

# Korea's Experience with Export-Led Industrial Development

# SWP249

World Bank Staff Working Paper No. 249

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February 1977

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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

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KOREA'S EXPERIENCE WITH EXPORT-LED INDUSTRIAL DEVELOPMENT

This paper is a summary of findings from the author's research conducted intermittently over the past seven years and reported elsewhere in greater detail for more specialized audiences. As may be seen in the bibliography, collaborators in this research have included Kwang Suk Kim, Charles R. Frank, Jr., Yung W. Rhee, and David C. Cole. The research has also benefitted immensely from having been conducted in large measure as a country study under the aegis of two large scale comparative analyses: Development Strategies in Semi-Industrial Countries, sponsored by the World Bank and directed by Bela Balassa; and, Foreign Trade Regimes and Economic Development, sponsored jointly by the United States Agency for International Development and the National Bureau of Economic Research, and directed by Jagdish N. Bhagwati and Anne O. Krueger.

The paper is a revision of an earlier version presented at the Seminar on Export Promotion Policies, jointly sponsored by the United Nations Economic Commission for Latin America, the World Bank, and the United Nations Development Program, and held in Santiago, Chile in November 1976. The revision has benefitted from discussion at this seminar as well as at a seminar held in the Bank. Helpful comments have been received from Bela Balassa, Benjamin B. King, Ian Little, and T.N. Srinivasan.

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Korea's Experience with Export-Led Industrial Development

Summary and Conclusions

The Republic of Korea, often referred to as South Korea (and here simply as Korea), was created at the end of World War II by the partition of the Korean peninsula, which had been occupied by the Japanese since the early 1900s. Under Japan's colonial administration, agriculture had been intensively developed in the Southern half of the peninsula, while industrial development was limited to the establishment of a small "modern" manufacturing sector largely concentrated on producing light consumer goods.

Economic activity in the South was dominated until approximately 1955 by adjustments first to the partition and then to the dislocations caused by the Korean War. In 1955, manufacturing accounted for only eight percent of GNP, while nearly half of GNP originated in the primary sectors. Due to the disruption and aftermath of the Korean War, exports were but 1.4 percent of GNP; manufactured exports were virtually nil.

Korea's industrial strategy during the last half of the 1950s was predominantly one of import substitution. Protection was afforded by a complicated system of multiple exchange rates, complemented by widespread quantitative restrictions on imports as well as tariffs. The discrimination against exports was not, however, as great as might appear, for export earnings were convertible in a free market and commanded a sizable premium; there were also direct cash subsidies to exporters. Partly in response to these incentives, but also as a return to the situation prevailing before the Korean War, exports grew at an average annual rate of 16 percent between 1955 and 1960. In real terms, exports in 1960 were roughly 16 percent greater than 1950, just prior to the Korean War.

Fueled by import substitution for non-durable consumer goods, the growth of industrial output was quite rapid (12 percent per annum) during the latter half of the 1950s. However, as opportunities for "easy" import substitution diminished rapidly in the early sixties, industrial growth began to falter. At the same time, political and social instability resulted in several changes of government. Starting in 1961, with the temporary establishment of a unified exchange rate, a number of attempts were made at policy reform and economic liberalization. These culminated in 1964/65, during which a number of reforms were successfully implemented. Among these were fiscal and monetary reforms which aimed at increasing both public and private savings, through respectively expanding direct tax revenues and raising the real interest rate in commercial banks to roughly 10 percent. As a result, domestic savings increased from less than eight percent of GNP in 1965 to an average of more than 17 percent in the period 1970 to 1975.

Policy makers came firmly to accept that rapid economic development depended upon an export oriented industrialization strategy. This view was predicated on the relatively small size of the domestic market, which meant that extending import substitution further into new lines would involve increasing inefficiency if carried out immediately, and on Korea's very poor natural resource base. A major associated policy change was the lasting establishment of a uniform exchange rate in 1964. The gradual adoption of a complete set of explicit export incentives had started earlier, in 1959. By 1966 exporters operated under a virtual free trade regime, receiving indirect tax and tariff exemptions, free access to imported inputs, reduced charges on overhead inputs, and interest rate and direct tax preferences. Estimates for 1968, for example, indicate

that value added on the given volume of exports was about the same as under a free trade regime, with interest rate and direct tax preferences approximately compensating for the modest overvaluation (roughly nine percent) of the domestic currency. In turn, the overall effect of incentive policies was to favor exporting over production for sale on the domestic market to a slight degree.

To offset inflation at higher rates than experienced in Korea's export markets, frequent devaluations and changes in export incentive rates between devaluations have been required to maintain the real effective exchange rate for exports at a relatively constant level since 1961. Furthermore, the rate for exports has been kept nearly equal to that for imports, while quantitative import restrictions have been gradually relaxed. In turn, a variety of evidence indicates that export and import effective exchange rates were very close to the optimal, growth maximizing free trade exchange rate. Also important has been the relative uniformity of export incentives in their total impact on value added across industries; this has led to the expansion of exports more or less in line with Korea's comparative advantage and has avoided undue stimulus to inefficient exports. At the same time, protection on the domestic market has been quite low by international standards, and has offered few opportunities for profitable investment in inefficient import substituting activities.

The export incentive policies adopted in the first half of the 1960s undoubtedly resulted in some increase in the overall inducement to export; however, their main thrust was to replace a complicated, largely ad hoc system based on multiple exchange rates and direct cash subsidies and requiring frequent adjustments with a simplified and more stable system. In fact, exports had increased rapidly between 1960 and 1965, at an annual compound rate

of 24 percent. The export policy reforms are therefore most properly credited with having laid the foundations for continued rapid growth once a larger base had been established. In response, export growth accelerated for several years and has continued to be very rapid in spite of a continually expanding base. Thus, in constant prices, the annual compound growth rate of exports between 1965 and 1975 was 31 percent.

Manufactured exports, which accounted for only 14 percent of commodity exports in 1960, rose by 1975 to 82 percent of the total. In addition, manufactured exports have become increasingly more diversified, so that in 1975 Korea was a major exporter of electrical machinery and appliances, transport equipment, various manufactures of metal and nonmetallic minerals, and footwear, in addition to textiles, clothing, and plywood, which had led the initial growth of exports. In turn, the concentration of exports by destination has become less: in 1975, Japan and the U.S. were the market for 56 percent of Korea's exports, while Japan alone had received 63 percent of the total in 1960. There is little evidence to suggest that Korea's special relationship with Japan and the U.S. has been responsible for this phenomenal performance. In particular, direct foreign investment has played a very small part in Korea's industrial growth: thus, direct foreign investment accounted for less than five percent of the capital stock in the manufacturing sector in 1970.

Largely because of the growth of manufactured exports, Korea has experienced atypically rapid industrialization. Since 1960, manufacturing output has grown at an annual rate of 19 percent, while manufacturing value added has increased at 17 percent per annum. With real GNP rising at nine percent annually, the share of manufacturing in GNP has risen from 11 percent in 1960 to 32 percent in 1975. Real per capita income over this period increased at 6.6 percent per annum, so that in 1975 Korea's population of over 34 million enjoyed a per capita income in excess of \$400.

The growth of manufactured exports over the past 15 years has contributed to Korea's industrial development in various ways. Including the backward linkage to domestically produced intermediate inputs, export expansion has been responsible for more than one quarter of the growth of manufactured output and for an even more sizable fraction of the growth in manufacturing employment. In turn, the manufacturing sector has directly accounted for nearly 40 percent of GNP growth and 38 percent of employment growth. But these figures understate the contribution of export growth, for they do not reflect the multiplier effect due to increased consumption and investment out of the additional income earned or the increase in economic efficiency that results when the resource cost of exports is less than the value of the foreign exchange earned.

All of the available evidence points to increased factor utilization and allocative efficiency as a result of export growth. One indicator, albeit crude, is the fall in the open unemployment rate from 8.3 percent in 1962 to its current level of 4.1 percent. Another is the increase in the aggregate capacity utilization rate within manufacturing, which by one set of estimates increased by more than 7 percent per annum between 1962 and 1971. In turn, to the degree that Korea's comparative advantage may be said to lie in labor intensive as opposed to capital intensive activities, several studies demonstrate that Korea's industrial growth has exploited its comparative advantage: over the 1960s, for which the evidence has been most carefully analyzed, manufactured exports were more labor intensive than manufactured imports, and they became increasingly more labor intensive over time even as shifts in the composition of output caused manufacturing production for the domestic market to become somewhat more capital intensive. Overall, the labor-capital ratio in the manufacturing sector actually increased between 1960 and 1973; at the same time,

total factor productivity about doubled.

In the Korean case, resource allocation along the lines of comparative advantage has meant not only that labor intensive exports pay for capital intensive imports but also, due to a very poor natural resource endowment, that there be an increase in the share of trade in total economic activity. As a result, import substitution has contributed very little in the aggregate to the growth of manufacturing, though it has been very important in particular sectors at different times. Among the sectors in which import substitution, often fostered by government promotion, has played an important role since 1960 are cement, fertilizer, chemicals, metals, and, more recently, machinery. Korea's industrial structure can thus not be characterized as overly concentrated in the light manufacturing sectors; the heavy industrial sectors are relatively large and expanding rapidly. The important point is that selective import substitution has permitted the concentration of scarce investment resources in one or a few sectors at a time and thereby enabled greater exploitation of scale economies and of linkages among closely related activities.

