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Labor Absorption in Korea Since 1963

by

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I   BACKGROUND

Economic progress in South Korea (the Republic of Korea) was unimpressive during the decade after the close of the Korean War (1953). The annual rate of increase in real GNP averaged 4.6 percent. In the spring of 1960, the Rhee government was overthrown by a student revolution. Rhee's successor, John M. Chang (Chang Myŏn) was turned out by a military coup in the spring of 1961. Political turmoil, poor harvests in 1959-60 and again in 1962, and a poorly conceived currency reform in June 1962 combined to produce virtual economic stagnation toward the end of the decade. Between 1959 and 1962, the average annual increase in real output was only 3.4 percent.

The economic situation since 1962 or 1963 has been very different. The military leadership, converted into a civilian government in 1963 under General (now President) Park, established the First Five-Year Plan (1962-66) and instituted a stabilization program. This program has been marked by conversion of government budget deficits to surpluses beginning in 1963-64, major devaluation of the won in June 1964, and an interest-rate reform in September 1965 in which the basic loan rate doubled and deposit rates more than doubled. Political stability, heavy plan investment, better harvests, and the new stabilization policies all affected the rate of economic growth. From 1963 to 1970, the annual rate of increase in GNP averaged 10.9 percent (10.7 percent from 1962 to 1970). This was undoubtedly one of the highest national growth rates achieved in the 1960s.[1]

Accelerated growth of this magnitude has produced major shifts in economic structure. Korea's expansion in the 1960s was concentrated in the

industrial sector which has been dominated, in turn,

by manufacturing. (Manufactures account for 82 percent of the 1965

value-added weights assigned to mining, manufacturing, and electric

generation in Korea's index of industrial production). The index of

manufacturing output doubled from 1960 to 1966, and more than doubled

from 1966 to 1970. This increase has been led by exports. The value

of merchandise exports doubled from 1963 to 1965, almost doubled from

1965 to 1967, and again from 1967 to 1969. Exports rose another 35

percent from 1969 to 1970, when they reached a total of 835 million dollars.

Less than a fifth of merchandise exports were manufactures in 1957-59, the

share of manufactures in this total was more than three-fifths by 1969.

Agricultural output has increased too, but at a lower rate (the annual

growth averaged 4.5 percent from 1960 to 1970). The share of GNP

originating in agriculture (forestry and fisheries), in consequence, fell

from 40 percent in 1962-64 to 28 percent in 1968-70 while that of the

industrial sector rose from 25 to 39 percent.[2]

Investment has taken an increasing share of gross national expen-

diture (the investment ratio rose from 10-12 percent in 1959-61 to over

30 percent in 1968-70), but there has also been a substantial increase

in real per capita consumption. There was practically no rise in

individuals' consumption from 1953 until 1963, but then consumption rose

from an average of 21.6 thousand _won_ to 34.3 thousand in 1970 (all value

figures shown here, unless otherwise indicated, are given in constant

1965 market prices or factor costs). This was equivalent to 59.1 thou-

sand _won_ in current 1970 prices, or approximately $190 at prevailing

exchange rates. The increase in consumption has not been evenly

distributed, however, as the averages might imply. Real wages of urban

workers' families rose 87 percent from 1963 to 1969; farm-family incomes, in contrast, were no higher in 1968 than in 1963, and only 5 percent higher in 1969. By 1969, current incomes of urban wage-earner families equaled 333.6 thousand won while the figure for farm households was 227.6 thousand.[3]

Growing disparity between rural and urban incomes has undoubtedly been a main cause of urbanization in recent years. Ministry of Agriculture and Forestry (MAF) estimates show that farm population grew less than 8 percent from 1960 to 1969, and actually began to drop after 1965.[4] Non-farm (urban) population, however, rose 54 percent so that by 1969 the two populations were about equal. Much of the urbanization has been concentrated in Seoul, which grew from 2.4 million to 5.5 million inhabitants between 1960 and 1970. Total population rose from 21.5 million in 1955 to 29.2 million in 1966 and 31.5 million in 1970. This represents a decline in the rate of population increase from an annual average of 3.0 percent in 1955-60 to 2.9 percent in 1960-66 and 1.9 percent in 1966-70.

II. ACTUAL AND POTENTIAL LABOR SUPPLY

The Economic Planning Board (EPB) has conducted quarterly surveys of persons aged 14 years and over based on the "labor-force" approach to measuring economic activity (i.e. classification depends on actual status during the survey week). The surveys employ a stratified, two-stage sampling scheme in which the overall samples (1 in 1,000) are collected in the middle weeks of March, June, September, and December. The EPB shows coefficients of variation (ratios of standard error of the estimate to the estimate) for different size estimates. These indicate, for example,

that estimates of total employment (8.5 to 9.5 million in recent years)
lie within ± 225 thousand of the true value at the 95 percent probability
level.[5] Subtotals have proportionately wider confidence intervals.

Estimates of population aged 14 years and over, the economically
active and inactive, and employment with and without adjustment for hours
worked in 1963 and 1970 (or 1969) are shown in Table 1. The population
aged 14 and over increased 14 percent between 1963 and 1970 while the
economically-active population (those working one hour or more per week
or persons who "have an intention and are looking for work actively")
rose 16 percent and the number of people actually employed grew 20 percent.
If allowance is made for increasing length of the average work week (full-
time equivalent employment is shown in the last column of Table 1), the
rate of increase in actual labor inputs between 1963 and 1970 may well
have been double the rate of increase in potential supply.

The larger increase in actual than in potential supply suggests that
there was a considerable surplus of labor in 1963. If there were "unlimited
supplies" of labor or substantial "disguised unemployment," insofar as
labor unemployed in a covert fashion was readily available, then the
existence of such labor must certainly have facilitated Korea's rapid
economic growth during the 1960s.[6] This hypothesis receives support from
the Second Five-Year Plan (1967-71), in which it was assumed that labor
supply would impose no constraints on growth. Early Third Plan (1972-76)
documents suggest that this assumption may have been dropped.[7]

Level and growth-rate data shown in Table 1 and the conclusions about
supply and demand drawn here from such data may well be misleading. The
annual figures are calculated as the simple average of four quarterly
surveys. The surveys may or may not be representative of actual economic

activity throughout the year. Quarterly estimates of numbers of economic-
ally active persons, the employed, and agricultural and non-agricultural
workers during 1966-70 are given in Figure 1. It is clear from this figure
that annual averages cover wide variation in seasonal activity, with the
number of economically active and employed some 3 million higher at June
peaks than during December troughs. The variation is concentrated in
agriculture, where seasonal swings of 3.5 to 4.0 million are partly
offset by a reverse pattern in non-agricultural employment. Farmers
evidently engage in some non-agricultural work during the off season.

Rice planting takes place in late April and early May, transplanting
in late May and early June. Barley and wheat are harvested in mid-June
and early July, while rice is harvested in October. Barley and wheat are
planted in late October. The June survey may reflect the extra labor
needed to transplant rice, but the September survey misses the rice
harvest and the planting of wheat and barley. The March survey comes
too early to catch rice-planting activity. Whether the surveys are in
fact representative of overall activity during the year is not clear, but
as the relative importance of agriculture declines (see Figure 1), what-
ever error may result from the present scheduling of surveys is likely to
change. This change, in turn, is likely to bias trend estimates of the
economically active population and its components.[8]

A major point revealed in Figure 1 is the striking similarity of the
seasonal patterns for the economically active and the employed. The
residual, unemployment, is relatively small and shows much less (absolute)
variation--- 200 to 300 thousand -- than does the number of economically
active (2.5 - 3.0 million). When employment ceases, particularly in
agriculture, workers leave the labor force. They are not unemployed (e.g.
looking for work) because, presumably, there is no work for them. Would
those who are economically inactive during off-peak seasons be available
for work if work existed for them? The composition of the economically

inactive population must be examined before this question can be answered.

The answer, if one exists, has important implications for labor supply, the disguised-unemployment hypothesis, and the meaning of unemployment in a country like Korea. If all persons employed in June 1969 were employed throughout the year, for example, employment in 1969 would have averaged 10,733 thousand, not 9,347 thousand, the actual figure. If many of the economically inactive in non-peak seasons would work were work available, then the shift from economic activity to inactivity constitutes a major, seasonal form of disguised unemployment. Also, if there is substantial disguised unemployment, then open unemployment may be relatively insignificant, or at least the distinction between the two types of unemployment may lose its relevance.

The number of non-economically active rose from 6.4 million in June to 9.3 million in December 1969 (see Table 2). Members of farm households accounted for 90 percent of the increase. Of these, two-thirds were women engaged in housekeeping, and half of the rest (17 percent) were men similarly engaged. Housekeeping duties of many farm women evidently permit them to help with harvesting barley and wheat and transplanting rice in June. Whether such duties could also be abandoned in December and other periods of seasonal slack is unlikely, but even if they could, there remained a hard core of 6.4 million inactive at the seasonal employment peak in June 1969. Of these, 1.1 million were aged and disabled, almost 1.8 million were students, while 3.3 million were farm and non-farm women engaged in housekeeping. Unless substantial numbers of non-farm housewives can be enlisted in the labor force or students employed, slack at the seasonal peak (263 thousand) is insignificant. If 1969 was typical with respect to the economically inactive population, then the

main single source of extra labor in December and other slack seasons
is probably the farm men who are engaged in housekeeping.

Employment surveys provide little information on the sort of
disguised unemployment due to low or even zero marginal productivity, the
hallmark of the traditional or structural form of the disguised-unemploy-
ment hypothesis. Insofar as seasonal disappearance from the labor force
constitutes another form of disguised unemployment, however, then these
surveys show that there are between half a million (farmers engaged in
housekeeping) and 2.8 million "disguised" unemployed at the seasonal
employment low in December, depending upon one's hypotheses about the
actual number of economically inactive who would work were work available.
Seasonal disappearance of potential labor is therefore at least as large
as open unemployment, which averaged 471 thousand in 1969, and possibly
much larger. If "unemployment" is a term used to denote the situation
in which supply exceeds demand at some given price, then to the extent
that the economically inactive are available for work, the distinction
between overt and covert unemployment loses relevance. Published (open)
unemployment estimates, in consequence, are likely to be a poor proxy for
excess labor supply.[9]

Additional clues on potential labor supply can also be found in the
shifting composition of the non-economically active population from
1963 to 1969, shown in Table 2, and in the 1966 population census. The
number of economically inactive rose 10 percent from 1963 to 1969.
Housekeeping activity accounted for 60 percent of the total in both years
while the number of aged and disabled was constant at 1.1 million. There
was a large decrease in the "other" category, possibly because of more
accurate classification techniques as survey experience accumulated. The

big increase came in those attending school, whose number grew by 574
thousand from 1963 to 1969.[10]   Single-year age estimates from the 1966
census show that the number of 14-year olds rose from 540 thousand in
1963 to 830 thousand in 1969. The number of potential (14-year old)
labor-force entrants should increase to a peak of 969-970 thousand in
1974-75 before declining in subsequent years.[11]

Expansion of upper level education has more than offset growth in the
numbers of those reaching working age. Continued diffusion of secondary
and higher-level education combined with a decreasing rate of population
growth is likely to produce a decline in the number of new labor-force
entrants, particularly after the mid-1970s. Also, the sort of labor
surplus that may have been concealed in the 1960s by seasonal disappear-
ance from the economically-active population should diminish with
reduction in the relative (and absolute) number of agricultural workers,
especially if employment continues to expand in other sectors as it has
in recent years.

