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9. ABSTRACT Analyzes changes in the distribution of income in Korea between 1960 and 1970 in terms of changes in the structure of demand, output, and employment. The study is confined to agriculture, mining, and manufacturing - comprising roughly 65% of the work force during the 1960's. The data were analyzed in two steps: first the factors contributing to the change in the output structure were quantitatively identified; then the results of the first step are linked with the changes in patterns of employment and income distribution. Income inequality increased among industrial workers but decreased among farmers; combining the two groups on a countrywide basis, inequality increased. Changes in the structures of domestic demand were found to be the most unequalizing factor, and rapid industrialization led to a larger increase in the employment of the relatively higher paid industrial workers than that of farmers. The faster growth of heavy industries using higher paid skilled workers increase the inequality among industrial workers. Export expansion tended to narrow income inequality among industrial workers but increased inequality among all households, while import substitution tended to equalize countrywide distribution.			
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Structural Change, Employment
and Income Distribution:
The Case of Korea 1960-1970

by

Daemo Kim

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The author is a member of faculty of the Department of Economics at Chung-Ang University in Seoul, Korea. The research reported in this paper was performed under an Agency for International Development contract No. AID/otr-C-1394 at Rice University on "Distribution of Gains, Wealth and Income from Development."

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Abstract

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This paper analyzes changes in the distribution of income in Korea between 1960 and 1970 in terms of changes in the structure of demand, output, and employment. As a result of data limitations the study is confined to agriculture, mining, and manufacturing which comprised roughly 65 percent of the work force during the 1960s.

During the 1960s income inequality increased among industrial workers but decreased among farmers. On a countrywide basis (combining the two groups) inequality increased. Changes in the structure of domestic demand were the most unequalizing factor for both the countrywide distribution and the distribution among industrial workers. Rapid industrialization led to a larger increase in the employment (and hence income) of the relatively higher paid industrial workers than that of farmers. The relatively faster growth of heavy industries which used more skilled (and higher paid) workers increased inequality among industrial workers. Export expansion tended to narrow income inequality among industrial workers but increased inequality among all households. Import substitution tended to equalize countrywide distribution and, to a very small extent, the distribution among industrial workers as well.

Structural Change, Employment
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1. Introduction

Since Kuznets first presented the hypothesis that income inequality increases at the initial stage of growth and then eventually decreases,¹ this hypothesis has been supported on several occasions.² Yet, it now seems clear that the time period required to reach the "eventual decrease" in inequality is beyond some tolerable span: Almost two decades of rapid growth in many developing countries has been of little or no benefit to a large group of their population and, during the past few years, the need for policies aiming explicitly at the income distribution in general, and the poverty problem in particular, has been increasingly called for.

Theories on the (size) distribution of income are one of the most poorly established in economics. Consequently, studies on income distribution frequently begin with the most basic questions like the following: What determines income distribution? Where or how can we possibly find factors which contribute to income inequality?

¹Simon Kuznets, "Economic Growth and Income Inequality," American Economic Review, 45 (March, 1955), 1-28.

²See, for example, Harry T. Oshima, "The International Comparison of Size Distribution of Family Incomes with Specific Reference to Asia," Review of Economics and Statistics, 44 (November, 1962), 439-445.

Kuznets again made a suggestion in this regard¹ by raising the following question: Do structural changes that occur in the process of growth affect the distribution of the growing income among the population?

Recently, Bell and Duloy identified four poverty groups, based on access to remunerative employment and access to non-human assets.² These four groups are small farmers, landless laborers and submarginal farmers, urban unemployed, and urban underemployed. Bell-Duloy's identification thus implies that access to cultivable land is crucial to the rural poverty problem, whereas access to employment opportunities is crucial to the urban poverty problem. This in turn implies that, in countries where the scope for improving the access to land is not bright, the only hopeful way to attack the poverty problem is to improve the access to employment opportunities.

The present study is intended to quantitatively identify factors which contributed to the change in patterns of income distribution in Korea between 1960-1970. Following Kuznets' suggestion, this study will begin with analyzing the structural change, or the change in output composition as conceived in this study, which occurred during the period. In accordance with Bell-Duloy's identification, and in view of the fact that the supply of cultivable land is virtually fixed in Korea, the change in patterns of employment will be brought into a special focus. Factors

¹Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations: VIII. Distribution by Size," Economic Development and Cultural Change, 11 (January, 1963), 1-80.

²C.L.G. Bell and John H. Duloy, "Formulating a Strategy," in Hollis B. Chenery et al., Redistribution with Growth (London: Oxford University Press, 1974), Chapter V.

which contributed to the change in output structure will first be quantitatively identified. How these factors systematically affected patterns of employment and income distribution will then be traced out.

Because of the lack of relevant data, the analysis of the present study will be confined to agriculture, mining, and manufacturing, which together comprised roughly 65 percent of the economy's work force during the 1960s. Since major changes in output structure during the period occurred between agriculture and manufacturing,¹ the analytical results of the present study are expected to shed some light on the explanation of the changing patterns of income distribution, despite the non-comprehensiveness of coverage.

2. Analytical Framework

The analytical framework consists of two steps. The first step is to quantitatively identify factors which contribute to the change in output structure. The second step is to link the results of the first step with the changes in patterns of employment and income distribution.

Decomposition of the Change in Output Structure

This subsection begins with the identity between total supply and total demand. Total supply of a commodity is equal to its domestic production (Q) plus importation (M), while total demand for a commodity is equal to its domestic demand (D, which in turn is the sum of domestic intermediate demand DI and domestic final demand DF) plus exportation (X).

¹According to the Bank of Korea, Economic Statistics Yearbook, between 1960-70, the share in GNP of agriculture, forestry, and fishery decreased from 41.3% to 28.0%, while that of mining and manufacturing increased from 12.1% to 22.8%.

Therefore, for each commodity (industry),

$$Z = Q + M = D + X = DI + DF + X \quad (1)$$

Let u be the ratio of domestic production to total supply, $u = Q/Z$. A rise (fall) in u means that the relative dependency of total supply upon importation decreases (increases). Therefore, if u increases (decreases) over time in an industry, that industry's import substitution is said to be positive (negative).¹ For each industry, then,

$$\begin{aligned} dQ &= Q_t - Q_o & (2) \\ &= u_t Z_t - u_o Z_o \\ &= (u_t - u_o) \bar{Z} + \bar{u} (Z_t - Z_o) \\ &= dQ_M + dQ_{DI} + dQ_{DF} + dQ_X \end{aligned}$$

where $\bar{Z} = (Z_t + Z_o)/2$

$$\bar{u} = (u_t + u_o)/2$$

Subscripts o and t denote respectively the initial and the final periods under consideration.

In equation (2), dQ_M , dQ_{DI} , dQ_{DF} , and dQ_X are intended to measure parts of the change in domestic production for an industry attributable, respectively, to import substitution, the change in domestic intermediate demand, the change in domestic final demand, and export expansion.²

¹This is Chenery's definition of import substitution. See his "Patterns of Industrial Growth," American Economic Review, 50 (September, 1960), 624-654.

