquad \text{(export expansion)}$$

$$+ \; R_2^d (\widehat{m_1} - \widehat{m_2}) D_1 \qquad \text{(import substitution of final goods)}$$

$$- \; R_2^d (\; \overline{A_2}^m - A_1^m) X_1 \qquad \text{(import substitution of intermediate goods)}$$

$$+ \; R_2^d [\Delta A - (\; A_2^m - \overline{A_2}^m)] X_1 \qquad \text{(technological change)} \quad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (5)$$

In equation (5), each term of $(\; \overline{A_2}^m - A_1^m) X_1$ is expressed by $\sum_j (\frac{a_{ij2}^m}{a_{ij2}} - \frac{a_{ij1}^m}{a_{ij1}}) a_{ij1} \cdot X_{j1}$. So the effect of the import substitution of intermediate goods is calculated by the change in the shares of imports among intermediate inputs weighted by the quantity of intermediate goods in the first period.

Thus far, the concept of Paasche has been used, whereby the inverse coefficient matrix of the second period is combined with the volume of the first period. Nevertheless, the Laspeyres formula can also be applied.[7] In this paper, we take the arithmetical average of the Paasche and Laspeyres weighting result.[8]

2. Results of Analysis

A. Total Industry

The expansion of domestic final demand and of exports were the major sources of growth accounting for 69.9% and 27.2% for the whole period 1975–1995, respectively. On the other hand, the effects of technical change and import substitution were relatively small, being only 2.5% and 0.4%. Looking into import substitution in detail, import substitution of final goods[9] accounted for 0.7% of gross domestic output, but the contribution ratio of intermediate goods was negative at −0.3%.

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7)

	Paasche	Laspeyres
domestic final demand expansion	$R_2^d (I - \widehat{m_2}) \Delta D$	$R_1^d (I - \widehat{m_1}) \Delta D$
export expansion	$R_2^d \Delta E$	$R_1^d \Delta E$
import substitution of final goods	$R_2^d (\widehat{m_1} - \widehat{m_2}) D_1$	$R_1^d (\widehat{m_1} - \widehat{m_2}) D_2$
import substitution of intermediate goods	$- R_2^d (\; \overline{A_2}^m - A_1^m) X_1$	$- R_1^d (\; A_2^m - \overline{A_1}^m) X_2$
technological change	$R_2^d [\Delta A - (\; A_2^m - \overline{A_2}^m)] X_1$	$R_1^d [\Delta A - (\; \overline{A_1}^m - A_1^m)] X_2$

8) In each concept of Paasche and Laspeyres, when the I-O coefficient and volume of production are combined, the problem of choice of the based year occurres. Using the arithmetical average of two results by Paasche and Laspeyres, such a problem can be diminished more or less.

9) Final goods are commodities for domestic final demand.

A remarkable feature is displayed by all the sources of growth. In the 1980s, the effects of domestic final demand expansion, import substitution, and technological change were all enlarged, whereas that of export expansion declined. However, in the early 1990s, the situation reversed. Most notably, import substitution and technological change had negative effects, bringing about a decrease in the gross domestic output. On the other hand the contribution ratio of export expansion increased steeply from 20.6% to 32.2%. As usual domestic final demand expansion explained most of the growth.

The above results show a progressive worsening of the structure of the Korean economy from the early 1990s. The dependence upon exports became even more accentuated, which shows that the Korean economy became more sensitive to external economic fluctuations. Import substitution, which had a positive effect before, showed a negative effect on production because of the slower pace of technological development in the early and mid 1990s.