III. OUTPUT AND EMPLOYMENT

Annual output and employment estimates during 1963-1970 for the
agricultural, industrial, and service sectors are shown in Table 3. The
output figures are GNP originating in each sector at constant (1965)
market prices, while the employment data are shown with and without
adjustment for average hours worked.[12] The main sectoral shifts in these
years were the decline in agriculture's share in output (from 39 percent
in 1963 to 26 percent in 1970) and employment (from 63 percent in 1963
to 50 percent in 1970), largely offset by industry's rising shares (from
25 to 41 percent of output, and from 13 to 21 percent of employment).

The service sector's output share increased 2 percentage points; service-type employment rose 5 percentage points. Adjustment of the employment data to a full-time (50-hour workweek) equivalent (FTE) is also shown in Table 3.

The FTE estimates rise more (or drop less for agriculture) than the unadjusted series because of a lengthening in the average workweek from 1963 to 1969.[13] There was a discernible upward trend between 1963 and 1969 in the workweek for several of the major subsectors (manufacturing, construction, services), but not in others (agriculture and forestry, commerce). Yet the average for all sectors increased noticeably after 1966 (Table 4). The reason was continued decline in the relative (and absolute) importance of the agricultural sector (see Table 3) and an increase in the shares of other sectors. The average workweek in agriculture and forestry has been 10 percent or more below the all-sector average; working hours in the commercial sector, for instance, have been 20 percent or more above average. As agriculture's share in total employment decreased, that of commerce rose from 10 to 13 percent.

Growth of the average workweek is likely to continue in the near term as the balance of Korea's economic structure shifts more toward non-agricultural activity. Present workweeks of 55-60 hours in most industrial and service industries do not permit much increase in labor input through longer hours in these sectors, however. In the long run, given the backward-bending nature of the labor-supply function and the secular decline in average workweek observed in advanced industrial countries such as the United States and United Kingdom, it would be surprising if actual labor inputs (the FTE series) did not begin to lag behind the increase in (unadjusted) employment.

Over half of the additional (unadjusted) employment between 1963
and 1970 was in the industrial sector; two-thirds of the increment was
in manufacturing. The rest of the increase came in the service sector.
These increases were offset by a small decline in agricultural employment,
for a net gain of 1.6 million new jobs. Income (output) more than
doubled to 1.4 trillion won, with over half of the growth originating
in the industrial sector. Again, manufacturing accounted for two-thirds
of the industrial increment. Two-thirds of the remainder was increase
in service income, the rest growth in agricultural product (see Table 5).

The ratio of employment (n) to income (y), n/y, or the number of man-
years per million won of income (output) originating in each sector
during 1963 is also shown in Table 5. These ratios or labor coefficients
are the inverse of the usual productivity measure (net output per worker,
or y/n), and show labor intensity in each sector.[14] Observed n/y values
indicate that labor absorption associated with a unit of value added (net
output) in agriculture was three times that in the industrial sector
(and manufacturing), and almost two-and-a-half times that in the service
sector.

Ratios of incremental income, Δy, to increase in the number of
workers (Δn), or $\Delta y/\Delta n$, are also given in Table 5. The negative
value of $\Delta y/\Delta n$ for agriculture is a statistical artifact (is withdrawal
of labor responsible for an increase in output of 0.56 billion won for
each man who leaves agriculture? Would continued withdrawal of labor
lead to continued output increase?), but the values of $\Delta y/\Delta n$ for other
sectors are clearly very high relative to average levels of y/n (e.g.
y/n is simply the reciprocal of n/y, or 1/n/y) in 1963.) It is conceptually
wrong, of course, to attribute all of the increase in output to additional

labor input because this ignores possible growth in productivity of the existing labor force; nevertheless, it is legitimate to ask what employment would have been in 1970 if labor intensity (n/y) had been the same in 1970 as in 1963, or if productivity ($\Delta y/\Delta n$) between 1963 and 1970 had remained at average 1963 levels. The difference between the actual and hypothetical increase measures the reduction in potential labor absorption due to productivity growth during 1963-70.

Employment would have risen by 6.1 rather than 1.6 million from 1963 to 1970 if productivity had not increased.[15] Hypothetical increases for each sector are shown in Table 5. Greater proportionate differences between actual and hypothetical increases in employment are seen in the industrial than in the service sector, as one would suspect, because marginal labor intensity ($1/\Delta y/\Delta n$) is lower relative to 1963 levels (n/y) or, alternately, because marginal productivity ($\Delta y/\Delta n$) has increased more relative to the 1963 average ($1/n/y$). Again, because of the negative sign for Δn in agriculture, there is no valid way to measure the relative impact of increasing productivity in reducing labor absorption in that sector. Still, agriculture accounts for almost half of the total difference between actual and hypothetical employment increase.

Annual (compound or geometric) growth rates for employment (G_n) and income (G_y), and the ratio of the two (G_n/G_y) are also given in Table 5. These growth rates show that manufacturing income has increased at almost double the rate of service-sector income. Service-sector income, in turn, has risen twice as fast as agricultural income. The same ranking prevails for employment growth, but levels and differences between growth rates are smaller. The ratio G_n/G_y for each sector and the whole economy shows the increase in employment associated with income growth, or the

amount of labor absorption per unit of rise in income. This measure, related to the product of labor intensity (n/y) and the incremental output associated with additional workers ($\Delta y / \Delta n$), reveals that labor absorption in the industrial and service sectors has been over twice the national average, mainly because labor has been expelled from rather than absorbed in agriculture.[16] The labor absorption rate of income growth is low. Income has to grow at an average annual rate of 4 percent to support a one percent increase in employment. This is not surprising in view of experience elsewhere.[17] That the labor absorption rate for services is not much higher than for industry (or manufacturing) is unexpected, however.[18]

Measures for labor intensity, marginal product, and the labor absorption rate of income growth presented in Table 5 combine to show that a large decline in the labor intensity of economic activity occurred in Korea from 1963 to 1970. The decline was intensified by a shift in the composition of output from highly labor-intensive production in agriculture to much less labor-intensive industrial output. Whether labor intensity in each sector would have declined as rapidly in the absence of major structural change is unknown. Given such change and declining labor intensity, however, the increase in employment was clearly much less than it might have been had labor intensity been maintained at 1963 levels. Employment rose mainly because of the phenomenal increase in industrial output.

The same measures for the components of the industrial and service sectors can be derived to determine whether labor intensity, marginal product, or the labor absorption rate of income growth vary much within the larger aggregates (see Table 6). Labor intensity of construction is

particularly high, that of public utilities specially low within the
industrial sector. Labor intensity is much lower for commerce than for
other services in the service sector. Marginal productivity (Δ_y/Δ_n) was
generally lower than in manufacturing, but only in mining and quarrying
has the change in productivity been so limited as to maintain the 1963
level of labor intensity during 1963-70. Since mining output actually
dropped from 1967 to 1970, and rose little more than 10 percent from
1963 to 1970, low marginal productivity probably reflects failure to
modernize operations as demand for coal (60 percent of mining output in
1965) has declined. Both construction and public utilities, in
contrast, show major rises in productivity (output more than quadrupled
with no increase in public-utility employment) and, consequently, low
labor-absorption rates of income growth (G_n/G_y).

Reasons for changes in labor absorption might be examined at different
levels of generalization in which factors responsible for structural change
(more general) are distinguished from those associated with declining
labor intensity in each sector (less general) but unfortunately for
analytical purposes, the distinction is not always valid. A policy to
encourage exports by granting exporters access to subsidized loans, for
instance, not only favors industrial growth but also substitution of
capital for labor in other sectors as well. Nevertheless, an attempt
is made in the next section to examine the determinants of labor absorption
with some respect for the difference between more and less general factors.

IV   DETERMINANTS OF LABOR ABSORPTION

The nature of Korea's development under the Japanese, the effects of
partition at the end of World War II, and subsequent national planning
strategy have all combined to shift the economic balance from agriculture

to industry in South Korea during recent years. Industrialization under the Japanese had proceeded to the point where over a third of net commodity product originated in mining and manufacturing by 1939-41.[19] The most rapid industrial development had occurred in the North, where the bulk of heavy manufacturing (especially chemicals and metals) and electric capacity was located. The South had accounted for most of the country's textile and machinery production and also contained three-quarters of the area cultivated in rice and the summer grains. Division of an essentially complementary economy into American and Soviet-dominated spheres in 1945 was reinforced by Korean War, which ended any chance for trade between North and South and indefinitely postponed the prospect for reunification.

Much industrial growth in the South, such as the creation of a chemical fertilizer industry and expansion of electric output, has been determined by the need to replace capacity lost through partition. But this does not explain the development of new industry nor why the South (united Korea's "rice bowl") no longer exports rice when Korea had once been a major rice exporter before liberation from Japanese.[20] In fact, despite predictions that rice exports would reach half-a-million tons by 1958-59, or that the Republic would achieve self-sufficiency in food production by 1956, the value of net food imports climbed from an average of 27 million dollars yearly in 1960-62 to 209 million in 1968-70.[21] Korea is farther away than ever from achieving self-sufficiency in food production.

Agricultural output has lagged behind demand for a number of reasons. One is rapid population increase. Population in the Southern part of Korea rose from 15.9 million in the spring of 1944, the last pre-division census, to 25.0 million by the end of 1960. Another is the fact that

pre-war rice exports (termed "starvation exports" by Japanese food
officials) were offset by heavy imports of millet from Manchuria and by
other, low-grade grains.[22] Perhaps the main reason, however, has been
the heavy emphasis on industrialization -- largely at the expense of
agriculture.

"The gist of the first five-year economic plan" (1962-66) was the
attempt to "build an industrial base..." Though major First-Plan
industrial projects (construction of an integrated steel mill, expansion
of machinery industries) were abandoned when the plan was revised downward
in 1964, the basic objective of the Second Plan (1967-71) was "to promote
the modernization of the industrial structure..."[23] One consequence of
this objective has been that the proportion of total plan investment
allocated to the agricultural sector has been less than half the proportion
of GNP expected to originate in agriculture. Agriculture's actual
investment share was less than 40 percent of agriculture's GNP share in
1962-66, and less than a third in 1967-69. The industrial sector, in
contrast, accounted for two thirds of actual investment in 1962-66 (71
percent in 1967-69) but only 27 percent of output in the earlier period
and 36 percent in the latter.