²In Lewis and Soligo, u_t instead of \bar{u} is used in equation (2). (See Stephen R. Lewis and Ronald Soligo, "Growth: Some Country Experience--South Korea," in Chenery et al., op. cit., Appendix.) As correctly pointed out by Eysenbach (M. L. Eysenbach, "A Note on Growth and Structural Change in Pakistan's Manufacturing Industry 1954-1964," Pakistan Development Review, 9 [Spring, 1969], 58-65) and Fane (George Fane, "Import Substitution and

Decomposition of the Change in Employment Patterns

Let n be the ratio of the number of workers employed (N) to domestic production (Q) in an industry, $n = N/Q$. This ratio may vary for several reasons, among which probably the most important are factor substitution and technological progress. Consequently, a change in n over time will be called a "techno-substitution" effect. For each industry,

$$\begin{aligned}
 dN &= N_t - N_o & (3) \\
 &= n_t Q_t - n_o Q_o \\
 &= (n_t - n_o) \bar{Q} + \bar{n} (Q_t - Q_o) \\
 &= dn\bar{Q} + \bar{n}dQ_M + \bar{n}dQ_{DI} + \bar{n}dQ_{DF} + \bar{n}dQ_X \\
 &\quad \text{(due to equation (2))} \\
 &= dN_T + dN_M + dN_{DI} + dN_{DF} + dN_X
 \end{aligned}$$

Equation (3) thus decomposes the change in employment of an industry into five parts, ascribed respectively to the techno-substitution effect, import substitution, the change in domestic intermediate demand, the change in domestic final demand, and export expansion.

Now let f^e be the ratio of the number of bracket¹ e workers (N^e) to that of all workers (N) employed in an industry, $f^e = N^e/N$. Obviously, the whole set of f^e for an industry will show employment composition within that industry. A change in f^e over time will therefore be called

Export Expansion: Their Measurement and an Example of Their Application, Pakistan Development Review, 11 [Spring, 1971], 1-17) u_t is also equally viable. In the present analysis, therefore, \bar{u} (that is, the average between u_o and u_t) is used.

¹In the present study, the term "bracket" specifically refers to income level for mining-manufacturing workers and land holding for farmers.

an "intra-industry composition" effect. For each industry, then,

$$\begin{aligned}
 dN^e &= N_t^e - N_0^e & (4) \\
 &= f_t^e N_t - f_0^e N_0 \\
 &= df^e N + f^e dN_T + \bar{f}^e dN_M + \bar{f}^e dN_{DI} + \bar{f}^e dN_{DF} + \bar{f}^e dN_X \\
 &\quad \text{(due to equation (3))} \\
 &= dN_{C1}^e + dN_T^e + dN_M^e + dN_{DI}^e + dN_{DF}^e + dN_X^e
 \end{aligned}$$

Equation (4) thus decomposes the change in employment of bracket e workers in an industry into six parts, attributed respectively to the intra-industry composition effect, etc. Notice that, when equation (4) is aggregated over all industries of an economy, the results will show not only the change in employment patterns in the whole economy but sources of that change.

Decomposition of the Change in Patterns of Income Distribution

Suppose we have information on the number (N^e) and average income (y^e) of each bracket of workers in the whole economy.¹ We can then estimate the share of each bracket in the economy. Normally, however, our analytical interest is in shares of, say, quintiles rather than in shares of brackets.

Let $k^{e,q}$ be the ratio of bracket e workers who belong to the qth quintile ($N^{e,q}$) to total bracket e workers in the economy (N^e), $k^{e,q} = N^{e,q}/N^e$. This ratio will vary if employment composition in the whole economy changes. A change in $k^{e,q}$ over time will therefore be called "economy composition" effect. From this definition follows:

¹In the remaining part of this section, notations are for the whole economy rather than for individual industries.

$$\begin{aligned}
 dN^{e,q} &= N_t^{e,q} - N_o^{e,q} \\
 &= k_t^{e,q} N_t^e - k_o^{e,q} N_o^e \\
 &= dk^{e,q} N^e + \bar{k}^{e,q} dN_{C1}^e + \bar{k}^{e,q} dN_T^e + \bar{k}^{e,q} dN_M^e + \bar{k}^{e,q} dN_{DI}^e + \\
 &\quad \bar{k}^{e,q} dN_{DF}^e + \bar{k}^{e,q} dN_X^e \\
 &\quad \text{(due to equation (4))} \\
 &= dN_{C2}^{e,q} + dN_{C1}^{e,q} + dN_T^{e,q} + dN_M^{e,q} + dN_{DI}^{e,q} + dN_{DF}^{e,q} + dN_X^{e,q}
 \end{aligned}$$

Equation (5) thus partitions the change in employment of bracket e workers who belong to the qth quintile into seven parts, attributed respectively to the economy composition effect, etc. The economy composition effect ($dN_{C2}^{e,q}$) and the intra-industry composition effect ($dN_{C1}^{e,q}$) will be combined to be called the "employment composition" effect ($dN_C^{e,q}$).

Now let $Y^{e,q}$ be the gross sum of incomes of bracket e workers who belong to the qth quintile. Consider the identity, $Y^{e,q} = y^e N^{e,q}$, where y^e is the average income of bracket e workers and $n^{e,q}$ is the number of bracket e workers who belong to the qth quintile. From this identity follows:

$$\begin{aligned}
 dY^{e,q} &= Y_t^{e,q} - Y_o^{e,q} \\
 &= y_t^e N_t^{e,q} - y_o^e N_o^{e,q} \\
 &= dy^{e,q} N^{e,q} + \bar{y}^e dN_C^{e,q} + \bar{y}^e dN_T^{e,q} + \bar{y}^e dN_M^{e,q} + \bar{y}^e dN_{DI}^{e,q} + \\
 &\quad \bar{y}^e dN_{DF}^{e,q} + \bar{y}^e dN_X^{e,q} \\
 &\quad \text{(due to equation (5))} \\
 &= dY_Y^{e,q} + dY_C^{e,q} + dY_T^{e,q} + dY_M^{e,q} + dY_{DI}^{e,q} + dY_{DF}^{e,q} + dY_X^{e,q}
 \end{aligned} \tag{6}$$

Equation (6) breaks down the change in gross sum of incomes of bracket e workers who belong to the q^{th} quintile into seven sources, ascribed respectively to the change in their average income, etc. Notice that, when equation (6) is aggregated over all brackets within each quintile, the results will show not only the change in the share of each quintile but sources of that change.

3. Analytical Results

This section presents analytical results computed according to the equations in the previous section. Sources of data are diverse and methods of industry classification are not the same among these sources. After proper matching operations, the number of industries is reduced to 37. Some of these industries are grouped into larger sectors to see the results on a more aggregated basis.