<Table 12> Decomposition of the Sources of growth

(Total Industry)

(unit : %)

	Domestic Final Demand Expansion	Export Expansion	Import Substitution			Technological Change
			Sum	Final Goods	Intermediate Goods	
1975-1980	71.9	24.7	3.3	1.6	1.7	0.1
1980-1985	64.3	29.1	2.1	1.9	0.3	4.4
1985-1990	68.9	20.6	4.5	3.0	1.5	6.1
1990-1995	71.9	32.2	-4.0	-1.8	-2.3	-1.0
1975-1995	**69.9**	**27.2**	**0.4**	**0.7**	**-0.3**	**2.5**

B. Manufacturing

① Domestic Final Demand

During the whole period 1975-95, domestic final demand expansion made a contribution of 54.9% to the growth of manufacturing and its contribution ratio showed an upward trend until the 1990. However, it decreased subsequently in the early 1990s. This tendency was particularly prominent in basic material manufacturing, and assembly and processing within the manufacturing sector. But the situation was different in the case of consumer goods. The contribution ratio of consumer goods was higher than any other sectors over whole period and it rose sharply in the first half of the nineties. Therefore, domestic final demand expansion in manufacturing to growth may be seen as having been most prominent in the contribution made by the expansion of the final demand for consumer goods.

② Export Expansion

The contribution ratio of export expansion was 39.7% over the period 1975-95. Export expansion showed an opposite trend to domestic final demand expansion in general. Export expansion in manufacturing was mainly influenced by basic material manufacturing, and assembly and processing. In the first half of the 1990s, respectively their contribution ratios rose suddenly from 26.6% to 41.7% and from 27.9% to 50.0%. These figures explain the contemporary increase in the contribution ratio of manufacturing from 30.0% to 45.5%. In fact, during that period, the Korean economy became more and more dependent on exports from assembly and processing activities.

③ Import Substitution

Looking at contribution ratios for the period 1975-95, import substitution explained the 2.2% of growth, while that of final goods was 1.2% and that of intermediate goods was 1.0%. The effect of import substitution declined during the period under review, eventually turning negative. Import substitution of consumer goods had a relatively minor effect in the earlier part of the period and made a steeply negative contribution in the first half of the 1990s in a move centering on intermediate goods. The reason is that imports of consumer goods were much greater than any other sectors and were on the increase. On the other hand, import substitution was largely achieved in basic material manufacturing, and in assembly and processing owing to the government's policy of fostering heavy and chemical industry during the 1970s and 1980s. However, there was a falling off in its effect in the later part of the period.

④ Technological Change

The contribution ratio of technological change was 3.2% over the period 1975-95. Until the 1980s, its contribution ratio to growth had showed an upward trend, but it suddenly reversed, registering -1.1% in the 1990s. The steepest fall in the ratio was occurred in consumer goods because imports of raw materials associated with them increased at that time. But basic material manufacturing, and assembly and processing played an important role in technological change throughout the period.

<Table 13> Decomposition of the Sources of Growth

(Manufacturing)

(unit : %)

	Domestic Final Demand Expansion					Export Expansion					Technological Change				
	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95
Manufacturing	49.7	40.7	58.8	57.1	54.9	36.5	46.9	30.0	45.5	39.7	5.6	6.7	7.2	-1.1	3.2
Consumer Goods	64.2	41.4	59.3	149.3	75.7	28.2	49.3	37.3	37.8	37.3	4.8	10.4	9.2	-44.5	-2.6
Basic Material Manufacturing	36.5	48.7	58.9	50.0	51.0	44.9	48.3	26.6	41.7	38.3	3.2	0.4	8.5	4.3	5.0
Assembly and Processing	36.3	30.9	58.3	44.5	47.0	42.0	42.6	27.9	50.0	42.4	13.0	10.1	4.5	3.2	4.6

