

## **Industrial Policy and Export-led Industrialization in the Republic of Korea in 1975–1985: An Input-Output Perspective**

By  
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### **Abstract**

The Republic of Korea is a well-known success story of export-led industrialization steered by active state intervention which was manifested in a series of five-year economic development programmes implemented since the early 1960s. In general, the empirical findings of a decomposition analysis based on the constant price 1975–1980–1985 Korean input-output tables seem to corroborate the successful outcomes of the industrial policy for export-led industrialization as designed and implemented by policy-makers and planners in the 1960s and 1970s.

### **1. Overview**

The Republic of Korea is a well-known success story of export-led industrialization steered by active state intervention. Emerging from the initial period of easy import substitution which lasted from the end of the Korean War to 1960, the Republic of Korea reached a turning-point in its industrialization drive in 1963 when the first five-year economic development programme (1962–1966) was launched with a clear shift to an export-oriented strategy. The first plan emphasized the expansion of light manufactured goods and their exports. The second programme (1967–1971) was an extension of the first programme and stressed further consolidation of economic growth and export expansion achieved in the first period. It was in the third programme (1972–1976) that heavy and chemical industries were fostered in order to broaden the Korea's industrial base and to upgrade its international competitiveness. The gains made in the third programme was further consolidated in the fourth programme (1977–1981) as manifested in the sophistication of industrial structure, expansion of capital and intermediate goods industries, and institution-building for science and technology. However, emphasis was shifted to macroeconomic stabilization in the fifth programme (1982–1986) because of various macroeconomic disequilibria caused by rapid growth in the previous periods such as price instability and worsening income distribution.

A general picture emerging from a series of these five-year development programmes is a shift in policy emphasis from exports of light manufacturing in the 1960s to the development of heavy and chemical industries, and capital goods industries in the 1970s, and the consolidation of export capabilities of these industries and upgrading of industrial structure along with economic stabilization and trade liberalization in the 1980s<sup>1</sup>.

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<sup>1</sup>For a detailed account of industrial policy in the post-Korean War period, see K.S. Kim (1985) and S.J. Kim (1993).

Table 1: Structural Change in the Republic of Korea, 1975-1985  
(1985 constant prices)

	1975		1980		1985		Annual growth rates		
	Production	%	production	%	Production	%	75-80	80-85	75-85
	(bil.won)		(bil.won)		(bil.won)				
1. Agriculture, forestry, and fisheries	9702.0	13.6	11410.7	8.9	14643.3	7.7	3.3	5.1	4.2
2. Mining and quarrying	938.5	1.3	1145.5	0.9	1353.5	0.7	14.3	11.8	11.5
3. Manufacturing	31525.7	44.2	62089.8	48.5	95300.3	50.0	14.5	8.9	11.7
Light manufacturing <sup>o</sup>	14308.8	20.1	24261.8	19.0	31262.2	16.4	11.1	5.2	8.1
Industrial materials <sup>**</sup>	13119.5	18.4	27572.7	21.5	41243.2	21.6	16.0	8.4	12.1
Capital goods <sup>***</sup>	4097.4	5.7	10255.3	8.0	22794.9	12.0	20.1	17.3	18.7
4. Electricity, water and gas	1299.9	1.8	2559.9	2.0	4459.4	2.3	14.5	11.7	13.1
5. Construction	4237.2	5.9	9422.6	7.4	15462.5	8.1	17.4	10.4	13.8
6. Services	23625.6	33.2	41374.9	32.3	59445.1	31.2	11.9	7.5	9.7
Total	71328.9	100.0	128023.4	100.0	190664.2	100.0	12.4	8.3	10.3

Source: (Tables 1 to 8) Bank of Korea, 1975-1980-1985 Link Input-Output Tables, Seoul, Korea, 1989.

<sup>o</sup> Food, beverage and tobacco; textile and leather.

<sup>\*\*</sup> Lumber and wood products; paper, printing and publishing; chemicals and chemical products; primary metals; non-metallic minerals.

<sup>\*\*\*</sup> Fabricated metals; electrical and non-electrical machineries; transport equipment; scientific instruments.

Table 2: Structure of Imports, 1975-1985

	1975		1980		1985		Annual growth rates		
	Import	%	Import	%	Import	%	75-80	80-85	75-85
	(bil.won)		(bil.won)		(bil.won)				
1. Agriculture, forestry, and fisheries	1022.0	9.0	1854.7	9.3	2489.2	8.6	12.7	6.1	9.3
2. Mining and quarrying	2884.9	25.4	4863.3	24.4	6708.3	23.1	11.0	6.6	8.8
3. Manufacturing	7102.9	62.6	12098.0	60.7	17977.2	61.8	11.2	8.2	9.7
Light manufacturing <sup>o</sup>	1081.9	9.5	1539.2	7.7	2056.7	7.1	7.3	6.0	6.6
Industrial materials <sup>**</sup>	2402.8	21.2	4496.3	22.6	7530.8	25.9	13.4	10.9	12.1
Capital goods <sup>***</sup>	3618.2	31.9	6062.5	30.4	8389.7	28.8	10.9	6.7	8.8
4. Services	338.1	3.0	1112.7	5.0	1912.3	6.6	26.9	11.4	18.9
Total	11347.9	100.0	19928.7	100.0	29087.1	100.0	11.9	7.9	9.9

<sup>o</sup> Food, beverage and tobacco; textile and leather.