Change in Output Structure

Basic data used in this subsection are two input-output tables for 1960 and 1970, respectively.¹ The 1960 statistics are first inflated into figures in 1970 prices by using wholesale price indices of individual commodities. Computations are done according to equation (2). The results are presented in Table 1.

In Table 1, column (1) represents the growth rate of domestic production in each industry or sector between 1960-1970. Columns (2)-(4) in turn indicate parts of this growth rate attributable respectively to

¹Sources of these two tables are Bank of Korea, Economic Statistics Yearbook, 1965 and 1973, respectively.

TABLE 1: Decomposition of the
Change in Output Structure

Industries and Sectors	$\frac{dQ}{Q_0}$	$\frac{dQ}{Q_0}$	$\frac{dQ_X}{Q_0}$	$\frac{dQ_M}{Q_0}$
	(1)	(2)	(3)	(4)
Agriculture	121.1%	130.2%	.7%	- 9.9%
Forestry	41.6	110.2	- .5	- 68.1
Fishery	258.3	186.0	74.0	- 1.6
Mining	203.4	302.2	31.2	-129.7
Coal	116.5	112.8	4.4	- .7
Others	318.8	553.1	66.8	-301.0
Manufacturing	454.9	439.8	63.1	- 48.1
Food & beverages	328.5	325.1	13.1	- 9.6
Textile products	337.5	245.8	105.4	- 13.4
Wood products	284.3	147.1	136.2	1.3
Paper products	531.8	507.1	8.8	16.0
Chemical products	880.8	943.5	55.1	-117.8
Non-metal mineral prod.	680.2	629.6	25.4	25.3
Basic metal	1022.3	1042.0	40.7	- 60.4
Metal prod. & machinery	623.3	840.1	41.0	-257.8
Misc. manufacturing	403.1	115.2	230.8	57.1
Electricity	243.7	230.3	13.6	- .2
Construction	698.8	688.9	9.9	.0
Wholesale & retail trade	464.8	446.7	18.4	- .3
Transportation	384.4	322.0	65.2	- 2.7
Real estate	148.8	147.7	.7	.4
Services	204.6	195.5	5.1	4.0
Unclassified	567.6	462.5	87.1	18.0
<u>Total</u>	<u>295.4</u>	<u>287.5</u>	<u>25.6</u>	<u>- 17.6</u>

Notes: Column (1) represents the growth rate of domestic production between 1960-1970. Columns (2) through (4) indicate parts of this growth rate attributable respectively to the change in domestic demand, export expansion, and import substitution.

SOURCES: See subsection (p. 8).

the change in domestic demand (both intermediate and final), export expansion, and import substitution.

According to column (1) of Table 1, agricultural output grew by only 121 percent between 1960-1970, while manufacturing output expanded by 455 percent during the same period. This reflects rapid industrialization of the economy during the 1960s. Also notable is the relatively low growth rate of mining production (203 percent), which is indicative of the fact that the rapid industrialization during the 1960s relied rather heavily on imported raw materials due to the poorly endowed natural resources of the economy.¹

Within the manufacturing sector, food and beverages, textile products, and wood products, which together may be said to represent light industries, showed relatively low growth rates (329 percent, 338 percent, and 248 percent, respectively). Paper products, chemical products, non-metallic mineral products, basic metal, and metal products and machinery, which may be said to represent heavy industries, in turn showed relatively high growth rates (532 percent, 881 percent, 680 percent, 1022 percent, and 623 percent, respectively). Column (1) of Table 1 thus characterizes the Korean economy during the 1960s not only by rapid industrialization in general but by industrialization relatively in favor of heavy industries.

In this process of industrialization, the change in domestic demand (column [2]) played the dominant role, whereas both export expansion and import substitution played relatively minor roles. Specifically, the change in domestic demand alone created a gap in growth rates of domestic

¹There are no known deposits of petroleum and virtually no iron ones. Even the main item, coal, is too poor in quality to be used for industrial purposes.

production between agricultural and manufacturing sectors by 310 percentage points (= 440% - 130%) in favor of the latter. The same gaps created by export expansion and import substitution were, respectively, 62 and -38 percentage points.

Although export expansion and import substitution played relatively minor roles, the former contributed positively, while the latter negatively, to the expansion of most of the industries or sectors. This reflects the economy's switch from import substitution to export promotion strategy in the early 1960s.¹ The positive contribution of export expansion was exceptionally high for textile products and wood products, which are known to be relatively labor-intensive.² The highest negative contribution of import substitution was in turn found in chemical products, metal products and machinery, and minerals other than coal, which are known to be relatively capital-intensive.³

¹During the 1950s and the early 1960s, import substitution was the major strategy of industrialization and light consumer goods grew to a substantial extent under extensive government protection. In the early 1960s Korea switched to the export promotion strategy and accordingly introduced several policy measures such as currency devaluation, interest subsidies to exporters, export-import link system, etc.

²According to the Bank of Korea's estimates for 1968, these industries had capital-labor ratios below the manufacturing average, both by big margins, in any of the following three definitions; tangible fixed assets per employee, machinery and equipment per employee, and liabilities and net worth per employee. See Economic Planning Board, Korea Statistical Yearbook (1973), pp. 252-255.

³According to the same source as in footnote (2) above, these industries had capital-labor ratios substantially higher than the manufacturing average.

Patterns of Employment and Income Distribution

This subsection traces out the patterns of employment and income distribution implied by the output structures discussed in the previous subsection. As mentioned above, analyses of this and the subsequent subsections are confined to agriculture, mining, and manufacturing due to lack of relevant data. Because of some characteristics peculiar to agriculture, two different approaches are employed between the agricultural sector and the mining-manufacturing category.

(1) Mining and Manufacturing

The 1970 input-output table contains data on both value added by labor (V_t) and the number of workers employed (N_t) in each industry. From this information is computed the average labor income (w_t) in each industry according to the following identity:

$$V = wN \tag{7}$$

The 1960 input-output table, however, contains data only on value added by labor (V_0), but not on the number (N_0) or average labor income (w_0) in each industry. Accordingly, the 1960 average labor income is obtained from an independent source,¹ and the number of workers is estimated according to equation (7). The results on patterns of employment, both for 1960 and 1970, are presented in Table A.1.

The next task is to get the average labor income (w^e) and the number (N^e) of each bracket of workers in each industry. But, data on

¹The source of this information is the Bank of Korea, Economic Statistics Yearbook (1972), pp. 332-333.

this type of information (that is, w^e-N^e pairs) are available only for 1967.¹ Therefore, w^e-N^e pairs for 1960 and 1970 are estimated under the following conditions:²

- (a) Within each industry, the ratio of each bracket of workers (N) remained unchanged,
- (b) Within each industry, the average labor income of each bracket of workers (w^e) grew at the same rate as the average labor income of all workers (w).

