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# INTERINDUSTRIAL LINKAGES AND EMPLOYMENT IN KOREAN INDUSTRY, 1975–85

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## I. INTRODUCTION

THE rapid growth of labor-intensive manufactured exports was the hallmark of Korean industrialization in the 1960s and the early 1970s [11]. However, beginning in the period after the first of oil shock, the Republic of Korea embarked upon a program of heavy industrialization until 1980 [12].[1] During this period, light industrial exports were de-emphasized and import-substitution policies were instituted in a number of heavy and relatively capital-intensive industries such as steel, chemicals, and machinery. Korea experienced negative growth in 1980. It had to contend with the adverse effects of the second oil shock and a deep world recession that followed in 1981–83. Korea sought to rekindle export-oriented growth during the early 1980s. By the late 1970s, Korea had began to lose competitiveness in more labor-intensive and resource-based industries. Continued export orientation in the 1980s, therefore, required that Korea move into more sophisticated products, including products of industries which were promoted during the phase of heavy industrialization in the late 1970s. The shift away from traditional labor-intensive goods to more skill- and capital-intensive sectors would also require changes in employment patterns. Korea also had a large external debt that required servicing during this period. Hence, the growth prospects of the Korean economy were largely dependent on the success of newer industries in exporting as the renewed export drive would feature increasingly sophisticated products including those of heavy and chemical industries.

In order to stimulate exports and improve international competitiveness, beginning in 1980 the Korean government took strong measures to curb fiscal deficits and restrain growth of money supply, hence, reducing inflationary pressures. Money supply, which had been growing by almost 33 per cent annually between 1974 and 1979, grew by less than 18 per cent per annum between 1980 and 1985 [7, 1984 and 1986 editions]. Financial policies were liberalized in the early 1980s to boost domestic savings and to allow a more market-determined investment pattern as well. The Korean won was sharply devalued in 1980 and further depreciated against a strong dollar every year from 1980 to 1985. This contrasts strongly with maintenance of a fixed dollar-won exchange rate for the period 1975–79 [7, 1984 and 1986 editions]. The early 1980s also saw substantial

[1] Also see Hasan and Rao [6].

import liberalization and some decontrol of inward foreign investment into Korea. These measures further enhanced the macroeconomic measures taken to enhance competitiveness of Korean exports [8].

The policy changes introduced in Korea will be taken into account in assessing changing patterns of output and employment in Korean industry. However, the method of analysis herein has limitations in that the causal links between policies and effects are not explicitly incorporated in the framework.

In this paper we evaluate the patterns of growth of industry and employment in Korea for the periods 1975–80 and 1980–85, making use of constant price input-output (I-O) tables [1, various issues]. In particular, we will assess the success of export orientation of various industries in 1980–85 compared with the earlier period. In addition, we will assess how changes in the growth patterns of industries influenced employment. The measures analyzed herein are based on real rather than nominal values [5]. In addition, the present analysis allows disaggregation into fourteen sectors compared to only nine in the previous study [5] and incorporates the more recent 1985 I-O tables, whereas the previous study only went to 1983.

## II. METHODOLOGY

In the framework of an I-O model, the following balance equation can be derived [9].

$$X_t + M_t = A_t X_t + F_t + E_t, \tag{1}$$

where $t$, $X$, $M$, $F$, $E$, and $A$ denote period $t$, vectors of output, imports, domestic final demand, exports, and an input coefficient matrix, respectively. When imports are assumed to be a function of total demand, $M$ can be written as:

$$M_t = (I - U_t)(A_t X_t + F_t), \tag{2}$$

where $I$ is a fourteen-by-fourteen identity matrix and $U$ denotes a diagonal matrix of self-sufficiency ratios.

By assuming $X$ and $M$ to be endogenous variables, the following solution can be derived [3]:

$$X_t = R_t(U_t F_t + E_t), \tag{3}$$

where $R = (I - UA)^{-1}$ is a domestic Leontief inverse matrix.