To summarize: Korea's overall development performance since the policy reforms in 1964/65 has indeed been striking. The role of monetary (especially interest rate) and fiscal policy in increasing public and private savings has been a key factor. But also, exports have proven to be a powerful engine of growth and, due to their labor intensity, they have contributed greatly to the rapid expansion of productive employment, which in turn has doubtless been a major factor in maintaining a relatively even distribution of income. The most important lessons from Korea's experience appear to be that exports respond to incentives while efficiency in resource allocation can be assured by operating close to a free trade regime.

The changes in export incentive policies during the first half of the 1960s provided assurance of stable profits on exports and were the concomitant of the government's decision to adopt a strategy of export expansion. At the same time, the government began to provide assistance in marketing and established annual export targets broken down in considerable detail by commodity, market, and domestic exporter. However, it would be naive to conclude from the latter that targets independently set by the government determined actual export levels via a command-type system, for the targets were set jointly by the government and the exporting enterprises and were often exceeded. Rather, the targets complemented incentives to exporters, without which rapid export growth would not have been possible. Perhaps the most important function filled by the export targeting system and its trappings was to publicize the importance attached by the government to exports: export incentives were well advertised and access to them was immediate. But there remains some question whether exports would have grown as rapidly without the additional impetus provided by the targeting system.

In other ways, policy reforms affecting prices, though quite certainly a necessary condition, should not be interpreted simply as the sufficient condition leading to Korea's remarkable performance, particularly as regards to the level of the growth rate or the relatively even distribution of the fruits of growth. Korea has been the recipient of relatively large foreign capital inflows over the past 20 years, and only in the past five to ten years could these be considered as a synergistic response to its performance. In turn, events predating 1955 led to a relatively egalitarian distribution of assets and a social and political structure lacking an aristocratic or oligarchic class. Equally, atypically large, mostly privately financed expenditures on education have not only permitted the formation of a highly skilled labor force but

have also made it possible for the mass of the labor force to participate in jobs of increasing productivity. Nonetheless, though the evidence is presumptive, and not conclusive, there is little doubt that government policies affecting prices have contributed greatly to Korea's development performance, and in particular to the rapid growth of its exports.



## Korea's Experience with Export-Led Industrial Development

Larry E. Westphal

It is widely known that Korea has achieved remarkable success as an exporter of manufactured products. Less widely appreciated, however, are the circumstances underlying Korea's export performance and the role that trade expansion has played in its industrial development. Several major pieces of research into these questions have recently been completed, and the purpose of this paper is to summarize their findings.<sup>1/</sup> As most of the research surveyed here was conducted during the early 1970s, detailed empirical results largely pertain to the 1950s and 1960s. However, where and as possible, this paper updates the analysis into the 1970s.

The discussion is organized as follows: First is a short sketch of Korea's industrial growth performance, followed by a brief history of industrial incentive policies. Succeeding sections present time series estimates of the real effective exchange rate for exports and summarize estimates for 1968 of effective protection and subsidy rates. Following a somewhat more detailed appraisal of export performance, the paper turns to examine the role of trade expansion in Korea's industrial development. Here the focus is on contributions to output growth as well as to improved factor utilization. The paper then concludes with a discussion of the relevance of Korea's experience to policy making in other developing countries.

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<sup>1/</sup> Earlier summaries can be found in K. S. Kim (1975) and Frank (1976). Based on the then available material, Balassa (1971) provides a useful survey of Korea's development through the 1960s.

### Industrial Growth Trends

The Republic of Korea, often referred to as South Korea (and here simply as Korea), was created at the end of World War II by the partition of the Korean peninsula, which had been occupied by the Japanese since the early 1900s. Under Japan's colonial administration, agriculture had been intensively developed in the Southern half of the peninsula to promote exports of foodstuffs to Japan. In turn, industrial development had been suppressed until shortly before World War II in order to reserve the Korean market for Japan's manufactured exports. A change in colonial economic policy due to the war led to the establishment of a small "modern" manufacturing sector to supply war materiel as well as local demand for light consumer goods.

Economic activity in the South was dominated until the mid-1950s by adjustments first to partition and then to dislocations caused by the Korean War. The economy's structure in 1955 was thus much the same as it had been left at the end of the Japanese occupation. As may be seen in Table 1, manufacturing activity accounted for only eight percent of GNP in 1955, while nearly half of GNP originated in the primary sectors. Due to the disruption and aftermath of the Korean War, exports were but 1.4 percent of GNP, and manufactured exports were virtually nil.

Industrial expansion from 1955 through the early 1960s was predominantly oriented toward the domestic market, with import substitution for light manufactured and non-durable consumer goods playing a major role. From a meager base, exports, particularly exports of manufactures, began growing at a gradually accelerating rate in the late 1950s. While exports

TABLE 1 -- Major Economic Indicators

	1955	1960	1965	1970	1975
<b>A. Computation of Per Capita Income</b>					
GNP (billion won at 1970 prices)	938.2	1,129.7	1,529.7	2,589.3	4,107.7
Population (million persons)	21.5	24.9	28.3	31.4	34.7
GNP per capita (thousand won at 1970 prices)	43.6	45.3	54.0	82.4	118.4
<b>B. Percentage Shares in GNP at 1970 Prices</b>					
Value added in:					
Primary production	47.5%	42.6%	41.0%	29.2%	23.0%
Manufacturing	7.9	10.8	13.9	21.6	31.9
Social overhead <sup>1/</sup>	4.2	6.0	8.5	13.3	13.7
Services	40.4	40.6	36.6	35.9	31.4
Gross investment	10.0	8.6	12.9	27.2	26.3
Total exports	1.4	2.4	5.2	14.7	28.3
Total imports	11.2	10.4	9.8	24.8	27.2
<b>C. Percentage Shares in GNP at Current Prices</b>					
Government revenue	10.5%	19.8%	16.1%	20.1%	19.7%
Government savings	.6	4.1	5.7	7.5	3.6
Total domestic savings	3.7	1.6	7.7	17.1	17.7
Gross investment	11.9	10.9	15.1	27.2	27.1
Total exports	1.6	3.3	8.5	14.7	30.2
Total imports	9.8	12.6	15.9	24.8	39.6
<b>C. Compound Annual Growth Rates</b>					
	1955-60	1960-65	1965-70	1970-75	
GNP (at 1970 prices)	3.8%	6.2%	11.1%	9.7%	
GNP per capita (at 1970 prices)	.7	3.6	8.8	7.5	
Manufacturing value added (at 1970 prices)	10.3	11.8	21.3	18.5	
Index of manufacturing output	12.0	9.5	24.2	23.2	
Total exports (at 1970 prices)	16.3	24.0	36.5	25.0	
Population 14 years and older	-	2.5 <sup>3/</sup>	2.8	3.6	
Economically active population	-	2.7 <sup>3/</sup>	2.9	3.9	
Employment					
Total	-	2.4 <sup>3/</sup>	3.5	3.9	
Manufacturing	-	12.2 <sup>3/</sup>	10.7	11.4	
Real wages					
Average in mining and manufacturing	5.1 <sup>2/</sup>	1.1	7.1	8.4	
Agricultural labor	-	-0.1	8.2	1.5	
Prices					
GNP deflator	12.0	19.3	13.7	15.3	
Wholesale price index	10.2	17.2	7.9	18.9	

<sup>1/</sup> Includes construction; electricity, gas, water, and sanitary services; transportation, storage and communication.

<sup>2/</sup> For 1957-1960.

<sup>3/</sup> For 1960-1966.

Sources: Bank of Korea, Economic Statistics Yearbook, 1967, 1969, 1976; National Income in Korea, 1975; Economic Planning Board, Korea Statistical Yearbook, 1975; and, Hong (1976).

in 1956 were less than half of their real value in 1950, the year preceeding the Korean War, by 1960 the real value of exports surpassed that in 1950 by nearly 16 percent. However, in absolute terms as well as relative to GNP, exports remained small. In current U.S. dollars, total exports (including merchandise and non-factor services) amounted to roughly \$100 million in 1960, of which only five percent were manufactured products.<sup>1/</sup> The share of total exports in GNP at current prices was only 3.3 percent.

Manufactured exports rose rapidly before 1965, albeit from a small base, but the real "turning point" in the pace of both export and industrial growth came around 1965, during a period of trade liberalization and other major policy reforms. Thus, in the decade following 1965, manufactured export growth coupled with rising domestic demand fueled industrialization at a much faster rate than experienced earlier. The compound annual rate of growth in the index of manufacturing output was 10.7 percent from 1955 to 1965; it increased to 23.7 percent from 1965 to 1975. Underlying the acceleration of manufacturing output growth, the share of exports in manufacturing (gross) output, which was nil in 1955, rose from roughly six percent in 1965 to nearly 25 percent in 1975. In the space of only ten years, from 1965 to 1975, the ratio of total exports to GNP more than trebled and the share of GNP originating in the manufacturing sector more than doubled. Manufactured products constituted 42.4 percent of total exports in 1965 and 73.8 percent in 1975.

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<sup>1/</sup> Throughout this paper, manufactured exports include SITC categories 5 through 8 except 68.

Nearly every indicator of development performance improved dramatically after the mid-1960s. Thus, for example, the annual growth rate of real per capita income increased from 2.1 percent in the decade preceeding 1965 to 8.1 percent in the decade that followed. By 1975, Korea's population of over 34 million enjoyed a per capita income well in excess of \$400. The economy has also performed well with respect to employment and income distribution.