<sup>\*\*</sup> Lumber and wood products; paper, printing and publishing; chemicals and chemical products; primary metals; non-metallic minerals.

<sup>\*\*\*</sup> Fabricated metals; electrical and non-electrical machineries; transport equipment; scientific instruments.

During the period of 1975–1985, export-led growth had brought about a phenomenal structural change in the Republic of Korea. Real GDP grew 2.7 times between 1975 and 1985 at an annual growth rate of 10%. The share of agriculture in total output declined sharply from 13.6% in 1975 to 7.7% in 1985, while the manufacturing share increased from 44% to 50% during the same period. The service share was slightly down from 33% in 1975 to 31% in 1985. Particularly notable is structural change within the manufacturing sector. The production of capital goods increased rapidly at an annual rate of nearly 19% with its share of total output rising sharply from 5.7% in 1975 to 12% in 1985. By contrast, light manufacturing grew at an annual rate of around 8% and its share of total output dropped considerably from 20 to 16% between 1975 and 1985. The intermediate goods industry also grew fast at a rate of 12% per year with its output share increasing from 18% to almost 22% during the same period (Table 1).

The salient feature of the export-led industrialization strategy pursued by the Republic of Korea during the period is that the competitive export industry is built on foreign technology with heavy reliance on imported intermediate inputs and capital goods. As the imports of intermediate and capital goods became essential to sustaining the export drive, the government launched the second phase of import substitution commonly known as time-phased localization programmes with a view to produce domestically an increasingly larger proportion of imported inputs. The comparison of the structure of imports (Table 2) and that of exports (Table 3) provides some partial evidence to the secondary import substitution linked to the export expansion. Manufactured exports, whose share of total exports increased from 72% to 77.5% between 1975 and 1985, grew by about 13% per year during the period, while manufactured imports, whose share of total imports remained constant at the level of around 62%, increased at a lower rate of 9.7% per year during the period of 1975–1985. Manufactured exports increased by almost 3.5 times from 6,245 billion won in 1975 to 21,481 billion won in 1985, while manufactured imports increased by about 2.5 times from 7,103 billion won to 17,977 billion won during the same period. The most striking change in trade occurred again in the capital goods industry. Capital goods exports jumped six-fold from 1,364 billion won to 8,149 billion won between 1975 and 1985. This increase represents an impressive real annual growth rate of almost 20% with its share of total exports rose steeply from 16% in 1975 to 30% in 1985. By sharp contrast, capital goods imports slightly more than doubled from 3,618 billion won to 8,390 billion won at a much slower annual growth rate of 8.8% with its percent of total imports declining from 32% to 29% between 1975 and 1985 (Tables 2 and 3).

It is worth noting that the nature of industrial production may determine the extent to which the export-linked secondary import substitution, alternatively known as the localization programme, is carried out. In general, such a secondary import substitution is relatively easier in industries where the production process could be broken down into many subprocesses - final assembly, subassemblies, and numerous parts and components production in such industries as motor vehicles, machinery and equipment, and consumer durable goods. Import dependence as shown by intermediate input imports as a percentage of total output by industry in Table 4 provides a partial measure of the extent of secondary import substitution. Import dependence of the manufacturing sector as a whole declined slightly from 22.4% in 1975 to 20.6% in 1980, but slightly up again to 21.7% in 1985. However, import dependence varied remarkably among manufacturing industries. Many industries have seen their import dependence increased in varying degrees during the period of 1975 to 1985. They include food, beverage and tobacco; textile and leather; lumber and wood products; and non-metallic minerals. On the other hand, import dependence for other manufacturing industries decreased. Particularly notable was a substantial drop in primary metals from 31.3 to 18.2% and in metal fabrication and machineries from 26.5% to 20.8% between 1975 and 1985. These two industries are where the vertical disintegration of the production process can be easily achieved, for instance, import substitution of parts and components in capital goods industry, to the extent that expanding exports permit such a division of labour.

Table 3: Structure of Exports, 1975-1985

	1975		1980		1985		Annual growth rates		
	Export	%	Export	%	Export	%	75-80	80-85	75-85
	(bil.won)		(bil.won)		(bil.won)				
1. Agriculture, forestry, and fisheries	625.3	7.2	615.7	3.6	554.3	2.0	-0.3	-2.1	-1.2
2. Mining and quarrying	69.5	0.8	51.3	0.3	27.7	0.1	-5.9	-11.6	-8.8
3. Manufacturing	6244.8	71.9	12655.4	74.0	21480.7	77.5	15.2	11.2	13.1
Light manufacturing*	2874.9	33.1	4668.8	27.3	6513.5	23.5	10.2	6.9	8.5
Industrial materials**	2006.3	23.1	4224.2	24.7	6818.4	24.6	16.1	10.0	13.0
Capital goods***	1363.6	15.7	3762.4	22.0	8148.8	29.4	22.5	16.7	19.6
4. Electricity, water and gas, construction	26.1	0.3	51.3	0.3	194.0	0.7	14.5	30.5	22.2
5. Services	1719.7	19.8	3728.2	21.8	5432.5	19.6	16.7	7.8	12.2
Total	8685.4	100.0	17101.9	100.0	27717.0	100.0	14.5	10.1	12.3

\* Food, beverage and tobacco; textile and leather.

\*\* Lumber and wood products; paper, printing and publishing; chemicals and chemical products; primary metals; non-metallic minerals.