	Import Substitution														
	Sum					Final Goods					Intermediate Goods				
	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95
Manufacturing	8.3	5.7	4.0	-1.5	2.2	3.6	3.5	1.2	0.0	1.2	4.7	2.2	2.9	-1.5	1.0
Consumer Goods	2.8	-1.2	-5.8	-42.6	-10.4	0.3	0.8	-3.2	-20.7	-5.2	2.5	-2.0	-2.6	-21.9	-5.2
Basic Material Manufacturing	15.3	2.6	6.0	4.1	5.7	6.0	-1.6	2.8	3.9	3.2	9.4	4.2	3.2	0.2	2.5
Assembly and Processing	8.8	16.5	9.3	2.3	5.9	8.4	12.2	2.8	1.0	2.9	0.4	4.3	6.5	1.2	3.0

C. Services

Domestic final demand expansion made the greatest contribution to the growth of services. In comparison to its 79.0% in contribution, those of export expansion and of technological change were quite minor, measuring 18.0% and 4.7%, respectively. Import substitution, meanwhile, made a negative contribution both in the case of intermediate goods and of final goods.

<Table 14> Decomposition of the Sources of Growth

(Services)

(unit : %)

	Domestic Final Demand Expansion					Export Expansion					Technological Change				
	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95
Services	84.0	78.8	76.5	79.6	79.0	18.8	20.3	14.4	19.8	18.0	-2.2	2.5	8.0	4.8	4.7
Wholesale and retail trade	80.4	68.8	74.0	122.0	95.3	34.4	34.7	23.0	17.2	23.4	-17.2	-18.7	-0.5	-36.8	-19.3
Eating and drinking places, hotels and other lodging	147.8	81.8	70.5	101.9	93.4	62.1	54.9	46.7	49.7	50.9	-79.9	-13.1	-2.0	-9.3	-14.8
Transportation and warehousing	72.0	89.4	67.2	46.7	63.6	42.9	30.4	28.9	63.3	44.3	-12.8	-14.7	0.6	-0.9	-5.1

	Import Substitution														
	Sum					Final Goods					Intermediate Goods				
	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95
Services	-0.5	-1.5	1.1	-4.1	-1.7	0.0	-0.9	-0.5	-1.3	-0.8	-0.5	-1.1	1.6	-2.8	-1.0
Wholesale and retail trade	2.5	0.3	3.5	-2.3	0.6	1.9	1.2	0.4	-0.1	0.5	0.6	-0.9	3.1	-2.2	0.2
Eating and drinking places, hotels and other lodging	-30.0	-23.7	-15.3	-42.3	-28.4	-5.7	-21.3	-27.0	-15.4	-19.0	-24.3	-2.3	11.7	-26.9	-10.4
Transportation and warehousing	-2.1	-0.2	3.3	-4.1	-2.0	0.3	0.3	-1.3	-4.9	-2.0	-2.4	-0.5	4.6	-4.2	-0.8

Looking into the trend according to each period, no distinct features are apparent, but the contribution ratios of domestic final demand and export expansion rose after

1990. In the case of technological change and import substitution, not only the ratios of their contributions declined over time, but they also increasingly acted to induce a decrease in gross domestic output. These features were prominent in the sectors of wholesale and retail trade, eating and drinking places, and hotel and other lodging places.

V. Conclusions

The main characteristics of Korean economy over the period 1975-95 can be described as follows.

From the time the first economic development plan was launched in Korea, manufacturing industry drove the rapid growth of the economy. During the years under review, the share of manufacturing in total output rose from 35.5% to 47.6%. Although its overall upward trend was sustained, the make-up of manufacturing changed a lot shifting from the labor intensive industry to capital intensive sector. The primary products of manufacturing in the earlier half of the period were consumer goods such as textiles and food, but subsequently, the assembly and processing items such as vehicles, chemical products, and steel took a dominant position. This tendency was also apparent in the structure of exports. As the economy grew rapidly, the dependence upon the foreign sector deepened, mostly due to the increase in imports of capital goods. The degree of dependence on the foreign sector rose from 19.7% to 24.9%.