The final task is to convert the average labor income (w^e) into average total (that is, labor plus nonlabor) income (y^e). Since this type of information is not directly available, the following equation is used:³

$$\frac{(w^e/y^e)^{0.29} - 1}{0.29} = -0.13831 - 0.13230 \cdot \frac{(w^e/w)^{0.29} - 1}{0.29} \quad (8)$$

¹The source of data on w^e-N^e pairs is the Bank of Korea, Report on Wage Survey 1967, in which workers are classified into 18 income brackets for each of mining and manufacturing industries.

²Condition (1) implies that the structure of employment remained unchanged within each industry. Condition (2) has an analogous implication: The structure of labor income remained unchanged among different brackets of workers within each industry.

³Equation (8) is based on the model first presented by Box and Cox (G.E.P. Box and D.R. Cox, "An Analysis of Transformation," Journal of Royal Statistical Society, Series B, 27 [1964], 211-243). Data used for computation are from Economic Planning Board, Korea Statistical Yearbook, several volumes. Both time series and cross-section data are pooled together, which give 37 observations of w^e-y^e pairs. Standard deviations² for constant and coefficient are 0.01182 and 0.00543, respectively. R^2 is 0.7915. Both F and t statistics are significant at 0.5 percent level.

where w^e = average labor income of bracket e workers
 y^e = average total income of bracket e workers
 w = average labor income of all workers

The results so far obtained are w^e - y^e - N^e triplets for each bracket of workers in each industry. They are aggregated, bracket by bracket, over all industries in the mining-manufacturing category. These aggregated results are presented in Table A.2.

(2) Agriculture

As mentioned earlier, a different approach is employed for the agricultural sector. In Korea, as in many other countries, a typical farmer cultivates his own farmland. Furthermore, he normally engages in more than one crop item. Accordingly, total value added of each farm household (rather than value added by labor) in the whole agricultural sector (rather than in individual agricultural subsectors) is the figure appropriate for the present analysis.

From the statistic on total value added in the agricultural sector and the information on the number of all farmers¹ is determined the average farming income according to equation (7), where V , w , and N now denote total value added, average farming income, and the number of farmers, respectively. Sets of information on the dispersion of farming income among different brackets of farmers and on the ratio of farming to total income for each bracket of farmers are also available, from which average

¹Except the statistic on value added, sources of all information used for the agricultural sector are Economic Planning Board, Korea Statistical Yearbook, several volumes.

farming income, average total income, and the number of each bracket of farmers are determined. These results are presented in Table A.3.

Change in Patterns of Employment

Most estimates needed in this subsection have already been done in the previous subsection and presented in Tables A.1 through A.3. Computations left to be done in this subsection are to break down the change in employment (dN and dN^e) into several components according to equations (3) and (4). These results are presented in Tables 2 and 3.

Table 2 shows, for each industry, the change in employment patterns and sources of this change. Specifically, column (1) represents the growth rate of employment between 1960-1970. Columns (2) through (5) indicate parts of this growth rate attributable respectively to those sources denoted by corresponding subscripts.

According to column (1), agricultural employment grew by only 2.2 percent, whereas manufacturing employment increased by 169 percent, both between 1960-1970. This reflects rapid industrialization of the economy during the 1960s.

Column (2) shows that contribution of the change in domestic demand was substantially higher in some of the heavy industries such as chemical products and machinery, reflecting the economy's strategy of putting more emphasis on heavy industries.

According to columns (3) and (4), export expansion contributed more favorably to the employment creation in light industries (notably in textile products, wood products, and miscellaneous manufacturing), while import substitution contributed more unfavorably to the employment generation in heavy industries (notably in mining other than coal, chemical

TABLE 2: Decomposition of the Change
in Employment Patterns by Industry

Industries and Sectors	$\frac{dN}{N_0}$	$\frac{dN}{N_0}$	$\frac{dN_X}{N_0}$	$\frac{dN_M}{N_0}$	$\frac{dN_T}{N_0}$
	(1)	(2)	(3)	(4)	(5)
Agriculture	2.2%	95.2%	.5%	- 7.2%	- 86.3%
Mining	25.6	233.5	25.0	-105.9	-127.0
Coal	- 7.5	80.4	3.2	- .5	- 90.6
Others	57.4	380.4	45.9	-207.1	-161.9
Manufacturing	169.0	336.5	51.1	- 37.1	-181.5
Food & beverages	119.2	256.0	9.5	- 6.4	-139.9
Textile products	191.4	200.8	88.1	- 10.6	- 86.8
Wood products	158.9	119.4	94.6	- .7	- 54.4
Paper products	113.9	319.6	5.3	7.7	-218.7
Chemical products	154.5	542.3	38.7	- 70.6	-356.5
Non-metal min. prod.	123.5	405.0	16.3	16.3	-314.1
Basic metal	248.0	676.1	27.1	- 42.7	-412.5
Mtl. prod. & machinery	173.5	670.5	26.7	-210.4	-313.4
Misc. manufacturing	487.0	124.8	250.1	61.8	50.3

Notes: Column (1) represents the growth rate of employment between 1960-1970. Columns (2) through (5) represent parts of this growth rate attributed respectively to the change in domestic demand, export expansion, import substitution, and the techno-substitution effect.

SOURCES: See subsection (p. 15).

products, and metal products and machinery). That is, during the 1960s, exportation centered relatively more on light industries, while importation centered relatively more on heavy industries.

Finally, column (5) shows that the techno-substitution effect, or technological change and factor substitution, also contributed more unfavorably to the employment creation in heavy industries (notably in chemical products, nonmetallic mineral products, basic metal, and metal products and machinery). This implies that, during the 1960s, heavy industries tended to rely relatively more on capital-intensive techniques.

Columns (2), (4) and (5) together indicate one interesting aspect in relation to the strategy of putting more emphasis on heavy industries. As a result of this strategy, the change in domestic demand created a great potential of employment growth in heavy industries. But, this potential was offset, at least partly, by these industries' heavier reliance on importation and by their increased resort to capital-intensive techniques.

Table 3 shows similar information for each bracket of workers (farmers). Column (1) represents the growth rate of employment of each bracket of workers. Columns (2) through (7) indicate parts of this growth rate attributable respectively to the structural sources now familiar to us. Column (7), which shows the contribution of the intra-industry composition effect (or the change in employment composition within each industry), is zero by assumption (2) on page 13.