### A. *Decomposition Analysis of Output and Employment*

Several methods of decomposing output growth have been proposed within the framework of I-O models [3].[2] Among the alternatives, Syrquin's approach[3] is useful in assessing the roles of import substitution and export promotion in output growth.

Using equation (3), output at time $t + 1$ can be written as:

[2] Also see Torii and Fukasaku [10] and Bulmer-Thomas [2].

[3] See Syrquin [9]. Syrquin's method is really an extension of Chenery's [3] method.

$$X_{t+1} = R_{t+1}(U_{t+1}F_{t+1} + E_{t+1}). \tag{4}$$

Further, by combining equations (3) and (4), it is possible to solve for the change in output in terms of changes in internal and external demand and in two sets of parameters:

$$\Delta X = R_tU_t\Delta F + R_t\Delta E + R_t\Delta UY_{t+1} + R_tU_t\Delta AX_{t+1}, \tag{5}$$

where $\Delta$ denotes the change in the values of variables and parameters, and $Y$ is a vector of total domestic demand.

The four terms on the right-hand side of equation (5) can be interpreted as follows:

(a) Domestic final demand (DF) expansion effect: The $i$th element of the first term captures the effect of expansion of domestic final demand in all sectors on the output growth of sector $i$.

(b) Export expansion (EE) effect: The $i$th element of the second term captures the effect of the expansion of exports in all sectors on the output growth of sector $i$. When this factor is the largest, an industry's growth pattern may be termed to be export-led.

(c) Import substitution (IS) effect: The $i$th element of the third term captures the effect of the changes in self-sufficiency ratios in all sectors on the output growth of sector $i$. When this factor is the largest, the growth pattern is termed to be of the import-substitution type.

(d) Technological change (TC) effect: The $i$th element of the fourth term captures the effect of the changes of technological coefficients in all sectors on the growth of sector $i$.

This method can be applied to analyze growth patterns of manufacturing sectors in developing economies in order to quantitatively evaluate the extent to which export orientation or import substitution is characteristic of industrial growth. Employment is also an important objective in design of industrialization strategy in developing economies. Hence, we also propose to decompose the sources of emplyment growth.

The above approach can be modified as follows in order to assess patterns of employment growth.

$$\begin{aligned}\Delta W &= \Delta LX_{t+1} + L_t\Delta X \\ &= \Delta LX_{t+1} + L_t(R_tU_t\Delta F + R_t\Delta E + R_t\Delta UY_{t+1} + R_tU_t\Delta AX_{t+1}),\end{aligned} \tag{6}$$

where $W$ is a vector of employment and $L$ is a diagonal matrix of employment coefficients. Since the first term ($\Delta LX_{t+1}$) captures the effects induced by changes in labor productivity, we will call it the LP effect. The employment coefficients tend to become smaller as average labor productivity improves. Thus, the LP effect is generally negative.

## III. RESULTS OF OUTPUT AND EMPLOYMENT GROWTH DECOMPOSITION

The proposed methodology for decomposition analysis of output and employment growth in Korea was applied to I-O tables for 1975, 1980, and 1985. The three