#### Industrial Incentive Policies

Industrial incentive policies during the last half of the 1950s were those typically associated with an import substitution strategy. Large scale purchases of won (the domestic currency) at the official exchange rate by the resident UN military establishment provided a major motivation to maintain an overvalued exchange rate, from which a complex structure of multiple exchange rates evolved to deal with recurrent balance of payments problems. In addition, high tariffs were imposed on imports having domestically produced similars, mostly finished consumer goods, and the government increasingly relied upon quantitative import restrictions as an additional measure to offset the progressively greater overvaluation of the won. The principal incentive to exports during this period came from the multiple exchange rate system, under which export earnings were converted into foreign exchange certificates that were traded at a premium in a free market. In addition, modest direct cash subsidies were also used.

The first half of the 1960s was a period of social, political, and economic instability during which there were a number of attempts at policy reform and economic liberalization. Upon taking control in 1961, the military government immediately completed the task of unifying the exchange rate that had begun under the civilian authorities who had

replaced Singman Rhee after the Student Revolution in 1960. The transition to the unitary rate did not appreciably affect export incentives, since the rate established in 1961 was somewhat lower than the pre-existing free market rate on export earnings. In 1963, largely as a result of a decline in U.S. grant aid, a balance of payments crisis led to the reintroduction of a multiple exchange rate system, while import controls were again tightened by means of licensing through semi-annual trade programs, variable tariffs, and selective import prohibitions.

The liberalization philosophy that had emerged but remained largely ineffective during the early sixties took firm hold after the election of a civilian government under Chung Hee Park in early 1964. (President Park continues in power today.) The ensuing two years brought major and successful policy changes in a number of areas. In addition to changes more directly related to trade policy, there were several key reforms aimed at increasing public and private savings. The administration of government revenue collection was revised to insure a high ratio of revenue to GNP, while conscious steps were also taken to hold down current government expenditures. An increase in commercial bank deposit and lending rates together with a price stabilization program increased the real interest rate to approximately ten percent per annum. By substantially increasing the domestic savings rate (see Table 1), these reforms were instrumental in financing the higher investment rates required for accelerated GNP growth.<sup>1/</sup>

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<sup>1/</sup> For comprehensive discussions of these policy reforms, see Cole and Lyman (1971) and Brown (1973).

At the same time, policy makers came firmly to accept that rapid economic development depended upon an export oriented industrialization strategy. This view was predicated on the understanding that Korea's natural resource base was very poor and the realization that further opportunities for import substitution were only to be found in intermediate and durable goods where technological economies of scale and the limited domestic market of the mid-1960s precluded establishing efficient size plants. A major associated policy change was the lasting establishment of a uniform exchange rate in 1964, when the official won-dollar exchange rate was nearly doubled for the second time in three years.

As had been the case in the earlier devaluation in 1960, the devaluation in 1964 was aimed primarily at simplifying the exchange regime and offsetting domestic inflation, rather than increasing the level of export incentives. In fact, exporters had begun to benefit from an expanded range of explicit export incentive mechanisms starting in 1959, when tariff exemptions on imports of raw materials used in export production were first granted. Other price incentive mechanisms were gradually added, so that by 1966 exporters operated under a virtual free trade regime, benefitting from free access to imported inputs, indirect tax and tariff exemptions, and reduced charges on overhead inputs as well as credit and direct tax preferences.<sup>1/</sup> Also, an export performance criterion was established as the basis for granting importers' licenses and a system

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<sup>1/</sup> These mechanisms are described and analyzed in greater detail in the next section.

of export targets for individual firms in particular markets (by product and destination) was introduced. The concluding section of the paper discusses the importance of the latter.

As regards incentives to production for domestic sale, a small number of import substituting industries have benefitted from promotional activities (project identification, feasibility studies, etc.) under the aegis of successive Five Year Plans as well as from the same price incentive mechanisms that have applied to exports.<sup>1/</sup> But in most sectors the only price incentive to domestic sales has been the protection potentially afforded by import controls and tariffs.<sup>2/</sup> Import controls were gradually relaxed following the 1964 devaluation as the number of items eligible for import increased along with quota amounts. However, it was not until 1967 that a major step was taken in liberalizing import restrictions through a switch from the so-called "positive" list system, under which only those commodities listed in the trade program could be imported, to the "negative" list system, under which all commodities not listed could automatically be imported without restriction. Import controls continue to this day, though they have gradually been liberalized. In turn, the tariff structure has remained substantially unchanged since

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<sup>1/</sup> A system of short and medium term indicative planning was instituted with the First Five Year Plan running from 1962 to 1967. For a description and evaluation of Korean planning, see Adelman (1969) and Westphal and Adelman (1972).

<sup>2/</sup> For a quantitative assessment, see the next section.

its original creation in 1949, though there have been several minor reforms.

### Real Effective Exchange Rates

An incentive system that generally favored exports over import substitution within manufacturing gradually came into being over the first half of the 1960s. In this section a quantitative assessment of the impact of this change in policy on export incentives is made using time series estimates of real effective exchange rates. But first, the incentive mechanisms introduced during this period will be described.

The most important incentives to exporters by 1966 included: unrestricted access to and tariff exemptions on imported intermediate and capital goods; exemption from payment of indirect taxes both on major intermediate inputs, whether imported or purchased domestically, and on export sales; generous wastage allowances in determining duty and indirect tax free raw material imports, which permitted the use of some of these imports to produce for sale on the domestic market; price reductions on several overhead inputs including electricity and railroad transport, which were intended at least in part to compensate for payment of indirect taxes included in the normal charges for these inputs; a 50 percent reduction in direct taxes on income earned in exporting; and, immediate access to subsidized short and medium term credit to finance working capital and fixed investment respectively. In addition, the so-called "export-import link" system entitled selected exporters to import certain popular items that were not otherwise approved for import. This system was used to subsidize exports during the late 1950s and much of the 1960s. It has since been used only intermittently on a more or less ad hoc basis

to offset exporters' temporary losses due to market fluctuations or entry into new markets, and by now it has almost been completely abandoned.

Some of these incentives are not genuine subsidies. Except where there is over-rebating, the exemption of export sales from indirect taxes on the same products sold domestically merely establishes tax neutrality under the destination principle that exempts exports from indirect taxes while such taxes are imposed on imports. In turn, exemption from tariffs on imported inputs and from indirect taxes regardless of the source of the purchase does favor exports vis-a-vis production for domestic sale; so too does permitting exporters to have free access to imported inputs while restricting access in the case of production for domestic sale. Vis-a-vis world market prices, however, the effect of these measures is simply to subject exporters to a free trade regime: exporters purchase their (tradable) inputs and sell their output at world market prices.

The effective exchange rate for exports is obtained by adding export subsidies per dollar of exports to the official exchange rate. It would therefore appear that the value of indirect tax and tariff exemptions should not be included in the calculation. However, while indirect tax and tariff exemptions do not add to exporters' revenues, they do reduce costs in comparison to production for the domestic market. Thus, an increase in indirect tax or tariff rates paid to produce a given product for domestic sale makes its production for export using existing capacity more attractive, even though it does not increase the profit rate earned on export sales. In this sense, inclusion of these exemptions

yields an index of the incentive to exporting vis-a-vis selling domestically, but not of export incentives as they affect profits from exporting. Two effective exchange rates for exports should thus be distinguished: a "gross" rate, which includes indirect tax and tariff exemptions per dollar of exports; and, a "net" rate, which does not include them. In turn, profits from exporting will be affected if such exemptions are granted or withdrawn over time, which makes the gross rate the only meaningful measure of incentives when there are changes in the scope of exemptions.

Lack of consistent time series data precludes incorporating into these estimates the subsidies due to the export-import link system, the excess of wastage allowances over actual wastage in production for export, and price reductions on overhead inputs. Very little is known about the magnitude of the first of these subsidies. More is known about the subsidy due to wastage allowances, which has been estimated to have been equal to 2.4 percent of the total value of merchandise exports in 1968.<sup>1/</sup> There is also evidence that this subsidy has fluctuated over time, generally rising and falling in relative value with the degree of the won's overvaluation. In turn, the value of overhead price reductions has always been quite small in relative terms; it equalled only 0.4 percent of exports in 1968.<sup>1/</sup>

Table 2 shows the value per dollar of exports of those incentives for which consistent time series information is available. For

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<sup>1/</sup> See Westphal and Kim (1974), p. 65.

convenience, these values are shown as a percent of the official exchange rate. Some discussion is in order regarding the estimation of direct tax and interest subsidies. The total subsidy owing to the 50 percent reduction in direct taxes has been calculated as the difference between tax liabilities in the absence of any such preference and actual direct tax payments. In turn, the total interest subsidy has been computed as the difference between the interest that would have been paid on outstanding credits of various types, including both short and medium term loans, at the non-preferential commercial bank lending rate and the interest actually paid. The resulting estimate understates credit subsidies on **two** counts. Most important, it does not reflect the fact that exporters benefit from immediate access to credit within very generous limits, while credit from formal-sector financial institutions has been subject, depending upon the period, to more or less stringent rationing for all other borrowers. Additionally, the non-preferential commercial bank lending rate is neither an equilibrium rate nor a robust proxy for the average rate on all producers' outstanding debt, the latter because of general recourse among those frustrated by credit rationing to an active informal money market on which interest rates have in the past been very high.