For the mining-manufacturing category, column (1) shows that the growth rate of employment was higher, the closer the bracket under consideration was to either extreme. That is, the change in employment patterns

TABLE 3: Decomposition of the Change
in Employment Patterns by Class

<u>Classes</u>	$\frac{dN^e}{N_o^e}$ (1)	$\frac{dN_{DI}^e}{N_o^e}$ (2)	$\frac{dN_{DF}^e}{N_o^e}$ (3)	$\frac{dN_X^e}{N_o^e}$ (4)	$\frac{dN_M^e}{N_o^e}$ (5)	$\frac{dN_T^e}{N_o^e}$ (6)	$\frac{dN_C^e}{N_o^e}$ (7)
<u>Mining-manufacturing workers</u>							
Bkts (1)-(3)	160.0%	179.3%	128.1%	52.2%	-36.5%	-162.2%	--
Bkts (4)-(6)	143.5	204.3	109.3	50.8	-48.4	-172.3	--
Bkts (7)-(9)	123.0	213.1	104.8	39.1	-57.1	-176.7	--
Bkts (10)-(12)	118.0	244.3	117.2	30.8	-76.2	-198.1	--
Bkts (13)-(15)	131.2	250.0	119.6	37.1	-75.3	-200.2	--
Bkts (16)-(18)	141.1	248.7	98.4	34.2	-46.4	-193.8	--
<u>All</u>	<u>144.7%</u>	<u>200.6%</u>	<u>118.5%</u>	<u>46.7%</u>	<u>-48.7%</u>	<u>-172.3%</u>	--
<u>Farmers</u>							
- .5 h.a.	- 7.7%	30.0%	60.6%	.5%	-6.9%	-82.1%	-9.8%
.5 - 1.0 h.a.	9.7	32.7	66.0	.6	-7.5	-89.5	7.4
1.0 - 2.0 h.a.	5.0	31.9	64.6	.5	-7.3	-87.5	2.8
2.0 - h.a.	.5	31.3	63.2	.5	-7.2	-85.6	-1.7
<u>All</u>	<u>2.2%</u>	<u>31.5%</u>	<u>63.7%</u>	<u>.5%</u>	<u>-7.2%</u>	<u>-86.3%</u>	--

Notes: Column (1) represents the growth rate of employment between 1960-1970. Columns (2) through (7) represent parts of this growth rate attributed respectively to the change in domestic intermediate demand, the change in domestic final demand, export expansion, import substitution, the techno-substitution effect, and the employment composition effect.

SOURCES: See subsection (p. 15).

during the 1960s was characterized by bipolarization.

Underlying this bipolarization were, most conspicuously, contributions of the change in domestic intermediate demand (column (2)), export expansion (column (4)), and the techno-substitution effect (column (6)). Specifically, the change in domestic intermediate demand contributed relatively more favorably to the employment creation of upper-bracket workers. Obviously, this was a result of the faster expansion of heavy industries during the 1960s. Since heavy industries use as inputs relatively more of skill-intensive products than light industries, faster growth of heavy industries must create patterns of intermediate demand relatively in favor of skill-intensive products, which in turn results in patterns of labor demand in favor of upper-bracket workers. Export expansion in turn contributed more favorably to the employment generation of lower-bracket workers. This reflects that exportation during the 1960s centered on products which required low-skilled workers. Finally, contribution of the techno-substitution effect was more unfavorable for upper-bracket workers. This implies both technological progress and factor substitution tended to increase labor productivity relatively more in heavy industries than in light industries and, hence, exerted more adverse effect on the employment creation of skilled workers than on that of unskilled workers.

The lower panel of Table 3 shows similar information for the agricultural sector. Unlike in the the mining-manufacturing category, column (1) shows that the growth rate of employment was lower, the closer the class under consideration was to either extreme.

Note that each of columns (2) through (6) contains virtually the same figure for different classes of farmers. This stems from the way the agricultural sector is handled in this study.¹ More importantly, however, the closeness of figures in each of columns (2) through (6) is in fact consistent with our expectation. Specifically, the agricultural sector in Korea is characterized by a structure of very small owner-operated farms, which grow largely the same crop items with practically the same farming techniques. Accordingly, any change in, say, domestic demand is not expected to affect different classes (sizes) of farmers to a significantly different extent.

Finally, column (7) shows the composition effect was negative for the bottom and the top classes, while it was positive for the others in between. This implies that, as a result of rural-urban migration, the number of both small and large farmers relatively decreased, whereas that of medium-size farmers increased.

Change in Patterns of Income Distribution

Shares of Quintiles

Shares of quintiles in the gross sum of incomes of workers (farmers) are estimated, for 1960 and 1970 respectively, on the basis of information in Tables A.2 and A.3. Estimates are done respectively for mining-manufacturing workers (to be called hereinafter "M workers") alone, farmers

¹Namely, all farmers in the whole sector (rather than some farmers in individual subsectors) are broken down into 4 classes and, hence, changes in weights among these subsectors do not affect the employment structure in the whole sector.

alone, and M workers and farmers combined. The results are presented in columns (1) and (2) of Table 4. Column (3) of the table represents the change by percentage points in the share of each quintile between 1960-1970. Notice, however, column (3) does not directly reflect the relative degree of improvement (deterioration) of each quintile's living standard, since an increase (a decrease) in the share by one percentage point means relatively more improvement (deterioration) for lower quintiles than for higher ones. This aspect is taken into account in column (4), which will be called hereinafter "improvement (deterioration) index."

As shown in columns (1) and (2) of Table 4, income distribution among M workers (top panel) was more unequal than that among farmers (middle panel) over the period of 1960-1970. Shares of the bottom and the top quintiles were respectively somewhere around 6 percent and 50 percent for M workers, and 15 percent and 27 percent for farmers. Income distribution for M workers and farmers combined (bottom panel) was in between, with shares of the two extreme quintiles being around 13 percent and 34 percent, respectively.

Columns (3) and (4) of Table 4 show in which direction and to what extent each of the three distributions moved between 1960-1970. Among M workers, column (3) shows that the share of only the top quintile increased by some two percentage points, while that of each of the remaining four quintiles decreased, an apparent symptom of increasing inequality. Among the lower four quintiles, however, column (4) shows that the deterioration index was higher for the middle two quintiles than for the other two. Overall, therefore, it is not exactly clear whether or not the distribution among M workers may be said to have moved toward

TABLE 4: Shares of Quintiles in 1960 and 1970

<u>Quintiles</u>	<u>1960</u> (1)	<u>1970</u> (2)	<u>(2)-(1)</u> (3)	<u>(3)/(1)</u> (4)
<u>Mining-manufacturing workers</u>				
1st quint.	6.22%	6.05%	- .18%	- 2.86%
2nd quint.	8.85	8.31	- .55	- 6.17
3rd quint.	13.67	12.76	- .91	- 6.67
4th quint.	21.40	21.03	- .37	- 1.74
5th quint.	49.86	51.86	+2.01	+ 9.38
<u>Farmers</u>				
1st quint.	14.82%	15.82%	+1.00%	+6.77%
2nd quint.	15.95	16.97	+1.03	+6.43
3rd quint.	17.12	17.63	+ .41	+2.42
4th quint.	24.15	23.40	- .75	-3.12
5th quint.	27.96	26.18	-1.78	-6.36
<u>Mining-manufacturing workers and farmers combined</u>				
1st quint.	13.43%	12.49%	- .94%	-7.02%
2nd quint.	14.75	14.89	+ .15	+1.01
3rd quint.	16.10	16.07	- .03	- .16
4th quint.	22.87	20.93	-1.49	-8.50
5th quint.	32.86	35.62	+2.76	+8.40

SOURCE: Tables A.2 and A.3.

increasing inequality. The distribution among farmers, however, may clearly be said to have moved toward more equality during the 1960s. Column (4) indicates that, for farmers, the improvement (deterioration) index was higher for lower (higher) quintiles. Finally, for M workers and farmers combined, shares of the second and the fifth quintiles increased, while those of the remaining quintiles decreased. Once again, therefore, it is not exactly clear whether this distribution may be said to have moved toward more equality or inequality.

