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8 Export Promotion and Employment Growth in South Korea

Wontack Hong

Introduction

The phenomenal growth Korea has achieved over the past two decades is by now well known.[1] Korea's growth rate has exceeded that of any other country in the world. Growth was based upon an export promotion strategy that resulted in an average annual growth rate of the dollar value of exports of more than 40 percent annually even before the worldwide inflation of the mid-1970s. Exports have continued to grow rapidly in real terms even since that time.

The rapid growth of real GNP has transformed the Korean economy, and many other policies were changed in addition to trade policy. Among the results of the transformation has been the virtual elimination of open unemployment and a rapid rise in the real wage.

Korea's success has stimulated a great deal of interest on the part of other countries in the policies she followed and their results. Although the rapid growth of trade and its effects on GNP have been closely studied (see Frank, Kim, and Westphal 1975; Westphal and Kim 1977), less attention has been devoted to an assessment of the relationship between Korea's choice of an export-oriented trade strategy and the rapid rate of growth of urban employment and real wages. Because of that gap, this examination of Korea's commodity composition of trade and its relationship with employment should be of great interest.

Focus in this study is upon 1970, a year for which data are readily available. By 1970 the export-oriented growth strategy had been in effect for ten years. Real wages were rising rapidly, and the rapid accumulation of capital implied that Korean factor endowments were beginning to change. I therefore examine not only the pattern of trade in 1970, but also the way it evolved over time. During the 1970s, Korean policy

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began to shift toward the encouragement of capital-intensive industries. A final focus of this paper is upon those policies, and upon their compatability with the continued success of an export-oriented growth strategy in Korea.

8.1   Major Characteristics of the Korean Economy

8.1.1   Growth and Structure

Table 8.1 gives salient data on the growth and structure of the Korean economy. In the early 1950s Korea was one of the poorest countries in the world, with a very high population density and a per capita income of only $240 measured in 1977 prices. There was little manufacturing activity, reflecting both the underdeveloped state of the economy and the aftereffects of the Korean War. Exports were almost nonexistent and consisted primarily of agricultural commodities (see table 8.2).

After the devastation of the war, Korea pursued inward-looking policies. Throughout the 1950s it had most of the characteristics of an import substitution, relatively slow growth economy. The exchange rate was overvalued, and numerous direct controls were applied to international transactions. Aid inflows were sizable, since foreign-exchange earnings failed to cover more than a small part of the import bill.

By the late 1950s it was evident to all that aid flows would not be sustained and that Korea, dependent on imports for most raw materials, could not grow satisfactorily through further import substitution. In the early 1960s, policy signals were reversed, starting with a large devaluation in 1960, followed by a program of export incentives that maintained the real exchange rate for exports despite fairly rapid domestic inflation (see section 8.1.2). The switch to an export promotion strategy was followed by rapid increases in exports: from 1962 to 1972, exports rose from 2 to 18 percent of GNP, while per capita income rose from $275 to $541 in 1977 prices. Per capita income growth has continued to be rapid and is estimated to have been $864 in 1977. Over the period 1962 to 1977, per capita GNP rose at an average annual rate of nearly 8 percent. Government development programs and investment and credit policies were largely concentrated on export promotion, although that concentration necessarily implied attention to infrastructure for ports, transport, communications, and other facilities necessary for the success of the export promotion drive.

The switch in incentives in the trade sector was accompanied in 1964–65 by a very significant set of monetary and fiscal reforms, which raised the nominal interest rate and lowered the inflation rate significantly. For this and other reasons, the domestic savings rate rose rapidly. This was absolutely essential, since the inflow of United States aid,

Table 8.1   **Growth and Changes in Industrial Structure, 1953–77**

	1953	1957	1962	1967	1972	1977[a]
Industries (percentage distribution of value added)						
Agriculture and forestry	46	42	39	32	23	16
Fishery	2	2	2	2	2	3
Mining and quarrying	1	1	2	1	1	1
Manufacturing	6	9	12	17	25	35
Electricity, water and sanitation	0	0	1	1	2	2
Transportation and communications	2	2	3	5	6	7
Construction	2	2	3	4	5	6
Wholesale and retail trade	11	13	15	15	18	17
Banking and other services	8	8	9	8	8	6
Education and public administration	17	14	12	10	8	5
Ownership of dwellings	5	4	4	3	2	2
GNP (in billions of 1977 $)	5.0	6.1	7.3	11.2	18.0	31.5
Per capita GNP (in 1977 $)	240	266	275	368	541	864
Commodity exports/GNP[b]	1	1	2	7	18	33
Commodity imports/GNP[b]	10	11	16	21	25	35
Trade (in billions of current $)						
Commodity imports	0.35	0.44	0.42	1.00	2.52	10.81
Service imports[c]	0.01	0.01	0.03	0.08	0.19	1.68
Commodity exports	0.04	0.02	0.06	0.32	1.62	10.05
Service exports[c]	0.12	0.04	0.10	0.30	0.49	2.69
Official aid[d]	0.19	0.37	0.22	0.15	0.07	0.00
Foreign loans	—	—	0.00	0.17	0.63	1.02

Source: Bank of Korea, *National Income in Korea* and *Economic Statistics Yearbook*
[a]Preliminary data.
[b]Includes freight and insurance.
[c]Total invisible payments or receipts minus investment income and donations.
[d]Including imports financed by properties and claims funds from Japan.

which had peaked in 1957 at nearly $400 million, had already begun to decline. The government not only increased taxation and raised interest rates to encourage domestic savings, but also enacted measures designed to encourage an inflow of foreign loans. Borrowing from abroad turned out to be a major source of capital formation in Korea in the late 1960s and early 1970s.

As can be seen in table 8.1, the acceleration in the growth rate was accompanied by a very rapid shift in the structure of production. Agri-

Table 8.2   **Composition of Korean Exports by Major Sectors, Selected Years 1953 to 1975 (Percentage Distribution)**

SITC Code Year	Food and Beverages (0 and 1)	Crude Materials (2 and 4)	Mineral Fuels (3)	Chemicals (5)	Manufactured Goods (6 and 8)	Machinery and Transportation Equipment (7)
1953	5.6	89.6	2.6	—	2.3	—
1955	6.2	81.8	2.7	.5	7.3	1.3
1957	15.2	65.9	.0	.0	18.2	.3
1960	30.9	48.8	3.5	1.2	12.3	.3
1963	20.8	30.5	3.0	1.0	39.8	4.7
1965	16.6	21.2	1.1	.2	57.6	3.1
1968	11.7	13.5	.5	.7	68.2	5.4
1970	9.6	12.0	1.1	1.4	68.7	7.4
1972	7.5	7.4	1.1	2.2	71.2	10.6
1975	13.2	3.0	2.0	1.3	66.3	13.8

Source: Bank of Korea, *Economic Statistics Yearbook*, various years.
Note: Figures do not add to 100 owing both to rounding and to a small "unclassified" category in Korean imports.

culture, forestry, and fishing, which had accounted for 44 percent of GNP in 1957, constituted less than 20 percent by 1977. Manufacturing rose from 9 to 35 percent of GNP over the same period. Accompanying these changes, the share of agricultural employment fell from 61 percent of total employed persons in 1963 to 40 percent in 1977.

The high rate of economic growth in Korea has been accompanied by a high rate of population growth, although it has fallen significantly in recent years. During the period 1963–76, the population aged fourteen years and over increased at an average annual rate of about 3 percent. Despite this, recorded urban unemployment has fallen sharply (see section 8.1.4).

8.1.2   International Trade

The Pattern and Composition of Trade

Reflecting the transformation of the entire economy, the commodity composition of Korea's trade has changed markedly from that of the 1950s. Until the early sixties, the major export items were such primary products as metals, ores, and concentrates, raw materials of vegetable or animal origin, fish, swine, and raw silk. By the mid-sixties, plywood, textiles, clothing, and miscellaneous manufactures emerged as the principal export commodities. In the early 1970s, electronic products, foot-

wear, steel plates and sheets, and woven synthetic fabrics joined the list of major exports. In addition, the rapid expansion in Korean shipping, tourist services, remittances from Korean workers abroad, and revenues from overseas construction projects made large contributions to a remarkable increase in noncommodity exports.

The rapid shift in the commodity composition of exports can be seen from the data in table 8.2. Starting from a NRB-dependent/export structure (albeit with exports equaling only a small fraction of GNP), manufactured goods—from SITC sectors 5 through 8—rose from less than 5 percent of exports in 1953 to about 14 percent in 1960, 77 percent in 1970, and 81 percent in 1975. Table 8.3 enumerates the fifteen largest four-digit export categories for 1971. As can be seen, textile and apparel items were dominant, although iron and steel products, plywood, footwear, and fishery products were also important.

Table 8.4 gives data on the origin and destination of exports and imports. The United States was the largest single market for Korean exports, with Japan second. Exports to LDCs were relatively unimportant until the mid-1970s, accounting for 13 percent of exports in 1970, the year I focus on. A higher share of imports—17 percent—originated in LDCs, but these were mostly raw materials. Because of data difficulties and the relatively small size of Korea's trade with developing countries in 1970, no separate estimates are given below for the factor proportions of trade with DCs contrasted with LDCs.

Table 8.3   **Major Four-Digit Commodities Exported, 1971**

SITC Code	Commodity	Value (Millions of U.S. Dollars)
8414	Clothes and accessories, knitted or crocheted	132.9
8411	Clothing of textile fabrics	129.2
6312	Plywood	126.8
8999	Miscellaneous manufacturing n.e.c.	70.6
7293	Valves and tubes	48.5
2613	Raw silk	39.3
8510	Footwear	37.4
8412	Clothing and accessories made of fabric	36.2
6521	Cotton fabrics (unbleached)	20.7
0311	Fish (fresh, chilled, and frozen)	20.0
6516	Yarn and thread of synthetic fibers	19.2
6743	Iron and steel plates and sheets	19.2
6556	Twine, cord, and rope	17.2
6535	Fabrics made of synthetic fibers	14.4
0313	Crustaceans and mollusks	14.1

Source: Bank of Korea, *Economic Statistics Yearbook*, various years.

Table 8.4   **Pattern of Trade among Countries, Selected Years**
                       1953 to 1975

	Exports			Imports		
	United States	Japan	Other Developed Countries	United States	Japan	Other Developed Countries
1953	77%	15%	1%	23%	16%	2%
1955	41	40	7	23	6	11
1960	11	61	13	39	20	27
1965	35	25	14	39	36	10
1970	47	28	12	29	41	13
1975	30	25	24	26	33	13

Sources: Korean Traders Association, *Trade Yearbook: 1953*; Bank of Korea, *Annual Economic Review*, 1957; Economic Planning Board, *Statistical Yearbook*, 1966 and 1977.

The Trade Regime

In the 1950s the Korean currency was highly overvalued because of destruction caused by the war, the resultant shortages of various essential goods, and the associated inflation. The government nonetheless resisted devaluation as long as possible. Export promotion was not given serious consideration.

Trade and industrialization policies were designed essentially to overcome the various side effects of currency overvaluation, which had resulted in inefficiencies of resource allocation. The government bureaucracies, especially the Ministry of Commerce and Industry (MCI) and the Ministry of Finance (MOF), gained powerful controls over the private economy by maintaining a disequilibrium system associated with the currency overvaluation. It was only in the sixties that a movement toward import liberalization and a vigorous export promotion began, although some early measures, as for example export incentives, were begun in the late 1950s.

Not only were the range and variety of export incentives smaller in the fifties than later, but the scale and intensity of each incentive scheme were much weaker. For instance, although an export credit system existed in this period, the automatically synchronized short-term export credit system (awarding a specified number of won per dollar exported) via unlimited rediscounts at the Bank of Korea and the allocation of large amounts of long-term loans for direct investment in export production became possible only in the sixties. Tariff exemptions on equipment and raw materials imported for export production, together with generous wastage allowances, were also introduced in the sixties.

The policymakers of the fifties simply could not imagine the possibility of Korea's exporting large amounts of rice, as it did in the colonial period, or exporting, on the basis of its very limited experience, significant quantities of manufactured goods. Their major concern was to maximize aid inflows, save foreign exchange, and promote import substitution. This is not meant to imply that the policymakers of the sixties started export promotion policies because they could perceive all the advantages of export-oriented growth as later revealed. The adoption of an export promotion policy was a natural response to the declining grants-in-aid and expanding demand for foreign exchange. The officials promoted exports, saw the benefits, and consequently adopted an export-oriented growth strategy. Several instruments were used for the purpose, including tax incentives, tariff exemptions, and financial and other inducements.[2]

It seems clear that most of the export promotion policies of the sixties did not systematically favor specific export industries selected with a view to their factor intensity. As demonstrated by the First Five-Year Plan document, in the early sixties the government did not envision a major role for labor-intensive manufactured exports. However, as export expansion developed along the lines of classical comparative advantage theory, the government quickly started to encourage investments into such emerging export sectors as textiles, clothing, plywood, electronics, and wigs. While the authorities maintained a high effective exchange rate for exports, it was private entrepreneurs who played the major role in determining sectoral resource allocation for exports. Of course some policies, such as the subsidized financing of capital goods imports, could have indirectly affected the factor intensity of exports as well as import substitution.