Even though manufacturing industry led the fast growth of total output, its share of total employment declined thanks to the increase of capital stock per worker and the capital-intensive industrial structure. In contrast the share of employment provided by the services industry increased to over half the total and showed an upward trend. Considering the repercussion effects of final demand, those on production and on employment showed a reduction, whereas that of import maintained its an increasing trend. This demonstrated the continued import dependency of the industrial structure.

The decomposition results may be summarized as follow.

First, domestic final demand expansion and export expansion both made a much greater contribution to the economic development of Korea than either import substitution or technological change. This shows that the Korean economy developed through volume expansion rather than technological progress. When we take a look at

the contribution ratio of each source of growth, the picture becomes much clearer. While the contribution ratio of export expansion rose from 24.7% in the 1975-80 period to 32.2% in 1990-95 period, those of technological change and import substitution both showed a negative effect, bringing about a decrease in gross domestic output.

Second, the growth of manufacturing industry which drove the rapid growth of the Korean economy was largely attributable to the expansion of domestic final demand and exports. Their contribution ratios both increased for the period 1975-95, whereas technological change and import substitution both showed a negative contribution ratios after 1990. Moreover, the contribution ratio of import substitution sustained a continued downward trend centering consumer goods.

Third, as had been expected, the growth of services industry was found to be mainly led by the expansion of domestic final demand. Because the contribution ratio of domestic final demand expansion to growth has been increasing, the services industry which was mainly driven by domestic final demand is expected to develop rapidly in the future.

In conclusion, although the contribution of domestic final demand to growth was on the rise, the economy's dependence on the foreign sector deepened in the 1990s. The size of the contribution of exports to growth was still moving upward in the 1990s, while import substitution in both intermediate demand and final demand made a negative contribution to the growth of gross domestic output. Especially in the case of industries leading economic growth such as basic material manufacturing and assembly and processing, the induced import coefficients were higher than those of any other industries. Therefore, to sustain robust economic growth, it is necessary to reduce the dependence on the foreign sector and develop domestic demand to lead Korean economic growth. Korea should make efforts to improve its current economic structure in which production and final demand induce large quantities of imports.

Progress toward what is termed a 'services economy' was not apparent even by the end of the period. As the influence of domestic final demand on growth becomes greater, the share of services will expand. The services industry in Korea though still lagged far behind manufacturing industry as well as the service industries of developed countries. Hence, the economic environment should be modified so as to be more conductive to the further development of services industry.

In this paper, methodology employed is that of decomposing the disproportional growth among sectors using the criterion of first differences. But deviation from balanced growth could also be applied. The present study explains the decomposition of the growth of gross domestic output, but imports, value added, and employment could also be treated in a similar fashion. So, we plan to add those results in a future study.

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<Appendix 1>

Table A1: Decomposition of the Sources of Growth

(unit:%)