TABLE I

FACTORS OF GROWTH IN KOREA

| | DF | EE | IS | TC |
|---|---|---|---|---|
| 1975–85: | | | | |
| 1. Agriculture, fisheries, forestry | 121 | 14 | −15 | −21 |
| 2. Mining | 162 | 156 | −131 | −86 |
| 3. Food processing | 66 | 4 | 3 | 26 |
| 4. Textiles and leather | 14 | 68 | 1 | 18 |
| 5. Lumber products, paper, printing | 52 | 10 | 1 | 37 |
| 6. Chemicals | 47 | 46 | −5 | 11 |
| 7. Nonmetallic mineral products | 42 | 22 | −4 | 40 |
| 8. Primary metal products | 11 | 59 | 41 | −10 |
| 9. Fabricated metal products | 13 | 53 | 8 | 26 |
| 10. General machinery | 21 | 8 | 55 | 15 |
| 11. Electrical, electronic products | 25 | 56 | 12 | 7 |
| 12. Transportation equipment | 10 | 47 | 37 | 6 |
| 13. Miscellaneous manufactures | 36 | 60 | −4 | 7 |
| 14. Others[a] | 73 | 18 | 0 | 9 |
| 15. Total | 54 | 31 | 5 | 10 |
| 1975–80: | | | | |
| 1. Agriculture, fisheries, forestry | 189 | 19 | −33 | −75 |
| 2. Mining | 159 | 125 | −116 | −68 |
| 3. Food processing | 83 | 2 | 1 | 15 |
| 4. Textiles and leather | 31 | 55 | 9 | 6 |
| 5. Lumber products, paper, printing | 52 | 24 | 4 | 20 |
| 6. Chemicals | 46 | 32 | 5 | 17 |
| 7. Nonmetallic mineral products | 41 | 26 | 0 | 33 |
| 8. Primary metal products | 13 | 65 | 24 | −2 |
| 9. Fabricated metal products | 19 | 62 | 3 | 16 |
| 10. General machinery | 41 | 17 | 23 | 18 |
| 11. Electrical, electronic products | 28 | 49 | 20 | 4 |
| 12. Transportation equipment | −9 | 57 | 32 | 20 |
| 13. Miscellaneous manufactures | 35 | 49 | 1 | 15 |
| 14. Others[a] | 80 | 18 | −1 | 2 |
| 15. Total | 62 | 29 | 4 | 5 |
| 1980–85: | | | | |
| 1. Agriculture, fisheries, forestry | 76 | 9 | −1 | 16 |
| 2. Mining | 124 | 131 | −96 | −59 |
| 3. Food processing | 49 | 8 | 6 | 37 |
| 4. Textiles and leather | −16 | 96 | −19 | 39 |
| 5. Lumber products, paper, printing | 58 | −2 | −6 | 50 |
| 6. Chemicals | 55 | 66 | −17 | −4 |

TABLE I (Continued)

| | DF | EE | IS | TC |
|---|---|---|---|---|
| 7. Nonmetallic mineral products | 55 | 21 | −7 | 31 |
| 8. Primary metal products | 15 | 56 | 46 | −18 |
| 9. Fabricated metal products | 13 | 48 | 11 | 28 |
| 10. General machinery | 18 | 7 | 64 | 11 |
| 11. Electrical, electronic products | 30 | 63 | −6 | 12 |
| 12. Transportation equipment | 23 | 46 | 32 | −2 |
| 13. Miscellaneous manufactures | 41 | 72 | −8 | −5 |
| 14. Others[a] | 69 | 18 | 1 | 13 |
| 15. Total | 50 | 33 | 4 | 13 |

Notes: 1. Data are in 1985 constant prices.
2. Rows may not sum to 100 due to rounding.

[a] Includes construction, utilities, and services.

I-O tables used herein are evaluated in 1985 constant prices; hence, the computations are free of any biases resulting from nominal price changes during the period 1975–85. Using the aggregated tables, growth patterns in fourteen sectors are reviewed. The results are summarized in Tables I and II. The figures in Table I are normalized so that the change in output ($\Delta X$) becomes 100. The figures in Table II are normalized so that the change in employment ($\Delta W$) becomes 100.