\*\*\* Fabricated metals; electrical and non-electrical machineries; transport equipment; scientific instruments.

Table 4: Import Dependence\*  
(Percentage)

	1975	1980	1985
Agriculture, forestry, and fisheries	1.6	1.8	1.8
Mining and quarrying	2.4	0.4	0.7
Manufacturing	22.4	20.6	21.7
Food, beverage and tobacco	5.0	6.9	9.3
Textile and leather	15.8	13.3	16.6
Lumber and wood products	38.4	45.9	39.9
Paper, printing and publishing	18.0	12.3	13.5
Non-metallic minerals	6.1	5.7	10.7
Chemicals and chemical products	43.3	38.7	40.2
Primary metals	31.3	22.4	18.2
Metal fabrication and machineries	26.5	21.1	20.8
Miscellaneous manufacturing	12.2	11.2	9.1
Water, electricity, gas	3.2	5.2	8.8
Construction	5.2	4.2	3.2
Services	2.5	4.2	3.2
Industry Average	11.3	12.5	12.9

\* Intermediate input imports as a percentage of industry output.

The percentage change in the composition of final demand during the period of 1975–1985 as shown in Table 5 may reflect the resource mobilization of the Korean government to accelerate the export-led economic growth during the period. Although both private and government consumption doubled in absolute amount between 1975 and 1985, each respective share of total final demand declined appreciably. Particularly notable was a considerable drop in the private consumption share from 51% in 1975 to 44% in 1985, implying a significant accumulation of private savings. The share of government expenditure increased slightly from 9.2% to 10.5% in the period of 1975–1980, but subsequently reduced to 7.5% by 1985, reflecting tight monetary and fiscal policy pursued by the government to achieve price stability during the first half of 1980s. By sharp contrast, both capital formation and exports nearly trebled between 1975 and 1985. Gross capital formation as a percentage of total expenditure rose from 18% to 22% and the share of private capital formation increased by 3.5 percentage points from 14.6% to 18% during the period of 1975–1985. This substantial increase in private investments was facilitated by aggressive government investment promotion measures such as investment tax credits and other preferential treatments, and expansion of investment capital earmarked for export promotion, as well as the mobilization of domestic savings. However, most remarkable was a three-fold increase in exports with its share of total final demand also climbing steeply from 19% to almost 26% between 1975 and 1985. In short, the data seem to depict a significant resource mobilization to accelerate export-led economic growth during the period.

This study attempts to measure the relative importance of exports as opposed to other factors in industrial growth in the Republic of Korea, using the 1975–1980–1985 linked constant price input-output tables constructed by the Bank of Korea. The original 390 sector input-output tables are aggregated to 161, 65 and 22-sector summary tables. These tables are deflated by 1985 price indices<sup>2</sup>.

## 2. Methodology

The analytical framework used for the decomposition of the sources of growth is based on an accounting identity of input-output material balance, namely each industry output is equal to its various uses, that is intermediate use, final demand and exports. Then a change in the material balance between two periods was taken to match the change in industry output to changes in various uses. In short, it is a demand-side decomposition using a comparative statistical framework<sup>3</sup>.

To describe the decomposition method used in this study, we define the following variables. Unless specified otherwise, matrices are henceforth denoted by capital letters, and vectors are written as lower-case letters.

$A$  is a  $(n \times n)$  total input coefficient matrix, that is, domestic plus imported inputs divided by the total output of each industry (column sum).

$M$  is a  $(n \times n)$  imported input coefficient matrix.

$A^d = A - M$ , a  $(n \times n)$  domestic input coefficient matrix.

$q$  is a  $(n \times 1)$  output vector.

$f$  is a  $(n \times 1)$  final demand vector.

$f^m$  is a  $(n \times 1)$  import demand vector.

$f^d = f - f^m$ , a  $(n \times 1)$  domestic demand vector.

$x$  is a  $(n \times 1)$  export vector.

<sup>2</sup>For a detailed description of the methodology for the construction of Korean tables, see the Bank of Korea (1989), Chapter 1.

<sup>3</sup>For a comprehensive discussion of the methodology of multisector comparative analysis including input-output growth accounting, see Hollis Chenery et al. (1986), Chapter 5. For empirical applications, for instance, see Dewhurst (1993), Feldman, et al. (1987), Inagawa (1987), Kubo and Robinson (1984), Skolka (1989), Nishimizu (1978), Melo (1985), and UNIDO (1993).

Table 5: The Structure of Final Demand  
(1985 constant prices)

	1975		1980		1985	
	bil.won	%	bil.won	%	bil.won	%
Consumption	27214.4	60.2	44086.8	57.7	55701.2	51.6
Private	(23053.6)	(51.0)	(36063.9)	(47.2)	(47626.6)	(44.1)
Government	(4160.8)	(9.2)	(8022.9)	(10.5)	(8074.6)	(7.5)
Gross Investment	9294.0	20.6	15239.6	19.9	24516.8	22.7
Fixed Capital formation	(8073.9)	(17.9)	(15448.1)	(20.2)	(23745.1)	(22.0)
Private	(6620.2)	(14.6)	(12287.3)	(16.1)	(19397.1)	(18.0)
Government	(1453.7)	(3.2)	(3160.8)	(4.1)	(4348.0)	(4.0)
Inventory change	(1220.1)	(2.7)	(-208.5)	(-2.7)	(771.7)	(0.7)
Exports	8685.4	19.2	17101.9	22.4	27717.1	25.7
Total	45193.8	100.0	76428.3	100.0	107935.1	100.0