	Domestic Final Demand Expansion					Export Expansion					Technological Change				
	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95
Agriculture, forestry, and fisheries	161.3	95.2	-363.9	355.6	126.3	4.2	4.5	95.2	23.9	16.6	-58.3	-3.4	-113.6	-108.2	-48.4
Mining and quarrying	184.2	204.1	107.1	150.6	145.7	68.7	34.1	28.9	38.9	38.5	-87.7	-100.6	7.3	-9.1	-27.6
Manufacturing	49.7	40.7	58.8	57.1	54.9	36.5	46.9	30.0	45.5	39.7	5.6	6.7	7.2	-1.1	3.2
(Consumer goods)	64.2	41.4	59.3	149.3	75.7	28.2	49.3	37.3	37.8	37.3	4.8	10.4	9.2	-44.5	-2.6
Food, beverage and tobacco	95.7	78.2	75.1	127.3	92.7	1.6	12.1	18.3	37.1	16.5	6.7	4.2	18.4	-41.9	-0.3
Textile products and leather products	31.0	-8.3	34.5	440.5	50.6	55.6	104.3	67.4	107.1	73.7	5.2	9.0	1.4	-211.1	-9.4
Wood and paper products	70.0	107.5	75.7	117.9	93.3	29.2	-22.6	26.8	36.5	26.0	-9.9	32.4	3.5	-28.7	-7.5
Printing, publishing and reproduction of recorded media	73.3	55.7	74.5	81.8	74.5	9.2	12.3	12.0	16.5	13.7	18.4	29.8	14.9	6.9	14.1
Furniture and other manufacturing products	73.9	42.7	66.1	125.3	76.2	23.5	52.4	22.6	8.2	24.6	0.5	5.6	12.5	-10.0	5.1
(Basic material manufacturing)	36.5	48.7	58.9	50.0	51.0	44.9	48.3	26.6	41.7	38.3	3.2	0.4	8.5	4.3	5.0
Petroleum and coal products	64.5	164.4	66.9	58.9	67.6	27.7	143.9	36.5	39.6	42.5	3.6	-192.4	-0.2	4.4	-7.8
Chemicals and allied products	21.7	51.0	41.9	39.0	39.8	37.1	39.9	33.9	52.7	43.7	10.1	27.4	19.2	-5.1	7.9
Nonmetallic mineral products	73.4	82.0	75.2	61.7	69.2	21.6	9.5	14.6	22.8	18.7	4.0	12.5	6.7	14.8	10.9
Primary metal products	26.7	25.6	65.1	57.0	52.1	62.4	52.4	27.6	46.4	43.3	-5.7	-8.9	-1.9	-0.2	-2.5
Fabricated metal products	24.7	22.5	91.9	47.1	50.0	63.6	50.5	-11.0	21.5	23.3	11.5	19.6	6.9	28.2	21.6
(Assembly and Processing)	36.3	30.9	58.3	44.5	47.0	42.0	42.6	27.9	50.0	42.4	13.0	10.1	4.5	3.2	4.6
General machinery and equipment	46.6	27.4	63.2	64.0	59.3	21.8	12.5	16.1	30.5	23.4	19.8	14.3	13.1	8.2	11.1
Electronic and other electric equipment	40.5	36.6	37.0	30.2	32.8	42.3	54.3	50.1	63.9	58.7	11.5	8.0	-0.5	1.1	1.5
Precision instruments	37.8	71.7	43.7	58.2	53.6	35.6	35.0	39.7	32.7	35.0	5.8	26.9	7.7	-3.2	2.8
Transportation equipment	21.8	26.3	81.3	54.9	58.2	58.7	49.2	8.7	40.9	32.7	11.2	8.6	4.4	4.1	5.0
Electric, gas, water services, Construction	90.1	86.6	95.6	98.2	94.3	4.0	5.9	2.4	6.7	4.5	5.1	7.4	1.6	-4.0	1.2
Electric, gas, and water services	54.8	55.1	69.5	71.7	67.5	31.8	23.1	18.8	22.8	22.4	6.2	21.6	9.9	7.9	10.1
Construction	94.1	91.4	98.9	107.1	99.3	0.9	3.3	0.3	1.4	1.2	5.0	5.2	0.6	-8.0	-0.4
Services	84.0	78.8	76.5	79.6	79.0	18.8	20.3	14.4	19.8	18.0	-2.2	2.5	8.0	4.8	4.7
Wholesale and retail trade	80.4	83.8	74.0	122.0	95.3	34.4	34.7	23.0	17.2	23.4	-17.2	-18.7	-0.5	-36.8	-19.3
Eating and drinking places, hotels and other lodging places	147.8	81.8	70.5	101.9	93.4	62.1	54.9	46.7	49.7	50.9	-79.9	-13.1	-2.0	-9.3	-14.8
Transportation and warehousing	72.0	84.4	67.2	46.7	63.6	42.9	30.4	28.9	63.3	44.3	-12.8	-14.7	0.6	-0.9	-5.1
Communications and broadcasting	62.1	55.9	70.5	74.2	70.6	17.7	21.1	17.4	11.4	14.2	24.5	19.8	13.0	17.3	17.0
Finance and insurance	42.2	69.7	55.5	78.4	67.8	24.9	17.1	11.4	16.6	15.4	21.6	14.8	29.4	8.1	16.5
Real estate and business service	66.5	66.7	81.9	65.3	70.0	8.2	14.4	9.5	11.5	11.0	24.8	19.2	9.9	26.2	20.9
Public administration and defense	99.9	95.7	99.5	101.2	100.0	0.3	4.1	0.5	-1.4	0.0	0.7	0.0	0.0	-0.3	0.1
Educational and health service	93.1	99.7	91.9	84.0	89.9	1.9	5.0	6.2	10.3	7.0	4.8	-2.0	3.2	9.6	5.4
Social and other services	124.9	92.3	98.0	90.9	97.7	4.0	10.2	2.8	11.8	8.2	-27.8	-2.2	-1.3	0.7	-4.3
Dummy sector	137.4	59.3	50.0	62.8	62.1	39.9	24.5	25.1	47.9	36.3	-58.0	23.7	20.5	-5.7	4.2
Total	71.9	64.3	68.9	71.9	69.9	24.7	29.1	20.6	32.2	27.2	0.1	4.4	6.1	-0.1	2.5