Reasons for the planners' choice to emphasize industrialization
rather than agriculture have never been stated publicly, to the best
of my knowledge. Among such reasons might be Korea's limited supply of
arable land (only 20 percent of total land area) and high population
density (over 300 per square kilometer in 1968· above Japan but below
Taiwan). The "seed-fertilizer" revolution had yet to occur but large
quantities of surplus farm products (mainly wheat and cotton) were
available under the United States PL 480 program. Also Japan, Korea's

traditional market, had adopted agricultural subsidies and tariffs to keep out foreign rice. More generally, income-elasticity of demand for primary products is usually thought to be low. Prospects for accelerating the pace of development through the expansion of agricultural exports were correspondingly poor. Further, rice cultivation was already highly labor intensive and thus unlikely to provide much additional employment. Perhaps the main positive factor favoring industrialization in Korea was the abundance of cheap, literate, and relatively well-educated labor.[24]

Whatever the reasoning, industrialization had to be linked either to import substitution or to export promotion. High aid levels following the Korean War were expected to decline and other sources would be needed to finance Korea's balance-of-payments deficits.[25] Substantial import substitution occurred as cement, newsprint, petroleum processing, and rubber-tire industries expanded. Domestic output in each case grew from 25 percent or less of apparent consumption in the mid-1950s to 95-100 percent by 1965. More recently, the first plants of a petrochemical complex were opened and an integrated steel mill is scheduled for the mid-1970s. This new domestic capacity has helped to reduce sharply the share of materials in manufactured imports (from two-thirds of the total in 1956-58 to 37 percent in 1966-68). Imports of investment goods (machinery and transport equipment) rose from 16 to 41 percent of the total during this period.

Development of domestic machinery industries would seem to have been a logical next step in import substitution, but this has yet to be taken. The integrated steel mill, scheduled for the First-Plan period, may not be completed much before the end of the Third Plan. Construction of the petrochemical complex is behind schedule. This is all evidence that

import substitution has held second priority behind export promotion
(see Part I). There are a number of reasons why the potential for
import substitution is limited, and these apply in Korea as elsewhere.[26]
Perhaps the main reason that export expansion has taken precedence over
import substitution is that steel mills and petrochemical plants, like
cement and chemical-fertilizer establishments, are highly capital-
intensive operations [27] And capital has been the scarce factor in Korea.

Structural change in which resources are shifted to industry from
agriculture involves a shift from a more labor-intensive composition of
output to a less labor-intensive one according to the estimates of labor
intensity (n/y values) shown in Table 5. This is logically separable
from changes in labor (capital) intensity of operations within each sector.
The decision to promote export expansion rather than push import substitution
has undoubtedly limited decline in overall n/y and the potential fall in
labor absorption within the industrial sector. Comparison of capital-output
ratios for manufacturing industries in 1965 with ratios of export to
import values in 1960 and 1968 by Norton shows that the most rapid
export growth (in finished textiles, miscellaneous manufactures /e.g. wigs7,
rubber products and plywood) has occurred, in fact, among the least
capital-intensive of Korea's manufactured products.[28]

Though export-promotion policies have served to limit the decline in
labor intensity of output within manufacturing, a number of other policies
have had the opposite effect. Industrial investment is only one blade of
the scissors which has opened the gap between rural and urban incomes
(see Part I) The other is neglect of agricultural development. When
rural-urban wage differentials widen, as long as urban unemployment does
not rise appreciably, agriculture's absorptive capacity will fall as

prospects for urban employment become more attractive relative to
agricultural work.[29] Also, anything which alters relative factor prices
by raising labor costs or lowering capital costs will encourage adoption
of more capital intensive techniques where factor substitution is possible.
In addition, policies that favor large-scale at the expense of small-
scale enterprise are likely to reduce labor absorption because small
firms generally employ more labor-intensive methods than large ones.

Evidence on whether agricultural development has been neglected
or not in Korea is mixed, but there are enough signs to indicate that
agricultural modernization has lagged and, in particular, that the course
of development has been such as to widen urban-rural income differentials.
On the other hand, the factor-substitution possibilities associated with
rice-dominated cultivation have resulted in factor reversals which, in
a country like Korea, permit use of labor-intensive techniques in what
would otherwise be an increasingly capital-intensive sector. The
characteristics of rice cultivation, in short, have tended to offset the
effects of backwardness on labor absorption.

Average farm size in Korea, after a full-scale land reform in the
1940s and 1950s designed to eliminate tenancy, was only 0.9 chongbo
(2.2 acres) by the early 1960s. The hallmarks of successful land reform,
according to Raup, have usually included expanded irrigation, a greater
supply of agricultural credit, increased factor inputs, and improved
marketing arrangements.[30] The proportion of irrigated paddy and the
consumption of fertilizer in Korea have increased markedly during the
past decade, but neither have reached levels attained in China (Taiwan)
or Japan. Organized credit, both in meeting projected loan requirements
and as an intermediary for farmers' liquid savings, has been a conspicuous

failure.[31] Some portion of commercialized production passes through
government channels, mainly grains obtained from the grain-fertilizer
exchange program, as taxes in kind, or purchased outright. The rest is
marketed by private means, which are largely unknown. Perhaps the main
marketing problems have been uncertainty about prices at harvest time,
the traditional tying of credit to grain delivery (at usurious terms),
and the government's interest in holding down prices at the retail level.
Mechanization is in its infancy, not because of small holding size or
historic difficulties of adapting machinery to standing-water cultivation,
but because low priority has been attached to expanding the supply of
machines [32]

Though some of the hallmarks of successful reform are missing or
fragmentary, Korean yields (per harvest) of rice, barley, and wheat in
the mid-1960s compared favorably with those obtained in China (Taiwan),
but were still significantly below Japanese levels. Korea ranked fairly
high in cross-country comparisons of production per hectare, but last in
output per worker [33] Good yields seem to have been associated with
particularly labor-intensive cultivation

Evaluation of agricultural progress is complicated by the large
number of explanatory factors and their interaction, but the last
finding is of particular interest Gross yields per unit area in
Korea have been somewhat larger for small holdings than for large ones,
but the major variation by holding size is related to inputs. Smaller
units employ substantially more labor (and somewhat less irrigation)
per unit area than large ones [34]

Korea's small average holding size, rice specialization, and relative
factor prices permit labor intensive agriculture of a sort which is not

necessarily found elsewhere. Ranking of industry by capital intensity
for Japan and the United States has shown a major difference between the
two in the relative capital intensity of agriculture, which casts doubt
on the usual "strong factor intensity" assumption implicit in the
Heckscher-Ohlin theorem.[35] Korea is certainly more like Japan than
the United States in this respect. There is, in other words, a possibility
of factor reversals, and rice is "the one agricultural product for
which there seems to be general agreement ... that factor reversals do
occur."[36] It follows that displacement of agricultural labor in Korea
has been less than it might otherwise be, and that the need to absorb
labor in other sectors has therefore been less urgent than in some other
developing countries.

Beside plan emphasis on industrialization, perhaps the main factors
tending to reduce labor absorption have been government policies which
alter relative factor prices so as to reduce the cost of capital. Such
policies also tend to discriminate in favor of large scale, more capital-
intensive production Chief among these are the tariff structure and
exchange controls of commercial policy, maintenance of an overvalued
exchange rate, and government credit allocation.

Published tariff rates for Korea are high, though the actual level
has been more modest (8.4 percent in 1966) because over half of actual
imports are duty free.[37] Machinery and equipment are either exempt or
rates are low. Effective rates of protection (the net effect of tariffs
on inputs as well as outputs) have been highest for finished or semi-
finished manufactures, especially import-substitute or export goods, but
quite low for food grains and machinery.[38] The structure of duties and
"provisional special customs duties" has been quite elaborate; the main

means of government control, however, have been registeration requirements and regulations governing the use of foreign exchange.

The Ministry of Commerce and Industry issues import license to firms which meet minimum export requirements ($200 thousand in 1970). Firms which fail to meet the minimum lose their licenses Foreign suppliers of plant, equipment, and raw materials are guaranteed repayment in their own currency by the Korea Exchange Bank. The government, because it is ultimately responsible for repayment, screens loan applications. Large enterprises, especially those with good export prospects, are usually favored. Over a billion dollars worth of commercial loans (mainly suppliers' credits) were outstanding at the end of 1970.

Overvaluation of the won has made imports more attractive relative to domestic output, the high cost and limited supply of domestic credit have both encouraged foreign borrowing Since the last major devaluation of the won in May 1964, the won rose from 257 to 319 won per dollar by January 1971, or 24 percent. Wholesale prices increased 62 percent during the period. High domestic interest rates since the interest-rate reform in the fall of 1965 (bill rates have been 24-26 percent per annum) and domestic credit ceilings, designed to ease the impact of large inflows of foreign funds on Korea's money supply, have both raised the cost and limited the availability of domestic loans. It is hardly surprising that local entrepreneurs have turned increasingly to overseas suppliers of goods and credit.

The main organized sources of domestic funds have been the government-controlled commercial banks and the Korea Development Bank (KDB) The KDB's business is with large industrial enterprises, particularly "government-invested" firms such as the Korea Electric Company and Chungju

Fertilizer which mainly supply basic materials or are public utilities. This leaves the Medium Industry Bank (MIB) as the chief source of funds specifically intended for small enterprises. MIB loans and discounts at the end of 1970 were only 40 percent of KDB levels. A little over one billion won in MIB acceptances (the local currency equivalent of KEB guarantees to foreign lenders) were outstanding at the end of 1970   The KDB figure was 424 billion.[39]

Tariff structure, import licensing, access to credit, and loan subsidy have all been used as instruments of export-promotion policies in Korea   There is nothing inherent in the nature of such policies which should discriminate against small enterprise or favor machinery imports, but in practice this has been the case. One result has been to lower the cost of capital relative to labor (by granting access to undervalued imports, financed by subsidized credit), with the incidental effect of stultifying Korea's domestic machinery industry.[40] Another has been to restrict access to imports and credit for small enterprise. Both tend to increase capital intensity of output and reduce labor absorption.

Whether measured in terms of workers or value added, there was a marked trend toward concentration in the manufacturing sector during the 1960s   Firms with less than 20 workers accounted for a quarter of value added and a third of employment in 1958-59, but only 12 percent and 22 percent, respectively, in 1968. In fact, employment and value shares of all size categories below 200 workers fell during the period (see Table 7).

The tendency toward concentration has undoubtedly been associated with growth of demand, economies of scale, and increasing capital intensity as relative factor prices shifted in favor of capital, but it was also probably connected with the displacement of traditional

goods and traditional, small-scale operations by modern products
produced by modern -- large scale -- means.

In 1958, for example, Korean style paper accounted for half the
employment and a sixth of value added in the manufacture of paper and
paper products. Two-thirds of establishments with less than 50 workers
were engaged in producing Korean style paper. A decade later, value
added in producing Korean style paper had quadrupled (in current prices)
and employment has risen 10 percent. But fewer than half of the small
establishments were engaged in producing Korean style paper, less than
3 percent of value added in the manufacture of paper and paper products
originated in Korean style paper making, and employment in the industry
had fallen below 20 percent of the total for all paper production.
(Value added per worker declined from one-third to less than a sixth of
the industry-group average). The Korean style paper industry is clearly
a dying industry, whose product is being displaced by the output of
larger, more capital-intensive establishments.

Value added per worker is one possible proxy for capital intensity
of output, but suffers from the fact that value added may vary with
indirect taxes (which are included in value added), efficiency of factor
utilization, or monopoly pricing as well as with changes in the amount
of capital employed per worker. Other possible measures of capital
intensity are value added per unit of fixed tangible assets, and the wage
bill as a proportion of production costs (all direct charges including
freight costs and payment for materials) or as a proportion of value
added Values of these four measures in 1968 for mining and manufacturing
establishments grouped according to establishment size are shown in
Table 8.