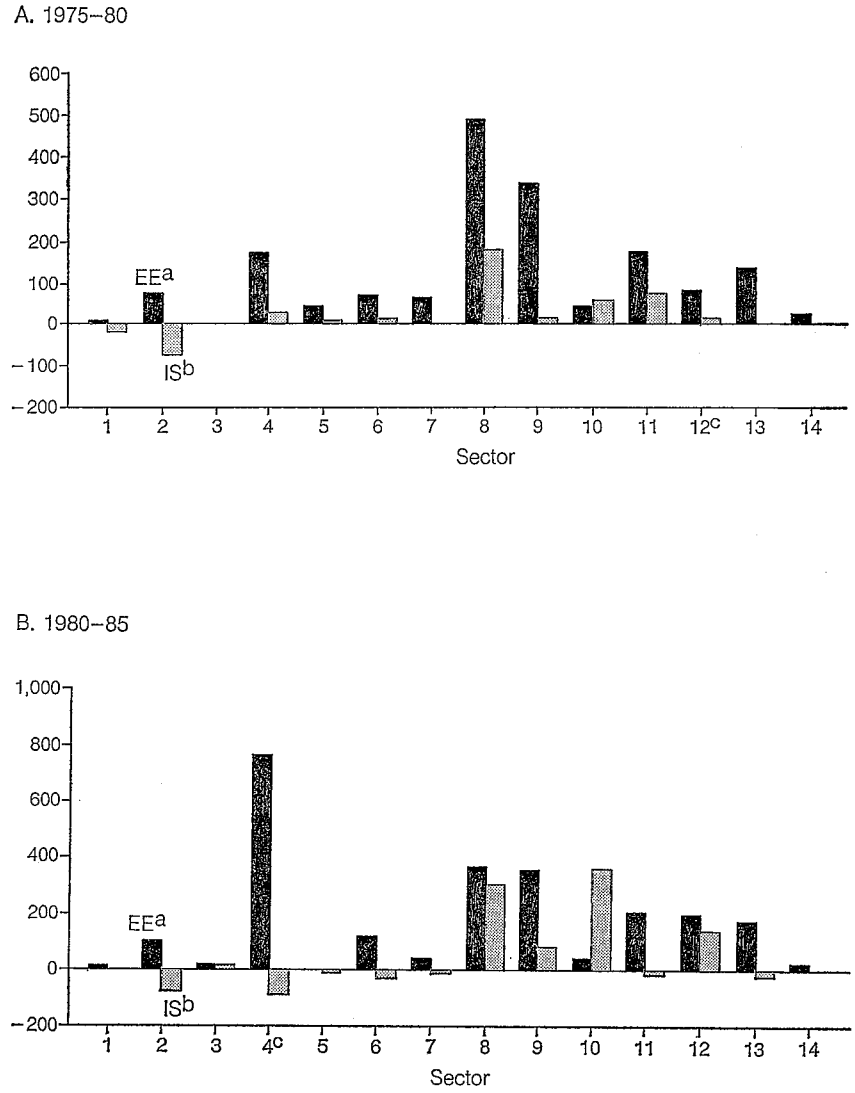
## A. *Output Growth*

*1975–80.* During this period, at the aggregate level, DF was responsible for 62 per cent of output growth, compared to 29 per cent for EE, 5 per cent for TC, and 4 per cent for IS. Of fourteen sectors, output growth was led by DF in eight, while the remaining six were export-led. Export-led sectors included textiles and leather, primary metal products, fabricated metal products, electrical and electronic products, transportation equipment, and miscellaneous manufactures. IS was not the leading factor in output growth in any single sector, but in general machinery it was the second largest component of growth and larger than the EE effect. IS was also substantial in a number of export-led sectors, including primary metal products, electrical and electronic products, and transportation equipment. In mining and agriculture, IS and TC effects were large and negative. DF outweighed the EE effect in these primary sectors and was of overwhelming significance in food processing and "others" as well.[4]

*1980–85.* At the aggregate level (see row 15), Table I shows that the DF effect accounted for one-half of total output growth, followed closely by the EE effect, which accounted for one-third of growth. The IS effect explained again only 4 per cent of total output growth, while TC accounted for 13 per cent. Thus, during 1980–85, the EE effect became relatively stronger than during 1975–80.