Table A1 Continued

(unit: %)

	Import substitution														
	Sum					Final Goods					Intermediate Goods				
	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95	75/80	80/85	85/90	90/95	75/95
Agriculture, forestry, and fisheries	-7.2	3.6	472.3	-171.3	5.5	-4.1	7.5	552.8	-149.1	19.9	-3.1	-3.9	-80.4	-22.2	-14.4
Mining and quarrying	-65.2	-37.5	-43.4	-80.4	-56.5	13.1	-16.2	-9.3	2.0	-3.7	-78.3	-21.3	-34.1	-82.4	-52.8
Manufacturing	8.3	5.7	4.0	-1.5	2.2	3.6	3.5	1.2	0.0	1.2	4.7	2.2	2.9	-1.5	1.0
(Consumer goods)	2.8	-1.2	-5.8	-42.6	-10.4	0.3	0.8	-3.2	-20.7	-5.2	2.5	-2.0	-2.6	-21.9	-5.2
Food, beverage and tobacco	-4.0	5.5	-11.8	-22.5	-8.8	-3.3	3.3	-5.8	-23.2	-7.2	-0.7	2.3	-6.0	0.7	-1.6
Textile products and leather products	8.2	-5.0	-3.3	-236.4	-14.9	3.6	-0.9	-1.9	-73.4	-4.5	4.5	-4.1	-1.4	-163.0	-10.4
Wood and paper products	10.8	-17.4	-5.9	-25.7	-11.8	-0.3	0.2	-1.7	-8.5	-3.8	11.1	-17.6	-4.3	-17.2	-8.0
Printing, publishing and reproduction of recorded media	-0.9	2.2	-1.3	-5.2	-2.3	1.2	0.4	-2.0	-0.8	-0.9	-2.1	1.8	0.6	-4.4	-1.5
Furniture and other manufacturing products	2.1	-0.7	-1.2	-23.6	-5.9	2.3	-0.6	-3.6	-21.9	-6.7	-0.2	-0.1	2.4	-1.7	0.8
(Basic material manufacturing)	15.3	2.6	6.0	4.1	5.7	6.0	-1.6	2.8	3.9	3.2	9.4	4.2	3.2	0.2	2.5
Petroleum and coal products	4.1	-15.9	-2.1	-2.9	-2.3	2.4	-14.7	9.9	7.2	5.9	1.7	-1.2	-12.1	-10.1	-8.2
Chemicals and allied products	31.1	-18.3	5.0	13.5	8.6	15.8	-5.9	2.4	10.1	6.3	15.2	-12.4	2.5	3.4	2.3
Nonmetallic mineral products	1.0	-4.0	3.6	0.8	1.2	0.1	-0.8	-0.4	-1.0	-0.7	0.9	-3.3	4.0	1.7	1.8
Primary metal products	16.6	30.9	9.2	-3.2	7.1	2.7	4.6	2.4	-2.3	0.6	13.9	26.4	6.8	-1.0	6.5
Fabricated metal products	0.2	7.4	12.2	3.2	5.1	0.8	0.9	3.0	0.8	1.2	-0.6	6.5	9.3	2.4	3.9
(Assembly and Processing)	8.8	16.5	9.3	2.3	5.9	8.4	12.2	2.8	1.0	2.9	0.4	4.3	6.5	1.2	3.0