In preparing the Fourth Five-Year Plan (1977–81), the Korean government appears to have adopted policies that may directly affect the factor intensity of exports. It has started to plan investment schedules for such industries as shipbuilding, electronics, machinery, steel and metal products, and petrochemicals, anticipating that Korea will soon have comparative advantage in these industries and will be in a position to export their products. Thus, by selecting specific industries to be promoted as major export sectors, government decisions have started to affect directly the factor intensity of exports and employment growth.

After the sixties, Korean entrepreneurs soon learned that generous subsidies and other promotional schemes would be provided for production activities the government wished to support, while various disincentives would be applied to nonfavored activities. As a result, in the seventies most of the large firms that could successfully accumulate wealth from light manufacturing, including textiles and footwear pro-

duction, have willingly started to invest in manufacture of steel and other metal products, electrical and nonelectrical machinery, electronic products, shipbuilding, other transportation equipment, and petrochemical products.

In Korea a successful entrepreneur usually owns, possibly as a result of economies of scale in financial operations, a group of firms involved in various activities extending from import substituting production for the domestic market to exclusively export-oriented production. As the emphasis of the government shifts from simple labor-intensive manufactures to more skill- and capital-intensive manufactures, the entrepreneur begins to adapt to this shift by investing in a new set of projects, adjusting the relative scale of existing production activities, and reshuffling workers accordingly. This ability of Korean entrepreneurs to adapt to changing economic variables and venture into new activities, combined with government policies that encourage continual shifts in production activities, seem to constitute the necessary ingredients for rapid economic growth.

In weighing the policies underlying successful export expansion in Korea since 1962, one should not fail to note that the most important factor has been the commitment of the government to promoting exports. This effort has involved the government at all levels from the president down to officials responsible for export administration work, together with the entire private sector related to exports, through the monthly sessions of the "Expanded Meeting for Export Promotion." It is at these meetings that various problems in export expansion are identified and activities coordinated. Furthermore, successful exporters are highly honored and encouraged. This has an immense psychological impact in a society that still carries remnants of traditional Confucianism. This honor and encouragement bestowed on exporters has undoubtedly helped channel the best of the entrepreneurial class in Korea into export activities.

With such a strong national commitment to export promotion, the relevant ministers, especially the minister of commerce and industry, are expected to show no less enthusiasm for the cause. The MCI announces the annual export target at the beginning of each year. If there develops a risk that the target will not be met, the staff of the MCI and other officials concerned with export administration work seven days a week and overtime to expedite administrative processes, to strengthen existing export support schemes, to institute new subsidies, and to exert irresistible pressures on businessmen to accelerate exports even though it may entail losses. If all such efforts fail to achieve the target amount, MCI officials may even try to adulterate export statistics—for example, by counting receipts in advance of exports or exports without drafts in bonded processing as actual exports. This is why there have been sig-

nificant differences between the MCI export figures and the Bank of Korea's (BOK) export figures, which are based on customs clearances, and why MCI has sometimes reported a sharp drop in exports in January. Such overenthusiasm for export expansion has apparently caused some losses (Hong 1976), but it has kept fueling the export oriented growth process in Korea.

As I mentioned already, quantitative restrictions and import licensing were important components of the trade regime in the 1950s. Their importance diminished substantially in the 1960s. Quantitative controls were lessened after the 1964 devaluation. They were further relaxed in 1967 when a switch was made in the MCI system from a positive list of items that could be imported, with or without authorization, to a negative list of items that could not be imported without specific government authorization. Import licenses were automatically approved for all commodities (AA items) unless they were on the list of restricted or prohibited items.

Under the negative list system, more than half of the 1,312 basic (five-digit SITC) import items became AA commodities. There were about seventy prohibited import items during 1967–76, but the number of quota items has decreased steadily from more than one hundred in 1967–68 to zero in 1976. On the other hand, the number of items that, though not subject to quotas, require recommendations from MCI or other appropriate ministries has steadily increased from more than 300 items in 1967 to 550 in 1975 (see table 8.5) and more than 600 in 1976. Importers of these items must acquire approval to import and frequently must also get approval for the quantity of imports from MCI or other appropriate authorities. Although this system is more flexible than a quota or a system linking imports to export performance, the government can still effectively control the amount of imports of each commodity group by imposing annual import ceilings on the basis of estimated import needs and the overall balance of payments situation. More than half the items that require approval have been subject to such ceilings, resulting in an effect similar to quantitative restrictions.[3]

In principle, imports of finished consumer goods have not been allowed. Imports of raw materials for exports were normally approved automatically, irrespective of their classification. However, quantitative restrictions were sometimes applied when there were influential domestic suppliers of these raw material. This generated conflicts between export producers who wanted to use low-priced (and high-quality) imported raw materials and domestic producers of high-priced (and allegedly poor-quality) raw materials.

To accelerate investment, capital goods imports received preferential treatment and, to raise the utilization rate of existing capacity, intermediate goods imports also received preferential treatment. Since the

Table 8.5   **Sectoral Pattern of Import Restrictions, Based on 1,312 Basic (Five-Digit) SITC Items**

Sector	1967 (Second Half)		1970 (Second Half)		1975 (Second Half)	
	Prohibited, Linked, and Quota Items	Recommendation Required	Prohibited, Linked, and Quota Items	Recommendation Required	Prohibited, Linked, and Quota Items	Recommendation Required
Total restricted imports	220 (100%)	337 (100%)	157 (100%)	437 (100%)	110 (100%)	553 (100%)
Agriculture and fishery	2 (1%)	41 (12%)	2 (1%)	49 (11%)	1 (1%)	53 (10%)
Mining	2 (1%)	1 (0%)	2 (1%)	9 (2%)	0 (0%)	20 (4%)
Manufacturing	216 (98%)	295 (88%)	153 (97%)	379 (87%)	109 (99%)	480 (87%)
Food products	8 (4%)	48 (14%)	7 (5%)	60 (16%)	6 (6%)	74 (15%)
Textile products	83 (38%)	16 (5%)	41 (27%)	51 (14%)	39 (36%)	53 (11%)
Wood products	9 (4%)	11 (3%)	4 (3%)	13 (3%)	3 (3%)	12 (3%)
Paper products	15 (7%)	8 (2%)	11 (7%)	10 (3%)	6 (6%)	21 (4%)
Rubber products	10 (5%)	2 (1%)	10 (7%)	1 (0%)	6 (6%)	2 (0%)
Chemicals	16 (7%)	52 (15%)	10 (7%)	61 (16%)	4 (4%)	73 (15%)
Nonmetallic products	9 (4%)	8 (2%)	4 (3%)	7 (2%)	0 (0%)	18 (4%)
Basic metals	3 (1%)	22 (7%)	10 (7%)	23 (6%)	0 (0%)	31 (7%)
Metal products	14 (6%)	26 (8%)	11 (7%)	26 (7%)	7 (6%)	26 (5%)
Machinery	0 (0%)	13 (4%)	5 (3%)	17 (5%)	6 (6%)	42 (9%)
Electrical machinery	2 (1%)	21 (6%)	4 (3%)	22 (6%)	12 (11%)	15 (3%)
Transportation equipment	0 (0%)	12 (4%)	0 (0%)	19 (5%)	0 (0%)	21 (4%)
Miscellaneous manufactures	47 (21%)	56 (17%)	36 (24%)	69 (18%)	20 (18%)	92 (19%)
Amount of import ($ million)	70	220	128	842	590	3,190
Share in total imports	(7%)	(23%)	(6%)	(42%)	(9%)	(44%)

Source: Hong (1977).

intermediate and capital goods imports were subject to fewer quantitative controls, import substitution for these goods could not be as profitable as for consumption goods. Korea's relative failure to promote intermediate and capital goods industries in the fifties and sixties positively contributed to the rapid export expansion in the late sixties and seventies, because manufacturers of export goods were relatively free to use low-cost imported intermediate and capital goods instead of high-cost domestic products. While there was some earlier import substitution, as for example in fertilizers, it was largely in commodities that exporters did not use as inputs.

In the mid-seventies, however, the government's emphasis has clearly shifted to active development of various intermediate and capital goods industries both for domestic consumption and for export. Should these industries fail to achieve efficiency in terms of international competitiveness because of abuse of tariff and nontariff protection measures, the adverse effects may spread over the entire field of production in Korea whether for domestic consumption or for export. The effect of high-cost intermediate and capital goods may be more serious than that of high-cost consumer goods, although this could occur only if exporters were constrained to buy from domestic sources.

Balance of Payments

As was seen in table 8.1, imports of commodities and services exceeded exports until the mid-1970s. Korea achieved a current account surplus for the first time in 1977. As I already mentioned, the deficits of the 1950s were financed almost entirely by foreign aid: with an overvalued exchange rate and almost no exports, Korea was not creditworthy for foreign loans, and prospects for repatriation of profits were not attractive to foreign investors. As aid flows diminished in the late 1950s, the Korean government began taking measures to attract foreign capital, primarily in the form of loans. As can be seen from table 8.1, these loans increased in size and importance. In recent years, foreign direct investment has assumed some importance in Korea, although it has remained much smaller than foreign borrowing.

Exchange Rate Policies

Table 8.6 gives data on nominal, effective, and price level adjusted exchange rates for exports and imports. The price level deflated EER for exports, with or without adjustments for trading partners' price levels, rose significantly from the mid-1950s to the early 1960s. After sizable fluctuations in the early 1960s (not all shown in table 8.6), the real exchange rate has fluctuated much less since that time. This reflects the government's policy of relying much more on the exchange rate to promote exports and import substitutes.

Table 8.6　　　Nominal, Effective, and Price-Adjusted Exchange Rates for Exports and Imports, Selected Years, 1955–75 (Won per Dollar)

Rate	1955	1958	1961	1964	1967	1970	1973	1975
A. Official exchange rate	37	50	128	214	271	311	398	485
Export rates								
B. Export dollar premiums	n.a.	64	15	40	—	—	—	—
C. Export subsidies	n.a.	1	9	27	62	88	94	81
D. Effective exchange rate (EER) for exports (A + B + C)	72	115	151	281	333	399	493	566
E. Price level deflated EER for exports[a]	n.a.	289	294	310	286	273	255	163
F. Purchasing power parity EER for exports[b]	224	281	289	305	299	308	396	321
Import rates								
G. Tariffs and tariff equivalents	n.a.	14	20	33	26	26	19	25
H. Effective exchange rate (EER) for imports (A + G)	42	64	147	247	296	336	418	510
I. Price level deflated EER for imports[a]	n.a.	160	287	272	256	231	216	147
J. Purchasing power parity EER for imports[b]	131	156	282	268	266	260	332	287

Sources: Frank, Kim, and Westphal (1975); Westphal and Kim (1977).

[b]Immediately preceding item multiplied by average price level of trading partners.

[b]Immediately preceding item multipled by average price level of trading partners.

8.1.3   Structure of Protection

Table 8.1 depicts the rapid growth of manufacturing's importance in the South Korean production structure and the steady decrease in the importance of NRB sectors. By 1977 the modernized manufacturing sector contributed about 35 percent of GNP, while the social overhead sectors contributed nearly 10 percent. The once-dominant agricultural sector had declined to a mere 16 percent of GNP, and even the share of the service sectors was reduced to about 35 percent, from 43 percent in 1962. Paralleling these trends in output, the composition of employment also altered: the share of agricultural employment fell from 61 percent of total employed persons in 1963 to 40 percent in 1977.

8.1.4   The Labor Market

A consistent series of employment data for Korea is available only for the period after 1962. Korea's labor force has grown at an average annual rate of 3 percent since 1963. Before 1963, nearly two-thirds of employed persons were engaged in agriculture, and unemployment in nonfarm areas was estimated to have been more than 16 percent.

Industrial employment began rising sharply in the sixties. As can be seen from table 8.7, the real wage began rising after 1964. Simultaneously, the share of employment in agriculture fell and the overall unemployment rate was reduced. In 1977 the urban unemployment rate was estimated to have fallen to 5.8 percent.

Although there is reason to believe that capital was implicitly subsidized through a variety of credit-rationing devices, the Korean labor market seems to have been fairly distortion-free by the late 1960s: unions were nonexistent or had relatively little power, and government regulations did not result in a wage above market-clearing levels. It appears that the Korean labor market was transformed from one fairly typical for LDCs, with open unemployment and slow urban employment growth, to a neoclassical, full-employment labor market by the 1970s.[4]

8.1.5   Inflation

Inflation has been a significant factor in Korea throughout the period since 1953, although inflation rates have varied substantially in different subintervals. On a 1970 base, wholesale prices in 1953 were only 8.2, and they rose to 31.0 in 1960. This represented an average annual rate of increase of 19 percent. As already discussed, this contributed to the overvaluation of the exchange rate and the severity of exchange controls during the 1950s.