Table 6: Decomposition of Sector Output  
(Absolute figures in millions of 1985 won)  
1975-1980

Sector	Gross output		Decomposition(%)					
	1975	1980	Prod. change	% share	Final demand	Final demand import sub.	Exp.	Technical change & import sub.
Agriculture	9701997	11410657	1708660	3.01	199.39	16.46	98.10	-181.03
Mining	938537	1145489	206952	0.37	185.84	-38.23	71.13	-195.19
Manufacturing	31525740	62089827	30564087	53.91	52.29	2.54	31.32	18.93
Utilities	1299859	2559865	1260006	2.22	57.79	1.37	21.92	21.66
Service	22287506	39257947	16970441	29.93	79.55	1.07	19.40	2.11
Dummy	1338077	2115990	778913	1.37	102.55	4.69	30.61	-28.47
Total	71328888	128023381	56694493	100.00	70.07	2.14	26.91	5.17
1980-1985								
Agriculture	11410657	14643322	3232665	5.16	100.96	-1.58	46.82	-49.37
Mining	1145489	1353537	208048	0.33	170.37	-26.46	73.49	-170.32
Manufacturing	62089827	95300315	33210488	53.02	45.05	2.32	42.67	14.60
Utilities	2559865	4459418	1899553	3.03	50.60	1.10	20.63	29.87
Construction	9442606	15462488	6019882	9.61	87.06	0.10	3.52	9.51
Service	39257947	55991585	16733638	26.71	69.13	2.19	19.93	13.12
Dummy	2116990	3453509	1336519	2.13	43.11	1.77	18.44	40.22
Total	128023381	190664174	62640793	100.00	58.95	1.73	31.97	10.81

Then, an input-output material balance equation is

$$\begin{aligned} q &= A^d q + f^d + x \\ &= (I - A^d)^{-1}(f^d + x) = R^d(f^d + x) \\ &\text{where } R^d = (I - A^d)^{-1} \end{aligned} \quad (1)$$

Taking a difference of  $q$  between two periods and adding to and subtracting from the equation the same term  $R_1^d(f_2^d + x_2)$  will yield

$$\begin{aligned} \Delta q &= q_2 - q_1 = R_2^d(f_2^d + x_2) - R_1(f_1^d + x_1) \\ &= R_2^d(f_2^d + x_2) - R_1^d(f_2^d + x_2) + R_1^d(f_2^d + x_2) - R_1(f_1^d + x_1) \end{aligned} \quad (2)$$

From the 3rd and 4th terms, we derive

$$\begin{aligned} R_1^d(f_2^d + x_2) - R_1^d(f_1^d + x_1) &= R_1^d(\Delta f^d + \Delta x) \\ &= R_1^d(\Delta f - \Delta f^m + \Delta x) \end{aligned} \quad (3)$$

and from 1st and 2nd term,

$$R_2^d(f_2^d + x_2) - R_1^d(f_2^d + x_2) = \Delta R^d(f_2^d + x_2) \quad (4)$$

From equations (3) and (4), a change in output is decomposed as follows:

$$\begin{aligned} \Delta q &= R_1^d \Delta f && \text{(final demand effect)} \\ &\quad - R_1^d \Delta f^m && \text{(final demand import substitution effect)} \\ &\quad + R_1^d \Delta x && \text{(export effect)} \\ &\quad + \Delta R^d(f_2^d + x_2) && \text{(effects of technical change + input import substitution)} \end{aligned} \quad (5)$$

In sum, the changes in the sectoral output between two periods were decomposed into the four sources of growth, namely, (1) final demand, (2) final demand imports substitution, (3) exports, and (4) technical change and input import substitution. It is mathematically intractable to separate the effect of technical change from that of input import substitution in the last term<sup>4</sup>.

### 3. Empirical Results

The purpose of this section is to estimate the relative contribution of various sources of growth to sectoral output growth and particularly the effect of exports on the industrial output growth, using the methodology developed in the preceding section.

Table 6 summarizes the overall decomposition of the five sectoral output changes into four effects-final demand, import substitution, exports, and technical change and input import substitution combined in the two periods, between 1975 and 1980, and between 1980 and 1985.

Obviously, factors affecting the growth of manufacturing output are of crucial importance to a study of industrialization. The manufacturing sector was the fastest growing sector during

<sup>4</sup>It must be noted, however, that the effect of changes in input coefficients can be separated from that of import substitution of intermediate input by making a simplifying assumption that intermediate import coefficients,  $m_i$ , are the same for all sectors using commodity  $i$  as an input, where  $m_i$  is defined as total intermediate imports of sector  $i$  as a percentage of total output of that sector (Chenery et al., 1986). It is obvious that such estimated intermediate imports of commodity  $i$  by sector  $j$  may differ considerably from actual values of a full import matrix detailing the sectoral use of intermediate imports of commodity  $i$  when available, and hence introduce an estimation error.

the two periods, accounting for the largest share of total output changes; 54% in the period of 1975–1980 and 53% in the period of 1980–85. Among the four factors affecting the growth of manufacturing output, final demand was the strongest, but its effect declined appreciably from 52% to 45% between the two periods. By contrast, the effect of exports, the second largest source of manufacturing output growth, was sharply up from 31% in the period of 1975–1980 to 43% in the period of 1980–1985 and hence almost caught up with final demand. The empirical results seem to confirm the crucial role of manufactured exports in accelerating industrialization of the Republic of Korea during the periods. Moreover, the effect of final demand may have been overestimated and that of manufactured exports underestimated, since the output multiplier effects of manufactured exports on final demand was not properly taken into account in the numerical results.