Because of the way in which the interest subsidy is measured, a change in its value per dollar of exports does not necessarily imply a change in the cost of borrowed capital to exporters, it is sometimes simply the result of a change in the non-preferential commercial bank lending rate. As in the case of indirect tax and tariff exemptions, one should thus distinguish between an effective exchange rate in which the

interest subsidy is as calculated above and another in which the interest component reflects only the interest rate paid by exporters. However, only the first of these rates will be considered here. In turn, preferential direct tax treatment is a subsidy only insofar as there are profits to be taxed, so that the magnitude of the subsidy depends upon the profit rate per dollar of exports. All of this is to say that the net effective exchange rate, which includes exchange premia plus direct cash subsidies as well as direct tax plus interest subsidies, is an imperfect index of export incentives as they affect profits from exporting, because the latter subsidy component may fluctuate without there having been any change in either the direct tax rate on income earned from exporting or the interest rates paid by exporters.

Only real effective exchange rates are shown in Table 2. These have been obtained from the corresponding nominal rates in the following manner. Assuming that the prices of a country's exports move in parallel with foreign price movements, multiplying a nominal effective exchange rate by an index of prices in overseas markets yields the number of won in current prices received per dollar of exports, the latter in constant prices.<sup>1/</sup> Then, deflating the figure so obtained by an index of domestic prices gives the number of won in constant prices received per dollar of exports, also in constant prices; i.e., a purchasing power parity adjusted, or real, effective exchange rate for exports. In addition to the gross and net rates, also shown for comparison in Table 2 is the rate including

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<sup>1/</sup> The index used combines wholesale price movements in Korea's major overseas markets with changes in exchange rate parities among these countries. See Westphal and Kim (1974), forthcoming revision.

only those incentives which directly affect revenues, i.e. exchange premia and direct cash subsidies.

Exporters first obtained tariff exemptions on imported intermediate inputs in 1959; indirect tax exemptions, in 1962; and, tariff exemptions on imported capital goods, in 1966. Thus, for appraising trends in export incentives before 1966, as well as for comparisons pre- and post-the mid-1960s, the gross real effective exchange rate for exports is the only relevant indicator, since its value alone reflects the granting of exemptions. In turn, the net rate is the superior index for examining trends after 1965, since there have been no subsequent changes in the granting of exemptions while variations in their relative value after 1965 reflect only changes in tariff and indirect tax rates from which exports were exempted, including the effect of shifts in the composition of exports.

There is unfortunately no information on the value of tariff exemptions between 1959 and 1961. Thus, using the net rate for these years and the gross rate for the remaining years, one may conclude only that the average level of the gross real effective exchange rate for exports was something in excess of 295.5 between 1958 and 1965. The average gross rate was 302.0 between 1966 and 1970. However, the rise in the overall inducement to export resulting from the incentive policies adopted over the first half of the 1960s was certainly greater than indicated by this comparison. In the first place, the gross real effective exchange rate for exports exhibits wider fluctuations before 1965 than for the following five years. Thus, its average value in 1962 and 1963, prior to the devaluation upon the return to a unified exchange rate, was only 270.1. In addition, our estimates neglect two incentive mechanisms that became important in the mid-sixties, namely wastage allowances and the

TABLE 2

Effective Exchange Rates for Exports and Imports  
(Annual averages; won per U.S. dollar)

Official Exchange Rate (Nominal)	As a Percent of the Official Exchange Rate				Purchasing Power Parity Adjusted (Real) Effective Exchange Rates <sup>1/</sup>				
	Per Dollar of Exports:			Per Dollar of Imports:	For Exports			For Imports	
	Exchange Premia Plus Direct Cash Subsidies	Direct Tax Plus Interest Subsidies	Indirect Tax and Tariff Exemptions		Including Only Revenue Incentives	Excluding Indirect Tax and Tariff Exemptions (net)	Including Indirect Tax and Tariff Exemptions (gross)		
				Actual Tariffs and Tariff Equivalents					
1958	50.0	128.0%	2.4%	.0%	28.8%	276.7	279.6	279.6	156.5
1959	50.0	169.4	2.6	-	65.6	321.8	324.9	-	197.9
1960	62.5	134.2	2.0	-	60.3	317.5	320.1	-	217.4
1961	127.5	17.3	.8	-	15.3	287.4	289.3	-	282.2
1962	130.0	7.9	1.1	7.6	12.6	244.7	247.1	264.2	255.5
1963	130.0	33.8	2.8	9.1	13.9	253.5	258.8	276.1	215.9
1964	214.3	19.9	3.2	8.2	15.3	278.7	286.1	305.3	268.0
1965	265.4	.0	3.7	11.1	10.4	265.4	275.3	304.6	293.1
1966	271.3	.0	4.6	14.4	9.3	256.4	268.2	305.1	280.4
1967	270.7	.0	7.4	15.7	9.4	242.8	260.7	298.8	265.4
1968	276.6	.0	6.6	21.5	9.4	233.2	248.5	298.7	255.0
1969	288.2	.0	5.1	22.7	8.5	234.3	249.3	299.4	254.5
1970	310.7	0	6.7	21.7	8.3	239.9	255.9	307.9	260.0
1971	347.7	0	6.5	23.1	6.3	253.5	270.1	328.6	269.7
1972	391.8	.0	3.2	23.7	6.0	275.0	283.8	348.9	290.2
1973	398.3	.0	2.2	21.5	4.9	320.6	327.6	396.5	332.5
1974	407.0	.0	2.1	19.1	4.5	279.2	285.1	338.4	288.1
1975	485.0	.0	2.7	14.0	5.1	275.0	282.3	320.9	286.6

<sup>1/</sup> At 1965 prices.

Source: Westphal and Kim (1974), Tables B.1 and B.2, forthcoming revision.

export-import link system, though the latter was unimportant after about 1967. Because of the understatement noted earlier, they also fail to indicate adequately the increase in credit subsidies arising from the relaxation of credit ceilings for exporters that took place in the early and mid-sixties.

Most important, the comparison neglects the simultaneous reduction in incentives given to import competing production, including the gradual relaxation of import controls. And, it is of course not the level of export incentives per se that should concern us, but rather their relative level vis-a-vis the incentives granted to production for domestic sale. Table 2 also gives estimates of the real effective exchange rate for imports, the nominal value of which equals the official exchange rate plus average customs duties and tariff equivalents (eg., premia paid to purchase foreign exchange certificates from exporters) paid per dollar of imports.<sup>1/</sup> Unfortunately, though, the effective exchange rate for imports is a virtually meaningless indicator of protection from imports due to its failure to reflect the effect of import controls. Excepting estimates for 1968 (discussed in the next section), there is no solid evidence concerning the impact of import controls, let alone how it has changed over time. But it is most certainly known that import controls were substantially liberalized between the late 1950s and mid-1960s.

Owing largely to the sale of exporters' foreign exchange receipts in a free market, export incentives were by no means lacking in the late

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<sup>1/</sup> The almost continuous fall in the actual tariff rate paid on imports is due to the rising share of tariff exempt imports for use in export production and not to a general lowering of legal tariff rates.

fifties and early sixties. In fact, it will be recalled that exports began growing at a modestly rapid pace in 1957. While the growth of exports up to about 1960 may be interpreted simply as a return to the situation prevailing before the Korean War, it is notable that this did not take place in the absence of incentives. In turn, exports increased rapidly between 1960 and 1965, at an annual compound rate of 24.0 percent in real terms (see Table 1). But in the five years following 1965, the real growth of exports accelerated to 36.5 per annum.

Relative to its average over the preceding five or six years, the net real effective exchange rate for exports increased nearly 30 percent between 1970 and 1973, principally as a result of the appreciation of the Japanese yen. In turn, exports in 1973 were more than two and a half times their real value in 1970. In response to these and other, less transitory indications that export incentives were perhaps yielding excessive profits, the government abolished a number of incentive mechanisms. Thus the benefits of lower direct tax rates and automatic tariff exemptions on imported capital goods were withdrawn, while wastage allowances declined as did interest subsidies. Nonetheless, the net real effective exchange rate in 1974 and 1975 remained higher than its average over the latter half of the 1960s. Owing not to the change in incentives, but rather to the world recession, the value of real exports fell by 2.3 percent in 1974. In turn, real export growth was nearly 15 percent in 1975 and appears to have regained its rapid pace in 1976.<sup>1/</sup>

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<sup>1/</sup> Exports in current dollars rose by two thirds between the second quarters of 1975 and 1976.

The real effective exchange rates for exports shown in Table 2 are of course only very crude indicators. It would increase the precision of the estimates as indicators of profitability if the nominal exchange rate were multiplied by an index of export unit values or export prices abroad rather than by an index of the general price level abroad. Equally, the overall domestic wholesale price index should be replaced by an index of wholesale prices weighted by export volumes (to gauge profitability relative to domestic sales) or by an index of export production costs. Likewise, the precision of the estimates as indicators of the competitiveness of Korea's exports would be increased by using indices of domestic and foreign production costs in place of price indices. Unpublished refinements of the estimates in the latter direction by Bela Balassa confirm that the competitiveness of Korea's exports in 1974 and 1975 was slightly greater than in the late 1960s, while it had achieved an extreme level between 1971 and 1973.