Value added per worker and value added per unit value of fixed assets vary directly with establishment size, while the wage bill as a proportion of production costs or value added moves inversely with establishment size Such behavior is consistent with the thesis that capital intensity increases with plant size. The different proxies for capital are erratic, as has been noted before, which indicates either that the relationship between unit size and capital intensity is a weak one, or that intervening variables are obscuring the true relation.[41] The relationships shown in Table 8 provide evidence, nevertheless, of a positive, possibly weak relation between capital intensity and establishment size If this interpretation of the evidence is correct, policies which favor large firms or discriminate against small ones also tend to limit labor absorption.

Determinants of labor absorption in the goods-producing industries (mining, manufacturing, and agriculture) can also be expected to affect labor absorption in the construction, public-utility, and transport-communications components of the industrial sector, and the service-sector industries as well. Overvaluation of the won, for example, should encourage the substitution of imported machinery for domestic labor in a dry cleaning establishment just as in a plywood plant. There are basic differences between labor-absorption characteristics of the goods-producing and other industries, however. Some of these other industries are either much more labor intensive (construction and services) or less labor intensive (public utilities) than mining and manufacturing (though not agriculture). Output in most cases is not exportable and so these industries have not benefited, except indirectly, from the government's export-promotion policies. Also, government

engagement is heavy in some instances, which is not true of the goods-producing industries. Economic incentives and, consequently, labor absorption are likely to differ for government and private activities.[42]

Construction output has grown more rapidly than that of most other sectors in the Korean economy since 1963 (see Table 6). Ability of the construction industry to keep pace with industrial expansion in the past has prevented one of the major bottlenecks to growth found elsewhere. Relatively low construction costs have also helped. Second-plan capital coefficients were almost 20 percent below those found in the United States because construction costs per unit of output in Korea were less than three-fifths of U.S levels. The difference was due mainly to lower labor costs.[43]

Korea's comparative advantage in construction has probably diminished in the last few years. One reason is that Korean firms received large contracts for construction of facilities in Vietnam following the escalation of the war there in 1965-66. As a result, the domestic supply of construction workers - particularly the more skilled - has been constrained.[44] Skill shortages combined with the initiation of a national highway network, port expansion, construction of power facilities, and other large-scale non-residential building have undoubtedly led to substitution of capital for labor in construction, the rapid productivity increases shown in Table 6 and, possibly, above-average wage increases.[45]

Output of public utilities is dominated by electric generation. The Korea Electric Company (KECO), a government-invested corporation, produces most of Korea's electric power and handles all power distribution. KECO accounts for roughly 40 percent of public-utility employment, the

remainder includes workers engaged in providing water, gas, and sanitary
services The public-utilities sector has been at the same time the
least labor intensive and the most rapidly growing of all sectors.

Underestimate of actual growth rates in both the First and Second
Plans created power shortages in the late 1960s as expansion of gen-
erating capacity lagged. Though electric generation more than doubled
between 1963 and 1967, and rose 87 percent from 1967 to 1970, total
public-utility employment actually fell in 1964 and was no higher in
1970 than in 1963.[46] Demand for water and sanitary services, which are
supplied by local governments, should increase with urbanization .
Potential for employment expansion depends on government action and,
with the possible exception of sanitary services (which have been quite
labor intensive), is probably limited.

Employment has risen more rapidly in the transport, communications,
and storage sector than in any other sector. The Ministry of Commun-
ications and Korean National Railroad (KNR) accounted for 42 percent of
sector employment in 1963, but only 26 percent in 1969. This drop was
due to slow rise in KNR employment (14 percent), even though passenger
and freight traffic each expanded two-thirds or more over the period.
The same sort of large productivity increase in rail transport has been
observed elsewhere.[47] Though pushed to the limits of capacity, the KNR
has failed to keep up with increasing demand. The KNR's share in total
transport has declined as road haulage increased, aided by new road
construction (mileage of paved road rose 50 percent from 1966 to 1969)
and the rapid increase in numbers of trucks and buses (each more than
doubled from 1966 to 1969). The switch from rail to road transport,
which is inherently more labor intensive, has probably been a main
reason for the sector's high labor-absorption rate of income growth.

Communications demand has also expanded rapidly. The volume of mail rose two-and-a-half times from 1966 to 1969; the number of local telephone calls quadrupled. A World Bank mission observed in 1966 that "transportation in Korea is characterized by a general undercapacity of all modes of transportation."[48] The same can be said of communications, especially telephone service. As in the case of utilities, output growth has failed to keep up with demand. Unlike utilities, however, prevailing communications technology is considerably less capital-intensive than existing technology in use elsewhere. Future expansion will undoubtedly be characterized by replacement of crossing guards with electric signals, substitution of automatic switchboards for operators, increased use of materials-handling equipment, etc.

The service-sector category groups commerce (low labor intensity, high marginal productivity) with services (high labor intensity, low marginal productivity). Wholesale and retail trade generated about 90 percent of income originating in commerce in the 1960s, the rest was derived from banking, insurance, and real estate. A census of retail and wholesale trade in July 1968, excluding those establishments with "removable or temporary business space and installations" (i.e. street vendors and many market sellers), listed 555 thousand employees of 278 thousand establishments.[49] The EPB employment survey for June showed 1,135 thousand persons employed in commerce. A large portion of the difference was probably composed of itinerant vendors.

Fewer than 10 percent of wholesale establishments shown in the census had 10 or more employees, the figure for retail establishments was less than 1 percent. Since annual sales per employee or per unit area of floor space rose sharply with establishment size, larger units

appear to be more efficient than small ones. A recent government project
to group selected retail food and appliance stores in Seoul into a chain
system may foreshadow the future course of commercial development.[50] If
so, continued productivity increase and declining labor-absorption rates
of income growth can be expected.

The service-industry part of the service sector, which includes
government, community, business, amusement, and personal services, is
probably the least homogeneous of the employment categories in terms of
scale, capital intensity, and mixture of traditional and modern activity.
It is certainly the most heterogeneous in terms of skill, occupational,
and wage differentials. Data are available for only two major components
government services and personal (less domestic) services. The EPB
trade census of 1968 included information on personal services (less
domestic) which showed employment of 361 thousand in 141 thousand
establishments. The main employment categories included eating houses
(20 percent of the total), barber and beauty shops (another 20 percent),
and taverns (25-30 percent). Government employment (less KNR and
Ministry of Communications workers) was 315 thousand at the time.
Together, these two categories accounted for approximately half of
total service-industry employment in 1968.

Published figures for government employment show the total divided
among national, local, and government-agency (such as the Office of
National Railroads /KNR/) categories.[51] (Government-invested enter-
prises, including KECO, the five commercial banks, major fertilizer
and coal companies, are not included) A third of listed employees
have been teachers. Though government employment has grown faster
than all-service industry employment (36 percent versus 25 percent from

1963 to 1969), the government's share in total non-agricultural employment has remained quite low relative to that in a number of other countries [52] The published figures provide no evidence that government employment has been expanded simply to soak up surplus labor.

Services and petty trade have been the traditional dumping grounds for excess labor which could not be absorbed in agriculture. If so, one should find below-average wage levels, and increasing numbers of traditionally low-paid workers (women) in the trade and service occupations. In Korea, the number of women in service industries has risen substantially faster than the number of men (53 percent from 1963 to 1969 versus 15 percent) This is not so in commerce. Women also receive lower wages than men in all non-agricultural employment (about half the rate for permanent employees) However, the big increase in women's employment came in manufacturing, not the service sector, and the average manufacturing wage is substantially below the average service-industry wage.[53] A number of possible intervening factors such as differences in the age, education, and tenure-status attributes of the typical service-sector and manufacturing employee may account for these results On the other hand, the data on relative wages and growth of female employment may indicate either that there is little excess labor in Korea or that service-sector employment characteristics do not always conform to traditional expectations

Employment, labor intensity, and demand for the product of the different industry groups vary widely, even at the broad levels of aggregation used here Still, where evidence is available, most of the groups show that rapid output growth has been the product of lesser employment expansion, increasing productivity and, therefore, declining labor intensity of operations The bottlenecks caused by inadequate infrastructure which

appeared in the 1960s are particularly significant in this respect.
Whatever their cause (unexpectedly fast growth or the government's
earlier unwillingness to invest in highly capital-intensive projects),
the increasing share of investment allocated to infrastructure in the
last few years has worked to reduce the labor-absorption rate of income
growth.[54] So have a number of the government's trade and credit
policies which, though evidently designed to promote exports, have had
the incidental effect of discriminating against smaller and more labor
intensive activities.

Unionization is another factor which frequently has had similar
results, though union policies are designed to raise the price of labor
rather than to reduce the cost of capital.[55] The effect of unions on
labor absorption in Korea has been minimal. There is little or no
union tradition in Korea. The first union, established in the late
1920s to resist the Japanese, was suppressed in the early 1930s.
Unions were active for a brief period before Rhee's election in 1948,
mainly as strong-arm adjuncts of opposing political parties. Since
then, unions have been instruments of the government. Unions are not
allowed to engage in political activity, while the law preventing
interference with existing unions gives the Federation of Korean Trade
Unions (FKTU) a permanent monopoly against possible competition. It
is significant that unions were inactive in the overthrow of the Rhee
regime in 1960, and that the FKTU leaders have been replaced each time
a new government has assumed office.

Measures of the FKTU's weakness are the abysmal working conditions
and repeated violation of labor standards in Korean industry. This
became most apparent after the fiery suicide of a market worker in

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November 1970, when the Office of Labor Affairs began to release a stream of reports on violations of the labor law.[56] Another measure of weakness is relatively low union membership. There were an estimated 367 thousand members at the end of 1967. This was only a small fraction of the 1,370 thousand regularly employed non-farm employees who constituted the population of potential members at the time. Until they are freed from government patronage or a shortage of labor develops, unions will have little effect on wages, working conditions, or labor absorption rates in Korea.

V. SUMMARY AND CONCLUSIONS

Seasonal employment patterns, composition of the economically inactive population, and the effects of demographic and educational trends on numbers of potential labor-force entrants were examined in Part II The accuracy of the employment surveys was questioned, while the concept of "unemployment" was found to be ambiguous in an economy like Korea's in which there are pronounced seasonal patterns in the numbers of economically active and inactive.

Measures for labor intensity, marginal productivity, and the labor absorption rate of income growth were discussed in Part III A large decline in the labor intensity of economic activity evidently occurred from 1963 to 1970. The decline has been due partly to a change in economic structure, as the industrial sector expanded and the agricultural sector shrank in relative importance But it was also due to rising marginal productivity in the different sectors as output per worker increased The result has been that the labor absorption rate of income growth for each major sector and the economy as a whole (Table 5) has been low Employment growth has been substantial, nevertheless,

mainly because of phenomenal increases in manufacturing output.