The effect of import substitution of final manufactured products was positive but relatively weak, accounting for around 2% of the manufacturing output growth in both periods. The last source of growth corresponds to the net effect of the two types of change, namely changes in the domestic input-output coefficients and a change in the import matrix of intermediate goods. The change in the import matrix is brought about by the imports of new inputs as well as domestic substitution of imported inputs as manifested in local contents programmes pursued vigorously in the Republic of Korea. The changes in domestic input-output coefficients are basically caused by changes in production technology as well as by substitution among various inputs, often induced by changes in relative prices. Of course, the two effects are closely interrelated and difficult to separate algebraically one from the other, as described earlier. The combined effects of technical change and input import substitution are quite significant, explaining almost 20% of the manufacturing output growth in the first period and nearly 15% in the second period. A substantial part of these effects may have resulted from local contents programmes within a broad strategy of export-linked secondary import substitution actively pursued by the Republic of Korea during the periods.

The service share of total output change ranked a distant second to that of the manufacturing sector, about 30% in the first period and 27% in the second period. The growth of service sector was predominantly influenced by the domestic market, but its effect declined appreciably from 80% to 70% between the two periods, while the positive effect of technical change and intermediate import substitution increased sharply from 2% to 13% during the periods. The effect of service exports was quite considerable, amounting to around 20% in both periods.

The share of construction in total output growth was slightly less than 10% in both periods. Since construction is basically non-tradeable, the growth of construction is expected to be little affected by exports, but predominantly determined by final demand. Empirical results confirmed theoretical expectations. The rest of the sectors are relatively insignificant in terms of their respective share of total output change. Agricultural share was less than 5%, mining less than 1%, and utilities around 3% in both periods. The source of growth in agriculture was dominated by domestic markets, although the effect of agricultural exports was quite substantial; the same holds for mining and utilities, although the relative importance of exports in utilities is rather unexpected in view of the non-tradeable characteristics of its output. All these three sectors appear to be significantly affected by technical change and input import substitution during the periods.

Table 7: Decomposition of Manufacturing 1975–1980  
(Absolute figures in millions of 1985 won)

Sector	Gross output		Decomposition(percentage)					
	1975	1980	Prod. change	% share	Final demand	Final demand import sub.	Exp.	Technical change & import sub.
Light Mfg.	14308781	24261802	9953021	32.56	65.02	-0.57	28.51	5.91
Diry	845770	1683475	837705	2.74	95.24	1.45	1.07	5.15
Seafood	376380	486619	111239	0.36	185.82	-2.28	-93.24	5.14
Pol Grain	4162473	4867325	704852	2.31	94.14	-12.83	3.61	-10.58
Flour	259802	327136	67334	0.22	270.09	5.78	14.66	-178.97
Sugar	143573	331357	187784	0.61	70.37	6.05	24.46	11.23
Bread etc.	404175	1015172	610997	2.00	83.44	0.18	2.58	14.17
Other Food	755686	1432431	676745	2.21	52.49	-2.75	8.00	36.76
Beverages	828885	1833982	1005097	3.29	117.60	4.56	5.44	-18.48
Tobacco	697625	1328382	630757	2.06	106.58	0.10	1.88	-8.36
Yarn	1447233	2722614	1275381	4.17	35.01	-0.38	57.06	7.54
Fibre Fabric	1319029	2677388	1358359	4.44	13.22	-2.29	56.31	28.18
Textiles	1045356	1913836	868480	2.84	65.22	2.99	32.81	4.96
Wearing Apparel	1605649	2691947	1086298	3.55	41.49	-0.70	55.81	2.01
Leather	418145	950138	531993	1.74	23.79	-0.51	62.11	13.59
Intermediate Goods	12424050	26315181	13891131	45.45	47.89	0.84	38.66	14.29
Wood Products	817060	1223817	406757	1.33	113.97	0.58	18.68	-32.07
Pulp and Paper	490148	1279456	789308	2.58	57.24	3.52	25.10	21.18
Printing Publishing	318.681	641563	322882	1.06	84.78	2.17	9.09	8.30
Basic Chemicals	990027	2230914	1240887	4.06	2.09	-9.09	46.27	42.55
Chemical Fiber	541975	1065851	523876	1.71	17.91	-0.51	43.74	37.84
Agrichemicals	679428	914375	234947	0.77	-80.38	-27.82	90.16	62.40
Drugs	372754	971754	599000	1.96	93.50	3.09	3.29	6.30
Other Chemicals	316937	673651	356714	1.17	27.83	-7.10	27.83	7.89
Synthetic Resin	407133	858588	451455	1.48	49.03	-0.40	8.39	42.18
Petroleum Prod.	3601263	6124042	2522779	8.25	77.91	0.92	36.39	-13.38
Coal Prod.	532529	1137581	605052	1.98	48.60	0.82	7.42	44.79
Rubber Prod.	477085	1224677	747592	2.45	21.90	-0.71	69.51	7.87
Non-metal Prod.	993742	2242189	1248447	4.08	77.20	1.42	17.61	6.61
Iron and Steel	581976	2053219	1471243	4.81	29.49	5.20	611.06	14.66
IS Primary Prod.	1088334	3019947	1931613	6.32	34.30	5.67	56.23	15.14
Non-ferrous Prod.	214978	653557	438579	1.43	38.45	9.65	47.93	23.27
Capital Goods	4097396	10255268	6157872	20.15	49.76	13.10	44.66	18.67
Metal Prod.	412769	1441386	1028617	3.37	29.16	2.07	60.52	12.39
Machinery	631471	1716466	1084995	3.55	140.03	88.63	19.16	29.44
Electrical Equip.	469424	1355818	886394	2.90	70.29	20.39	29.95	20.15
Electronic Equip.	1219896	2941114	1721218	5.63	34.43	11.42	49.74	27.25
Transport Equip.	1209124	2348117	1138993	3.73	-22.36	-60.55	60.31	1.50
Scientific Inst.	154712	452367	297655	0.97	95.38	45.70	37.49	12.83
Miscellaneous Mfg.	695513	1257576	562063	1.84	34.77	3.69	50.92	18.00
Total Mfg.	31525740	62089827	30564087	100.00	53.60	2.90	36.79	12.51