There clearly appears to be a relationship in the Korean experience between export incentives and the growth of exports. Nonetheless, efforts to "prove" the relationship statistically have not yielded notably robust results.<sup>1/</sup> But, based on regressions of real exports against the gross real effective exchange rate and real nonagricultural output, Frank, Kim, and Westphal (1975, pp. 85-86) conclude that ". . .the responsiveness of [manufactured]

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<sup>1/</sup> Most of these are crude efforts focussed on the correlation between real exports and the real effective exchange rate for exports. The correlation may be nil even though the two variables are significantly related, for the implicit model is not theoretically sound. Thus, for an economy in dynamic equilibrium, with the real exchange rate maintained at its appropriate level, real exports would continue growing even were the appropriate real exchange rate constant over time. This factor is partially reflected in the test by Frank, Kim, and Westphal (see the text), since they include real nonagricultural output in the regression. In turn, one would expect lagged responses to the removal of trade distortions to undermine the efficacy of even this formulation, particularly if the real exchange rate remains constant after the removal of trade distortions.

exports changed sharply after 1963. . . Before 1963, sensitivity to [effective] exchange rate policy was lacking. . ." Two major factors appear to have made exports more highly responsive to the real effective exchange rate after 1963: it was probably not until 1963 or shortly thereafter that the government's intention to stabilize exporters' profits at relatively high rates was clearly perceived; and, the general capacity of the economy to produce, which did not begin expanding rapidly until after 1963, may have been an important element.

As to the overall effectiveness of Korean exchange rate and incentive policies, Frank, Kim, and Westphal (1975, Chapters 8 and 9) develop and estimate a simultaneous equation model to demonstrate that the historical values of the official exchange rate, import tariffs, and export incentives, taken together, nearly resulted in achieving the maximum potential growth rate. Assuming that incentives to exports and tariffs on imports had remained unchanged at their historical levels, the optimal official exchange rate was found to be about equal to the historical rate. However, to yield the maximal growth rate, actual tariff rates should have been somewhat higher than they actually were, which would have yielded higher government savings, investment, and thus growth. Under the hypothetical maximal growth regime starting in 1960, real GNP by 1970 would have been roughly seven percent higher than it actually was.

To conclude: the changes in export incentive policies that took place up to 1966 clearly brought about an increase in the total incentive to export. Furthermore, they led to the gradual replacement of a complicated, largely ad hoc system based on multiple exchange rates and direct cash subsidies and requiring frequent

adjustments with a simplified and more stable system. The export policy reforms may thus be credited with having laid the foundations for continued rapid export growth once a larger base had been established. They provided assurance of stable profits on exports and were the concomitant of the government's decision to adopt a strategy of export-led industrialization. In response, export growth accelerated for several years after 1965 and has continued to be quite rapid despite a continually expanding base. The growth of exports, in turn, has contributed to output growth, leading to a very substantial increase in the share of exports in GNP and that of manufactured exports in output. At the same time, to sustain this performance has required periodic devaluations<sup>1/</sup> and changes in export incentive rates (principally wastage allowances and credit preferences) between devaluations in order to maintain the real effective exchange rate for exports at a relatively constant level in the face of more rapid inflation domestically than abroad.

#### Effective Rates of Protection and Subsidy in 1968

A more detailed analysis of incentive policies may be obtained from an effective protection study, which makes possible a quantitative comparison of incentives granted to exports versus those granted to

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<sup>1/</sup> By giving annual averages of the official exchange rate, Table 2 makes it appear that devaluations occurred more frequently than they in fact did.

import competing production. Such a study conducted for 1968 sheds valuable light on the impact of incentives under the post-1965 policy regime. Its principal results are summarized in this section.<sup>1/</sup>

As indicated previously, legal tariff rates have never been a good measure of the divergence between domestic and world market prices in Korea. First, many imports are exempt from duties, including intermediate goods imported for use to produce exports and capital goods imported for various uses. Second, tariffs are virtually prohibitive for a number of commodities with the result that these are not imported. Domestic production is sufficient to satisfy local demand at or below the world market price plus tariff. In these two cases, the legal tariff overstates the nominal (i.e., actual) degree of protection. Third, many imports are subject to controls. The domestic price of such commodities can be higher than the world market price plus tariff if demand at that price exceeds the permitted volume of imports.

For the study of incentives in 1968 it was thus necessary to compare domestic and world market prices directly. The divergence for a particular commodity is conventionally expressed in terms of the nominal rate of protection, which is the percentage excess of the domestic over the world market price, with the latter converted into

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<sup>1/</sup> See Westphal and Kim (1974), summarized in Frank, Kim, and Westphal (1975), Chapter 10.

its domestic currency equivalent at the prevailing exchange rate.<sup>1/</sup>, <sup>2/</sup>  
Average rates of legal and nominal protection are compared in  
Tables 4 and 5 below according to several classifications of sectors.  
(The basis for the classification used in Table 5 is explained further  
below.)

Korean legal tariff rates in 1968 were quite low by  
comparison with other developing countries.<sup>3/</sup> Furthermore, the  
protection potentially afforded by tariffs to domestic sales (i.e., of  
domestically produced output) was generally realized only in very small  
measure. The average tariff rate across all commodities in 1968 was  
54.3 percent whereas the average nominal protection rate was only  
14.0 percent.<sup>4/</sup> There was thus a large amount of "water" in Korean tariff  
rates, with this being most evident for industrial rather than for  
primary products.

In view of these results, it is tempting to conclude  
immediately that import controls added little to the protection

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<sup>1/</sup> In the case of commodities that are not exported, world price  
refers to the c.i.f. import price; for exports, world price refers  
to the f.o.b. export price.

<sup>2/</sup> Note that this convention implies that nominal protection is equivalent,  
from a resource allocation point of view, to an actual tariff rate, were  
it imposed at the same level. As Bhagwati (1965) has shown, this is not  
always true where markets are imperfect. The nominal rate tends to be  
greater than the equivalent tariff when domestic production or quotas are  
monopolized, which means that nominal protection rates in the Korean context  
may overestimate the protective effects of import controls in an  
equivalent tariff sense.

<sup>3/</sup> The basis for this and the following comparisons with other  
developing countries is found in Little, Scott, and Scitovsky (1970) and  
Balassa and Associates (1971).

<sup>4/</sup> In all cases, legal and nominal protection rates are averaged using  
domestic sales in world prices as weights; effective incentive rates (see  
below) are averaged using value added at world prices as weights.

provided by the tariff structure. However, to make this conclusion valid, it is necessary to analyze import restricted commodities separately. This is because legal tariff rates in 1968 were the sum of two elements: a regular rate that was legislated and a special rate that was administered and used to mop up the scarcity premiums resulting from import controls.

Final judgment on the importance of import controls thus rests on a comparison of nominal protection with regular tariff rates alone. Table 3 gives estimates which are weighted averages over all commodities for which nominal protection exceeded the regular tariff rate. The definitions chosen for assigning sectors to trade categories classify a sector as "exporting" if more than ten percent of its output is exported; as "import competing" if more than ten percent of domestic supply is imported; and, as "nonimport competing" if neither the export nor the import share exceed ten percent. XIC (export and import competing) sectors comprise those in which both shares exceed ten percent. The classification is based on export and import shares in 1968.

TABLE 3

Protection Due to Import Controls in 1968

<u>Trade Category</u>	<u>Number of Commodity Groups</u>	<u>Nominal Protection</u>	<u>Regular Tariff</u>
Export	5	64.9%	56.5%
Import Competing	22	41.5	18.0
Nonimport Competing	46	66.2	26.9
XIC	<u>4</u>	<u>98.6</u>	<u>38.7</u>
All	77	62.6	26.6

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Source: Westphal and Kim (1974), p. 31.

Except for the commodity groups in the export category, import controls did afford some commodities significant additional protection. However, out of a total of 365 commodity groups included within the price comparison survey's sample, there were only 77 for which nominal protection exceeded the regular tariff rate, and these 77 accounted for only 11.4 percent of total domestic sales within the sample. Thus, in total effect, import controls were relatively unimportant. This holds even though import controls were ostensibly imposed on competing imports in the markets for commodities representing 75.6 percent of all domestic sales in the sample.<sup>1/</sup>

We now turn to estimates of effective protection and subsidy rates for 1968. These estimates are based on nominal protection rates, rather than tariff rates, and further incorporate the effects of all incentive policies operating in 1968, including the export incentives discussed in the previous section as well as subsidies granted to key import substituting industries.<sup>2/</sup> Averages based on estimates made at the level of 150 commodity producing sectors are given in Tables 4 and 5. In turn, Annex Table 1 gives estimates averaged according to industrial classification.

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<sup>1/</sup> The last figure cited, however, represents a biased estimate of the imposition of import controls relative to total domestic sales, for a commodity group's inclusion in the price comparison sample was based, in part, on the imposition of import restrictions.

<sup>2/</sup> The subsidy due to the export-import link system is not included, but it is known to have been very small. For details regarding the estimation procedure, see Westphal and Kim (1974), Chapter 3. The estimates presented here are based on the so-called "Balassa method" for dealing with nontradables. Westphal and Kim also provide estimates according to the "Corden method." The differences between estimates under the two methods are small. For the distinction between these methods, see Balassa and Associates (1971), p. 321 ff.

Effective protection calculations express the impact of protection measures on value added per unit of production instead of the gross price.<sup>1/</sup> The effective protection rate of -0.9 percent for manufacturing output as a whole (see Table 4) thus indicates that protection measures on balance provided no protection to value added in the manufacturing sectors, the protection on outputs being slightly more than offset by the cost raising effects of protection on inputs. It may further be seen that protection measures afforded an implicit subsidy to primary producers, particularly in the agricultural sectors. Both of these results -- no effective protection to manufacturing, and higher effective protection to primary producers -- are nearly unique to Korea, as most other developing countries protect industry at high levels and at the expense of primary production.