Determinants of labor absorption were considered in Part IV
Composition of output and the geographic distribution of activity under
the Japanese, the effects of partition, and subsequent planning strategy
all served to emphasize industrial expansion. This emphasis, largely
at the expense of agriculture, has widened the rural-urban income
gap and hastened the outflow of labor from the countryside.

Korean industrialization has been characterized by export promotion
rather than by import substitution. Since Korean exports have been
produced by more labor-intensive means than import substitutes, labor
absorption in the industrial sector has been greater than it might
otherwise have been. On the other hand, export-promotion policies
and, more generally, commercial policy, exchange controls, and credit
policy have all tended to discriminate in favor of large (more capital
intensive) firms and machinery imports. Such discrimination, by altering
relative factor prices, may have hastened the substitution of capital
for labor Union activity and minimum-wage legislation might each
achieve the same result, but there is no evidence that either has done
so in Korea

Examination of subsectors showed institutional developments and
shifts in output composition that have generally tended to reduce labor
absorption. In particular, this examination revealed that infrastructure
has been neglected Such neglect has required a shift in investment
toward highly capital-intensive activities during the past few years
The labor absorption rate of income growth was reduced, in consequence,
and this reduction is likely to continue during the next few years
until the infrastructure catches up with the rest of the economy.

The discussion of actual and potential supply, output and employment, and the determinants of labor absorption has left unanswered several questions which, even if they cannot be answered satisfactorily, at least deserve attention. First, to what extent is labor absorption still a problem in Korea? That is, what are the signs of excess supply or insufficient demand that point to adequacy or inadequacy of absorption? Second, though not necessarily next in logical order, is a normative issue. What constitutes satisfactory labor absorption? This question obviously has many ramifications. Finally, the possibility of a mismatch between the supply and demand for labor with particular occupational skills has been ignored. Is the absorption problem partly a matter of failure to produce workers with the particular qualifications needed by an economy?

Price or price change is the conventional standard against which the sufficiency or insufficiency of demand is usually judged. The employment trend, and therefore the demand for labor in manufacturing, is hardly typical in Korea. Nevertheless, manufacturing wage-output relations are of interest. From 1963 to 1969, real output of manufactures more than tripled while employment doubled. The wage bill (average wage times employment) increased 6.86 times but GNP originating in manufactures (in current prices) rose only 5.74 times. The wage increase, in short, was greater than the growth of productivity so that unit labor costs rose 20 percent. Wage increases in other, non-agricultural sectors have also outstripped price increases since 1967, there is, in addition, somewhat tenuous evidence of narrowing differentials between wages.[57] All this points to increasing demand (or diminishing surplus) in manufacturing and the other non-agricultural

sectors Agricultural income, in contrast, rose only 5 percent from 1963 to 1969 while real output increased 37 percent. The wage-output relation and drop in the supply of workers are both consistent with declining demand (or increasing labor surplus) in agriculture.

The term "labor absorption" and the concept of a labor absorption rate of income growth used here both have normative implications Increased employment, reduction of seasonal disappearance from the labor force, and transfer from low to high-productivity jobs are generally conceded to be desirable. Yet there is a conflict between increased employment and rising productivity, just as in countries such as the United States, the benefits of declining unemployment rates tend to be offset by increasing costs of inflation There is little agreement on the relative costs of inflation and unemployment because judgment depends on non-economic values. The same problem arises in evaluating the labor absorption rate of income growth since valuation of the trade-off between employment and productivity rests on ethical rather than economic grounds.

Given undistorted relative factor prices, an established rate of future discount, and smooth factor substitution, some optimal rate of productivity increase is conceivable in which the capital intensity of particular processes reflects true relative factor scarcities and the actual trade-off between present and future, while production is efficient in that output per unit of combined factor inputs is maximized. The operational value of this optimal rate is of course limited by the extent to which actual factor-price ratios, interest rates, and factor-substitution possibilities conform to those given above. It is also limited by dynamic considerations.

In Korea, for example, tariff structure, import licensing, credit subsidy, and the other instruments of the export-promotion program have distorted factor prices so as to cheapen capital relative to labor. This has encouraged greater import of machinery and the use of more capital-intensive production techniques, especially in export industries, than can be justified in terms of actual factor scarcities or realistic interest rates. This violates the short-run efficiency criterion which requires that inputs per unit of output be minimized. The loss involved includes potential employment and output foregone due to withdrawal of capital from other uses less the actual increase in export production (and employment) attributable to the extra capital. The loss of potential output, employment, and capacity in the domestic machinery industry has probably been greatest. The overall residual (potential loss less actual gain) is presumably positive

Yet if exporters had been dependent for equipment on a domestic machinery industry characterized by limited capacity, poor product quality, and limited access to new technology (as in Korea), the export-promotion program would have probably died stillborn. Nor is it obvious that factor-price distortion has been solely responsible for declining labor intensity within particular industries. Actual opportunity for factor substitution in any given process may be quite limited.[58] Even where substitution is possible, the greater skill requirements of less capital-intensive techniques may prove excessive.[59]

But the basic argument here is that almost 40 percent of the actual increase in employment from 1963 to 1970 came in manufacturing despite factor-price distortion, and much of this increase was in the export industries. This is not to deny the possibility that other

policies might have expanded employment more but, rather, to indicate
the possible consequences of policies which have increased the exposure
of local enterprise to world markets, and thereby fostered learning
effects, adoption of new techniques, and increasing competitiveness
that have contributed to income growth and labor absorption.[60] None
of these factors are included in the usual short-run efficiency
criterion. However paradoxical, capital subsidy seems to have served
to increase employment in Korea.

Aggregate measures fail to reveal the sort of suboptimal labor
utilization, or even unemployment and disappearance from the labor
force which may result from mismatch between supply and demand for
particular types of labor. The assumption of labor homogeneity implicit
in the use of such measures is therefore likely to yield falsely
optimistic conclusions about labor absorption. That labor is homogeneous
is as strained a construct, perhaps even more strained, than the
concept of a single capital good (spread over different uses like
"capital jelly") which is often employed in capital theory. The obviously
non-competing characteristics of many occupational categories attest
to this. Because workers differ according to skill and quality, and
labor is essentially non-homogeneous, several issues which were hitherto
ignored seem worthy of attention. For instance, how has increased
education affected labor absorption? Has the educational system been
able to meet the demands of a rapidly growing economy for particular
types of skills? What evidence is there of surplus or shortage, or of
efforts to achieve equilibrium in particular labor markets?

Expansion of upper level education more than offset the growth of
new entrants to the labor force from 1963 to 1969 (see above, page 8)

Increase in enrollments of middle schools (72 percent) and vocational

high schools (57 percent) were particularly marked.[61] The average

worker, as a result of educational trends, is better educated and

enters the labor force at a later age.[62] To the extent that labor

quality is reflected in wage differentials and the older, better

educated worker is paid more as in Korea, than the quality of labor has

increased in recent years. Quality improvement, since it acts on output

like an increase in supply, must have raised output per worker and

reduced the labor absorption rate of income growth. But the labor

which has absorbed was in a sense "more labor" since it was more

effective. If employment measures were adjusted for increases in

quality, then, the decline in labor intensity would have been less and

the labor absorption rate of income growth would have been higher than

was shown by the measures used here.

Several studies of Korea's manpower requirements have revealed

imbalance between expected future supply and projected demand, and

urged the expansion of vocational and scientific training.[63] The

educational system has apparently been unable to keep up with the

demand for certain technical skills as the economy has expanded. Yet

there is evidence that technical or vocational training has been wasted.

An article by Paik in 1965 showed that only a fifth of technical

high school graduates who entered colleges entered engineering colleges,

fewer than 10 percent of students enrolled in agricultural colleges

graduated from agricultural high schools.[64] Another scholar found that

ten years after graduation, fewer than 30 percent of college graduates

were working in fields related to their college department.[65]

There is also widespread though uncertain evidence of a major brain

drain and, in addition, the government has followed a policy of "exporting" miners, doctors, and nurses in recent years.[66]

Surplus among particular high-level manpower categories (if not shortage among others) and the wastage of certain types of technical training are both evidence that education has been misdirected. The consequence has been that supply and demand for particular types of labor are mismatched. The mismatch is due partly to excess demand for higher education in Korea. Students undertake particular programs of study because they are the only ones available to them They have no intention of following careers which employ their training. On the other hand, expansion of training for which there is insufficient effective demand is also responsible. Efforts to expand vocational and technical training in Korea, as elsewhere, have not been successful in applying Say's Law.[67] If anything, they have caused disequilibrium in particular labor markets.

Whatever the reasons, mismatch between supply and demand for particular kinds of skills has been responsible for unemployment, emigration, or underemployment The magnitude of the problem is unknown, but the direction of effect is evident. Information on the extent of mismatch is clearly of intrinsic interest and would also serve to refine and make more useful our existing measures for labor absorption.

FOOTNOTES

[1]Estimates of GNP growth rates for most countries during 1960-1967 are

given in the United Nations, Yearbook of National Accounts Statistics,

1968, Vol. II, Table 5-B. Korea already had one of the four highest

rates in this period even though growth rates before 1962-1963 were low.

[2]The industrial sector is defined here, and in subsequent passages

unless otherwise indicated, to include mining, manufacturing, construction,

electric generation, water and sanitary services, transport, storage, and

communications. In 1965, over 62 percent of value added by this sector

originated in manufacturing.

[3]Farm income is net income (gross income less expenditures related

to farm and side-business activities) from Ministry of Agriculture and

Forestry, Reports on Results of Farm Household Economy Surveys and

Production Cost Surveys of Agricultural Products. Data on urban wage

earners are from the Economic Planning Board's Annual Reports on the

Family Income and Expenditure Surveys. Both are deflated by the

implicit deflator for private consumption expenditure, derived from the

Bank of Korea's national-accounts estimates.

[4]Farm and non-farm are equated with rural and urban here, which is

not strictly correct since fishermen, hunters, and others who do not

farm live in rural areas. On the other hand Seoul, the nation's dominant

metropolis, had 18 thousand farmers in 1965 (Economic Planning Board,

Korea Statistical Yearbook, 1966, p. 27). Nevertheless, estimates of

the farm and non-farm population probably represent the best available

substitute for census data on recent urban and rural population until

details of the 1970 population census become available.

[5]See Economic Planning Board, Annual Report on the Economically Active Population, 1969 (June 1970), p. 17.

[6]The notion of an infinitely elastic supply of labor at a wage somewhat above the average level of rural product originated in a celebrated article by Sir Arthur Lewis. See W. A. Lewis, "Economic Development with Unlimited Supplies of Labour," Manchester School, Vol. 22 (May 1954), pp. 139-91. The notion of disguised, as opposed to open unemployment, has been applied to those who sold "matchboxes in the Strand"during the depression of the 1930s as well as to peasants or others performing low-productivity work in developing countries. The literature on the unlimited-labor and disguised-unemployment hypotheses is by now enormous. Much of this literature is cited in a recent critical analysis of the structural versions of these hypotheses by Wellisz. See Stanislaw Wellisz, "Dual Economies, Disguised Unemployment and the Unlimited Supply of Labour," Economica, New Series, Vol. XXXV, No. 7 (February 1968), pp. 22-51.