The sources of growth for 37 manufacturing industries for the two periods are summarized in Tables 7 and 8. The most remarkable change occurred in the structure of output and exports in the manufacturing sector during the periods in line with a policy shift from the promotion of light manufactured exports in the 1960s to the emphasis on the development of intermediate and capital goods industries in the 1970s. The share of light manufacturing in total manufacturing output change declined sharply from 33% in 1975–1980 to 21% in 1980–1985, while the share of intermediate goods was also slightly down from 45% to 39% during the two periods. By contrast, the greater proportion of increasing manufactured goods was accounted for by the capital goods sector with its share soaring from 20% in the first period to almost 38% in the second period.

Table 8: Decomposition of Manufacturing 1980–1985  
(Absolute figures in millions of 1985 won)

Sector	Gross output		Decomposition(percentage)					
	1980	1985	Prod. change	% share	Final demand	Final demand import sub.	Exp.	Technical change & import sub.
Light Mfg.	24261802	31262802	7000389	21.08	28.01	-1.87	47.46	22.66
Diry	1683457	2909995	1225995	3.69	85.95	9.06	-0.36	23.47
Seafood	486619	842305	355686	1.07	47.06	0.07	37.74	15.26
Pol Grain	4867325	4801431	-65894	-0.20	544.28	396.32	-36.35	-11.60
Flour	327136	418938	91802	0.28	95.12	-	8.63	-3.75
Sugar	331357	419125	87768	0.26	30.33	-17.06	-7.68	60.29
Bread etc.	1015172	1304448	289276	0.87	79.80	1.52	10.20	11.51
Other Food	1423431	3143348	1710917	5.15	67.95	3.60	2.99	32.66
Beverages	1833982	2107839	273857	0.82	23.22	-3.33	26.23	47.22
Tobacco	1328382	1416166	87784	0.26	81.28	0.12	5.44	13.40
Yarn	2722614	3277665	555051	1.67	-6.75	1.10	120.93	-13.08
Fibre Fabric	2677388	3756712	1079324	3.25	3.04	0.38	71.61	25.73
Textiles	1913836	2606553	692717	2.09	-4.75	-6.01	86.94	11.79
Wearing Apparel	2691947	3090673	398726	1.20	-115.54	1.81	227.67	-10.32
Leather	950138	1167518	217380	0.65	-21.07	0.60	25.75	95.93
Intermediate Goods	26315181	39258578	12943397	38.97	57.20	3.54	46.75	-0.41
Wood Products	1223817	1392386	168569	0.51	370.29	11.66	-127.18	-131.45
Pulp and Paper	1279456	2117763	838307	2.52	21.84	-0.32	16.22	61.62
Printing Publishing	641563	1289055	647492	1.95	51.24	2.46	9.23	41.99
Basic Chemicals	2230914	3410042	1179128	3.55	52.13	10.59	64.70	-6.24
Chemical Fiber	1065914	3640489	574638	1.73	15.42	1.57	58.78	27.37
Agrichemicals	914375	929467	10092	0.05	1057.17	-167.55	98.21	-1222.93
Drugs	971754	2031482	1059728	3.19	74.20	-0.57	1.82	23.41
Other Chemicals	673651	1281573	607922	1.83	48.72	3.26	22.97	31.57
Synthetic Resin	858588	1873900	1015312	3.06	11.02	6.13	33.98	61.12
Petroleum Prod.	6124042	7098726	974684	2.93	163.06	13.16	183.52	-233.41
Coal Products	1137581	1321040	183459	0.55	152.37	3.59	52.29	-101.36
Rubber Prod.	1224677	2153509	928832	2.80	25.85	0.44	75.06	-0.48
Non-metal Prod.	2242189	3376353	1134164	3.42	85.81	3.34	8.19	9.33
Iron and Steel	2053219	3011233	958014	2.88	7.09	0.94	34.70	59.15
IS Primary Prod.	3019947	5120399	2100452	6.32	36.81	0.41	56.17	7.43
Non-ferrous Prod.	653557	1211161	557614	1.68	50.93	8.28	47.10	10.26
Capital Goods	10255268	22794922	12539654	37.76	42.18	4.01	42.98	18.85
Metal Products	1441386	3240901	1763515	5.30	20.11	2.06	45.59	36.36
Machinery	1716466	4354592	2638126	7.94	46.38	-0.30	7.64	45.67
Electrical Equip.	1355818	2838403	1482585	4.46	56.72	-0.12	32.34	10.82
Electronic Equip.	2941114	5161670	2675556	8.06	42.18	14.92	78.46	-5.71
Transport Equip.	2438117	6041192	3693075	11.12	37.35	-5.45	45.96	11.24
Scientific Inst.	452367	739164	286797	0.86	126.31	97.01	37.75	32.95
Miscellaneous Mfg.	1257576	1984624	727048	2.19	38.86	3.63	82.82	-18.05
Total Mfg.	62089827	95300315	33210488	100.00	44.97	2.58	46.27	11.34