The period from 1960 to 1964 was one during which the switch in policies away from import substitution was made. This was followed, in 1964–65, by a series of budgetary and financial reforms, including, as

Table 8.7   Korean Labor Force and Employment: 1963–77

	Population Fourteen and over (Thousand Persons)	Total Employment (Thousand Persons)	Manufacturing Employment (Thousand Persons)	Unemployment Rate		Manufacturing Real Wage (1975 = 100)
				Farm Household (%)	Nonfarm Household (%)	
1963	15,085	6,933	610	2.9	16.4	55.1
1964	15,502	7,799	637	3.5	14.4	51.8
1965	15,937	8,206	772	3.1	13.5	57.7
1966	16,367	8,423	833	3.1	12.8	59.6
1967	16,764	8,717	1,021	2.3	11.1	63.0
1968	17,166	9,155	1,170	1.9	9.0	68.8
1969	17,639	9,414	1,232	2.2	7.8	80.5
1970	18,253	9,745	1,284	1.6	7.4	89.9
1971	18,984	10,066	1,336	1.5	7.4	95.3
1972	19,724	10,559	1,445	1.3	7.5	95.6
1973	20,438	11,139	1.774	1.0	6.8	93.7
1974	21,148	11,586	2,012	1.2	6.8	97.4
1975	21,833	11,830	2,205	1.3	6.6	100.0
1976	22,549	12,556	2,678	1.0	6.3	113.7
1977	23,336	12,929	2,798	1.1	5.8	131.7

Source: Economic Planning Board, *Annual Report on the Economically Active Population*, various issues, and Bank of Korea, *Economics Statistics Yearbook*, various issues. GNP deflator was used to compute real wage rates.

I already mentioned, an increase in nominal interest rates. One result of this was that wholesale prices, whose index stood at 62.3 in 1964, rose much more slowly during the 1960s, averaging a 7.9 percent increase per year. As in most countries, inflation has accelerated in the 1970s, with rates of increase of 42 and 21 percent in 1974 and 1975 respectively.

In addition to monetary reforms, however, the Korean government began in about 1964 maintaining the real exchange rate at a fairly constant level, as already seen. Since the early 1960s, therefore, the Korean trade and payments regime has been fairly well shielded from the effects of the inflation.

8.1.6 Summary

The salient features of Korea's growth have been the emphasis upon export promotion and the transformation of the economy under those policies. Growth has been so rapid that a snapshot of the economy at any one point in time fails to capture the phenomenon: exports and the domestic production structure shifted from a heavy emphasis on rural, primary-commodity activities toward a modern, industrial sector orientation. Per capita incomes have risen sharply in this process, and urban employment and real wages also increased rapidly. A central question is the extent to which the export promotion policies accounted for the turnaround in the labor market and in employment. Closely related is the question whether recent policies, with somewhat greater emphasis upon heavy industry, will permit a continuation of past trends in employment and real wages.

8.2 The Trade Regime and the Structure of Protection

8.2.1 Tariffs

In the fifties and early sixties, the government relied on various quantitative import restrictions to offset the adverse effects of the overvaluation of the domestic currency on the balance of payments. A complex structure of multiple exchange rates also developed; nonetheless, on balance the structure of incentives during this period was biased against exports. Import liberalization in the 1960s consisted primarily of reduced reliance on quantitative controls and the shift already mentioned from a positive list to a negative list system. Tariff rates were not altered significantly during 1963–75. Data for 1968–72 can therefore be regarded as broadly representative of the rates in effect throughout the export promotion years.

According to the Major Taxation Statistics data of the Bureau of Taxation, available for years after 1968, the average legal tariff rate (in-

cluding special tariffs) for all commodity imports was about 26 percent during 1968–72. The average legal tariff rate was reduced to 24 percent in 1973 and to between 12 and 15 percent during 1974–75. However, because of tariff exemptions on materials for export production and for key industries and foreign investment projects (whose imports were rapidly increasing), the average rate of tariffs actually collected was only 8 or 9 percent from 1966 to 1970 and declined further to about 6 percent during 1971–72. This was due partly to generally lowered legal tariff rates and partly to a sudden increase in tariff-exempt imports of crude oil, which had been subject to a 5 percent tariff during 1968–74. The average rate of tariffs actually collected has amounted to only about 5 percent since 1973.

To ascertain the extent to which tariff data are sensitive to the choice of weights, I computed weighted average legal tariff rates using actual individual import volumes as weights. The average legal tariff rate so computed on all commodity imports was raised from 17 percent in 1963–67 to 26 percent in 1968–72 but was lowered to 20 percent in 1973–74 and to 12 percent in 1975 (see table 8.8). The 1967 tariff reform appears to have slightly lowered the simple arithmetic average tariff rate on all imports, but substantial shifts in the import pattern tended to raise the weighted average legal tariff rate. The legal tariff rates were very low on minerals, relatively low on agricultural products, and very high on most manufactures. Lower rates were preserved for essential raw materials than for finished goods and for noncompeting capital goods than for competing consumption goods.

8.2.2   Effective Rates of Protection

According to the sectoral effective rates of protection estimated by Westphal and Kim for 1968, the average ERP for agriculture, as shown in table 8.9, was about 18 percent and that for mining was about 3 percent, while the average ERP for manufacturing as a whole was a minus 1 percent (Westphal and Kim 1977). The average level of protection, especially that in manufacturing, was very low in Korea compared with other developing countries, which may reflect the fact that the exchange rate in 1968 was not greatly overvalued. However, the average ERP on import-competing manufacturing industries was estimated to be as high as 92 percent in 1968, while that on export industries and noncompeting industries was estimated to be below minus 10 percent. Furthermore, while the effective protection rates for domestic sales of import-competing and export-import industries were fairly high, the rates for export sales were either near zero or negative for all categories of industries. As Westphal and Kim suggest, ERPs may be indicators either of relative profitability or of relative inefficiency. Hence the negative rates on export industries and export sales of other industries

may indicate no room for either excess profitability or substantial inefficiency, while the extremely high rate on import-competing industries may indicate the opposite. The results might be interpreted as indicating that Korea's export promotion policies were relatively more efficient than its import substitution policies.

Table 8.8   **Weighted Average Sectoral Tariff Rates (Basic Rates)**

Sector	1963–67	1968–72	1973–74	1975
Rice, barley, and wheat	14%	18%	16%	0%
Other agriculture	11	17	13	5
Forestry	10	10	10	7
Fisheries	28	39	37	36
Coal	10	10	10	0
Other minerals	1	6	5	3
Processed foods	37	35	12	11
Beverages	180	150	150	150
Tobacco	224	95	126	150
Fiber spinning	30	64	52	47
Textile fabrics	75	98	81	80
Textile products	49	89	75	77
Lumber and plywood	12	16	30/25	25
Wood and furniture	80	91	76	75
Paper and products	10	10	11	15
Printing	0	0	0	0
Leather and products	75	68	61	60
Rubber products	41	51	44	38
Basic chemicals	23	24	24	21
Other chemicals	26	47	45	27
Chemical fertilizer	5	0	0	0
Petroleum products	18	20	20	20
Coal products	20	5	5	5
Nonmetallic minerals	17	29	26	22
Iron and steel	10	12	11	18
Steel products	16	28	28	19
Nonferrous metals	12	25	22	16
Metal products	33	45	40	40
Machinery	16	20	15	18
Electrical machinery	21	29	28	33
Transportation equipment	32	38	15	17
Miscellaneous manufacturing	19	55	55	52
Scrap	21	7	6	6
Agricultural products	13	15	13	3
Minerals	2	6	5	3
Manufacturing	20	34	26	23
All commodities	17	26	20	12

Source: Hong (1977).

Table 8.9   Average Effective Protection Rates by Major Industrial Groups: 1968

	Legal Protection[a]	Nominal Protection[a]	Effective Protection		
			Export	Domestic	Average
Agriculture	36%	17%	−16%	19%	18%
Mining	10	7	−1	4	3
Manufacturing	59	11	3	−1	−1
Export industries[b]	54	5	5	−18	−11
Import-competing[c]	55	32	−9	93	92
Exports-imports[d]	46	23	−2	73	45
Noncompeting[e]	64	5	−1	−16	−16
All tradables	49	13	—	—	10

Source: Westphal and Kim (1977).

Notes: Based on Balassa method.

[a]Legal protection is tariff protection. Nominal protection is actual, or realized, protection on prices. Legal tariff rates sometimes exceed nominal rates owing to tariff redundancy and duty exemptions as exporters import their raw material and intermediate imports duty-free.

[b]Manufacturing industries exporting more than 10 percent of total production.

[c]Manufacturing sectors in which imports provide more than 10 percent of total supply.

[d]Exports greater than 10 percent of total production and imports greater than 10 percent of total domestic supply.

[e]All other sectors. This classification system is not the same as the one used in other studies in this volume. For comparison, "export industries" and "export-import" here would include some of both "import competing" and "noncompeting imports" used in other studies.

8.3   Factor Supply and Factor Intensity of Trade

8.3.1   Factory Intensity of Trade

Table 8.10 shows factor requirements of trade in Korea in 1970, computed using domestic production as weights. Note that factor requirements are measured here by the amount of capital and the amount of labor per unit of value of output, and that factor intensity is measured by the ratio of capital requirements to labor requirements.[5] The total amount of labor required to produce $100 million worth of exports was 67,000 persons, while the capital required amounted to about $99 million. On the other hand, the labor required to produce $100 million worth of import-competing goods was 74,000 persons, and capital requirements amounted to about $115 million.[6] Import-competing replacements thus appear to have been slightly more capital-intensive than exports.

The most remarkable fact emerging from table 8.10, however, seems to be that the capital-intensity of Korea's noncompeting non-NRB im-

Table 8.10   **Factor Requirements per $100 Million of Tradable Goods by Trade Category, 1970**

Category	Capital (K) (Million 1970 Dollars)	Labor (N) (Thousand Persons)	Factor Intensity (K/N)
Exports (HOS and NRB)	99.0	67.0	1,478
Import-cometing products (HOS and NRB)	115.0	74.0	1,554
Noncompeting imports, applying			
1947 United States coefficients	182.9	8.9	20,551
1958 United States coefficients	165.2	7.3	22,630
1965 Japanese coefficients	135.7	33.3	4,075
1970 Japanese coefficients	130.9	27.3	4,795

Source: Hong (1977).

Note: The amount of capital directly and indirectly required for exports was computed with $k[I - A^d]^{-1}$ and that for import-competing products with $k[I - A]^{-1}$, where k represents the direct capital-output ratio, A^d the matrix of domestic input coefficients, and A the matrix of domestic and imported input coefficients for import-competing products. Labor requirements were computed in the same fashion. Both matrixes include indirect requirements of tradables. The justification for the different treatment of exports and import-competing products is that export industries can import raw materials and intermediate inputs, whereas import-substituting industries usually have to use domestic inputs. See text for the list of excluded NRB items.

ports, estimated by using the United States and Japanese sectoral factor coefficients, was much higher than that of either the export or the import-competing sectors. Crude oil, timber, raw cotton, raw sugar, crude rubber, and wool were excluded from the computation, being regarded as noncompeting NRB tradable goods.

Westphal and Kim (1977) have also estimated the factor intensity of trade, again using production (not value added) as weights. Their results for 1968 correspond with those reported in table 8.9: they estimated total labor requirements of all exporting sectors to be 7.53 man-years of labor per million 1965 won of output compared with 6.62 man-years for a comparable value of import-competing production (which probably had a higher ratio of value added to output). Westphal and Kim were also able to estimate factor intensities separately for manufacturers. For manufactured exports, they estimated labor requirements at 7.9 man-years, with a corresponding figure of import-competing production of 5.56. The labor-capital ratio in manufactured exports was 4.29, and that of import-competing production was 2.74 (Westphal and Kim 1977, pp. 4–47).

Therefore Korea's trade appears to have been consistent with the HOS comparative advantage doctrine, especially with respect to exports

versus noncompeting, non-NRB imports, and manufactured exports versus manufactured import-competing production.

The largest difference in factor intensities lies not between exports and import-competing goods but between both of these categories and noncompeting imports.