[7]See Roger D. Norton, "Planning with Facts: The Case of Korea," American Economic Review, Vol. LX, No. 2 (May 1970), pp. 59-64. More emphasis on manpower development than in the past is found in early Third Plan documents. See, for instance, Larry E. Westphal, "Labor Projections," in Economic Planning Board, Selected Papers on the Third Five-Year Economic Development Plan (Preparatory Stage), May 1970 (mimeographed).

[8]The practical implication here is that employment surveys should be conducted monthly or, failing this, that seasonal employment patterns be specified in detail by those responsible for conducting the surveys.

The second possibility at least allows users to draw their own con-
clusions about the representativeness of the survey data.

[9] This is especially true when small changes in unemployment estimates
are likely to be misinterpreted. A recent article headed "Jobless Rate
Down by 0.3 Percent," for example, noted that "this represents a
decrease of 25,000 in the number of the nation's jobless persons from
471,000 in 1969 to 446,000 in 1970." The author concludes that "this
percentage figure indicates that the nation's unemployment situation has
much improved since 1969" (The Korea Times, March 23, 1971). Not only
is this change well within the standard error of estimate for labor-
force estimates in the 400-500 thousand range, which means that it is
insignificant in itself, but it is also insignificant relative to the
increase in the number of the economically inactive between 1969-1970
(155 thousand).

[10] This figure is consistent with Ministry of Education (MOE) data
on numbers of students aged 14 years and over in 1963 and 1969, which
rose from approximately 1.0 million in 1963 to 1.5 million in 1969.
See MOE, Statistic /sic7 Yearbooks of Education.

[11] The 1966 population census shows that there were 658 thousand
persons aged 14 (i.e. those born in 1952). Numbers increased for each
younger age group to 969-970 thousand 5 and 6 year olds (who will reach
14 in 1974-75) before dropping among those aged 2 to 4. See EPB, 1966
Population Census Report of Korea (May 1969), Vol. 12-1, p. 44. Inaccurate
age reporting has been a problem in previous censuses, however, mainly due
to confusion between traditional Korean and Western methods of reckoning
age. A post-enumeration survey after the 1960 census revealed net

undercoverage which was highest among children under 5 (4 percent). The drop in numbers of 2-4 year olds in 1966 may therefore be partly illusory.   See Jay Soo Park, An Evaluation Study for the Accuracy of the 1960 Population and Houseing Census of Korea (A Volume in the 1960 Census Monograph Series). Seoul: Economic Planning Board, 1966.

[12]Gross domestic product at factor cost, which excludes both the excess of indirect taxes over subsidies and net factor incomes from abroad, would be preferable to GNP for comparison of income or output with employment. Unfortunately, GDP estimates by sector for 1970 were not available as this was written. It seemed more important to extend a short series than to substitute GDP for GNP.

[13]Annual compound (geometric average) growth rates for employment in each sector from 1963 to 1969, with and without adjustment to a full-time equivalent (FTE) basis, were as follows:

	Agriculture	Industry	Services	Total
Unadjusted	-0.76	11.4	5.3	2.7
FTE basis	-0.43	12.5	5.7	3.7

The FTE series would be preferable to the unadjusted series as measures of labor input, but are not used in subsequent analysis because information on average hours for 1970 was not yet available. Again, as in the decision to use GNP rather than GDP, it seemed more important to extend a brief series than to employ a more conceptually satisfactory measure.

[14]The expression for labor intensity (n/y) and the terms for incremental income per additional worker ($\Delta y / \Delta n$) which follows are both taken from Harry T. Oshima, "Labor-Force 'Explosion' and the Labor-Intensive Sector in Asian Growth," Economic Development and Cultural Change, Vol. 19, No. 2 (January 1971), pp. 162-63. Note, however, that

his $\Delta y / \Delta n$ is defined as "incremental income (or net output) per worker," while here the expression is employed to indicate incremental income (or net output) per additional worker.

[15] The hypothetical increase in total employment (Δn) was derived by multiplying 1963 labor intensity (n/y) by the increase in income ($\Delta \tilde{y}$) for each sector, and then adding the hypothetical changes for the three sectors. Labor intensity for total employment in 1963 (11.5) is equal to the sum of sectoral intensitites weighted according to 1963 income shares, and cannot be used to derive the hypothetical total since

$$\Sigma n/y \cdot \Sigma \Delta y \neq \Sigma \left(n/y \cdot \Delta y \right) .$$

[16] The product of n/y and $\Delta y / \Delta n$, or $n/y \times \Delta y / \Delta n = n(\Delta y) \div y(\Delta n) = \Delta y/y \times n/\Delta n = \Delta y/y \div \Delta n/n = R_y/R_n$. The notation R_y/R_n has been used by Oshima in the article cited and elsewhere as an index of labor absorption (see also Harry T. Oshima, "Growth and Unemployment in Singapore," The Malayan Economic Review, Vol. XII, No. 22 /October 1967/, p. 38). The inverse, R_n/R_y, is closely related to the expression G_n/G_y used here (though G_n/G_y is employed in the form of compound annual rates) since

$$R_n/R_y = \Delta n/n \div \Delta y/\tilde{y}$$

while $G_n/G_y = n + \Delta n/n \div y + \Delta y/y$.

[17] Yearly growth rates in employment and output for the manufacturing sector in a number of Latin American countries, India, and Egypt during the 1950s are shown by Baer and Hervé (Werner Baer and Michel E.A. Hervé, "Employment and Industrialization in Developing Countries," Quarterly Journal of Economics, Vol. LXXX, No. 1 /February 1966/, p. 91). With the exception of the last two countries, G_n/G_y was on the order of one-third to one-fourth (it was 0.7 for Egypt, 0.5 in India).

[18]The value of R_n/R_y $\left(\dfrac{1}{R_y/R_n}\right)$ calculated from Table 5 is 0.47 for services and 0.41 for industry, which shows that labor absorption associated with income growth was somewhat higher in the former. Rounding error that results from using annual growth rates in the derivation reduces the sensitivity of G_n/G_y as a measure of labor absorption, and is responsible for the identical values (0.54) for the two sectors shown in Table 5. Compare this value with the value of $\dfrac{n + \delta\, n/n}{y + \Delta\, y/y}$ for manufacturing in Table 6, for example.

[19]Suh Sang Chul, "Growth and Structural Changes in the Korean Economy Since 1910" (Ph.D. dissertation, Harvard, 1966), Table II-4.

[20]By 1930-36, almost half of Korean rice output was exported to Japan. This represented over half of Japanese rice imports. Suh, Table III-7, and B F Johnston, Japanese Food Management in World War II (Stanford Stanford University Press, 1953), p. 264.

[21]See United Nations Korean Rehabilitation Agency (UNKRA) and Food and Agricultural Organization (FAO), Rehabilitation and Development of Agriculture, Forestry and Fisheries in South Korea (New York Columbia University Press, 1954), p. 12, UNKRA, An Economic Programme for Korean Reconstruction (Washington /?/· Robert R Nathan Associates, 1954), p. 291 (mimeographed).

[22]Johnston, p. 22.

[23]Republic of Korea, Summary of the First Five-Year Economic Plan 1962-1966 (Seoul no author listed, 1962), p. 24 (English version), Government of the Republic of Korea, The Second Five-Year Economic Development Plan· 1967-1971 (Seoul EPB, July 1966), p 33 (English version)

[24]Literacy programs had reduced illiteracy to 28 percent by 1960 (EPB, Korea Statistical Yearbook, 1966), while schooling was sufficiently

widespread by 1958-61 that Korea could be ranked with semi-advanced count-
ries like Norway in terms of education. See Frederick Harbison and

Charles A Myers, Education, Manpower, and Economic Growth (New York

McGraw-Hill, 1964), p. 102.

[25]The merchandise balance in 1958-62 showed an average deficit of

almost 200 million dollars a year. Exports averaged only 33 million.

[26]There is a large literature which might be cited on the advantages

or disadvantages associated with import substitution as a strategy for

economic development. Among the more recent articles on the subject

that appear to be noteworthy in one respect or another is one by

Hirschman in which the change in views toward import substitution

in Latin America is summarized and the resistance toward substitution with

backward linkages examined. See Albert O Hirschman, "The Political

Economy of Import-Substituting Industrialization in Latin America,"

Quarterly Journal of Economics, Vol. LXXXII, No. 1 (February 1968), pp.

1-32. A strong case grounded on examination of effective rates of

protection has been made by Power against the sort of biases which have

resulted from the essentially naive substitution policy that has been

employed in the Philippines. See John H Power, "Import Substitution

as an Industrialization Strategy," Philippine Economic Journal, Vol. V,

No. 2 (Second Semester 1966), pp. 167-204. More general arguments for

export promotion (of manufactures), based mainly on the value of learning

effects, competition, and borrowing of technology are presented by

Keesing (Donald Keesing, "Outward-Looking Policies and Economic

Development," Economic Journal, Vol. LXXVII, No. 306 /June 1967/, pp

303-320.).

[27]The average labor coefficient (number of workers per billion won of gross output) in 1966 in mining and manufacturing was 1,457. Figures for some of the major import-substitute industries were chemical fertilizer, 593, petroleum products, 98; iron and steel, 324. See Bank of Korea, Interindustry Relations Tables for 1966 (1968)

[28]Norton uses marginal capital coefficients from plant profile data which show capital intensity for the most up-to-date rather than for the average establishment. See Roger D. Norton and Lee Kee Jung, "The Korean Input-Output Planning Model," A Paper presented before the Second Far Eastern Meeting of the Econometric Society (Tokyo United States Operations Mission to Korea, 1967), p. 25. These coefficients are also given in Irma Adelman, David C Cole, Roger Norton, and Lee Kee Jung, "The Korean Sectoral Model," in Irma Adelman, ed., Practical Approaches to Development Planning Korea's Second Five-Year Plan (Baltimore The Johns Hopkins Press, 1969), p. 120. Export/import ratios and the argument that Korea's trade is increasingly oriented toward less capital-intensive products can be found in Roger D. Norton, "The South Korean Economy in the 1960's," Paper presented before the Annual Meeting of the Association for Asian Studies (Washington International Bank for Reconstruction and Development, March 1971).

[29]Frank notes the tendency for labor supply and demand to interact so that increasing employment is accompanied by increasing unemployment. The number of entrants to the urban labor force is not only a function of rural-urban income differentials, but also of the (subjective) probability of getting an urban job which depends, in turn, on the ratio of unemployed to employed. See C R Frank, Jr., "Urban Unemployment and Economic Growth in Africa," Oxford Economic Papers (N S), Vol. 20, No.

2 (July 1968), pp. 266-68.

[30]See Philip M. Raup, "Land Reform and Agricultural Development,"

in Herman M Southworth and Bruce F. Johnston, eds, Agricultural Develop-

ment and Economic Growth (Ithaca, N.Y.: Cornell University, 1967),

pp. 285-92.

[31]Projections are from the National Association of Cooperative

Federations (NACF), Rural Credit Survey, 1964 (1965), pp. 71, 221.

Data on farmers' saving can be found in the Ministry of Agriculture and

Forestry's Reports on the Results of Farm Household Economy Surveys.