The relative importance of domestic demand versus exports changed and varied considerably across industry groups during the periods. The major source of growth in light manufacturing shifted clearly from domestic markets to exports. The domestic market dominated as a major source of growth, accounting for 65% of the output growth in light manufacturing in 1975–1980, while exports contributed to its output growth by 28% during the period. But in the second period of 1980–1985, the opposite happened, and the light manufacturing sector owed 47% of its growth to exports, and only 28% to domestic markets. Of course, not all light manufacturing industries are export-oriented. Exports dominated domestic demand as a source of output growth only in the textile products, wearing apparels, and leather and fur products, and their effects on output became even more pronounced in the second period. The rest of food, beverage and tobacco industries remained basically domestic market-oriented (Tables 7 and 8).

In the intermediate sector, both final demand and exports effects increased between two periods, with the former effect rising from 48% to 57% and the latter from 39% to 47%. This

may imply that the growth of output was stimulated by both the increasing domestic demand for intermediate inputs and expanding exports. At more disaggregated industry levels, the dominance of exports effect over domestic demand was led by the chemical products group and the metal products group, the industry groups along with the capital goods targeted by the Government of the Republic of Korea as priority industries for development in the 1970s. The former includes industrial basic chemicals, chemical fibres, chemical fertilizers and agricultural chemicals, excluding drugs and cosmetics, and other chemical products. The latter includes, iron and steel manufacturing, primary iron and steel products, and nonferrous metal products, excluding non-metallic products. The rest of intermediate goods industries, lumber and wood products, pulp and paper, and petroleum and coal products with a major exception of rubber products grew primarily on the strength of domestic markets (Tables 7 and 8).

In the capital goods sector, where a phenomenal annual growth rate of 19% was recorded during the period of 1975–1985, the output growth was stimulated by both domestic markets and exports almost to an equal extent. The effects of both domestic markets and exports were slightly down from 50% to 42%, and from 45% to 43%, respectively, between the two periods. As before, not all capital goods industries are export-oriented. Major exporters are fabricated metal products, electronic and communication equipment, and transport equipment as expected. The domestic market for import substitution was much important than exports in the rest of capital goods industries such as industrial machinery and equipment, electrical equipment, and scientific instruments (Tables 7 and 8).

Turning to the import substitution of final demand, the negative sign for this variable may imply importing final products more than being substituted by domestic production, for instance, due to import liberalization, thus offsetting partially the expansionary output effects of domestic demand and exports described above. In general, the import substitution effects are relatively weak for light manufacturing and intermediate goods with a minor exception of polished grains and agriculture chemicals. On the other hand, the import substitution effect was quite substantial for certain capital goods industries, and particularly machinery and equipment, electrical equipment, and scientific instruments for positive import substitution, and transport equipment for negative import substitution in the first period; and electronic and communication equipment, and scientific instruments for positive import substitution in the second period. The empirical result may partly reflect the consequences of Korea's industrial policy to expand the capital goods sector to broaden an industrial base and strengthen the export capacity. The last source of growth is the combined effects of technical change and input import substitution. They varied in signs and magnitude across industries and their effects were significant in general. It is worth noting that the combined effects on output are consistently positive in all capital goods industries in both periods, while the results are mixed in light manufacturing and intermediate goods sectors. The positive output effect in the capital goods sector may reflect partly the results of aggressive localization programmes for the domestic production of a wide range of parts and components, and machinery and equipment.

#### 4. Concluding Remarks

The period of Korea's export-led industrialization, 1975–1985, which we have examined was distinguished by the nearly trebling of real GDP and the rapid growth of real manufacturing output at an annual rate of almost 12% and particularly the phenomenal growth of capital goods at a rate of 19% as described at the outset (Table 1). Moreover, the empirical results of decomposition analysis point to the manufactured exports as one the most significant factors contributing to the economic growth and structural change during the period. It seems evident that the cumulative effects of active policy interventions for export promotion since the 1960s as manifested in a series of five-year programmes were reflected in the rapid economic growth

and structural transformation of Korea's economy. Such export-led transformation was possible due to the existence of skilled labour force and rapid capital accumulation embodying the world frontier technology, and most important of all, the political commitment to development coupled with the capacity of the state to discipline and lead the private sector toward export promotion. The Korean experience may not provide a good model for other developing countries, if the competent stewardship of the government over the private sector does not exist. However, it underscores among other factors the crucial importance of the dedication and commitment of the state to economic development and its bureaucratic capacity to guide structural transformation from protected import substitution strategy to more open export-oriented strategy at the initial stages of industrialization.