8.3.2   Capital Accumulation and Changes in Factor Intensity of Trade

The factor intensity of trade has been changing over time. According to the trade statistics in BOK's input-output tables, commodity exports increased about thirty-five times (in 1970 prices), while the estimated number of persons employed directly and indirectly in export production increased about 8.5 times (from 0.15 million to 1.24 million) during 1963–75. This implies average annual growth rates of about 35 percent and 20 percent, respectively, and an export expansion elasticity of employment of about 0.6. The fixed capital stock directly and indirectly employed for export production increased about thirty-seven times (from $0.10 billion to $3.90 billion) over the same period, implying an average annual growth rate of 35 percent and an export expansion elasticity of capital absorption of about 1.0.

Production of competitive imports increased about 6.4 times while the estimated number of persons required directly and indirectly to replace these competing imports increased about 2.5 times (from 0.41 million to 1.02 million) during 1963–75. This implies average annual growth rates of about 16.5 percent and 8.0 percent, respectively, and an import replacement elasticity of employment of about 0.5. The fixed capital stock directly and indirectly required for import replacements increased about 7.2 times (from $0.39 billion to $2.80 billion) over the same period, implying an average annual growth rate of 18 percent and an import replacement elasticity of capital requirement of about 1.1.

Han (1970) has computed the amount of fixed capital stock employed in Korean industries on the basis of the 1968 National Wealth Survey. To estimate the fixed capital stock by years for the period after 1953, I used Han's estimate for 1968 as a benchmark and subtracted or added the BOK's fixed capital formation figures for successive years. The results, starting with 1962, are shown on a per capita basis in constant 1970 prices in table 8.11.

Total net real fixed capital stock in Korea, excluding household wealth in the form of dwellings, increased at an average annual rate of 3.5 percent during 1953–61, at 6.7 percent per annum during 1962–66, and at a remarkable 13 percent per annum during 1967–76. Per capita, however, the net capital stock increased by only about 30 percent during the thirteen-year period from 1953 to 1966, and it was only after 1966 that it began to increase rapidly. From then until 1976, capital stock per capita increased by about 170 percent. Owing to rapidly in-

Table 8.11   **Changes in Factor Endowment**

| Year | All Industry Net Capital Stock (1970 Dollars) | | Total Employed Persons (Millions) | Manufacturing | | Total Number of Workers (Millions) |
| | Per Capita | Per Employed Person | | Net Capital Stock per Worker (1970 Dollars) | | |
				M and M Census	Han–BOK Data	
1963	175	624	7.66	—	1,534	0.61
1964	179	641	7.80	—	1,549	0.64
1965	185	649	8.21	—	1,388	0.77
1966	201	702	8.42	1,723	1,528	0.83
1967	220	761	8.72	1,637	1,426	1.02
1968	249	837	9.16	1,610	1,437	1.17
1969	287	962	9.41	1,831	1,557	1.23
1970	322	1,065	9.75	1,983	1,665	1.28
1971	356	1,163	10.07	2,302	1,759	1.34
1972	383	1,214	10.56	2,326	1,701	1.45
1973	418	1,280	11.14	2,748	1,583	1.77
1974	453	1,358	11.59	2,806	1,488	2.01
1975	495	1,477	11.83	3,119	1,447	2.21
1976	545	1,557	12.56	3,220	1,310	2.68

Source: Hong (1977).

creasing employment, capital stock per employed person increased by only about 120 percent. However, this still implies a significant overall capital deepening during 1966–76.

For the manufacturing sector alone, data from the Census of Manufactures indicate that the capital stock per worker has steadily and significantly increased since 1966, rising from $1,723 per worker in that year to $2,302 in 1971 and to $3,220 in 1976.[7]

According to the Farm Household Survey data, capital stock per man-year input in agriculture was estimated at about $240 before 1967 but increased significantly during 1967–73 to reach $560 in 1973. The capital stock per farmer (without taking account of underemployment) estimated on the basis of the Han–BOK capital stock data also doubled during 1966–74.

Annual wages of farm employees increased rapidly after 1967 (from about $200 in that year to $410 in 1975 in 1970 prices), as did the wages of employees in manufacturing (from about $410 in 1967 to about $680 in 1975). On the other hand, the weighted average real interest rates on all types of loans supplied by both banking institutions and curb markets reached their peak in 1967 and thereafter declined steadily and substantially. Hence we can conclude that, since 1967, there has been a rapid and significant capital accumulation and capital deepening in Korea accompanied by a fast-rising wage/rental ratio (see tables 8.14 and 8.20).

As capital accumulates and the wage/rental ratio rises, one can expect more capital-intensive production techniques to become profitable both for domestic consumption and for exports, and production of more capital-intensive commodities will increase. Hence there should be a shift in factor intensity of both output and export production.

The capital intensity (i.e., capital/labor ratio) of Korea's export bundle grew steadily during 1960–75. The ratio of capital to labor required directly and indirectly for export production (excluding imported inputs) was about 0.6 in 1960 and increased to about 3.1 in 1975 (defined as in table 8.12). However, the capital intensity of import-competing products did not increase as rapidly as that of exports during this time. Consequently, although import-competing production was much more capital-intensive than production of exports during 1963–68 (e.g., 1.6 versus 1.0 in 1966), the difference subsequently became smaller. After 1970 there seem to have been only moderate differences in their factor intensities. In 1975 the capital intensity of exports was above that of import-competing products. In theory, there is no reason why the capital intensity of exports from Korea should be lower than that of its import-competing products.

The total amount of labor required per unit of exports (at constant prices) steadily decreased from 1960 to 1975. That is, the (direct plus

Table 8.12   Changes in Factor Intensity of Trade (Millions of 1970 Dollars and Thousands of Persons)

I-0 Trade Data	1960	1963	1966	1968	1970	1973	1975
A. Production for export							
1. Direct factor intensity	(0.47)	(0.58)	(0.78)	(0.86)	(1.08)	(1.73)	(2.86)
a. Capital content	49	45	42	37	43	38	60
b. Labor content	105	78	54	43	40	22	21
2. Factor intensity of domestic inputs	(0.83)	(0.85)	(1.25)	(1.49)	(2.07)	(2.69)	(3.47)
a. Capital content	49	64	55	55	56	43	59
b. Labor content	59	75	44	37	27	16	17
3. Factor intensity of imported inputs	(—)	(—)	(1.63)	(1.88)	(2.75)	(3.50)	(3.38)
a. Capital content	(—)	(—)	13	15	22	35	27
b. Labor content	(—)	(—)	8	8	8	10	8
4. Aggregate Factor Intensity	(0.59)	(0.71)	(1.00)	(1.15)	(1.48)	(2.13)	(3.13)
a. Total capital employed (A1a + A2a)	97	109	97	91	99	81	119
b. Total labor employed (A1b + A2b)	164	153	97	79	67	38	38
B. Import-competing production							
1. Direct factor intensity	(0.34)	(0.70)	(1.40)	(0.98)	(1.05)	(1.57)	(1.72)
a. Capital content	36	57	60	42	46	44	43
b. Labor content	105	82	43	43	44	28	25
2. Factor intensity of domestic inputs	(1.05)	(1.45)	(1.83)	(2.08)	(2.27)	(4.00)	(4.17)
a. Capital content	44	61	53	52	50	44	57
b. Labor content	42	42	29	25	22	11	14
3. Factor intensity of imported inputs	(—)	(—)	(1.75)	(1.77)	(2.11)	(3.91)	(3.67)
a. Capital content	(—)	(—)	21	23	19	43	33
b. Labor content	(—)	(—)	12	13	9	11	9
4. Aggregate factor intensity	(0.54)	(0.94)	(1.58)	(1.46)	(1.55)	(2.60)	(2.75)
a. Total capital required (B1a + B2a + B3a)	79	117	134	117	115	130	132
b. Total labor required (B1b + B2b + B3b)	147	124	85	80	74	50	48

Source: Hong (1977).
Note: Factor intensity (figures in parentheses) is the amount of capital required divided by the amount of labor required per $100 million worth of exports or import-competing production. Note that, for reasons explained in the note to table 8.10, the aggregates for exports do not include, and the aggregates for import-competing production do include, the factor content of imported inputs.

indirect) labor/output ratios in export production as a whole decreased at an average annual rate of about 10 percent over the period. This trend seems to reflect the rapidly increasing labor productivity in export production owing to technical progress, factor substitution, and increasing returns to scale, on the one hand, and to shifts in the composition of the export bundle toward less labor-intensive products on the other. But in the case of capital requirements there was no rapid or sustained decline in the amount used per unit of exports. From the analysis in table 8.13, we can see that the substantial increase in capital intensity of Korea's exports during 1966–73 was predominantly due to labor-saving factor substitutions in production processes and only slightly due to shifts in the composition of exports.

8.4   Export Promotion and Subsidies on Capital Use

Along with the significant increase in capital intensity of exports and import-competing products, there has been a sharp rise in the wage/rental ratio in Korea since 1966. Although some of the capital-labor substitution in Korean industries may be attributed to the increase in capital stock per capita and the associated rise in the wage/rental ratio (that is, to a shift in the basic comparative advantage position), a substantial portion, especially that which occurred in export industries, may have to be attributed to the subsidy on capital use.

One of the most familiar themes in development economics is that wages paid by the modern manufacturing industry are higher than the marginal social cost of labor, while capital tends to be underpriced; together these circumstances tend to make the private profitability of capital-intensive projects exceed their social profitability. Most literature on labor markets in developing countries suggests that labor legislation and trade union activities are the major sources of the excess of wage rates above opportunity costs. In Korea there are no powerful labor unions or government legislation to affect wages. No thorough study of the Korean wage structure has been undertaken, but the apparent differences between rural and urban wages seem to reflect either or both of two things: (1) an imperfectly functioning labor market coupled with structural distortions; (2) the greater skill of the urban work force and the higher costs associated with urban living in such areas as housing, transportation, and public service fees.

To the extent, therefore, that there is an identifiable factor market distortion, it originates in government policies to encourage capital formation, and my focus is thus upon those policies. I will first examine the implicit subsidies on capital use in the form of accelerated depreciation allowances and low prices for imported capital goods. Then I will esti-

Table 8.13 Change in Factor Intensity of Commodity Exports Due to Factor Substitution and Shifts in Composition of Exports: 1966–73

	Average	1966	1968	1970	1973	Due to Changes in Export Composition		
						1966–68	1968–70	1970–73
Direct factor intensity of exports (capital/labor ratios)								
						2.5%	−1.1%	7.1%
Applying 1966 coefficients		0.78	0.84	0.81	0.88	7.7%	−3.6%	8.6%
Applying 1968 coefficients		0.87	0.86	0.87	0.90	−1.1%	1.2%	3.4%
Applying 1970 coefficients		1.11	1.11	1.08	1.17	0.0%	−2.7%	8.3%
Applying 1973 coefficients		1.54	1.59	1.60	1.73	3.2%	0.6%	8.1%
Due to factor substitution 1966–68	5.9%	11.5%	2.4%	7.4%	2.3%	10.3%	—	—
1968–70	27.7%	27.6%	29.1%	24.1%	30.0%	—	25.6%	—
1970–73	44.5%	38.7%	43.2%	48.1%	47.9%	—	—	60.2%
Direct plus indirect factor intensity of exports (capital/labor ratios)								
						2.3%	1.2%	5.0%
Applying 1966 coefficients		1.00	1.06	1.05	1.09	6.0%	−0.9%	3.8%
Applying 1968 coefficients		1.12	1.15	1.16	1.21	2.7%	0.9%	4.3%
Applying 1970 coefficients		1.51	1.54	1.48	1.56	2.0%	−3.9%	5.4%
Applying 1973 coefficients		2.05	2.02	2.00	2.13	−1.5%	−1.0%	6.5%
Due to factor substitution 1966–68	10.5%	12.0%	8.5%	10.5%	11.0%	15.0%	—	—
1968–70	31.3%	34.8%	33.9%	27.6%	28.9%	—	28.7%	—
1970–73	34.7%	35.8%	31.2%	35.1%	36.5%	—	—	43.9%

Source: Hong (1977).

mate the magnitude of, and interest rates on, domestic and foreign loans and the associated subsidies on capital use by estimating the real opportunity cost of capital use in Korea.

8.4.1   Accelerated Depreciation Allowances and Import Duty Exemptions on Capital Goods

Since 1967, corporations in mining, fishing, or manufacturing that get more than half their total revenue from foreign exchange earning activities have been allowed an extra depreciation allowance equal to 30 percent of the ordinary depreciation specified in the corporation tax law. The extra allowance is 15 percent of the basic allowance in the case of corporations whose foreign exchange earnings constituted 20 to 50 percent of total revenue. An extra 20 percent depreciation allowance was extended, in 1970, to firms operating in specified industrial estates such as the Gu-Mi Electronics Industrial Estate, the Ulsan Petrochemical Industrial Estate, and the Chang-Won Machinery Industrial Estate.