Effective subsidy calculations further include the impact of credit and direct tax preferences. These incentive mechanisms do not change unit value added in world prices, however they do affect the composition of value added as well as profits after taxes. These subsidies were incorporated in the following manner: The actual total direct tax liabilities of all firms were reapportioned to each sector on the basis of its share in the total tax base; i.e., it was assumed that each firm would have paid an identical average tax rate on its

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<sup>1/</sup> Formally, the effective rate of protection is defined as the percentage excess of domestic over world market value added, where the latter equals the difference between the world market price of the product and the cost of its inputs at world prices.

TABLE 4

Average Incentive Rates for Major Industry Groups in 1968

	<u>Primary Sectors</u>			<u>Total Manufacturing</u>	<u>All Industries</u>
	<u>Agri.</u>	<u>Mining</u>	<u>Total</u>		
<u>On Domestic Sales</u>					
Legal Protection	36.5%	12.2%	35.1%	67.6%	54.3%
Nominal Protection	17.0	8.9	16.5	12.2	14.0
<u>On Total Sales</u>					
Effective Protection	18.1	2.9	17.1	-0.9	9.9
Effective Subsidy	22.1	4.7	20.9	-6.5	10.0

Source: Westphal and Kim (1974), Tables 2.A and 2.B.

Note: Agriculture includes forestry and fishing; "all" industries refers only to commodity producing sectors.

TABLE 5

Average Incentive Rates in Manufacturing by Trade Category in 1968

	<u>Exporting Sectors</u>	<u>Import Competing Sectors</u>	<u>Nonimport Competing Sectors</u>	<u>XIC Sectors</u>	<u>All Manufacturing</u>
<u>On Domestic Sales</u>					
Legal Protection	83.4%	56.4%	65.5%	75.7%	67.6%
Nominal Protection	8.1	32.2	5.1	37.8	12.2
<u>Effective Protection</u>					
Domestic Sales	-18.0	93.1	-16.4	72.8	-1.4
Exports	<u>4.6</u>	<u>-8.6</u>	<u>-0.8</u>	<u>-2.1</u>	<u>3.1</u>
Total Sales	-10.7	91.7	-16.1	45.2	-0.9
<u>Effective Subsidy</u>					
Domestic Sales	-26.2	91.4	-24.3	55.0	-8.9
Exports	<u>13.5</u>	<u>35.3</u>	<u>6.1</u>	<u>8.7</u>	<u>12.4</u>
Total Sales	-13.4	90.7	-23.7	37.9	-6.5

Source: Westphal and Kim (1974), Tables 3.A and 3.B.

Note: The basis for classifying individual sectors is the same as that employed in Table 3 above.

net income under a neutral tax policy. The difference between the reapportioned tax liability and a sector's actual tax liability is the estimated tax subsidy, which could thus be negative as well as positive depending upon whether the sector actually paid a higher or lower tax rate than the average. Interest subsidies were determined in an analogous fashion, assuming that under a neutral policy all sectors would have paid an identical average interest rate on outstanding loans, that rate being determined as the ratio of total interest payments by all sectors to total loans outstanding. Total direct tax and interest subsidies were then added to each sector's value added in domestic prices.<sup>1/</sup> The effective subsidy rate is the percentage by which this adjusted value added exceeds value added at world market prices. Since the sum of all direct tax and credit subsidies over all sectors is zero, the weighted (by value added at world market prices) average of all effective subsidy rates is equal to the weighted average of all effective protection rates.

Under the incentive system prevailing in Korea, preferential credit goes largely to the manufacturing sectors while the primary sectors benefit from lower direct tax rates. As may be seen in Table 4, the net result of credit and direct tax preferences in 1968 was implicitly to tax manufacturing further at the expense of primary activity.

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<sup>1/</sup> Value added so adjusted is an estimate of what value added in the sector would have been if there were no tax and credit preferences and net factor returns were unaltered from their actual value under the incentive policies followed.

Adding these preferences reduces the effective incentive to manufacturing from -0.9 to -6.5 percent and increases that to primary production from 17.1 to 20.9 percent.<sup>1/</sup> Thus the overall result that manufacturing receives no preferential inducement under Korea's incentive mechanisms is strengthened by adding the effects of direct tax and credit policy.

Of course, these results obscure differences in the incidence of incentives among particular industries and between exports and domestic sales. As we are here most interested in the manufacturing sectors, Table 5 presents estimates for these sectors averaged by trade category, with separate figures given for exports and domestic sales. Starting first with the results for all manufacturing, one finds that greater effective incentives were afforded to exports than to domestic sales. By virtue of being **able** to import their inputs duty free, exporters faced world market prices both for their outputs and for their tradeable inputs. The positive effective protection rate of 3.1 percent on export sales reflects the implicit subsidy to exports through generous wastage allowances and preferential rates on electricity and transportation. In turn, export sales benefitted more than did sales on the domestic market from direct tax reductions and credit preferences, so that all the incentives together yielded an effective subsidy rate on exports of 12.4 percent. By contrast, the effective

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<sup>1/</sup> Manufacturing is here defined to include beverages and tobacco and processed food. Removing these sectors from manufacturing changes the average effective protection and subsidy rates to 5.7 and 0.3 percent respectively.

subsidy rate on domestic sales was -3.9 percent.<sup>1/</sup>

As among manufacturing sectors classified by trade category, the sectors exhibiting the lowest average effective subsidy rates on total sales are the export and nonimport competing sectors. These are also the sectors in which the effective subsidy on export sales on average exceeded that on domestic sales. These sectors together accounted for 84 percent of Korea's manufactured exports (at producer's prices) in 1968.<sup>2/</sup> The share of exports in the output of the export industries was 36 percent; that for the nonimport competing industries was roughly two percent. In turn, effective subsidy rates were highest on average in the import competing sectors, where domestic sales were highly protected. The share of exports in the output of these industries was less than two percent.

The results for the XIC sectors are somewhat puzzling on first glance. (Recall that for these sectors both the ratio of exports to output and the ratio of imports to domestic supply exceed ten percent.) Though the effective subsidy rate on domestic sales was over six times that on exports for these sectors, the share of exports in their output was nearly 40 percent. In turn, though, an examination of individual export industries finds a number in which total incentives to domestic sales

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<sup>1/</sup> These figures are respectively 13.9 and -1.8 percent when beverages and tobacco and processed food are removed from the average for total manufacturing.

<sup>2/</sup> This information and the following export shares based on Table 3.C, Westphal and Kim (1974).

were also higher than those to exports.<sup>1/</sup> There is strong, independent evidence of cartelization among producers in most if not every one of these export and all the XIC sectors, which together accounted for something less than 20 percent of Korea's manufactured exports in 1968. Nearly all of these sectors benefitted from above average nominal protection on the domestic market. Cartels in these sectors thus appear to have operated in the classic mold of discriminating monopoly, covering their fixed costs through high prices in the domestic market and selling at or above marginal cost abroad.<sup>2/</sup> This would explain the apparent inconsistency between high export shares and greater effective subsidy rates on domestic sales.

The measures of incentives presented to this point are gross estimates, in the sense that no adjustment has been made for the overvaluation of the Korean won. Such an adjustment is, however, necessary as the actual exchange rate is affected by protective measures against imports and by export incentives. The adjustment required to obtain "net" effective incentive rates is the replacement of the existing exchange rate with an estimate of the free trade exchange rate in the calculation of value added at world market prices. The free trade exchange rate is the rate that would have prevailed in the absence of all protection and incentive measures, except optimal tariffs, but these are not relevant

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<sup>1/</sup> See Westphal and Kim (1974), Section 3.5.

<sup>2/</sup> The most careful documentation of this is to be found in Rhee and Westphal (1976).

in the Korean case. Net effective rates thus indicate the difference between value added at domestic prices under the observed policy regime and world market price value added at the free trade exchange rate.

Westphal and Kim (1974, Section 3.6) present the full set of net effective incentive rate estimates. Here we need only note their principal finding in regard to export incentives. Relative to the free trade exchange rate, the degree of overvaluation of the won in 1968 is estimated to have been roughly nine percent. In turn, the average net effective subsidy rate on manufactured exports was virtually zero. Thus, value added on the given volume of exports was about the same as under a free trade regime, with excess wastage allowances plus credit and direct tax preferences roughly compensating for the modest overvaluation of the won.

#### A Closer Look at Export Performance

It has been seen that exports have grown rapidly, apparently in response to stable and adequate incentives. But there are other dimensions of interest as well in respect to export performance. Those touched on in the following include the diversification of exports, both by composition and destination, and the possible importance of unique factors in explaining the rapid growth of Korea's exports.

Export Composition: As shown in Table 6, more than half of Korea's foreign exchange receipts from current transactions in 1960 were

earned on government transactions, of which military procurement is the single largest item. Military procurement consists largely of services, with construction being particularly important. Sales of won (for personal use) to resident UN military personnel are also classified under government transactions and make up the second largest item under this heading. Merchandise exports, which accounted for only 44.0 percent of total exports, were dominated by primary products.