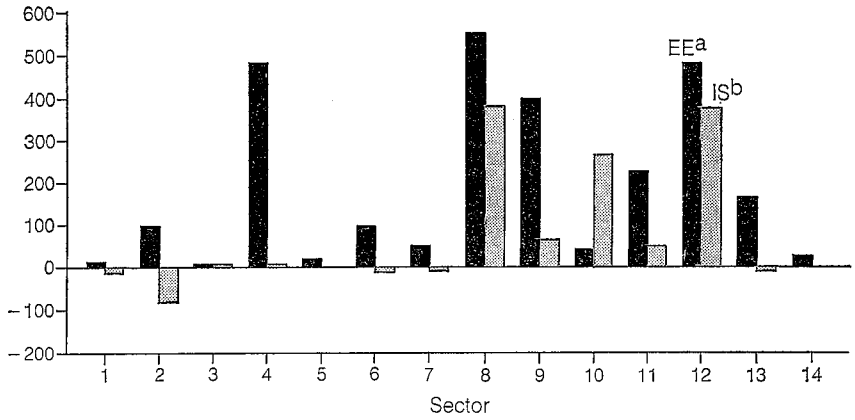
[4] The "others" sector is relatively large because it consists of construction, utilities, and services. These are mainly nontradables.

Fig. 1. Relative Contribution of EE and IS Effects to Growth of Output in Korea




The number of sectors that were export-led (eight) exceeded those that were led by DF (five) and IS (one) during 1980–85. This finding conforms with our expectation given the changes in macroeconomic, trade, and industrial policies between the two periods. Of the sectors where the EE effect was predominant, mining as well as chemicals can be added to the six sectors that were also export-led in the earlier period.

C. 1975–85




Notes: 1. Sector: 1=agriculture, fisheries, forestry; 2=mining; 3=food processing; 4=textiles and leather; 5=lumber products, paper, printing; 6=chemicals; 7=nonmetalic mineral products; 8=primary metal products; 9=fabricated metal products; 10=general machinery; 11=electrical, electronic products; 12=transportation equipment; 13=miscellaneous manufactures; and 14=others.

2. Data is in 1985 constant prices.

[a] EE/DF × 100.

[b] IS/DF × 100.

[c] Calculated in current prices as constant price DF was <0.

The DF effect became negative in textiles and leather. In the one IS-led sector, general machinery, the IS effect was quite large as DF and EE effects combined accounted for only one-fourth of output growth between 1980 and 1985. The IS effect, however, became negative in eight other sectors (compared to negative IS in only three sectors during 1975–80). This tends to confirm that across-the-board IS became less significant in the latter period. IS may have become more limited and targeted fewer sectors during 1980–85 compared to 1975–80.

For 1975–85 as a whole, output in seven sectors was mainly explained by domestic demand, export expansion explained the most growth in six sectors, while only in general machinery was IS the major factor in growth. Figure 1 presents the relative size of EE and IS effects for 1975–80, 1980–85, and for 1975–85 as a whole. Again, one can see that EE effects are more significant than IS effects, except in general machinery. While IS effects were positive in most sectors in the earlier period, IS became negative in most sectors in the latter period.

B. *Employment Growth*

*1975–80.* Labor productivity (LP) improved in every sector; however, the effect was relatively large in textiles and leather and secondarily in transportation