"Getting the prices right" is clearly the slogan of the day. Market reforms based on free market principles have been the heart of stabilization and adjustment programmes supported by IMF and World Bank in developing countries. The Korean case is a counter-example of getting the fundamentals right. At the early stages of industrialization in the 1960s and 1970s, the Republic of Korea heavily supported the export industries through export subsidies and other financial incentives, while shielding these industries from foreign competition in the domestic markets where their products were allowed to be sold at prices higher than the world market prices. In fact, Amsden (1989) argues that the relative prices were deliberately manipulated to shift resources to the key targeted sectors.

Perhaps the Korean export success story based on the selective interventionist approach may be historically a unique country experience, and hence may not be replicable in other developing countries. The central question is not whether the state intervention *per se* is good or bad, but what matters most is the nature and quality of intervention. The outcome of intervention will not only depend on the objective of intervention, for instance, inward or outward-oriented industrialization, but also the capability of the state to initiate and guide structural transformation leading to the functioning of free markets. The state could play an important role in such an economic transformation. After all, it takes an efficient and competent bureaucratic machinery to get certain basic things right in the early stages of industrialization such as price stability, a transparent legal framework, promoting domestic and international competition, investment in education, etc.

It must be noted, however, that the scope for intervention seems to depend on the stages of industrialization at which a given economy finds itself. Based on his study of European industrialization, Gerschenkron (1962) argued long ago that the nature and extent of state intervention would change at different stages of industrialization. At the initial stage, where there are no functioning markets, the state has to engage in pump-priming to mobilize resources to create an environment conducive to the smooth functioning of market systems. On the other hand, as the economy advances along the trajectory of industrialization, and its structure becomes more complex and sophisticated, the task of selective policy intervention aimed at specific sectors becomes increasingly difficult to implement without unforeseen distortions in other sectors. In the advanced stages of industrialization, the role of the state will be highly restricted to establishing and maintaining a competitive environment for private enterprise, and the resource allocation will be primarily guided by price signals and market incentives. Today, there are already visible signs of a policy shift towards the diminished role of the state and the greater reliance on market mechanisms in the Korean economy. For instance, the next Five-Year plan for the "the New Economy" (1993-1998), which was launched on July 2, 1993 was designed to deregulate fiscal, financial and administrative systems and accelerate the liberalization of trade and investment<sup>5</sup>. Evidently, the Korean economy has outgrown the nurture by the state.

<sup>5</sup>For further details on the new Five-Year plan of the Republic of Korea, see Yi (1993).

## References

- [1] Amsden, A. (1989), *Asia's Next Giant, South Korea and Late Industrialization*, New York, Oxford University Press.
- [2] The bank of Korea (1989), *1975-1980-1985 Link-Input Output Tables*, Seoul, Korea.
- [3] Chenery, H., S. Robinson and M. Syrquin (1986), *Industrialization and Growth: A Comparative Study*, London, Oxford University Press.
- [4] Dewhurst, J.H.L. (1993), "Decomposition of Changes in Input-Output Tables," *Economic Systems Research*, Vol.5, No.1, pp.41-53.
- [5] Feldman, S.J., D. McLain, and K. Palmer (1987), "Sources of Structural Change in the United States, 1963-78: An Input-Output Perspective," *Review of Economics and Statistics*, Vol.69, No.3, pp.503-510.
- [6] Gerschenkron, A. (1962), "Economic Backwardness in Historical Perspective," Cambridge, Massachusetts, Harvard University Press.
- [7] Inagawa, N. (1987), "Sources of Economic Growth and Structural Change in Hungary, 1970-1979, An Input-Output Analysis," *KEO Discussion paper*, Tokyo, Japan, Keio University.
- [8] Kim, K.S. (1985), "Lessons From South Korea's Experience with Industrialization," in *Export-Oriented Development Strategies*, V. Corbo, et al. (eds.), Boulder, Colorado, Westview Press.
- [9] Kim, S.J. (1993), "Structural Changes in Korean Industry and Economic Interdependency between Korea and the Asia-Pacific Region," a paper presented at the International Symposium on International Industrial Linkages and Economic Interdependency in Asia-Pacific Region – International Input-Output Analysis, held at the Institute of Developing Economies, Tokyo, Japan, 20-23 January 1993.
- [10] Kubo, Y. and S. Robinson (1984), "Sources of Industrial Growth and Structural Change: A Comparative Analysis of Eight Countries," paper presented at the Seventh International Conference on Input-Output Techniques, Innsbruck, Austria.
- [11] Melo, J.de. (1985), "Sources of Growth and Structural Change in the Republic of Korea and Taiwan: Some Comparisons," in V. Corbo et al. (eds.), *Export-Oriented Development Strategies*, Boulder, Colorado, Westview Press.
- [12] Nishimizu, M., and C.R. Hulten (1978), "The Sources of Japanese Economic Growth: 1955-1971," *Review of Economics and Statistics*, Vol.40, pp.351-61.
- [13] Skolka, J. (1989), "Input-Output Decomposition Analysis for Austria," *Journal of Policy Modelling*, Vol.11, No.1, pp.45-66.
- [14] UNIDO (1993), *Global Report: Industry and Development 1993/94*, Vienna, Austria, Chapter 3.
- [15] Yi, W.T. (1993), "The Five-Year Plan for the New Economy," *The Republic of Korea Economic Bulletin*, No.93-11, November 1993.