As already suggested in the previous paragraph, if the share of each and every quintile is to be examined, it is only under highly restricted circumstances that a definite statement can be made as to whether a particular distribution has moved toward increasing or decreasing equality. Practically, however, a rough statement can be made by focusing on shares of only the bottom and the top quintiles. Looked at along this line, Table 4 indicates that the distribution became more unequal among M workers alone, more equal among farmers, and more unequal for M workers and farmers combined, between 1960-1970.

Sources of the Change in Income Distribution

As the final step of this study, sources of the change in income distribution are now to be traced out. Sets of information in Tables A.2 and A.3 and Table 3 are applied to equations (5) and (6). Estimates are made respectively for M workers alone, farmers alone, and M workers and farmers combined. The results are presented in Tables 5, 6, and 7.

In Table 5, column (1) represents the gross sum of incomes of workers in each quintile in 1960. Column (2) shows the growth rate of this sum between 1960-1970 and, hence, reflects relative improvement of workers'

TABLE 5: Sources of the Change in Income Distribution among M Workers

Growth Rate of Gross Income Attributable to:

Quintile	Gross income in 1960 $\frac{Y^q}{Y^o}$ (1)	Growth rate of gross income $\frac{dY^q/Y^q}{dY^o/Y^o}$ (2)	Change in intermediate demand $\frac{dY^q_{DI}/Y^q}{dY^o_{DI}/Y^o}$ (3)	Change in final demand $\frac{dY^q_{DF}/Y^q}{dY^o_{DF}/Y^o}$ (4)	Export expansion $\frac{dY^q_X/Y^q}{dY^o_X/Y^o}$ (5)	Import substitution $\frac{dY^q_M/Y^q}{dY^o_M/Y^o}$ (6)	Techno-substitution effect $\frac{dY^q_T/Y^q}{dY^o_T/Y^o}$ (7)	Composition effect $\frac{dY^q_C/Y^q}{dY^o_C/Y^o}$ (8)	Change in labor income $\frac{dY^q_{Y1}/Y^q}{dY^o_{Y1}/Y^o}$ (9)	Change in non-labor income $\frac{dY^q_{Y2}/Y^q}{dY^o_{Y2}/Y^o}$ (10)
1st quint.	4409	311.0%	225.0%	175.1%	64.6%	-49.4%	-207.5%	-16.7%	116.2%	3.7%
2nd quint.	6270	297.0	229.4	155.9	70.7	-43.8	-205.2	-25.9	109.3	6.7
3rd quint.	9682	294.9	254.4	145.2	70.9	-54.5	-217.1	-21.2	105.5	11.7
4th quint.	15159	315.8	304.4	160.3	56.3	-82.4	-261.5	4.7	112.1	21.9
5th quint.	35317	340.1	353.1	160.3	52.2	-99.9	-279.1	10.5	102.5	40.6
5th - 1st		+ 29.1%	+128.1%	- 14.8%	-12.4%	-50.5%	- 71.6%	+27.2%	- 13.7%	+36.9%

Notes: Column (1) is in million won in 1970 prices.

For each row, columns (3) through (10) add up to column (2) within rounding-off error.

SOURCES: See subsection (p. 20).

living standard among different quintiles.¹ Columns (3) through (8) indicate parts of this growth rate attributable to the structural sources denoted by respective headings. Columns (9) and (10) in turn indicate remaining parts of the growth rate due to the change in labor income and the change in nonlabor income.² At the bottom row of Table 5, the difference between the top and the bottom quintiles is presented to see the degree of equalizing or unequalizing tendency of each source.

As shown at the bottom row of Table 5, the change in domestic intermediate demand (column (3)) was the most unequalizing source of all, creating a gap by 128 percentage points in the growth rate of gross income between the top and the bottom quintiles in favor of the former. This reflects the faster expansion of heavy industries during the 1960s, which resulted in patterns of intermediate demand relatively in favor of skilled workers. The change in domestic final demand (column (4)) in turn tended to narrow the gap (by about 15 percentage points) between the two extreme quintiles. But, this equalizing tendency was so dominated by the unequalizing tendency of the change in domestic intermediate demand that the overall contribution of both the final and the intermediate demand showed a tendency to widen the inequality among M workers.

¹The ordering of column (2) of Table 5 is the same as the ordering of column (4) of Table 4 (that is, the improvement index), as they should be.

²Column (9) is obtained as follows. Let w^e and y^e be respectively labor and total incomes of bracket e workers. $dY_{y1}^{e,q} = dw^e N^{e,q}$ is first estimated analogously to $dY_y^{e,q}$ in equation (6). The results are then aggregated over all e within each quintile. Column (10) is similarly estimated. $dY_{y2}^{e,q} = d(y^e - w^e) N^{e,q}$ is first estimated and the results are then aggregated over all e within each quintile.

Both export expansion (column (5)) and import substitution (column (6)) tended to narrow the inequality among M workers. The former reflects the increased concentration of exportation on products requiring relatively low-skilled workers. The latter in turn reflects the increased importation of skill-intensive products such as raw materials, machinery, and equipment, which was made necessary as a result of the rapid industrialization during the 1960s.

The techno-substitution effect (column (7)) also showed a tendency to equalize the distribution among M workers. This implies that both technological progress and factor substitution tended to increase labor productivity relatively more in skill-intensive heavy industries, thus hurting the employment generation of upper-income workers relatively more.¹ The composition effect (column (8)) in turn contributed to widening the inequality among M workers. Underlying this was the bipolarization of employment structure as shown in the top panel of Table 3.

The change in labor income (column (9)) contributed to equalizing, while the change in nonlabor income (column (10)) to unequalizing, the distribution among M workers. Furthermore, the equalizing gap created by the former (-13.7%) was completely dominated by the unequalizing gap created by the latter (+36.9%). Conceivably, there are two possibilities in relation to the unequalizing contribution of the change in non-labor income. One is the possibility of increased concentration of non-human

¹In general, an increase in labor productivity may affect the income distribution via two channels; namely, via its effect on employment and via its effect on wage rates. Column (7) captures only the effect of the change in labor productivity on income distribution via the first channel. Its effect via the second channel is reflected in column (9).

assets to upper-income groups. The other is the possibility of rising relative returns to non-human against human assets. Evidence indicates, however, that the relative returns actually fell during the 1960s in Korea.¹ That is, the unequalizing contribution of the change in non-labor income was due totally to the increased concentration of non-human assets to upper-income groups.