By 1975, government transactions were the source of less than three percent of foreign exchange earnings. In turn, the share of merchandise in total exports had reached 90.5 percent, while that of manufactured products grew to 73.8 percent. Though foreign exchange earnings in current prices expanded more than 50 times over these 15 years, manufactured exports expanded over 900 times, a rate of growth averaging more than 55 percent per annum.<sup>1/</sup> Admittedly, the growth of manufactured exports started from a very small base, but it continued at a rapid pace after manufactured exports had reached a substantial percentage of output. Thus more than 25 percent of the increase in manufactured output between 1970 and 1975 was due to export growth, while the share of exports in manufacturing output in 1970 had been only 13 percent.

The increasing diversification of Korea's merchandise exports over time may be seen in Table 7, while the following discussion is based on somewhat more detailed statistics. The most important items in Korea's merchandise exports in 1960 were primary products, including (in order of their importance) metallic ores, rice, crude animal and

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<sup>1/</sup> The expansion of manufactured exports is calculated from data in Table 7.

TABLE 6

Exports of Goods and Services

	<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>
A. <u>In Billion Won at Current Prices</u>				
Exports of Goods and Non-Factor Services	8.2	68.6	381.2	2,730.3
(Gross) Factor Income from Rest of World	1.9	8.3	47.1	99.2
B. <u>Percentage Shares in Exports of Goods and Non-Factor Services at Current Prices</u>				
<u>Merchandise</u>	44.0%	69.7%	75.2%	90.5%
Primary products	38.0	27.3	17.0	16.7
Manufactured products	6.0	42.4	58.2	73.8
Services	56.0	30.3	24.8	9.5
C. <u>In Million Dollars at Current Prices</u>				
Foreign Exchange Receipts from Current Transactions	111.8	298.0	1,306.7	5,909.7
D. <u>Percentage Shares in Foreign Exchange Receipts from Current Transactions, at Current Prices</u>				
Visible exports	29.0%	57.8%	62.4%	83.2%
Invisible exports	71.0	42.2	37.6	16.8
Receipts from government transactions <sup>1/</sup>	56.3	25.3	20.0	2.7
Military procurement <sup>2/</sup>	36.9	13.4	10.6	-
Won sales to UN military personnel	19.1	11.5	4.0	-

<sup>1/</sup> Includes nonmilitary transactions as well as military procurement and won sales to UN military personnel.

<sup>2/</sup> Includes U.S. offshore procurement related to the Vietnam War; also includes sales of electricity, water, and transport and communication services to the UN military command.

Source: A and B are based on national income accounting data found in Bank of Korea, National Income in Korea, 1975, and Economic Statistics Yearbook, 1976. C and D are based on foreign exchange settlements data found in various issues of Bank of Korea, Economic Statistics Yearbook.

Note: There are differences in statistical sources, coverage, and the times at which various transactions are recorded between the national income and foreign exchange settlements data; also, the former is in domestic currency values while the latter is in U.S. dollar values. Thus, at the official exchange rate, merchandise exports do not exactly correspond in current prices to visible exports, nor does the sum of non-factor service exports plus factor income from abroad equal invisible exports.

vegetable materials, fish, and dried seaweed. Woven cotton fabrics constituted more than half of exported manufactures, which in turn accounted for less than 14 percent of total commodity exports.

The share of manufactures reached slightly more than 50 percent by 1965. Clothing, plywood, woven cotton fabrics, and plates and sheets of iron and steel each accounted for more than five percent of commodity exports in that year. By 1970, clothing had grown to more than a quarter of Korea's exports of goods, plywood and textile fabrics were each more than ten percent, and electronics were approaching five percent. In turn, the ability of Korean entrepreneurs to respond aggressively to world market trends is exemplified in the rapid rise of wigs and human hair exports from nil in 1960 to about 12 percent of commodity exports in 1970. These exports later declined in value, falling to one and a half percent of exports in 1975, as the spotlight of fashion turned away from wigs and false eyelashes.

The composition of Korea's exports in 1975 was well diversified by comparison with other developing economies. Exports exceeded one hundred million U.S. dollars for each of the following items in that year (listed in order of importance): woven textile fabrics (of which cotton fabrics were less than ten percent), electrical machinery and appliances (including electronics), miscellaneous manufactures, fish, plates and sheets of iron and steel, veneer sheets and plywood, footwear, transport equipment (largely shipbuilding, plus rolling stock), clothing,

TABLE 7

## The Composition of Merchandise Exports

	1960		1965		1970		1975	
	Value	Percent	Value	Percent	Value	Percent	Value	Percent
Food and Live Animals (0)	9.7	29.6	28.2	16.1	65.6	7.9	602.3	11.9
Beverages and Tobacco (1)	.5	1.5	.9	.5	14.2	1.7	67.6	1.3
Inedible Crude Materials (2)	15.8	48.2	37.0	21.1	100.0	12.0	150.5	3.0
Mineral Fuels (3)	1.1	3.3	1.9	1.1	8.7	1.0	104.5	2.1
Animal and Vegetable Oils and Fats (4)	.2	.6	.1	.1	.1	.0+	.9	.0+
Chemicals (5)	.4	1.2	.4	.2	11.4	1.4	74.8	1.5
Manufactured Goods by Material (6)	3.9	11.9	66.4	37.9	220.9	26.4	1,484.6	29.2
Wood and Cork Products (63)	-	-	18.2	10.4	93.5	11.2	227.6	4.5
Textiles (65)	-	-	10.5	6.0	84.9	10.2	648.9	12.8
Nonmetallic Mineral Manufactures (66)	-	-	2.8	1.6	6.5	.8	106.8	2.1
Iron and Steel (67)	-	-	12.7	7.3	13.4	1.6	231.5	4.6
Manufactures of Metal (69)	-	-	2.2	1.3	12.2	1.5	124.1	2.4
Machinery and Transport Equipment (7)	.1	.3	5.5	3.1	61.5	7.4	702.1	13.8
Electrical Machinery and Appliances (72)	-	-	1.9	1.1	43.9	5.3	441.6	8.7
Transport Equipment (73)	-	-	1.1	.6	9.2	1.1	183.7	3.6
Miscellaneous Manufactured Articles (8)	.1	.3	34.5	19.7	352.5	42.2	1,882.6	37.1
Clothing (84)	-	-	20.7	11.8	213.6	25.6	1,148.2	22.6
Footwear (85)	-	-	4.1	2.3	17.3	2.1	191.2	3.8
Miscellaneous (89)	-	-	8.9	5.1	114.1	13.7	383.6	7.5
Human Hair and Wigs (89995)	-	-	6.8	3.9	101.1	12.1	75.3	1.5
Unclassified (9)	1.0	3.0	.2	.1	.4	.0+	11.1	.2
TOTAL	32.8	100.0	175.1	100.0	835.2	100.0	5,081.0	100.0

Source: Bank of Korea, Economic Statistics Yearbook, various issues.

Notes: The figures shown here are based on customs clearance data and thus exclude exports not cleared through customs, such as sales of goods to military forces overseas and offshore sales of fish.

Values are in millions of current U.S. dollars. Totals may not reconcile due to round-off error. Numbers in parentheses are SITC Codes.

manufactures of metal, and nonmetallic mineral manufactures. Together, exports of primary products included in SITC categories 0 through 3, which had represented more than 80 percent of commodity exports in 1960, accounted for only 18 percent of total exports. Nonetheless, the value of these exports increased from less than \$30 million in 1960 to \$925 million in 1975.

As is shown in Table 8, Korea's exports classified by destination also became less concentrated as manufactured exports grew. Japan's share fell from nearly two thirds in 1960 to little less than one fourth in 1975, while the share of the United States rose from nearly seven percent in 1960 to almost 50 percent in 1970 before falling to roughly 30 percent in 1975. In turn, Korea's exports to Europe and the rest of the world increased more than proportionately, with those to the Middle East rising particularly fast after 1973.

Unique Factors Possibly Explaining Export Growth: It is appropriate at this point to confront the common tendency among those unfamiliar with its details to ascribe Korea's success as an exporter to its special relationship with the United States and Japan. The first observation in this connection is that the data in Table 8 show the share of Korea's merchandise exports to countries other than the United States and Japan to have increased from 30.0 to 44.2 percent between 1960 and 1975. **This observation is not consistent with such an explanation.**

There is, however, one obvious way in which foreign exchange earnings have been increased by Korea's relationship with the United States, and that is through expenditures stemming from the stationing of UN forces in Korea and,

TABLE 8

Destination of Merchandise Exports

	<u>1960</u>		<u>1965</u>		<u>1970</u>		<u>1975</u>	
	<u>Value</u>	<u>Percent</u>	<u>Value</u>	<u>Percent</u>	<u>Value</u>	<u>Percent</u>	<u>Value</u>	<u>Percent</u>
United States	2.2	6.7	61.6	35.2	395.0	47.3	1,536.3	30.2
Japan	20.8	63.4	43.9	25.1	233.9	28.0	1,292.9	25.4
Europe	4.6	14.1	21.4	12.2	76.0	9.1	936.7	18.4
Other Asia	3.8	11.6	41.8	23.9	81.8	9.8	760.0	14.9
Rest of World	<u>1.4</u>	<u>4.3</u>	<u>6.3</u>	<u>3.6</u>	<u>47.6</u>	<u>5.7</u>	<u>555.2</u>	<u>10.9</u>
TOTAL	<u>32.8</u>	<u>100.0</u>	<u>175.1</u>	<u>100.0</u>	<u>835.2</u>	<u>100.0</u>	<u>5,081.0</u>	<u>100.0</u>

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Source: Bank of Korea, Economic Statistics Yearbook, various issues.