According to the Presidential Emergency Decree on Economic Stabilization and Growth issued on 3 August 1972, firms in specified key industries were entitled to a special depreciation allowance of 40 to 80 percent of the ordinary allowance during the five-year period starting in 1972 and ending in 1976. The industries that received an 80 percent rate were petrochemicals, steel, nonelectrical machines, electronics, shipbuilding, and tourist hotels. Electrical machinery, nonmetallic mineral products, textiles, ceramics, deep-sea fishing, mining, and electricity received a 60 percent rate, and the chemical industry received 40 percent. Since 1972, those mining, fishing, construction, and manufacturing industries not listed above have been entitled to an 80 percent special depreciation allowance for the portion of capital invested in domestically produced equipment. This provision was to be effective, even after 1976, for all industries.

In the aggregate, the ratio of provisions for the consumption of fixed capital to gross fixed capital formation in manufacturing jumped from about 40 percent during 1962–71 to nearly 70 percent in 1972–76. The expansion of accelerated depreciation allowances in the early seventies in terms of degree and industry coverage must have had a very biased effect on investment toward the capital-intensive sectors and techniques.

Turning to the cost of capital goods, we see that the tariff law has allowed duty-free imports of basic plant facilities and equipment for important industries since 1949. On the basis of this law, imports of machinery for export production received a tariff exemption from 1964 until 1974, when the tariff exemption system was changed into a deferred payment system on an installment basis. Capital goods imported for foreign investment projects in Korea have also been exempted from tariffs since 1960.

During 1953–66, about one-third of gross fixed capital formation was in the form of electrical and nonelectrical machinery and transportation equipment, compared with about 40 percent for 1967 to 1975. Of this machinery component, according to the BOK's input-output tables, the import content was as high as 73 percent in 1963 and 71 percent in 1973.

In the fifties, imports of capital goods were mostly financed by United States project assistance and partly by nonproject assistance. Official exchange rates were applied to project assistance imports, and hence imported capital goods were underpriced to the extent that the domestic currency was overvalued. In the sixties, however, an increasing proportion of imports was financed with nonaid funds. In addition, repeated devaluations eliminated the excessive overvaluation of domestic currency. Hence the subsidy on imported capital goods during this period consisted mainly of tariff exemption and subsidized financing of the imports by domestic or foreign loans.

Since a large part of capital goods was imported duty-free for either export production (until 1974), key industries, or foreign investments, the amount of duties actually collected on machinery imports amounted to only about 4 or 5 percent of the aggregate c.i.f. value during 1966–74, while that on electrical machinery was 8–12 percent before 1971 and between 3 and 4 percent after 1973. Duties actually collected on transport equipment amounted to about 7–11 percent before 1971 and 4–5 percent after 1972.

The absolute value of tariff exemptions per annum on capital goods imports was some $30 to $50 million during 1966–67, about $100 to $135 million during 1968–72, and about $140 to $150 million during 1973–74 (in 1970 prices). These exemptions were equivalent to approximately 5 percent of annual gross fixed capital formation in Korea.

8.4.2   Allocation of Domestic Bank Credit

During 1953–76, interest rates on bank loans (and savings) were usually kept extremely low compared with those on curb market loans. Although low interest rates raise the present value of the yield from real investments relative to their costs, the volume of such investments was necessarily restricted by credit rationing. It was this credit rationing that provided a financial subsidy to export production.

Credit rationing took the form of low-interest loans, both short-term and long-term, given by ten specialized government-operated banks and five nationwide commercial banks.[8] Short-term loans for export financing were provided within the limit specified by the BOK per dollar of exports at an interest rate of 13.8 to 9.13 percent per annum during 1960–63, 8.03 to 6.5 percent during 1963–67, 6 percent during 1967–73, and 7 to 9 percent since May 1973. The financial institutions could obtain rediscounts from the BOK on export loans they provided for foreign-

exchange-earning activities at an interest rate of 10.22 to 5.48 percent during 1960–63, 4.38 to 4.5 percent during 1963–64, and 3.5 percent since June 1964.

Because exports have increased rapidly and steadily and because short-term export credit is provided automatically as a fixed proportion of the export value, the net annual increase in export credit has also expanded rapidly. The average annual increase in export credit was equivalent to 16 percent of the increase in the money supply and 34 percent of that in bank notes issued during 1962–69. During 1970–76, however, these percentages rose to about 40 percent and 90 percent, respectively.

According to BOK data on loans for exports, the share of such short-term loans in total loans provided by the Deposit Money Banks (DMB) and the Korea Development Bank (KDB) increased from about 3 percent in 1961–66 to about 6 or 7 percent in 1967–72 and to between 12 and 13 percent in 1973–76. At the same time the share of long-term loans for export production increased from about 1 to 3 percent in 1965–70, to between 8 and 9 percent in 1973–76. According to these data, loans for exports were mostly short-term in the sixties, but long-term loans for investment in export production began to increase rapidly in the early seventies, so that nearly 40 percent of loans for exports were long-term by the mid-seventies. The BOK data on long-term loans for exports consisted mostly of loans by Medium Industry Bank (based on medium industry export promotion fund) and foreign currency loans by foreign exchange banks.[9] However, since all DMB and KDB loans have been allocated among industries according to the "Regulations on Loan Funds," which gave preferential treatment to export businesses, the BOK data do not seem to adequately approximate the "long-term" financial support for export production in Korea.

8.4.3   Encouragement of Foreign Loans and Investments

Faced with the prospect of declining United States grants-in-aid, the first serious efforts to attract foreign loans and investments were made in 1960. The Foreign Capital Inducement Law of 1966 allowed foreign, or joint, direct investment, capital and technology inducement, and foreign cash borrowing. Foreign investment earnings (as well as royalty earnings from technology inducement) were entitled to complete exemption from income and corporation tax for the first five years, a two-thirds exemption for the following two years, and a one-third exemption for the next year. Capital equipment imported for foreign-investment businesses was also exempted from tariffs. Furthermore, the law granted a complete income tax exemption on interest earnings arising from foreign loans since 1963, and no limits were placed on conversion and remittance of legitimate profits and dividends. The government has also

provided guarantees of repayment and repatriation to foreign lenders and investors since 1962.

Although the volume of bank loans increased greatly after the interest rate reform in 1965, the banks still could not meet the full demand for loan funds. The main long-term lending institution was the Korean Reconstruction Bank, which depended on limited government fiscal funds and repayments of past loans. Private enterprises, in the absence of well-developed institutional arrangements for equity financing and in light of the shortage of funds for long-term loans and high interest rates on short-term funds, were very much inclined to look abroad to finance their capital expansion needs. The government met their demand by opening doors to external credit from private sources and by continuing to encourage private borrowing from abroad (Cole and Lyman 1971, p. 81).

According to the Foreign Capital Inducement Law, the Economic Planning Board (EPB) minister could approve foreign loans to business if they would contribute significantly to improving the balance of payments position and the development of key industries, public enterprises, and projects specified in the economic development plan. The Korea Development Bank actually guaranteed the repayment in won, and the Bank of Korea assured convertibility of the won into foreign exchange. All such guarantees required the formal approval of the National Assembly until 1966.

Approval of private loans increased rapidly after the government introduced a system of repayment guarantees by the commercial banks in 1966 that bypassed the need for review and approval by the National Assembly. Government repayment guarantees are limited to loans to large-scale key national industries, which are regarded as difficult for a commercial bank to guarantee. Since very little foreign borrowing could be arranged without a repayment guarantee, the foreign loan guarantees gave the government, and particularly the EPB, which assumed the main responsibility for approval, a means of controlling the kinds of investment and loans being undertaken.

The total inflow of foreign investment (on an arrival basis) to the end of 1976 was $0.7 billion, contrasted with cumulative foreign loans to that time of about $6.4 billion. As these numbers make clear, foreign investment was small relative to foreign borrowing.

8.4.4   Interest Rate Subsidies on Capital Use

Table 8.14 provides information on loans and real interest rates for 1957–76. The major sources of loans in Korea were DMB loans, KDB loans, private and government foreign borrowing, and curb loans. The DMB loans constituted about 40–50 percent of total loans (as measured by year-end balances) during 1964–75. The share of KDB loans

Table 8.14   **Loans and (Weighted Average) Real Interest Rates**

	DMB Loans[a]		KDB Loans[a]		Curb Loans		Private Foreign Borrowing		Government Foreign Borrowing	
	Amount[b] (Billion Won)	Interest Rate (%)	Amount[b] (Billion Won)	Interest Rate (%)	Amount[b] (Billion Won)	Interest Rate (%)	Amount[b] (Million Dollars)	Interest Rate (%)	Amount[b] (Million Dollars)	Interest Rate (%)
1957	10.9		9.2				—		—	
1958	15.9		10.5				—	2.7	—	
1959	18.3		14.1				2.1	22.1	—	
1960	24.3		15.9				2.0	92.1	1.1	19.9
1961	32.7	0.1	20.3				1.7	92.1	2.1	90.0
1962	44.8	4.0	24.3	−1.0	—	—	1.5	−1.8	8.1	−2.4
1963	49.4	−7.5	27.6	−12.3	—	31.9	19.8	−15.0	32.1	−18.1
1964	49.9	−21.3	31.7	−26.2	11.7	27.2	36.0	35.6	43.0	32.6
1965	67.1	6.2	36.8	−0.8	20.4	48.9	60.3	19.8	53.8	16.4
1966	95.6	12.5	46.6	2.9	22.6	49.8	161.7	−1.3	114.5	−4.5
1967	168.4	15.4	52.4	6.1	38.9	50.1	288.7	−0.5	188.1	−3.9
1968	315.9	13.4	66.4	4.6	78.2	47.9	517.1	−0.8	292.8	−4.3
1969	540.4	13.9	96.1	5.4	112.1	44.5	829.3	3.1	433.7	−0.4
1970	682.1	8.4	129.0	3.3	181.6	40.6	1,039.6	5.4	576.7	1.7
1971	865.0	7.8	157.5	3.8	218.4	37.8	1,256.2	9.5	886.6	6.0
1972	1,125.6	3.7	239.1	−4.1	204.2	25.0	1,412.5	5.8	1,335.1	2.5
1973	1,492.8	7.0	318.5	2.8	246.4	26.4	1,720.5	2.3	1,790.2	−1.6
1974	2,303.9	−28.1	425.7	−32.4	323.6	−1.5	2,125.9	−32.0	2,112.0	−36.3
1975	2,751.6	−12.9	577.8	−15.3	408.4	14.8	2,766.9	0.0	2,548.2	−2.9
1976	3,552.1	1.6	739.0	−0.8	—	28.4	3,180.3	−5.1	3,168.4	−7.3

Source: Hong (1977).

Note: Real interest rates on domestic loans were computed by subtracting the rates of increase in the wholesale price index from nominal interest rates. Real interest rates on (private or government) foreign borrowing were computed by taking account of the rate of devaluation in Korea as well as the rate of change in the domestic wholesale price index.

[a]DMB = Deposit Money Banks; KDB = Korean Development Bank.

[b]Loans are amounts outstanding at end of year.

amounted to about 20–30 percent of total loans during 1964–66, but their share was reduced to about 10 percent thereafter. The share of foreign loans was negligible until 1962, but it has rapidly increased to about 30–40 percent of total outstanding loans in Korea since 1966. The share of curb loans, admittedly underestimated, amounted to about 11 percent of total loans during 1964–71 and about 7 percent during 1972–75.[10]

The weighted average real interest rate on DMB loans reached its peak of 15 percent in 1967, then steadily declined to become negative in 1974. The real rate on KDB loans was almost always negative except during 1966–71. Taking account of the devaluation effect, the real interest rate on private foreign borrowing was about 8 percent during 1962–66, 3 percent during 1967–71, and −6 percent in 1972–75. The interest rate on foreign borrowing by the government was estimated to have averaged about 5 percent during 1962–66, about zero percent during 1967–71, and about −10 percent during 1972–75.

To estimate the magnitude of subsidies on capital use, we need to have some idea of the real opportunity cost of capital use. For this purpose, I have attempted to estimate the aggregate as well as sectoral rates of return on capital in Korea by dividing the aggregate or incremental amount of national income that can be attributed to capital by the total or incremental stock of capital. The return on nonlabor factors in the business-accounting sense can indicate how much a unit of capital can earn in Korea under the existing pace of technical progress and scale economies, the average quality of entrepreneurship, the existing power structure among factor owners and institutional arrangements, the natural resource endowment, and the general business climate. Since the returns on nonlabor include returns on physical capital, technical progress, economies of scale, market imperfection, and entrepreneurship, what we will call the "rate of return on capital" represents the rate of return on all factors but labor. We presume indivisibility among these nonlabor factors of production. The value added may or may not include the depreciation allowance or indirect taxes or both depending on the selected estimate of the value-added/fixed-capital ratio.