Analogous results for farmers are presented in Table 6. Here, columns (1) through (8) maintain exactly the same interpretations as their corresponding columns of Table 5. Columns (9) and (10) of Table 6 now represent contributions of the change in farming income and the change in nonfarming income, respectively.

Column (2) of Table 6 indicates that the growth rate of gross sum of incomes was higher for lower quintiles, implying that the distribution among farmers moved toward greater equality during the 1960s. As shown in columns (3) through (8), the gaps in the growth rate of gross income created by respective structural sources were rather minor. This is consistent with our expectation, although it stems from the way the agricultural sector is handled in this study as already pointed out in the previous subsection. The most significant finding in Table 6 is that, while the change in farming income (column (9)) tended to unequalize the

²Economic Planning Board, Korea Statistical Yearbook, several volumes, give the following information: "value added per employee (V)," "personnel expense per employee (w)," and capital-labor ratio (K/L) where K is defined in three different ways, namely, "tangible fixed assets," "machinery and equipment," and "liabilities and net worth." The rate of returns to capital (r) is estimated according to the following identity; $V = wL + rK$ or $r = (V/L) - w)/(K/L)$. The resulting (r/w) shows a consistently decreasing tendency during the 1960s, regardless of whatever definition of K is used.

TABLE 6: Sources of the Change in Income Distribution among Farmers

Growth Rate of Gross Income Attributable to:

Quintile	Gross income in 1960	Growth rate of gross income	Change in intermediate demand	Change in final demand	Export expansion	Import substitution	Techno-substitution effect	Composition effect	Change in farming income	Change in non-farming income
	Y_o^q	$\frac{dY^q}{Y_o^q}$	$\frac{dY_{DI}^q}{Y_o^q}$	$\frac{dY_{DF}^q}{Y_o^q}$	$\frac{dY_X^q}{Y_o^q}$	$\frac{dY_M^q}{Y_o^q}$	$\frac{dY_T^q}{Y_o^q}$	$\frac{dY_C^q}{Y_o^q}$	$\frac{dY_{Y1}^q}{Y_o^q}$	$\frac{dY_{Y2}^q}{Y_o^q}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1st quint.	54640	109.8%	48.2%	97.5%	.8%	-11.1%	-132.0%	.0%	36.4%	70.0%
2nd quint.	58783	109.1	47.7	96.4	.8	-10.9	-130.6	2.7	55.0	48.1
3rd quint.	63118	102.3	47.0	95.0	.8	-10.8	-128.7	.0	66.5	32.5
4th quint.	89043	90.4	45.1	91.1	.8	-10.3	-123.4	1.3	67.7	18.1
5th quint.	103075	84.0	44.1	89.2	.8	-10.1	-120.8	-.36	63.5	17.6
5th - 1st		-25.8%	-4.1%	-8.3%	.0%	+1.0%	+11.2%	-.3%	+27.1%	-52.4%

Notes: Column (1) is in million won in 1970 prices.

For each row, columns (3) through (10) add up to column (2) within rounding-off error.

SOURCES: See subsection (p. 20).

distribution among farmers, the change in nonfarming income (column (10)) tended to equalize the distribution. Moreover, the unequalizing gap created by the former (+27.1%) was greatly dominated by the equalizing gap created by the latter (-52.4%). In other words, what was mainly responsible for the decreasing inequality among farmers was the change in nonfarming income.

The evidence that the change in nonfarming income contributed to narrowing the inequality suggests an important implication in the general context of development. As industrialization proceeds, farmers may conceivably show two types of response. One is outright migration into industrial sectors. The other is increased participation in industrial activities while maintaining their basic status as farmers. In this latter type of response, small farmers are likely to participate relatively more in, and hence to derive relatively more income from, these nonagricultural activities than large farmers.

Table 7 finally presents similar results for the countrywide (that is, M workers and farmers combined in the present study) distribution. Columns (1) through (8) are interpreted exactly the same way as their corresponding columns of the previous two tables. Column (9) now represents contribution of the change in total income (that is, labor plus nonlabor income for M workers, and farming plus nonfarming income for farmers). Since, in the countrywide distribution, the lower four quintiles were occupied mostly by farmers whereas the top quintile was occupied mostly by M workers, at the bottom row of Table 7 is presented the difference between the top and the average of the lower four quintiles (rather than the difference between the top and the bottom quintiles). In other words,

TABLE 7: Sources of the Change in Income Distribution
for M Workers and Farmers Combined

Quintile	Growth Rate of Gross Income Attributable to:								
	Gross income in 1960 y_o^q (1)	Growth rate of gross income $\frac{dY^q}{Y_o^q}$ (2)	Change in intermediate demand $\frac{dY_{DI}^q}{Y_o^q}$ (3)	Change in final demand $\frac{dY_{DF}^q}{Y_o^q}$ (4)	Export expansion $\frac{dY_X^q}{Y_o^q}$ (5)	Import substitution $\frac{dY_M^q}{Y_o^q}$ (6)	Techno-substitution effect $\frac{dY_T^q}{Y_o^q}$ (7)	Composition effect $\frac{dY_C^q}{Y_o^q}$ (8)	Change in income $\frac{dY_Y^q}{Y_o^q}$ (9)
1st quint.	59027	116.7%	73.0%	101.9%	11.4%	-15.7%	-134.9%	-21.0%	101.9%
2nd quint.	64805	135.4	50.9	102.9	.9	-11.7	-139.4	21.8	109.9
3rd quint.	70735	132.7	66.8	101.3	7.5	-14.8	-138.7	6.9	103.6
4th quint.	100516	113.2	48.2	96.1	1.1	-11.0	-130.4	18.6	90.6
5th quint.	144411	152.6	150.7	110.9	21.0	-40.5	-170.8	15.8	97.1
5th - Avg.		+ 28.1%	+91.0%	+10.3%	+15.8%	-27.2%	- 35.0%	+ 9.2%	- 4.4%

Notes: Column (1) is in million won in 1970 prices.

Avg. at the bottom row is average of lower four quintiles.

For each row, columns (3) through (10) add up to column (2) within rounding-off error.

SOURCES: See subsection (p. 20.

the bottom row of Table 7 may be interpreted as reflecting approximately the difference between M workers and farmers.

Column (2) of Table 7 indicates that the countrywide distribution became more unequal between 1960-1970, with the gap in growth rates of gross income being about 28 percentage points between the top and the remaining quintiles (bottom row).