[32]Korea had fewer than two thousand garden tractors in the mid-1960s

when Japan had 2.5 million (see FAO, Production Yearbook, 1967). The

reason is not small farm size (i.e. below the minimum efficient size that

would support a tractor) The doctrine that farms, to be efficient,

must be large enough to support tractors has been questioned by Schultz,

who argues that it is incorrect because it is concerned with pseudo-

indivisibilities rather than real ones. See Theodore W. Schultz,

Transforming Traditional Agriculture (New Haven· Yale University, 1964),

pp. 122-24. Instead, mechanization in Korea has been limited because

emphasis has been placed on raising output per unit of land rather than on

increasing output per worker.

[33]FAO, The State of Food and Agriculture, 1968, p. 78

[34]Korea is not unique in this respect. A study by Ishikawa of the

contribution of additional labor input to agricultural output in a number

of Asian countries also shows a positive relation between levels of out-

put and levels of labor inputs, and a negative one between labor input and

holding size. See Shigeru Ishikawa, Economic Development in Asian

Perspective (Economic Research Series Number 8, The Institute of

Economic Research, Hitotsubashi University). Tokyo· Kinokuniya,

1967, pp. 218, 230-31.

[35]B S Minhas, *An International Comparison of Factor Costs and Factor*

Use (Amsterdam North-Holland, 1963), pp. 24-42.

[36]M June Flanders, "Agriculture versus Industry in Development

Policy The Planner's Dilemma Re-examined," *Journal of Development*

Studies, Vol. 5, No. 3 (April 1969), p. 184.

[37]Ministry of Finance, *Foreign Trade of Korea, 1966*, p. 296.

[38]Korean Development Association, *Effective Protective Rates of*

Korean Industries (Seoul: Korean Development Association, 1967), Table

IV (English version).

[39]Discrimination against smaller firms in the allocation of credit

is not new In 1963, for example, small-scale enterprises (defined as

those having less than 30 million _won_ in assets and, in manufacturing,

less than 200 employees) accounted for approximately 60 percent of

manufacturing output but received less than 40 percent of outstanding

loans from all banking institutions ("banking institutions" do not

include the KDB, then the Korean Reconstruction Bank). See MIB, *An*

Introduction to Small Industries in Korea (1966), pp. 14, 77. If

KRB loans and discounts are included in the total for manufacturing, the

share of smaller firms falls to 27 percent, or less than half of their

output share. More recently, a number of small firms have closed for

lack of funds, and the government has promised to expand credit for

small and medium enterprise (see *The Korea Times*, January 29, 1971)

[40]Non-electric machinery includes a much higher proportion of

investment goods (as opposed to consumer goods) than electric machinery

or transport equipment, the two other conventional investment-goods

categories. The production index for all manufacturing shows that output

almost quadrupled between 1963 and 1970. Production of non-electric

machinery rose less than 40 percent.

[41]The capital coefficient (K/Y) figures for South Korea "..."jump'

a great deal, /but7 on the whole the tendency is for the capital

coefficient to be inversely related to size..." (Harry T Oshima,

"Labor-Force 'Explosion' and the Labor-intensive Sector in Asian Growth,"

p. 166)

[42]One other noteworthy difference, from the analyst's viewpoint, is

that information on establishment size, assets, output mix, wages, and

the other factors that might be expected to influence labor absorption

is either unavailable for these industries or has been collected only

during the past few years The first trade census was taken in 1968,

for instance, and the first survey of service-sector wages in 1969

[43]Roger D Norton and Lee Kee Jung, "The Korean Input-Output Planning

Model," pp 45-49

[44]See Table 6 I have seen no data on numbers of Korean workers

in Vietnam, but balance-of-payments receipts for "other services"

(which include remittances of such workers) almost tripled from 1966

to 1969 before levelling off in 1969

[45]Construction wages in 1970 were 1.5 times the all-industry average

(Korean Industrial Development Center, Report on Wage Survey, 1970

/Vol I7, p 99) The Seoul Consumer Price Index for 1969 (1965 = 100)

was 172 0 The index for housemending wages (266 3) was the highest for

any component of the Seoul CPI

[46]The small numbers (25 thousand) make public-utility employment

particularly liable to estimating error On the other hand, because

survey respondents are either government agencies or a large, government-invested firm, reporting is likely to be particularly accurate Also, the decline after 1963 is consistent with the sharp drop in government expenditure (relative to GNP) which occurred in 1963-64 as fiscal deficits were eliminated

[47]Regressions of percentage change in output on percentage change in employment for the East African Railways and Nigerian Railways also show rapid increase in ton-mile productivity from 1948 or 1949 to 1963 See C R Frank, Jr , "Urban Unemployment and Economic Growth in Africa," pp 260-61

[48]Ministry of Transportation, Korea Transportation Survey Draft Report (1966), Vol I, p. 10

[49]EPB, Wholesale and Retail Trade Census Report, 1968 (1969).

[50]The Korea Times, February 13, 1971

[51]The figures for government employment are given in the EPB, Korea Statistical Yearbook, 1970

[52]Government employment (excluding that in government-invested enterprises), was less than 10 percent of non-agricultural employment in 1969 This statistic varied between 38 and 52 percent in Uganda, Kenya, Tanzania, Nigeria, and Ghana in the early 1960s See C R Frank, Jr , "Urban Unemployment and Economic Growth in Africa," p 255.

[53]Data on wages by sector and male-female wage differentials are given in the Korean Industrial Development Center's Report on Wage Survey, 1970, Vol I

[54]The share of electricity, water, and sanitary services in gross domestic fixed capital formation more than doubled from 1966 to 1968-1969; outlays for transport and communications rose from a low of 17 per-

cent in 1964 to almost 28 percent in 1969.

[55]Government minimum-wage legislation can have the same effect as union action in raising the price of labor   For example, minimum-wage laws in Puerto Rico (where unions are weak as in Korea) have been tied to the wage provisions of the U S Fair Labor Standards Act in manufacturing plants sponsored by the Commonwealth's Economic Development Administration   The result has been a tripling of median wage minima from 1949 to 1963 and (given simplifying assumptions about the nature of production functions and labor intensity) a price elasticity of employment of approximately - 1 0   That is, changes in wages and employment are equiproportional in the opposite direction. Manufacturing employment rose 36 thousand from 1950 to 1962   Potential manufacturing employment lost through wage increase, given the estimated value for wage elasticity of employment, was calculated to have been nine thousand jobs from 1949 to 1954, and another 29 thousand from 1954 to 1958   See L G Reynolds, "Wages and Employment in a Labor-Surplus Economy," American Economic Review, Vol LV, No 1 (March 1965), pp 22-34. Adverse effects of such a minimum-wage policy on employment appear to be substantial There is no minimum-wage legislation in Korea

[56]"More than 98 percent of the nation's major enterprises are violating the labor standard law   the most frequent violation   was unhealthy working conditions" according to the Office of Labor Affairs (The Korea Times, January 22, 1971)   Perhaps the most that can be said for Korean enterprise is that the current labor law (enacted in 1953), which was based on the most enlightened Western models, is so poorly adapted to Korean conditions that employers who obeyed the law would probably be bankrupted

[57]Korea Industrial Development Center, Vol. I, pp. 136, 145.

[58]There is little quantitative evidence on the degree to which labor and capital may be substituted for each other. A recent study by Clague provides estimates of the elasticity of substitution between labor and capital for 11 manufacturing industries in the United States and Peru. His elasticity estimates are very low. See Christopher K Clague, "Capital-Labor Substitution in Manufacturing in Underdeveloped Countries," Econometrica, Vol. 37, No. 3 (July 1969), pp. 528-37.

[59]It has been argued that skilled labor must be distinguished from unskilled labor because the supply of skilled workers rather than capital may prove to be the scarce factor in labor surplus economies. If so, then the apparent anomaly of capital-intensive production coexisting with traditional, labor-intensive activities may result from substitution of capital for the scarce factor, skilled labor. See Baer and Hérvé, pp. 97-102.

[60]These are the main points raised by Keesing in arguing the merits of an outward-looking (as opposed to an inward-looking) development strategy. See footnote 26.

[61]Service in the armed forces (500-600 thousand men) has also acted to raise labor quality and reduce the supply of new labor-force entrants, though constancy of troop levels has diminished the relative importance of military training as population has grown.

[62]One consequence is that the proportion of the economically active population less than 30 years of age fell from 39.5 percent in 1963 to 35.3 percent in 1969 (EPB, Annual Report on the Economically Active Population, 1969, Table 5).

[63] Republic of Korea, The Second Five-Year Plan for Science and

Technology· 1967-71 (1966) provides estimates which show that the supply

of scientists, engineers, and other professionals was a third larger

than needed in 1967, but that the supply of new technicians would

satisfy only 55 percent of the expected increase in demand during the

Second Plan period. A Unesco advisory team held that "expansion of

technical high schools and science and engineering faculties ..is

imperative .." (United Nations Educational, Scientific, and Cultural

Organization, Long-term Projections for Education in the Republic of

Korea /Bangkok   Unesco Regional Office for Education in Asia, 1965_7,

p 14). President Park also emphasized the need for science education

and vocational training in a recent speech before a teachers' group

(The Korea Times, January 23, 1971)

[64] Paik Hyun-ki, "Educational Plans and Economic Plans," Journal of

Science and Humanities (Seoul   Bulletin of the Korea Research Center),

Vol. XXIII (December 1965), pp. 37-41.

[65] Horace Underwood, "Korean Education   Master of the Future or

Slave of the Past," Koreana Quarterly, Vol. V. No. 3 (Autumn 1963),

pp. 52-57.

[66] The need for more information on international migration of high-

level manpower is discussed in E.M Godfrey, "The Brain Drain from Low-

Income Countries," Journal of Development Studies, Vol. 6, No. 3 (April

1970), pp 235-38. A recent report of the Health-Social Affairs Ministry

indicated that over four thousand medical technicians (doctors, dentists,

and nurses) were practicing abroad (The Korea Times, January 24, 1971)

while a subsequent agreement to send 13 thousand nurses and nurses

aides to West Germany by 1974 touched off a controversy on the opportunity

cost to Korea of the government's sponsoring such migration (see

The Korea Times, February 28, 1971)

[67]The problem of misplaced emphasis on vocational training in the

manpower programs of developing countries is discussed by Foster. See

Philip J Foster, "The Vocational-School Fallacy in Development Planning,"

in C Arnold Anderson and Mary Jean Bowman, eds., Education and Economic

Development (Chicago Aldine, 1963), pp. 142-162.

Figure 1 - Seasonal Patterns of Economic Activity

Table 1 - <u>Activity Status of the Working-Aged Population</u>: <u>1963-1970</u>

thousands

	Population Aged 14 & up	Economically Active	Economically Inactive	Employment: Unadjusted	Employment: FTE[a]
1970	17,907	10,020	7,887	9,574	
1969				9,347	9,403
1963	<u>15,684</u>	<u>8,652</u>	<u>7,032</u>	<u>7,947</u>	<u>7,532</u>
Change: 1963-70	2,223	1,368	855	1,627	--
Change: 1963-69	--	--	--	1,400	1,851
% increase 1963-70	14	16	12	20	--
% increase 1963-69	--	--	--	¹18	25

a/   Full-time equivalent (FTE) adjusted to an average work week of 50 hours.