From the estimates shown in table 8.15, and using (per footnote *a* to the table) the results for the primary sector when land is included in total fixed capital stock, we can observe that the real rate of return on capital has been very high in manufacturing, relatively low in agriculture and services, and lowest in the social overhead sector. Artificially low prices in this last sector seem to have enhanced rates of return in other sectors, especially in manufacturing. In any case, such marked differences in the rate of return on capital among sectors may explain the rapid expansion of manufacturing, the moderate decline in the service sector, and the drastic decrease in the share of GNP contributed by

Table 8.15   **Estimates of Sectoral Rates of Return on Capital: 1954–75 (Percentage)**

Annual Average	Ratio of Net Nonlabor Value Added to Net Capital				Ratio of Gross Nonlabor Value Added to Gross Capital			
	Primary[a] Sector	Manu-facturing	Social Overhead Sector	Service Sector	Primary[a] Sector	Manu-facturing	Social Overhead Sector	Service Sector
	Applying Net Incremental VA/I Ratios at Market Price				*Applying Gross Incremental VA/I Ratios at Market Price —Type IV*			
1954–61	291	37	9	63	161	25	10	15
1962–66	292	47	10	31	172	38	12	14
1967–71	43	62	7	28	31	47	8	21
1972–75	27	108	6	14	20	54	8	10
	Applying Net-VA/Net-K-Stock Ratios at Market Price				*Applying Gross-VA/Gross-C-Stock Ratios at Market Price —Type III*			
1954–61	170	24	5	10	118	18	5	9
1962–66	153	31	7	13	102	23	6	10
1967–71	115	41	7	17	77	31	7	13
1972–75	82	60	6	18	56	39	7	13
	Applying Net Incremental VA/I Ratios at Factor Cost				*Applying Gross Incremental VA/I Ratios at Factor Cost —Type II*			
1954–61	291	23	6	41	160	17	8	10
1962–66	292	26	6	23	172	26	10	11
1967–71	43	38	5	19	31	32	6	15
1972–75	27	64	5	8	20	36	6	7

Table 8.15—continued

	Ratio of Net Nonlabor Value Added to Net Capital				Ratio of Gross Nonlabor Value Added to Gross Capital			
Annual Average	Primary[a] Sector	Manu-facturing	Social Overhead Sector	Service Sector	Primary[a] Sector	Manu-facturing	Social Overhead Sector	Sector Service
	Applying Net-VA/Net-K-Stock Ratios at Market Price				*Applying Gross-VA/Gross-C-Stock Ratios at Factor Cost —Type I*			
1954–61	1,701	15	4	7	118	12	3	7
1962–66	152	19	5	9	102	15	5	7
1967–71	115	25	5	12	77	20	6	9
1972–75	82	26	5	12	55	26	6	9

Source: Hong (1977).

Note: VA stands for value added, I for investment, K for net capital, and C for gross capital. The computations are made by applying non-labor shares in value added in 1970. See text for further details.

[a]The estimated average annual real rates of return on capital in the primary sector as shown in the table are extremely high because the value of land is excluded from total fixed capital stock. If land is included in total fixed capital stock, based on the Farm Household Economy Survey data, the rate of return on capital in the primary sector would be, at most, 17 to 20 percent during 1966–73. This range in the rates of return is more realistic.

agriculture. It may also explain the need for government direct invest-
ment in the social overhead sector.

The estimated rates of return to capital based on net value added
versus net capital (left-hand side of table 8.15) are much higher than
those based on a nondepreciating capital assumption. Since the so-called
allowance for consumption of fixed capital stock is a legal concept that
does not accurately reflect the actual depreciation, the "net" investment
figure may have grossly underestimated the real amount of capital. To
be on the conservative side, I decided to use the estimates based on
gross-value-added/gross-capital ratios (right-hand side of table 8.15) to
approximate the rate of return on capital. There are four such sets of
estimates, two including indirect taxes and two excluding them. In the
case of manufacturing, I took the set estimated at market prices (i.e.,
including indirect taxes) and incremental ratios as a possible upper
limit (type IV) and the set estimated at factor cost and stock ratios as
a possible lower limit (type I) for the real opportunity cost of capital
in the manufacturing sector. The other two sets (types II and III) are
fairly similar to each other and may be regarded as medium-level esti-
mates for the rate of return on capital.

Taking type II estimates in table 8.15 for manufacturing and type III
estimates for the service and social overhead sectors, I also estimated
the weighted average rate of return on capital in all nonprimary sectors
combined. I took the gross sectoral fixed capital stock as weights. Since
there are many different sets of estimates for sectoral rates of return, the
specific set selected for the computation was based on my subjective
judgment of what may be regarded as reasonable estimates. So com-
puted, the rate of return in Korean industries as a whole increased from
about 11 percent in 1954–62 to about 15 percent in 1967–75. Con-
sidering the estimated rate of return on capital in agriculture including
land, it does not seem likely that the rate of return in the primary sector
could deviate wildly from these weighted average rates of return in the
nonprimary sectors.

Next, I estimated the average real rates of return on fixed capital in
manufacturing, using various methods depending upon the treatment of
net working capital and capital loss. The results are shown in table 8.16.
Using the type II estimate and taking account of capital loss, the esti-
mated real rate of return was 12 percent in 1954–61, about 17 percent
during the First Five-Year Plan period, 26 percent during the Second
Five-Year Plan period, and about 27 percent during the Third Five-
Year Plan period. This striking increase implies that the use of large
amounts of domestic and foreign borrowed capital at low interest rates
has yielded extremely high rates of return on equity investment in
Korean industries. On the basis of the above estimates we can approxi-
mate the total amount of interest rate subsidies associated with bank

loans and foreign borrowings in Korea by subtracting the real (weighted average) interest rates on these loans from the real (average) rate of return on capital.

To get some idea of the aggregate magnitude of interest subsidies, I estimated the ratio of the total interest subsidy associated with domestic and foreign loans in the manufacturing sector to the total (gross or net) fixed capital stock in the manufacturing sector. The results are shown in table 8.17. The ratio of the subsidy to net stock was about 4 percent on the average during 1957–61 and about 6 percent during 1962–66. Between 1967 and 1971 it reached approximately 14 percent, and since 1972 it has exceeded 25 percent. The most remarkable fact is that, although the absolute amount of interest subsidies associated with foreign loans was negligible before 1966, after that it was equivalent to more than half the total amount of interest subsidies associated with KDB and DMB loans together. Moreover, the ratio of the interest subsidy to

Table 8.16   **Estimated Real Rates of Return on (Opportunity Cost) Capital Use in Manufacturing (Percentage)**

	Excluding Indirect Taxes		Including Indirect Taxes	
	Based on VA/C-Stock (Type I)	Incremental VA/I (Type II)	Based on VA/C-Stock (Type III)	Incremental VA/I (Type IV)
Annual Average	Possible Lower Limit	Possible Medium Range		Possible Upper Limit
Without Taking Account of Net Working Capital				
1954–61	13	17	17	25
1962–66	16	26	22	37
1967–71	20	32	31	47
1972–75	30	42	42	57
Taking Account of Net Working Capital				
1954–61	10	13	13	19
1962–66	12	20	17	29
1967–71	17	27	26	39
1972–75	25	35	35	48
Taking Account of Capital Loss				
1954–61	9	12	12	18
1962–66	9	17	14	26
1967–71	16	26	25	38
1972–75	17	27	27	40

Source: Hong (1977).

Note: Gross value added to gross capital ratios were used assuming nondepreciating capital stock. The type II estimate might be interpreted as representing marginal rate of return on reproducible (but nondepreciating) capital, and the type III estimate the average rate of return in manufacturing.

Table 8.17   **Estimated Rate of Interest Subsidy Associated with Domestic and Foreign Loans to the Manufacturing Sector (Millions of 1970 Dollars and Percentage)**

	Total Fixed Capital Stock		DMB and KDB Loans				Total Foreign Borrowing			
Year	Gross (C)	Net (K)	Total Loans	Subsidy Rate (%)	S/C (%)	S/K (%)	Total Loans	Subsidy Rate (%)	S/C (%)	S/K (%)
1957	972	647	124	12	2	2	—	—	—	—
1958	1,047	697	193	13	2	4	—	—	—	—
1959	1,110	735	236	13	3	4	3	9	0	0
1960	1,177	772	250	13	3	4	2	−10	0	0
1961	1,243	813	259	13	3	4	2	−80	0	0
1962	1,331	869	307	15	3	5	5	19	0	0
1963	1,447	936	257	27	5	7	27	32	1	1
1964	1,560	987	216	40	6	9	44	−18	−1	−1
1965	1,718	1,072	291	14	2	4	55	−2	0	0
1966	1,985	1,273	365	7	1	2	156	19	2	2
1967	2,251	1,456	501	13	3	4	273	27	3	5
1968	2,608	1,682	819	14	4	7	419	27	4	7
1969	3,013	1,918	1,168	13	5	8	514	23	4	6
1970	3,428	2,138	1,242	19	7	11	659	21	4	6
1971	3,852	2,351	1,437	19	7	12	624	16	3	6
1972	4,269	2,458	1,693	24	10	17	963	21	5	8
1973	5,036	2,809	2,234	21	9	17	977	26	5	9
1974	5,663	2,994	2,843	55	28	53	1,037	59	11	20
1975	6,361	3,190	2,743	40	17	35	1,286	27	5	11

Source: Hong (1977).
Note: S represents the amount of loans multiplied by subsidy rate; that is, the amount of interest subsidy.

(gross) capital stock has been steadily increasing from a moderate 3–4 percent before 1962 to more than 14 percent during the Third Five-Year Plan period (1972–76). The ratio of the interest subsidy to gross fixed capital formation in manufacturing increased from about 40 percent during 1962–66 to about 75 percent during 1967–71 and to more than 100 percent after 1972.[11]

8.5   Employment Implications of Trade and Subsidy Policies

8.5.1   Employment Growth in Korea

As I mentioned in section 8.1, the population fourteen years old and over, which represents Korea's potential labor force, increased by nearly 50 percent from 1963 to 1976 (i.e., from 15.7 million to 22.6 million). During the same period, the total number of employed persons in Korea increased by nearly 64 percent, implying an average annual growth rate of about 4 percent. The total number of employed males increased by about 3.5 percent per annum, while the number of employed females increased by nearly 5 percent per annum on the average. As a result, the labor force participation rate of males stayed at about 74–76 percent throughout the period 1963–76, while that of females steadily increased from about 36 percent in 1963 to about 42 percent in 1976. Although the annual growth rate of total employment was only about 1 percent higher than that of the total potential labor force from 1963 to 1976, there was a rapid transfer of labor from relatively less productive to more productive forms of employment. Moreover, there was a significant rise in the absolute level of productivity in the former.

The number of employed persons in manufacturing increased from 0.6 million in 1963 to 2.7 million in 1976, implying an average annual growth rate of about 12 percent (see table 8.7). Total male employment in manufacturing increased by about 11 percent per annum (from 0.43 million to 1.66 million), while female employment increased by about 14 percent per annum (from 0.18 million to 1.02 million). The number of employed persons in the service and social overhead sectors increased by about 5.5 percent per annum (about 5 percent for males and 6 percent for females). On the other hand, employed persons in the primary sectors increased by only about 1.2 percent per annum (about 0.5 percent per annum for males and 2.0 percent for females).[12]

The most noteworthy trend in employment was therefore an extremely rapid increase in the number of employed persons in manufacturing accompanied by a very slow increase in the primary sectors. Another important trend was the more rapid expansion in female employment than in male employment in every industrial sector in Korea.

According to data from the census of manufactures, the annual real wage rate in manufacturing (in 1970 United States dollars) increased

from $373 in 1966 to $569 in 1971 (an average growth rate of 9 per-
cent per annum) and to $683 in 1975 (an average growth rate of 5
percent per annum) (see table 8.18). On the other hand, possibly owing
to rapid capital accumulation and technical progress in the agricultural
sector, farm income per worker increased from about $224 in 1966 to
$352 in 1971 (average growth rate of 10 percent per annum) and to
$447 in 1975 (average growth rate of 6 percent per annum). Hence
one may attribute the rapid increase in the wage rate in manufacturing
to capital accumulation in manufacturing and the associated increase
in labor productivity that was sustained by a rising minimum wage floor
(such as Lewis proposes) via the rising average product of farm work-
ers. Furthermore, there was a significant decrease, especially after 1972,
in the ratio of urban to rural earnings in Korea, as may be seen in table
8.18.

8.5.2   Subsidies and Composition of Output and Trade

During 1957–75, the share of loans allocated to the agricultural and
service sectors in total loans (total KDB, DMB, and foreign loans) was
much smaller than the share of these sectors in GNP, while the reverse
was true of the manufacturing and social overhead sectors. On the other
hand, the relative contributions of agriculture and the service sector to
GNP declined, while the proportion of GNP arising from manufacturing
increased from 9 percent in 1957 to 32 percent in 1975 and that from
the social overhead sector rose from 3 percent in 1957 to 9 percent in
1975 (see table 8.19). Hence one can easily detect what seems to be a
close association between the pattern of loan allocations and shifts in
the industrial structure.