In this unequalizing process, the change in domestic intermediate demand (column (3)) played the dominant role, creating the biggest gap (+91.0%) in growth rates of gross income between the top and the other four quintiles. The change in domestic final demand (column (4)) also showed a tendency to widen the inequality in the countrywide distribution. The general implication of these evidences is as follows: As long as industrialization is pursued as the prime goal of an economy, patterns of domestic demand inevitably change in favor of industrial products. As long as industrial workers have substantially higher income than farmers, this change in patterns of domestic demand inevitably results in widening inequality in the countrywide distribution.

Export expansion (column (5)), which contributed to narrowing the inequality among M workers, now reversed its role in the countrywide distribution, creating an unequalizing gap (+15.8%). This is suggestive of the general possibility that even a policy measure intended to help lower-income industrial workers may turn out to be one which in fact helps upper-income groups in the countrywide distribution. Import substitution (column (6)) in turn tended to equalize the countrywide distribution, implying that import dependency increased relatively more in the mining-manufacturing category than in the agricultural sector.

The techno-substitution effect (column (7)) contributed to narrowing the inequality. This reflects the fact that, during the 1960s, technological progress and factor substitution tended to increase labor productivity relatively more in the mining-manufacturing category than in the agricultural sector and, hence, exerted relatively more adverse effect on the employment creation of M workers than on that of farmers.

The composition effect (column (8)) in turn tended to unequalize the countrywide distribution. Underlying this was obviously the rapid industrialization during the 1960s, which raised the relative weight of M workers in the economy. In general, however, an increase in the relative weight of M workers in itself does not necessarily raise the share of upper-income groups even if M workers have higher income than farmers. Specifically, as the relative weight of M workers increases, high-income farmers who have been in, say, the top quintile will be gradually replaced by M workers. This will increase the gross sum of incomes in the top quintile, since the incoming M workers have higher income than the outgoing farmers. But, the average income of the outgoing (from the top quintile) farmers is also higher than the average income of the lower quintiles into which they will move. Consequently, the gross sum of incomes in the lower quintiles will also increase. Depending upon the relative magnitudes of these increases in gross income, the share of the top quintile may increase or decrease as a result of the increase in the relative weight of M workers. The thesis that follows is: It is only when the gap in income between M workers and farmers is substantially large that the increase in the relative weight of M workers raises the share of upper-income groups. And its antithesis is: If the gap is below a certain level,

the increase in the relative weight of M workers may well lower the share of upper-income groups.

Finally, the change in income (column (9)) showed a tendency to equalize the countrywide distribution, implying that the gap in income between M workers and farmers decreased, though very slightly, between 1960-1970.

TABLE A.1: Patterns of Employment
by Industry or Sector

<u>Industries and Sectors</u>	$\frac{N_o}{(1)}$	$\frac{N_t}{(2)}$	$\frac{dN/N_o}{(3)}$
Agriculture	4681.8	4786.4	2.2%
Mining	84.7	106.4	25.6%
Coal	41.5	38.4	-7.5%
Others	43.2	68.0	57.4%
Manufacturing	414.9	1116.3	169.1%
Food & beverages	96.4	211.3	119.2%
Textile products	126.1	367.5	191.4%
Wood products	18.5	47.9	158.9%
Paper products	27.4	58.6	113.9%
Chemical products	45.7	116.3	154.5%
Non-metal mineral prod.	23.8	53.2	123.5%
Basic metal	10.0	34.8	248.0%
Metal prod. & machinery	53.3	145.8	173.5%
Misc. manufacturing	13.8	81.0	487.0%
<u>Total</u>	<u>5181.5</u>	<u>6009.2</u>	<u>16.0%</u>

Notes: Columns (1) and (2) represent the numbers of workers (farmers) employed in 1960 and 1970 respectively. Column (3) indicates the growth rate of employment between 1960-1970. Columns (1) and (2) are in thousand workers.

SOURCES: See subsection (p. 12).

TABLE A.2: Patterns of Income Distribution
(Mining-Manufacturing Workers)

<u>Income bracket</u>	<u>1960</u>			<u>1970</u>		
	<u>Labor income</u>	<u>Total income</u>	<u>No. of workers</u>	<u>Labor income</u>	<u>Total income</u>	<u>No. of workers</u>
(1)	34482	34797	59861	59310	59891	152803
(2)	54877	58074	118809	92544	97776	312636
(3)	73296	80161	54584	127165	139318	140969
(4)	90219	101358	43515	150781	168673	113337
(5)	99144	112763	32806	175105	199819	76128
(6)	112826	130580	27929	202624	236048	64425
(7)	127160	149526	23762	230896	274275	49101
(8)	145456	174441	34654	263192	318654	79276
(9)	173870	214617	27953	304706	377503	64260
(10)	195017	245185	20373	363034	463315	44523
(11)	221556	284678	13630	407807	531067	30946
(12)	246672	322845	9308	456073	606321	18961
(13)	294282	398012	14746	542894	746725	33459
(14)	367282	520091	6844	656958	941127	15991
(15)	444828	656496	6907	808213	1212306	16430
(16)	574110	900684	2378	1041886	1660388	5640
(17)	783441	1331720	1197	1428584	2477850	2897
(18)	896763	1596902	342	1685501	3063673	908
<u>All</u>	<u>115415</u>	<u>141790</u>	<u>499598</u>	<u>198008</u>	<u>245131</u>	<u>1222690</u>

Notes: Incomes are in won in 1970 prices.

SOURCES: See subsection (p. 12).

TABLE A.3: Patterns of Income Distribution
(Farmers)

<u>Land holding</u>	<u>1960</u>			<u>1970</u>		
	<u>Farm income</u>	<u>Total income</u>	<u>No. of farmers</u>	<u>Farm income</u>	<u>Total income</u>	<u>No. of farmers</u>
- .5	39886	58353	1415207	60878	119736	1306096
.5 - 1.0	54530	67407	1454109	98841	133375	1595493
1.0 - 2.0	84132	96996	1396393	148798	178458	1466532
2.0 -	115360	126435	416134	190089	223421	418355
<u>All</u>	<u>64339</u>	<u>78742</u>	<u>4681843</u>	<u>111764</u>	<u>151337</u>	<u>4786476</u>

Notes: Land holdings are in hectares.

SOURCES: See subsection (p. 12).

67. "Consumption and Earnings Patterns and Income Redistribution (1975), 26 pp..... J. Gregory Ballentine and Ronald Soligo
68. "Income Redistribution and Its Effects on Factor and Import Demand in Taiwan: A Simulation Approach" (1975), 33 pp.....Yhi-Min Ho
69. "The International Tin Agreement: A Reassessment" (1975), 19 pp., Gordon W. Smith and George R. Schink
70. "Ethnography of Migration: Breaking out of the Bipolar Myth" (1976), 15 pp.....Douglas Uzzell
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73. "Savings Behavior of Poor and Rich in Taiwan: 1964, 1966, 1968, and 1970" (1976), 30 pp..... Marian Krzyzaniak
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85. "Structural Change, Employment and Income Distribution: The Case of Korea 1960-1970" (1978), 37 pp..... Daemo Kim

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