TABLE II

FACTORS OF EMPLOYMENT GROWTH IN KOREA

| Sector | Total $\Delta W$ | Effects[a] | | | | |
|---|---|---|---|---|---|---|
| | | LP | DF | EE | IS | TC |
| 1975–85: | | | | | | |
| 1. Agriculture, fisheries, forestry | −1,207,800 | −292 | 232 | 27 | −28 | −39 |
| 2. Mining | 23,130 | −129 | 370 | 357 | −301 | −197 |
| 3. Food processing | 46,260 | −598 | 462 | 30 | 22 | 184 |
| 4. Textiles and leather | −31,790 | −3,862 | 526 | 2,544 | 20 | 672 |
| 5. Lumber products, paper, printing | 51,540 | −481 | 302 | 59 | 7 | 213 |
| 6. Chemicals | 184,270 | −102 | 95 | 93 | −9 | 23 |
| 7. Nonmetallic mineral products | 46,670 | −299 | 169 | 86 | −14 | 158 |
| 8. Primary metal products | 58,630 | −279 | 40 | 224 | 154 | −39 |
| 9. Fabricated metal products | 74,200 | −376 | 62 | 250 | 39 | 125 |
| 10. General machinery | 103,210 | −189 | 61 | 24 | 160 | 44 |
| 11. Electrical, electronic products | 169,920 | −242 | 85 | 193 | 40 | 24 |
| 12. Transportation equipment | 83,930 | −349 | 44 | 211 | 166 | 29 |
| 13. Miscellaneous manufactures | 98,620 | −106 | 75 | 124 | −7 | 15 |
| 14. Others[b] | 2,796,780 | −136 | 173 | 43 | 0 | 20 |
| 1975–80: | | | | | | |
| 1. Agriculture, fisheries, forestry | −647,700 | −223 | 233 | 24 | −41 | −93 |
| 2. Mining | 13,040 | −103 | 323 | 252 | −235 | −138 |
| 3. Food processing | 46,430 | −278 | 314 | 7 | 3 | 55 |
| 4. Textiles and leather | 38,850 | −1,855 | 607 | 1,067 | 169 | 112 |
| 5. Lumber products, paper, printing | 35,700 | −302 | 210 | 95 | 18 | 78 |
| 6. Chemicals | 93,910 | −109 | 96 | 67 | 11 | 35 |
| 7. Nonmetallic mineral products | 29,400 | −232 | 136 | 87 | 0 | 109 |
| 8. Primary metal products | 30,460 | −275 | 50 | 244 | 89 | −8 |
| 9. Fabricated metal products | 29,300 | −344 | 83 | 277 | 11 | 73 |
| 10. General machinery | 42,980 | −102 | 84 | 35 | 46 | 37 |
| 11. Electrical, electronic products | 112,970 | −98 | 54 | 97 | 40 | 7 |
| 12. Transportation equipment | 6,670 | −1,233 | −121 | 760 | 432 | 262 |
| 13. Miscellaneous manufactures | 73,890 | −26 | 45 | 61 | 1 | 19 |
| 14. Others[b] | 1,681,360 | −89 | 151 | 34 | −1 | 5 |

TABLE II (Continued)

| Sector | Total $\Delta W$ | Effects[a] | | | | |
|---|---|---|---|---|---|---|
| | | LP | DF | EE | IS | TC |
| 1980–85: | | | | | | |
| 1. Agriculture, fisheries, forestry | −560,100 | −297 | 149 | 17 | −1 | 31 |
| 2. Mining | 10,090 | −139 | 297 | 313 | −229 | −142 |
| 3. Food processing | −170 | −63,634 | 31,424 | 5,146 | 3,679 | 23,285 |
| 4. Textiles and leather | −70,640 | −444 | −55 | 330 | −64 | 134 |
| 5. Lumber products, paper, printing | 15,840 | −528 | 366 | −15 | −35 | 312 |
| 6. Chemicals | 90,360 | −46 | 81 | 96 | −25 | −6 |
| 7. Nonmetallic mineral products | 17,270 | −213 | 171 | 67 | −22 | 97 |
| 8. Primary metal products | 28,170 | −94 | 30 | 109 | 90 | −34 |
| 9. Fabricated metal products | 44,900 | −122 | 30 | 106 | 24 | 63 |
| 10. General machinery | 60,230 | −139 | 43 | 17 | 154 | 25 |
| 11. Electrical, electronic products | 56,950 | −338 | 133 | 278 | −24 | 51 |
| 12. Transportation equipment | 77,260 | −106 | 48 | 95 | 67 | −4 |
| 13. Miscellaneous manufactures | 24,730 | −298 | 163 | 288 | −34 | −20 |
| 14. Others[b] | 1,115,420 | −140 | 165 | 42 | 1 | 32 |

[a] Figures have been normalized so that $\Delta W = (100 \ldots 100)'$.

[b] Includes construction, utilities, and services.

equipment (see Table II). In both these sectors, the EE effect was predominant in creating employment though, simultaneously, the IS effect also was substantial. The EE effect was responsible for the bulk of employment expansion in primary and fabricated metal products and was second in size to the DF effect in mining. IS effects were positive in all sectors except agriculture, mining, and "others." Agriculture shed large numbers of workers that were then absorbed into manufacturing and service industries during the period. The DF effect was predominant in "others" which includes construction, utilities, and services.