Among the manufacturing industries (as may also be seen in table
8.19), the food products sector received very small loans in relation to
its share in total manufacturing output, while the chemical sector (in-
cluding petroleum refining and fertilizer) received a very large share of
loans over the period 1957–75. The share of the food products sector
in total manufacturing output declined from about 40 percent in 1957
to about 20 percent in 1975, while that of chemicals expanded from
about 4 percent in 1957 to about 14 percent in 1975.

On the whole, one may conclude that there was a positive association
between the pattern of loan allocations and the shifts in the industrial
structure, with the exceptions of the mining sector and, to a lesser extent,
the paper, nonmetallic mineral, basic metals, and metal products manu-
facturing sectors. These exceptional cases are explained in terms of
Korea's limited mineral endowments and the extremely capital-intensive
production techniques of these sectors.

For exports there is a drastic fall in the share of agricultural and
mining products and a rapid increase in the share of manufactures in

Table 8.18   **Differences in Urban-Rural Earnings (1970 Dollars and Percentage)**

Year	Farm Income per Worker A (dA/A)		Wage Rate for Farm Employee B (dB/B)		Wage Rate in Manufacturing Census Data C (dC/C)		Office of Labor Data D (dD/D)		Ratio of Urban to Rural Earnings C/A	C/B
1962	225	(—)	220	(—)						
1963	256	(14%)	210	(−4%)			334	(—)		
1964	255	(0%)	250	(19%)			308	(−8%)		
1965	218	(−15%)	190	(−24%)			338	(10%)		
1966	224	(3%)	170	(−10%)	373	(—)	348	(3%)	1.7	2.2
1962–66 average		(1%)		(−5%)				(2%)		
1967	225	(0%)	200	(18%)	405	(9%)	375	(7%)	1.8	1.9
1968	251	(12%)	230	(15%)	449	(11%)	424	(13%)	1.8	1.9
1969	273	(9%)	260	(13%)	495	(10%)	502	(19%)	1.8	1.9
1970	283	(4%)	270	(4%)	532	(7%)	563	(12%)	1.9	2.1
1971	352	(24%)	300	(11%)	569	(7%)	601	(7%)	1.6	2.0
1967–71 average		(10%)		(12%)		(9%)		(12%)		
1972	363	(3%)	300	(0%)	563	(−1%)	608	(1%)	1.6	2.0
1973	378	(4%)	350	(17%)	635	(13%)	617	(1%)	1.7	1.8
1974	429	(13%)	380	(9%)	632	(0%)	659	(7%)	1.5	1.7
1975	447	(4%)	412	(9%)	683	(8%)	674	(2%)	1.5	1.6
1976	513	(15%)	451	(10%)			785	(16%)		
1972–76 average		(8%)		(9%)		(5%)		(5%)		

Source: Ministry of Agriculture and Fisheries, *Report on the Results of Farm Household Economy Survey*; Economic Planning Board, *Report on Mining and Manufacturing Census (or Survey)*; Bank of Korea, *Economic Statistics Yearbook*.

Note: GNP deflator for all industries and the exchange rate of 310.6 won per dollar were applied to get 1970 dollar values.

Table 8.19   Sectoral Share in Value Added, Loans, and Exports

Sector	Share in Total Value Added		Share in Total Loans	Loan Share vs. Value-Added Share	Share in Total Exports		
				1957–75			
	1957	1975	1957–75	(4)	1960	1970	1975
	(1)	(2)	(3)	(3)/(1)	(5)	(6)	(7)
GNP[a]	3,266[d]	13,295[d]					
Total loans[b]			2,665[d]				
Total exports[c]					91.1[d]	1,208.7[d]	3,932.3[d]
Agriculture	42.4%	18.6%	7.5%	0.18%	12.1%	2.4%	1.8%
Fisheries	1.9	3.0	2.6	1.37	4.1	4.2	4.2
Mining	1.0	1.0	2.0	2.00	10.9	3.2	0.9
Social overhead sector	2.9	9.0	17.7	6.10	24.1	12.0	9.1
Service sector	42.4	36.3	14.9	0.35	22.5	9.9	9.5
Manufacturing	9.3	32.1	47.7	5.13	23.8	61.9	74.5
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%
Food products	39.6%	20.8%	8.7%	0.22%	24.2%	7.3%	7.4%
Textiles	25.1	13.4 ⎫			23.7	26.4	12.5
Wearing apparel	7.1	15.3 ⎬	23.5 ⎫⎬	0.70	1.6	16.7	22.7
Leather	1.2	3.3 ⎭			1.1	0.4	3.8
Wood products	3.3	1.6	4.6	1.39	3.8	12.0	5.0
Paper and products	0.7	1.8	3.9	5.57	1.1	0.5	0.6
Rubber products	1.5	1.3 ⎫			8.1	2.7	4.7
Fertilizer	—	1.7 ⎬	24.4 ⎫⎬	4.78		0.8	0.0
Other chemicals	2.7	6.2 ⎬			5.4	1.2	1.9
Petroleum and coal	0.9	5.7 ⎭				3.7	2.7

Table 8.19—*continued*

Sector	Share in Total Value Added		Share in Total Loans	Loan Share vs. Value-Added Share	Share in Total Exports		
	1957 (1)	1975 (2)	1957–75 (3)	1957–75 (4) (3)/(1)	1960 (5)	1970 (6)	1975 (7)
Nonmetallic minerals	2.5	3.7	7.4	2.96	3.2	1.3	2.2
Basic metals	1.0	2.7	8.3	8.30	4.3	2.4	5.4
Metal products	1.3	1.2	⎫	⎫	0.5	1.8	2.5
Machinery	2.0	1.1	⎬ 13.7	⎬ 1.90	2.7[d]	0.4	0.9
Electrical machinery	1.0	8.9	⎬	⎬	5.9[d]	6.2	12.3
Transportation equipment	2.9	5.9	⎭	⎭	5.4[d]	0.7	4.0
Miscellaneous manufacturing	7.3	5.4	5.6	0.77	10.2	16.3	11.3
Total	100.0%	100.0%	100.0%		100.0%	100.0%	100.0%

Source: Bank of Korea, *National Income in Korea*; Bank of Korea, *Input-Output Tables of Korea*; Hong (1977).

[a]Includes foreign sector.

[b]Annual average of total KDB, DMB, and foreign loans.

[c]Includes unclassifiable exports.

[d]Millions of dollars.

[e]Mostly reexports.

total exports during 1957–75. Among manufactured exports, the share of food products declined most rapidly, while that of electrical machinery (mostly electronic products) and wearing apparel expanded most rapidly. There was a significant expansion in exports of metal products, but there was no matching expansion of their share in total manufacturing output, which may reflect the fact that their exports were heavily dependent on imported intermediate input materials such as hot coils for steel sheets and pipes.

The shares of textiles and miscellaneous manufactures in total manufactured exports increased significantly in the sixties. However, loans to these industries were not commensurate with their shares in total output. Their share in total exports started to decline in the seventies. The expansion of exports of textiles, wearing apparel, and miscellaneous manufactures can be attributed more to the basic comparative advantage of Korea (i.e., low wages) than to subsidized interest rates associated with bank loans.

The share of basic metals, metal products, and electrical machinery sectors in total loans was relatively large, and their exports expanded rapidly in the early seventies. Since Korea mostly took care of the very labor-intensive "final-touch" (or assembling) processes, their export expansion may be attributed to both the low wage level and the availability of subsidized loans.

Although, as I noted above, the rapid expansion of the chemical sector's output in the sixties may be attributed to the allocation of a large amount of subsidized loans, there was no matching expansion of the sector's share in total exports. There was also a relatively large loan allocation to the nonmetallic mineral products sector, and its share in exports even declined. Hence the allocation of subsidized long-term loans to these extremely capital-intensive and inefficient sectors has contributed mostly to import substitution rather than to export expansion, as indicated by the rising proportion of value added in these industries as shown in table 8.19.

Other industries which received a large proportion of loans are steel sheets and plates, chemical fibers, and ships. They are moderately capital-intensive products. In these industries there was not only a substantial output expansion, but also significant increases in their export/output ratios. This may be attributed to the pattern of loan allocations in Korea during 1957–75. Most of these sectors could not be regarded as major export sectors of Korea in the early seventies, and yet the absolute amount of exports of these products has significantly increased over the period, which surely accelerated the rising trend in capital intensity of Korea's export commodity bundle.

8.5.3   Interest Rate Subsidies and Allocation of Capital

The data summarized in table 8.20 provide a basis for examining the association between changes in the wage/rental ratio and changes in the capital/labor ratio in manufacturing as well as in the entire industrial sector. Associative relationships of this type cannot, of course, be used as proof of causality, but the empirical relationships between changes in factor supplies, factor prices, and employment, in the aggregate, over time, are highly suggestive.

During 1967–73 the real wage rate increased by about 13 percent per annum on the average, while the weighted average interest rates on total KDB, DMB, curb, and foreign loans for all industries decreased by about 12 percent per annum.[13] This implies an average annual increase in the wage/rental ratio for all industries of approximately 25 percent.[14]

On the other hand, fixed capital stock for all industries increased by about 13 percent annually during 1967–73 on the average, while the total number of employed persons increased by about 4 percent annually. This implies an average annual increase in the capital/labor ratio for all industries of about 9 or 10 percent and an "elasticity of factor substitution" of about 0.4.[15]

According to the manufacturing census data, the average annual growth rate of fixed capital stock in manufacturing was about 19 percent between 1967 and 1973. Since the total number of workers in manufacturing increased by about 9 percent per annum, the capital/labor ratio increased by about 10 percent per annum, implying an elasticity of substitution of approximately 0.4.[16]

The numerical results outlined above clearly demonstrate that the wage/rental ratio rose during the period of export-oriented growth in Korea. A basic question, however, is whether the wage/rental ratio rose in response to increasing demand for labor or whether, instead, the rise in the wage/rental ratio precluded additional employment and prevented its growth.[17] That the former was more likely can be seen from the following demonstration. Suppose that the interest rate had not fallen after 1967 and instead had remained at the 12.5 percent level for all industries during the period. Assuming that both the fixed capital stock for all industries and the wage rate increased by about 13 percent annually during this period (as they actually did) the elasticity of substitution of 0.4 implies that employment would have had to increase by nearly 9 percent per annum instead of the actual 4 percent per annum. This implies that total employment in Korea would have increased by nearly 70 percent rather than 30 percent over this period, implying at least an additional 3.0 million extra persons employed. With this line of reasoning, one can go on to argue that, if the Korean government had

Table 8.20   **Rate of Change in Wage and Rental, 1967–73**

| | Real Annual Wage Rate in Manufacturing | | | | Average Real Interest Rate on Loans | | Wholesale Price Index | |
| | Office of Labor Data | | M and M Census Data | | | | | |
	GNP Deflator (1970 $)	Manu-facturing Deflator (1970 $)	GNP Deflator (1970 $)	Manu-facturing Deflator (1970 $)	All Industry (%)	Manu-facturing (%)	All Commodities (1975 = 100)	Capital Goods (1975 = 100)
1967	$375	$329	$405	$335	12.5%	16.2%	33.4	44.6
1973	$617	$668	$635	$687	5.5%	8.4%	55.6	70.2
Average annual percentage change in 1967–73	9%	13%	8%	12%	−12%	−10%	9%	8%

Fixed Capital Stock (Million 1970 Dollars)

| | (Han-BOK Data) | | | | M and M Census Data | | Number of Workers (Thousand Persons) | |
| | All Industries | | Manufacturing | | Manufacturing | | | |
	Gross	Net	Gross	Net	Gross	Net	All Industries	Manu-facturing
1967	10,217	6,637	2,251	1,456	1,634	1,062	8,717	1,021 (649)*
1973	21,315	14,253	5,036	2,809	4,579	3,167	11,139	1,774 (1,153)*
Average annual percentage change	13%	14%	15%	12%	19%	20%	4%	10% (10%)
Change in 1969–75	(12%)	(12%)	(14%)	(9%)	(19%)	(20%)	(4%)	10% (10%)

Source: Hong (1977).

Note: Figures with asterisks were obtained from the mining and manufacturing census data, which cover establishments with more than five workers. Other employment figures were obtained from the EPB's quarterly survey data.

tried to raise the weighted average interest rates on total loans to the manufacturing sector from 16.2 percent in 1967 to the estimated real rate of return on capital of about 26 percent by 1973, the real interest rate could have increased by about 8 percent instead of falling by 10 percent during 1967–73. This would imply only an approximate 4 percent increase in the wage/rental ratio per annum instead of 22 percent (applying census data). The annual rate of employment growth would then have been roughly 7 percent greater than the actual rate in manufacturing, using the 0.4 elasticity, implying about 50 percent more employment in manufacturing during 1967–73.