General machinery and equipment	11.8	45.8	7.6	-2.7	6.2	12.8	34.7	3.1	-1.1	4.5	-1.0	11.1	4.5	-1.6	1.7
Electronic and other electric equipment	5.7	1.1	13.4	4.9	7.0	-1.2	5.8	6.0	1.8	3.1	7.0	-4.7	7.4	3.0	3.9
Precision instruments	20.8	-33.6	8.8	12.3	8.6	10.9	-35.0	-9.4	16.1	5.0	9.9	1.4	18.3	-3.8	3.6
Transportation equipment	8.3	16.0	5.6	0.1	4.1	17.7	8.5	-0.2	-0.5	1.5	-9.4	7.5	5.9	0.6	2.6
Electric, gas, water services, Construction	0.8	0.0	0.4	-1.0	0.0	0.4	0.1	0.1	-0.3	0.0	0.4	0.0	0.2	-0.7	-0.1
Electric, gas, and water services	7.2	0.1	1.9	-2.4	0.0	3.3	0.3	0.5	-0.6	0.2	3.9	-0.2	1.4	-1.9	-0.2
Construction	0.1	0.0	0.2	-0.5	0.0	0.1	0.0	0.1	-0.2	0.0	0.0	0.0	0.1	-0.3	0.0
Services	-0.6	-1.5	1.1	-4.1	-1.7	0.0	-0.4	-0.5	-1.3	-0.8	-0.5	-1.1	1.6	-2.8	-1.0
Wholesale and retail trade	2.5	0.3	3.5	-2.3	0.6	1.9	1.2	0.4	-0.1	0.5	0.6	-0.9	3.1	-2.2	0.2
Eating and drinking places, hotels and other lodging places	-30.0	-23.7	-15.3	-42.3	-29.4	-5.7	-21.3	-27.0	-15.4	-19.0	-24.3	-2.3	11.7	-26.9	-10.4
Transportation and warehousing	-2.1	-0.2	3.3	-9.1	-2.8	0.3	0.3	-1.3	-4.9	-2.0	-2.4	-0.5	4.6	-4.2	-0.8
Communications and broadcasting	-4.4	3.2	-0.9	-2.8	-1.9	0.0	1.6	0.0	-0.5	-0.1	-4.4	1.6	-0.9	-2.3	-1.7
Finance and insurance	11.3	-1.5	3.8	-3.0	0.2	2.6	1.1	0.5	-0.3	0.3	8.6	-2.7	3.3	-2.7	0.0
Real estate and business service	0.4	-0.3	-1.2	-3.1	-1.9	0.3	0.3	0.1	-0.8	-0.3	0.1	-0.6	-1.3	-2.3	-1.6
Public administration and defense	-0.9	0.1	0.1	0.4	0.0	-0.2	0.1	0.1	0.2	0.0	-0.7	0.0	0.0	0.3	-0.1
Educational and health service	0.2	-2.7	-1.3	-3.9	-2.3	0.0	-2.7	-2.0	-1.5	-1.6	0.2	0.0	0.8	-2.3	-0.7
Social and other services	-1.2	-0.3	0.4	-3.4	-1.5	-0.8	0.3	-0.6	-3.2	-1.5	-0.4	-0.6	1.1	-0.3	0.0
Dummy sector	-19.3	-7.5	4.5	-5.1	-2.6	-12.8	-0.1	2.3	-0.3	0.0	-6.5	-7.5	2.1	-4.7	-2.5
Total	3.3	2.1	4.5	-4.0	0.4	1.6	1.9	3.0	-1.8	0.7	1.7	0.3	1.5	-2.3	-0.3