Sources: EPB, <u>Annual Reports on The Economically Active Population</u>; BOK, <u>Monthly Economics Statistics</u>, March 1971.

Table 2 - The Non-Economically Active Population

Year, Month	Total			Housekeeping		School		Aged, Disabled		Other	
	Sub-Tot.	M	F	M	F	M	F	M	F	M	F
	Farm Households										
1969-3	4,092	935	3,157	225	2,489	296	228	162	409	242	31
" -6	2,109	667	1,442	51	879	374	176	225	371	17	16
" -9	2,518	768	1,750	153	1,170	319	190	235	361	61	29
" -12	4,656	1,421	3,235	540	2,533	419	237	280	403	182	62
	Non-farm Households										
1969-3	4,235	905	3,330	58	2,539	551	448	220	328	76	15
" -6	4,328	1,010	3,318	57	2,434	678	531	190	316	85	37
" -9	4,484	948	3,536	86	2,636	575	487	206	337	81	76
" -12	4,622	1,056	3,566	77	2,612	706	623	185	308	88	23
	Whole Country										
1969-av.	7,761	1,928	5,833	312	4,323	980	730	428	708	208	72
1963-av.	7,033	1,742	5,291	166	4,019	749	387	428	703	350	125

Sources: EPB, The Economically Active Population Survey, 1963 and 1969.

Table 3 - <u>Sectoral Distribution of Output and Employment</u>: <u>1963-1970</u>

1. <u>Output</u> (Gross National Product at 1965 constant market prices)

<u>billion won</u>

Year	Agriculture[a]/	Industry[b]/	Services[c]/	Total
1963	270.56	174.95	247.72	693.03
1964	314.31	187.59	248.41	750.31
1965	311.63	227.58	266.64	805.85
1966	345.91	266.18	301.73	913.82
1967	326.90	322.00	346.26	995.16
1968	330.84	409.63	385.85	1,127.32
1969	370.36	505.36	430.47	1,306.19
1970 p	377.67	580.50	475.30	1,433.47

2. <u>Employment</u>   <u>thousands</u>

Year	Agriculture		Industry		Services		Total	
	<u>Unadj.</u>	<u>FTE[d]/</u>	<u>Unadj.</u>	<u>FTE[d]/</u>	<u>Unadj.</u>	<u>FTE[d]/</u>	<u>Unadj.</u>	<u>FTE[d]/</u>
1963	5,021	4,310	1,032	1,094	1,894	2,148	7,947	7,552
1964	5,084	4,251	1,094	1,193	2,032	2,288	8,210	7,732
1965	4,999	4,136	1,349	1,523	2,174	2,491	8,522	8,150
1966	5,013	4,087	1,356	1,547	2,290	2,625	8,659	8,259
1967	4,924	4,078	1,622	1,781	2,368	2,745	8,914	8,604
1968	4,863	3,984	1,869	2,157	2,529	2,989	9,261	9,130
1969	4,798	4,194	1,968	2,215	2,582	2,994	9,347	9,403
1970	4,834		2,016		2,724		9,574	

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a/ Agriculture, forestry, and fishery.
b/ Mining; manufacturing; construction; electricity, water, and sanitary services; transport, storage, and communications.
c/ All other.
d/ Full-time equivalent (actual /unadjusted/ employment adjusted to a 50 hour work week on basis of average hours worked in each of 9 subsectors).

Sources· BOK, <u>Monthly Economic Statistics</u>, March 1971, EPB, <u>Korea Statistical Yearbook, 1970</u>; EPB, <u>Annual Reports on the Economically Active Population</u>.

Table 4 - <u>Average</u> Work-Week <u>by</u> <u>Subsector</u>   1963-1969

Sector	<u>Average Hours per Week</u>						
	1963	1964	1965	1966	1967	1968	1969
- Ag., forestry	42.5	41.5	41.0	40.4	41.1	39.6	43.3
- Hunting, Fishery	52.9	50.4	49.5	50.3	48.1	69.7	57.2
- Mining, quarrying	52.3	52.0	55.2	53.8	54.9	54 0	53.6
- Manufacturing	54.3	55.1	57.0	57.4	53.8	57.6	56.3
- Construction	46.5	48.9	49.6	51.8	53.5	54.6	53.3
- Public Utilities	51.4	47.0	53.4	53.1	50.1	54.2	47.5
- Commerce	60.9	59.2	59.7	60.1	60.3	60.4	59.1
- Transport, Storage, Communication	57.7	60.6	63.4	63 8	63.9	64.6	61.5
- Services	53.8	54.1	55.3	55.2	55.9	57.9	57.1
TOTAL	47.5	47.1	48.2	47.7	48.3	49.3	50.3

Sources· Economic Planning Board, <u>Annual Report on the Economically Active Population, 1969</u>, Economic Planning Board, <u>Korea Statistical Yearbook, 1970</u>.

Note· Revision of average-hour estimates can be seen in the <u>Yearbook</u>, but are not given in the <u>Annual Reports</u>. Whereever there was a difference, the <u>Yearbook</u> figure was used.

Table 5 - **Labor Intensity, Marginal Productivity, and Growth Rates· Major Sectors**

	Agriculture	Industry	(Manufact.)	Services	Total
Employment (n)$\underline{a}$/					thousands
1970	4,830	2,026	(1,260)	2,717	9,573
1963	5,021	1,032	(631)	1,894	7,947
change (Δn)	-191	+994	(+629)	+823	+1,626
growth rate (G$_n$)$\underline{b}$/	-0.55	10.1	(10.4)	5.3	2.7
Income (y)$\underline{a}$/					billion won
1970	377.67	580.50	(378.14)	475.30	1,433.47
1963	270.56	174.75	(111.63)	247.72	693.03
change (Δy)	107.11	405.75	(266.51)	227.58	740.44
growth rate (G$_y$)$\underline{b}$/	4.9	18.7	(19.0)	9.8	10.9
labor intensity$\underline{c}$/ (n/y)	18.6	5.9	(5.7)	7.6	11.5
Marginal Productivity (Δy/Δn)	-0.56	0.41	(0.42)	0.28	0.46
Hypothetical increase$\underline{d}$/ in employment (Δn)	1,988	2,396	--	1,740	6,124
G$_n$/G$_y$	-0.11	.54	(.55)	54	.25

$\underline{a}$/ Employment (unadjusted) and income from Table 3.
$\underline{b}$/ Compound annual (geometric average) rates
$\underline{c}$/ Man years per million won of income (output) in 1963
$\underline{d}$/ Change in income (Δy) times labor-intensity in 1963 (n/y).

Sources Same as in Table 3.

Table 6 - Labor Intensity, Marginal Productivity, and
Growth Rates Within the Industrial and Service Sectors

	Industry					Services	
	Mining, Quar- rying	Mftrs.	Const.	Pub. Util.	Transp., Stor., Commun.	Commerce	Serv.
Employ. (n)							Thousands
1970	109	1,260	279	25	343	1,190	1,534
1963	59	631	200	25	117	785	1,109
Δn	50	629	79	0	226	405	425
Inc. (y)							
1970	19.24	378.14	75.61	30.47	77.04	316.90	143.33
1963	11.86	111.63	20.69	7.10	23.47	151.06	89.87
Δy	7 38	266.51	54.92	23 37	53.57	165.84	43.46
Labor intensity							
(n/y)	5 0	5.7	9.7	3.5	5.0	5 2	12.3
Marg. Prod.							
$(\Delta y/\Delta n)$	0.15	0.42	0.70	∞	0.24	0.41	0.10
$\dfrac{n+\Delta n/n}{}$	185.75	199.68	139.50	100.0	293.16	151.59	138.32
$\dfrac{y+\Delta y/y}{}$	162.23	338.74	365.44	429.16	323.99	209.78	159.49
$\dfrac{n+\Delta n/n}{y+\Delta y/y}$ [a]	1.14	0.59	0.38	0.23	0.90	0.72	0.87

[a] This last expression is equivalent to Gn/Gy in Table 5 (see footnote 16), except that it is expressed in index rather than annual (geometric) growth-rate form.

Sources As in Table 3.

Table 7 - Distribution of Employment and Value Added by Establishment Size in Manufacturing

Establishment Size (Number of Workers)

Number of Workers	Total	5-9	10-19	20-49	50-99	100-199	200-499	500+
1959	261,327	44,964	40,969	54,871	33,880	28,555	27,002	31,086
%	100.0	17.2	15.7	21.0	13.0	10.9	10.3	11.9
1963	401,981	60,564	56,038	64,758	46,811	38,651	45,767	89,392
%	100.0	15.1	13.9	16.1	11.7	9.6	11.4	22.2
1968	748,307	85,689	79,305	95,633	70,673	73,606	109,525	233,876
%	100.0	11.5	10.6	12.8	9.4	9.8	14.6	31.3
Value Added (million won)								
1958-59	15,755	1,906	2,171	2,800	1,945	1,725	2,730	2,478
%	100.0	12.1	13.8	17.8	12.3	10.9	17.3	15.7
1963	61,534	5,986	5,881	7,511	6,710	6,430	8,826	20,189
%	100.0	9.7	9.6	12.2	10.9	10.5	14.3	32.8
1968	301,445	16,783	19,691	24,944	22,344	23,943	54,701	139,040
%	100.0	5.6	6.5	8.3	7.4	7.9	18.2	46.1

Sources Korean Reconstruction Bank, Final Report-Census of Mining and Manufacturing, 1958, Economic Planning Board-Korea Development Bank, Report on Mining and Manufacturing Census, 1968; Economic Planning Board - Korean Reconstruction Bank, Report on Mining and Manufacturing Census, 1963.

Table 8 - Capital Intensity by Establishment Size·
Mining and Manufacturing, 1968*

million won

Est. Size	Value Added	No. of Workers	Fixed Assets	Wage Bill	Production Costs
5-9	13,980	82,183	23,722	4,975	18,881
10-19	17,150	79,141	28,601	6,315	26,210
20-49	24,642	100,586	38,367	8,317	38,298
50-99	22,397	73,467	28,695	6,791	36,205
100-199a/	22,662	76,485	28,406	7,660	37,196
200-499	52,792	120,875	68,512	14,152	76,874
500+	125,683	258,446	188,421	33,513	204,455

Est. Size	V.A./Assetsb/	V.A./Workerc/	Wage Bill Prod. Costs (%)	Wage Bill (V.A (%)
5-9	0.59	170	26.3	35.6
10-19	0.60	217	24.1	36.8
20-49	0.64	245	21.7	33.8
50-99	0.78	305	18.9	30.3
100-199	0.80	296	20.6	33.8
200-499	0.77	437	18.4	26.8
500+	0.67	486	16.4	26.7

*Note. The beverage and tobacco industries are excluded because a large portion of value added is composed of excise taxes in these industries.

a/ Cement manufactures are excluded from this size group. The Census shows 16.7 billion in assets, but no shipments or value added for the group.

b/ Value added (in won) per won of tangible fixed assets.

c/ Thousand won per worker.

Source EPB-KDB, Report on Mining and Manufacturing Census, 1968.