That this could not have happened is evident from the facts on labor force participation rates and unemployment in Korea. Even the differential in urban/rural earnings has been declining since 1970. Estimated unemployment rates in the early 1970s were very low—generally less than 5 percent of the labor force. Thus, employment has been relatively full in Korea since the early 1970s, and government policies that have affected the interest rate on loans cannot have affected the level of employment as significantly as demonstrated in the above numerical exercises.

What, then, have been the principal effects of interest rate subsidies in Korea? First, Korea could have achieved "full employment" instead of "relatively full employment" by the early seventies if there were no interest subsidies. The second point is related to the optimum utilization of capital. My results show that Korea has oversubsidized the use of capital since the late 1960s (as may be seen from tables 8.15, 8.16, and 8.20), when the real rates of return on capital began to exceed the real interest rates on loans. It seems evident that, during the early period of the export promotion drive, new investments were primarily in the labor-intensive export industries and the efficiency of allocation of resources was rapidly increasing. However, with the interest rate subsidies, some capital-intensive investments were undertaken that probably were not yet economical, given Korea's factor endowment at that time. Thus, although Korea's resource allocation in the mid-1970s was undoubtedly more economical than it had been before the export drive started, the subsidies to capital encouraged the development of some industries and the use of some processes that were too capital-intensive. Insofar as that was the case, the demand for labor might have shifted upward even more, with a higher real wage, had the subsidies to capital been eliminated. In terms of employment, however, the narrowing wage differentials between industry and agriculture, combined with the rapid decline in the unemployment rate, both suggest that Korea was at, and remained at, relatively full employment during the early 1970s.

8.5.4   Conclusion

Section 8.3.2 examined changes in the factor intensities of Korea's exports. Their direct plus indirect capital intensity was seen in table 8.13 to have increased during 1966–68 by 2.3 percent owing to shifts in export composition but also by as much as 11 percent owing to sectoral factor substitutions. Moving on to 1970–73, there is a further increase of about 5 percent in the capital intensity of exports owing to shifts in export composition, but a much greater change of about 35 percent owing to factor substitution in production processes. Some of the sectoral capital/labor substitution, as well as shifts in export composition, may be attributed to the increase in per capita capital stock in Korea and the associated rise in the wage/rental ratio. However, a substantial portion of the factor substitution should be attributed to the subsidy on capital use.

A notable fact seems to be that in the 1960s the capital intensity of Korea's exports was much lower than that of the manufacturing sector as a whole, but the difference between the two became smaller thereafter, and by 1975 the former exceeded the latter. This might imply that factor market distortions caused by the export promotion policy were significantly stronger than those caused by the general industrialization policy characterized by extensive subsidized capital financing. We have already seen that employment implications of export promotion and import substitution became approximately equal since the late sixties.

My conclusions on the employment implications of the export-led growth in Korea are as follows. First, there has been a continuous shift in employment from the farm sector to the manufacturing sector, as a direct result of the rapid export-led growth of manufacturing production. In the farm sector this has resulted in a rising real wage rate since about 1967 and a lessening of the difference between urban and rural earnings since about 1970. Second, within the manufacturing sector, capital intensity has been increasing since the early 1960s, with the rate of increase at first higher in import-competing industries than in export industries until the early 1970s, when capital intensity began to rise faster in exports. This has been attributed to the higher rate of capital subsidization in export industries, resulting in the differential increase in the wage/rental ratios. Thus, with this extensive capital subsidization, manufactured exports have not been creating as much employment as they otherwise would have.

A similar conclusion is drawn with respect to the manufacturing sector as a whole vis-à-vis other sectors. But, overall, my results show that Korea began to have relatively full employment about 1970, implying that the growth in total employment could not have been substantially higher even had the wage/rental ratios not increased as much as

they did. Therefore the effect of export promotion on employment in Korea was a rapid growth in total employment in the 1960s, a relatively full employment since about 1970, a change in the sectoral distribution of employment, and higher real wages than would otherwise have been possible.

It should also be noted that deducing the employment effects of trade and subsidy policies in terms of employment growth does not provide an adequate basis for judging the overall efficiency of such policies. For instance, Korea's exports might have been less capital-intensive if there had been no subsidy on capital use, but one might question whether Korea could have expanded its exports (and GNP) so rapidly if it had insisted upon using less capital-intensive production techniques. Slower growth in export earnings might also have resulted in slower growth of the Korean economy as a whole, thus reducing overall employment growth rates.

Appendix

Table 8.A.1   **Persons Employed by Industry (Thousands)**

Year	Primary Sector		Manu-facturing		Social Overhead Sector and Services		Total Employed Persons		Labor Force Participation Rate		Unemployment Rate
									Male	Female	
1963	4,894	(—)	610	(—)	2,158	(—)	7,662	(—)	76.4%	36.2%	8.2%
1964	4,878	(0%)	637	(4%)	2,284	(6%)	7,799	(2%)	75.6%	35.4%	7.7%
1965	4,887	(0%)	772	(21%)	2,547	(12%)	8,206	(5%)	76.6%	36.5%	7.4%
1966	4,956	(1%)	833	(8%)	2,634	(3%)	8,423	(3%)	76.5%	36.2%	7.1%
1967	4,905	(−1%)	1,021	(23%)	2,791	(6%)	8,717	(3%)	76.0%	36.8%	6.2%
1968	4,913	(0%)	1,170	(15%)	3,072	(10%)	9,155	(5%)	76.1%	38.2%	5.1%
1969	4,939	(1%)	1,232	(5%)	3,243	(6%)	9,414	(3%)	76.6%	37.5%	4.8%
1970	5,027	(2%)	1,284	(4%)	3,434	(6%)	9,745	(4%)	75.1%	38.5%	4.5%
1971	4,968	(−1%)	1,336	(4%)	3,762	(10%)	10,066	(3%)	74.2%	38.5%	4.5%
1972	5,400	(9%)	1,445	(8%)	3,714	(−1%)	10,559	(5%)	74.7%	38.9%	4.5%
1973	5,616	(4%)	1,774	(23%)	3,749	(1%)	11,139	(5%)	73.9%	40.8%	4.0%
1974	5,634	(0%)	2,012	(13%)	3,940	(5%)	11,586	(4%)	74.8%	40.6%	4.1%
1975	5,485	(−3%)	2,205	(10%)	4,140	(5%)	11,830	(2%)	74.5%	39.6%	4.1%
1976	5,666	(3%)	2,678	(21%)	4,212	(2%)	12,556	(6%)	74.6%	42.3%	3.9%
1977	5,508	(−3%)	2,798	(4%)	4,623	(10%)	12,929	(3%)	75.9%	40.7%	3.8%

Source: Economic Planning Board, *Annual Report on the Economically Active Population Survey*.
Note: Figures in parentheses show percentage increase over preceding year.

Notes

1. This paper summarizes my study *Trade, Distortion and Employment Growth in Korea*, undertaken while I was at the Korea Development Institute (Hong 1977). The study was partly financed by the Council for Asian Manpower Studies.

2. See Hong (1977) for a detailed list of these incentives. It is remarkable that during the Second Five-Year Plan, a time of unprecedented expansion of exports of labor-intensive light manufactures, the government established a legal foundation to promote the so-called heavy and chemical industries. The government introduced several laws that specified various tax-cum-financial supports for these industries. However, these promotion schemes were not completely implemented until the beginning of the Third Five-Year Plan period (1972–76).

3. The trade program for imports financed with government-held foreign exchange (KFX) has been prepared by the MCI. Imports financed by foreign grants and loans have been programmed separately by the Economic Planning Board (EPB) in consultation with the MCI. The foreign exchange budget has been based on the principles of increasing capacity to repay foreign debts, expanding export industries, and restricting imports of nonessential goods without obstructing the efficient supply of raw materials and goods required for stable economic growth.

4. See section 8.5 for further discussion of the behavior of the wage/rental ratio.

5. This measurement of factor requirements in relation to value of output differs from the methodology followed in most other country studies in this volume, where requirements are expressed per unit of value added.

6. Requirements of both labor and capital in exports were smaller than those in import-competing goods because estimates of the former include, as indirect inputs, only domestically produced intermediates, whereas estimates of the latter also include inputs of (competing) imported goods (see notes to table 8.10 and table 8.12).

7. According to the Han-BOK capital stock data, net capital stock per worker in manufacturing increased only about 15 percent during 1966–71, then fell by 5 percent during 1972–76, and gross capital stock per worker increased about 21 percent over the period 1966–71 but again fell by 25 percent during 1972–76. According to the manufacturing census data, however, both the gross and the net capital stock per worker increased by about 35 percent during 1966–71 and further increased by 30 to 40 percent during 1972–76. The enormous differences between these two sets of data seem to be due to serious problems associated with price conversions and allowance for the consumption of capital. It seems that the Han-BOK data substantially underestimate the magnitude of real capital formation in Korean manufacturing sector throughout the period.

8. The government is the majority stockholder in these banks.

9. The government began to provide foreign currency loans through foreign exchange banks in 1967 in order to finance the importation of capital equipment and raw material to be used in export industries recommended by the MCI. These loans were also provided for import-substituting industries and for government-planned investment projects on the basis of the recommendation of the competent minister. Foreign currency loans were provided mostly with government-held foreign exchange, but the branches of foreign banks stationed in Korea have also provided loans since 1969.

10. In compliance with the August 3 (1972) Presidential Emergency Decree, 40,677 enterprises reported their debts in the form of curb loans, which totaled 345.6 billion won.

11. I also estimated the ratio of the total interest subsidy associated with domestic and foreign loans to total (gross or net) fixed capital stock in all industries in Korea (excluding ownership of dwellings). The ratio to gross or net capital stock increased from about 1–2 percent during 1957–66 to more than 4–5 percent during the Third Five-Year Plan period. The ratio of the interest subsidy to gross fixed capital formation increased from about 20 percent during 1962–71 to more than 35 percent after 1972.

12. For further details, see appendix table 8.A.1.

13. Since our concern is with the costs confronting manufacturers rather than with the real purchasing power of wage earners, I applied the implicit price deflator for manufacturing output to estimate wages in 1970 prices.

14. The wholesale price index for all commodities rose at an average annual rate of about 9 percent during 1967–73, and that of capital goods rose at about 8 percent, implying a decrease in the relative price of capital goods of approximately 1 percent per annum. Since this magnitude was rather small, I decided to ignore it in order to simplify the exercise. The relative price of capital goods fell substantially only from 1974 to 1976.

15. The so-called elasticity of substitution I computed represents a historical association under the given (but unidentified) pace of technological change. It may be regarded as a "stylized fact" that can be observed but that has yet to be explained by an appropriate analysis.

16. To allow for time lags in factor substitution, I also computed the average annual rate of change in fixed capital stock and employment for the period 1969–75. The results were very close to those for the period 1967–73.

17. Of course, the wage/rental ratio and employment are simultaneously determined. In econometric terms, the problem posed here is one of "identification"— whether the demand for labor (and capital) shifted in such a way as to alter the wage/rental ratio or whether the wage/rental ratio was altered, thereby inducing movements along the demand curve for factors of production. In reality, there must have been some aspects of both, and the argument here goes simply to the relative importance of each.

References

Bank of Korea. Various years. *Economic statistics yearbook*. Seoul.

———. Various years. *Input-output table of Korea*. Seoul.

———. Various years. *Monthly economic statistics*. Seoul.

———. Various years. *National income in Korea*. Seoul.

Bureau of Taxation. Various years. *Major taxation statistics*. Seoul.

Cole, D. C., and Lyman, P. N. 1971. *Korean development*. Cambridge: Harvard University Press.

Economic Planning Board. Various years. *Annual report on the economically active population*. Seoul.

———. Various years. *Report on mining and manufacturing census (or survey)*. Seoul.

———. Various years. *Population and housing census of Korea*. Seoul.

————. 1972. *Report on national wealth survey* (as of 31 December 1968). Seoul.

Frank, C. R., Jr.; Kim, K. S.; and Westphal, L. E. 1975. *Foreign trade regimes and economic development: South Korea.* New York: NBER.

Han, K. C. 1970. *Estimates of Korean capital and inventory coefficients in 1968.* Seoul: Yonsei University.

Hong, Wontack. 1976. Distortions and static negative marginal gains from trade. *Journal of International Economics* 6 (August): 299–308.

————. 1977. Trade, distortion and employment growth in Korea. Working Paper 7711. Duplicated. Seoul: Korea Development Institute.

Ministry of Agriculture and Fisheries. Various years. *Report on the results of farm household economy survey.* Seoul.

Westphal, L. E., and Kim, K. S. 1977. *Industrial policy and development in Korea.* World Bank Staff Working Paper no. 263.

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