*1980–85.* Again, LP increased in all sectors (the LP effect was negative). The size of the LP effect was extremely large in food processing, but was also substantial in manufacturing sectors other than chemicals and primary metal products as well as in primary sectors (agriculture and mining). The EE effect was the largest positive influence on employment in eight of fourteen sectors. Though the EE effect was relatively large in textiles and leather, it was insufficient to offset negative employment effects of LP, DF, and IS. Total employment fell in agriculture as well as in food processing and textiles and leather. Positive IS effects on employment were dominant only in general machinery, although they

were also fairly large in primary metal products and transport equipment. In the majority of sectors, IS effects became a negative influence on employment during this period in sharp contrast to 1975–80. DF effects were predominant in lumber products, paper, and printing, nonmetallic mineral products, and "others." Though DF effects were large in food processing and agriculture, they were not enough to offset the LP effect. The data in Table II reveal a shift in employment out of agriculture and traditional labor-intensive manufacturing activities towards more capital-intensive manufacturing sectors and services. This trend holds for the entire period of 1975–85.[5]

## IV. MANUFACTURING GROWTH, EXPORTS, AND INTERINDUSTRIAL LINKAGES

It appears from the results of the decomposition analysis that Korea's growth pattern during the late 1970s was a remarkable combination of export promotion and import substitution. Figure 1A indicates positive influence on output during 1975–80 from both EE and IS effects in a majority of sectors. This was no longer the case during 1980–85. However, in a number of manufacturing sectors, EE and IS both remained positive even in the latter period (for example, in primary and fabricated metal products, general machinery, and transportation equipment). Export expansion was, nevertheless, the more important influence on patterns of growth of output and employment compared to import substitution. The sources of the EE effect, therefore, are of interest.

Recall that in equation (5) the EE effect of sector $i$ captures the effect of export expansion in all sectors (including that of sector $i$ itself) on the growth of output in sector $i$. In other words, the EE effect may be broken down into direct and indirect effects, the latter occurring through interindustrial linkages. For example, the EE effect on the growth of output of primary metal products is created not only through exports of these products, but also other sectors such as fabricated metal products, general machinery, and transportation equipment that use primary metal products as intermediate inputs.

In Table III, the direct and indirect effects of export expansion in each sector are shown for both periods. The direct effect is the diagonal element in Table III. It became smaller in agriculture, mining, nonmetallic mineral products, primary metal products, general machinery, electrical and electronic products, transportation equipment, miscellaneous manufactures, and "others." For example, 59 per cent of the total effect induced by the export expansion in the transport equipment sector contributed to the output growth of the transportation equipment sector itself during 1975–80. However, the direct effect declined to 56 per cent in 1980–85.

[5] Economic fluctuations probably have little influence on the comparison of the relevant variables such as output and employment and the effects of domestic demand, import substitution, export expansion, and technological change during the period in question. The composite index of business cycles computed by the Economic Planning Board shows that 1975, 1980, and 1985 are all low points in recent business cycles in Korea.