<APPENDIX 2>

Table A2 : Sector Classification

28 Sectors		77 Sectors	
1	Agriculture, forestry, and fisheries	1	Crops
		2	Livestock breeding
		3	Forestry products
		4	Fishery products
2	Mining and quarrying	5	Coal mining
		6	Crude petroleum and natural gas
		7	Metal ores
		8	Nonmetallic minerals
3	Food, beverages and tobacco	9	Meat and dairy products
		10	Processed seafood products
		11	Polished grains, flour and milled cereals
		12	Sugar and starches
		13	Bakery and confectionery products, noodles
		14	Seasonings and fats and oils
		15	Canned or cured fruits and vegetables and misc. food preparations
		16	Beverages
		17	Prepared livestock feeds
		18	Tobacco products
4	Textile products and leather products	19	Fiber yarn
		20	Fiber fabrics
		21	Wearing apparels and apparel accessories
		22	Other fabricated textile products
		23	Leather and fur products
5	Wood and paper products	24	Wood and wooden products
		25	Pulp and paper
6	Printing, publishing and reproduction of recorded media	26	Printing, publishing and reproduction of recorded media
7	Petroleum and coal products	27	Coal products
		28	Petroleum refinery products
8	Chemicals and allied products	29	Organic basic chemical products
		30	Inorganic basic chemical products
		31	Synthetic resins and synthetic rubber
		32	Chemical fibers
		33	Fertilizers and agricultural chemicals
		34	Drugs, cosmetics, and soap
		35	Other chemical products
		36	Plastic products
		37	Rubber products
9	Nonmetallic mineral products	38	Glass products
		39	Pottery and clay products
		40	Cement and concrete products
		41	Other nonmetallic mineral products
10	Primary metal products	42	Pig iron and crude steel
		43	Primary iron and steel products
		44	Nonferrous metal ingots and primary nonferrous metal products
11	Fabricated metal products	45	Fabricated metal products
12	General machinery and equipment	46	Machinery and equipment of general purpose
		47	Machinery and equipment of special purpose

Table A2 Continued

28 sectors		77 Sectors	
13	Electronic and other electric equipment	48	Electronic machinery, equipment, and supplies
		49	Electronic components and accessories
		50	Radio, television and communications equipment
		51	Computer and office equipment
		52	Household electrical appliances
14	Precision instruments	53	Precision instruments
15	Transportation equipment	54	Motor vehicles and parts
		55	Ship building and repairing
		56	Other transportation equipment
16	Furniture and other manufacturing products	57	Furniture
		58	Other manufacturing products
17	Electric, gas, and water services	59	Electric services
		60	Gas and water supply
18	Construction	61	Building construction and repair
		62	Civil Engineering
19	Wholesale and retail trade	63	Wholesale and retail trade
20	Eating and drinking places, and hotels and other lodging places	64	Eating and drinking places, and hotels and other lodging places
21	Transportation and warehousing	65	Transportation and warehousing
22	Communications and broadcasting	66	Communications and broadcasting
23	Finance and insurance	67	Finance and insurance
24	Real estate and business service	68	Real estate agencies and rental
		69	Business services
25	Public administration and defense	70	Public administration and defense
26	Educational and health service	71	Educational and research services
		72	Medical and health services, and social security
27	Social and other services	73	Culture and recreational services
		74	Other services
28	Dummy sector	75	Office supplies
		76	Business consumption expenditure
		77	Nonclassifiable activities