TABLE III

DIRECT AND INDIRECT EFFECTS OF EXPORT EXPANSION IN KOREA

| From/To: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1975–80: | | | | | | | | | | | | | | |
| 1. Agriculture, fisheries, forestry | 83 | 2 | 32 | 5 | 13 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 3 | 2 |
| 2. Mining | 1 | 78 | 0 | 1 | 1 | 7 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3. Food processing | 2 | 0 | 53 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4. Textiles and leather | 0 | 0 | 0 | 65 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 6 | 0 |
| 5. Lumber products, paper, printing | 0 | 0 | 1 | 1 | 61 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| 6. Chemicals | 8 | 6 | 5 | 13 | 7 | 76 | 16 | 6 | 7 | 6 | 7 | 6 | 12 | 8 |
| 7. Nonmetallic mineral products | 0 | 0 | 1 | 0 | 1 | 0 | 56 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 8. Primary metal products | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 74 | 27 | 15 | 9 | 12 | 5 | 2 |
| 9. Fabricated metal products | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 1 | 1 | 1 | 1 | 0 |
| 10. General machinery | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 0 | 2 | 0 | 0 |
| 11. Electrical, electronic products | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 65 | 1 | 0 | 1 |
| 12. Transportation equipment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 0 | 0 |
| 13. Miscellaneous manufactures | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 0 |
| 14. Others[a] | 5 | 11 | 7 | 13 | 15 | 12 | 18 | 15 | 17 | 15 | 13 | 14 | 16 | 80 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1980–85: | | | | | | | | | | | | | | |
| 1. Agriculture, fisheries, forestry | 78 | 2 | 26 | 4 | 11 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 2 | 1 |
| 2. Mining | 1 | 73 | 0 | 1 | 1 | 5 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3. Food processing | 4 | 0 | 57 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 4. Textiles and leather | 1 | 0 | 0 | 67 | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 8 | 1 |
| 5. Lumber products, paper, printing | 1 | 2 | 1 | 1 | 62 | 1 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 2 |
| 6. Chemicals | 9 | 6 | 6 | 13 | 8 | 77 | 18 | 11 | 8 | 7 | 9 | 7 | 12 | 9 |
| 7. Nonmetallic mineral products | 0 | 1 | 1 | 0 | 1 | 1 | 55 | 2 | 1 | 1 | 2 | 1 | 1 | 2 |
| 8. Primary metal products | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 72 | 25 | 16 | 8 | 15 | 6 | 2 |
| 9. Fabricated metal products | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 46 | 1 | 1 | 1 | 1 | 1 |
| 10. General machinery | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 54 | 0 | 3 | 0 | 0 |
| 11. Electrical, electronic products | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 62 | 2 | 1 | 1 |

TABLE III (Continued)

| From/To: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12. Transportation equipment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 0 | 1 |
| 13. Miscellaneous manufactures | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 | 0 |
| 14. Others[a] | 6 | 12 | 7 | 11 | 13 | 11 | 16 | 11 | 14 | 15 | 13 | 12 | 15 | 77 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Notes: 1. In 1985 constant prices.
2. Columns may not sum to 100 due to rounding.
[a] Includes construction, utilities, and services.

Instead, indirect effects became larger: 15 and 7 per cent of the total effect induced by export expansion in the transportation equipment sector contributed to output expansion in primary metal products and chemicals, respectively (compared to 12 and 6 per cent in the earlier period). Similarly, in the electrical and electronic products sector direct effects became 62 per cent in 1980–85 compared to 65 per cent in 1975–80. The larger indirect effects induced by the export expansion in the electronics sector contributed to increased output expansion of nonmetallic mineral products and chemicals at 2 and 9 per cent, respectively, in 1980–85 (compared to 1 and 7 per cent in 1975–80).

In general, the indirect effects of exports of more sophisticated products have increased in Korea, though interindustrial linkage effects remain weaker than those found in Japan for the period 1971–80 [4]. Nevertheless, evidence from this study indicates Korean industry entered a phase of maturing and deepening in the 1980s. The push into heavy and chemical industries of the 1970s thus appears to have been a success as Korean exports of more sophisticated and capital-intensive products have increased over time.

## V. CONCLUSION

Export expansion of Korean industries, including some heavy, chemical, and sophisticated sectors, increased in the period 1980–85. The improved export performance came after a period of relative emphasis on import substitution (1975–80) in these industries. Employment creation was also induced by export expansion, especially in 1980–85. Employment patterns shifted away from primary sectors and labor-intensive textiles and leather to more sophisticated manufacturing industries and services as well during 1975–85 as a whole.

This study has the advantage of using constant price I-O tables. The results indicate policy reorientation of the Korean economy in the early 1980s was broadly a success in stimulating growth of exports in sectors of emerging comparative advantage. Moreover, employment patterns shifted in a manner consistent with changing industrial structure. The study is limited, however, in that it does not

establish any causal links between policies and results. Nevertheless, it provides another piece of empirical evidence that such policy changes could have been effective.

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