Notes: See notes to Table 7.

over its duration, from offshore procurement by the United States for the war in Vietnam. As indicated in Table 6 under receipts from government transactions, militarily related expenditures (the sum of the two components shown) in the past accounted for a sizable fraction of Korea's foreign exchange earnings. However, the share of these expenditures in total earnings has fallen steadily over time, and was less than ten percent by 1973. Thus, only a small fraction of the growth in total exports between 1960 and 1975 was contributed by militarily related expenditures.<sup>1/</sup> Furthermore, the merchandise component of these expenditures has always been well below one half of the total.

With but one exception, Korean exporters have not received visible, special preferences unavailable to other developing countries' exporters from either the United States or Japan. The exception occurred during the Vietnam War, when Korean exporters were granted eligibility as suppliers under U.S. offshore military procurement. Since exports under this scheme are included within the militarily related expenditures just discussed, we need not consider them further. In turn, Korean exporters may have benefitted from more subtle forms of preferential treatment, for example in the allocation of import quotas on textiles by the United States. It is not known whether this is so. In any event, Korea's rapid diversification away from textile exports reduces the relevance of this possibility in explaining the growth of its exports.

It has also been suggested that Korea's exports have benefitted from commercial relationships (e.g., direct foreign investment, subcontracting) fostered by its close ties to the United States

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<sup>1/</sup> Receipts from government transactions peaked in 1969, at slightly over \$275 million, when militarily related expenditures were nearly \$210 million, the largest figure they ever reached. Offshore procurement in Korea for the Vietnam War achieved its highest level, \$64 million, in 1971.

and Japan. The most solid evidence concerning this possibility is in regard to direct foreign investment.<sup>1/</sup> While Korea has relied extensively on foreign savings to finance investment, most of the private capital inflow has been in the form of commercial loans.<sup>2/</sup> Between 1966 and 1971, direct foreign investment averaged less than four percent of total foreign capital inflows. Cumulative direct foreign investment in Korea prior to 1970 was appreciably less than \$100 million in current prices. Assuming that all of this investment went into the manufacturing sector and combining this figure with the capital stock data given in Table 14 below indicates that no more than five percent of the capital stock in manufacturing in 1970 was financed by direct foreign investment. In turn, Cohen (1973) estimates that "foreign" firms (i.e., those with any foreign equity participation) were responsible for a small fraction of Korea's exports: 11 percent in 1970 and 14 percent in 1971.

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<sup>1/</sup> Legislation controlling nongrant foreign capital inflows was first passed in 1960. Preferences, including a rather standard package of tax concessions for direct foreign investment, were simultaneously established to stimulate the inflow of foreign capital and technology, while limits on equity investment and profit remittances by foreign investors were completely removed in 1966. The relatively low volume of direct foreign investment in Korea during the 1960s is commonly explained either by the uncertainties of its political situation or, more plausibly, by purposeful administrative tactics that were apparently relaxed in the early 1970s; it was not due to the lack of legislated inducements.

<sup>2/</sup> The ratio of imports minus exports to investment averaged 56.4 percent between 1955 and 1975; the ratio of this difference to GNP averaged 9.6 percent. During the 1950s and early 1960s, Korea's continuing trade deficit was almost wholly financed by grant aid from the UN and the United States. It was not until the mid-sixties that foreign borrowing became important, but once started it assumed large proportions. In 1966, official grants were roughly equal in volume to foreign loans; by 1970, the volume of the latter was more than five times the size of the former, while less than half of the loan arrivals were from government and multilateral sources. Most of the private foreign loans flowing into Korea have come from Japan, the United States, and Western Europe; many, but by no means all, have been suppliers' credits of one form or another.

The picture in this respect has changed since 1971, for the share of direct foreign investment in total foreign capital inflows rose to an average of nearly 20 percent in the following four years. This was largely due to Japanese investment permitted by the relaxation of their government's control over foreign capital outflows and stimulated by rising wages and environmental controls at home. The cumulative direct foreign capital inflow from 1970 to 1975 totals in the neighborhood of \$700 million, or roughly 17 percent of total manufacturing investment over this period. I have unfortunately not been able to obtain estimates of the share of foreign firms in Korea's total exports for very recent years.<sup>1/</sup>

It was not until 1970 that Korea established its first free trade zone explicitly designed to attract direct foreign participation in exports. Up to mid-1973, total exports from firms located in this zone cumulated to only \$20 million.<sup>2/</sup> More than two thirds of these exports came from electrical machinery and appliance producers, most of whom were involved in offshore electronics assembly. In fact, foreign firms have dominated Korea's electronics exports from the start. In 1972, for example, wholly owned foreign subsidiaries accounted for 34 percent of total electronics production in Korea and 54 percent of the industry's exports; the respective figures for joint ventures were 20 and 18 percent.<sup>3/</sup> With foreign firms accounting for roughly 15 percent of Korea's total manufacturing exports, however,

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<sup>1/</sup> The foregoing information on direct foreign capital inflows is based on Frank, Kim, and Westphal (1975) and Hasan (1976), as well as various statistical publications of the Bank of Korea and the Economic Planning Board.

<sup>2/</sup> Figures in 1973 dollars from Choe (1975).

<sup>3/</sup> S.C. Suh (1975)

electronics represents an atypical case.<sup>1/</sup>

There has been very little research into how Korea's exports developed in terms of the marketing channels employed or the entrepreneurial activity involved. Thus, for example, one can not say how much of Korea's exports take place through international subcontracting arrangements not linked to direct foreign investment. Nor can one do more than speculate concerning whether Koreans derived unique benefits from their extensive contact with foreigners during and after the Korean War. In some cases this seems likely. For example, an explanation of the current success of Korean construction firms in being awarded major construction contracts in the Middle East would be incomplete without reference to the learning-by-doing gained through earlier contracts under military procurement in both Korea and Vietnam. But such factors should not detract from a fact evident to anyone who has come into contact with Korean exporters, which is that they are both aggressive and successful in seeking and exploiting opportunities for profitable export. In this respect, one certainly can not explain Korea's success as an exporter of manufactures without reference to the efforts of its entrepreneurs or the incentive policies under which they operate.

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<sup>1/</sup> Cohen (1973) gives an interesting statistic in this regard. He surveyed exporters of transistors, radios, cotton cloth, cotton yarn, baseball gloves, and wigs and found that Korean companies had initiated exports prior to the arrival of foreign firms in five out of these six products.

The Role of Trade Expansion in Industrial Development

We at last turn to examine at a broad level how the growth of exports has contributed to industrialization. It is first instructive to compare Korean experience with that of other developing countries. The atypically low share of exports in Korea's GNP observed in the 1950s suggests that the growth of its exports can be interpreted simply in terms of catching-up to the international "norm." If true, this would make the Korean case somewhat less interesting, as it could not be claimed to typify an export-led industrialization strategy.

What is needed is a comparison of Korea's economic structure with that of other countries of similar size and level of overall development. It is not very useful to do this directly, however, for there are very few countries in the world that are similar to Korea in these respects. A more useful, albeit indirect, comparison can be made using the results of cross-country regression analysis aimed at determining the average, or "norm," economic structure at different levels of development and according to country size.<sup>1/</sup>

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<sup>1/</sup> The cross-country regressions used are from Chenery and Syrquin (1975).

Table 9 compares structural norms applicable to Korea for 1955 and 1972 with the historically observed structural shares. (Nineteen seventy-two is used rather than a later year to avoid the possible distorting effects of the world boom in 1973 and the subsequent aftermath of the increase in oil prices.) Two sets of norm estimates are given: the first uses Korean values of per capita income, population, and the ratio of the current account balance of payments deficit to total domestic resources to calculate the norms from cross-country regressions in which these variables appear as explanatory factors; the second also uses Korean values of per capita income and population but arbitrarily assumes that the capital inflow ratio is zero. Differences between these sets of norms reflect the effects of foreign capital inflows at the unusually high rates observed in Korea.

In 1955, the share of industry (manufacturing plus construction) in GDP was somewhat below that which would be expected while the share of exports was very far below the average for a country of Korea's size and per capita income. By 1972, unusually rapid industrialization had reversed the pattern: industry's share was somewhat above the norm while the share of exports was nearly twice the norm when adjusted for the inflow of foreign capital. From the figures shown in Table 9, it may be concluded that: 1) the share of primary production was probably atypically low over the past 20 years; 2) the pace of industrialization was faster than in many other countries; 3) the growth of manufacturing exports was unusually rapid and reflects more than simply catching up to the norm after the dislocations caused by Japanese colonial policy and two wars. It is also interesting to observe that the growth of investment was abnormally great

TABLE 9

Observed and Norm Industrial Structure

<u>Observed Structural Shares in Korea</u>	<u>1955</u>	<u>1972</u>
Per capita GNP (1965 prices)	\$79	\$179
Capital Inflow Ratio	7.7%	4.9%
Share of Investment in GDP	12.0	20.8
Share of Exports in GDP	1.7	21.0
Share of Mfg. Exports in GDP	.4	17.8
Imports as Percent of GDP	10.0	26.1
Primary Share of GDP	48.0	32.0
Industry Share of GDP	13.0	26.0
Utilities Share of GDP	3.5	7.5
Services Share of GDP	35.5	34.5

  

<u>Norm Structural Shares</u>	<u>Actual Capital Inflow</u>		<u>Zero Capital Inflow</u>	
	<u>\$79</u>	<u>\$179</u>	<u>\$79</u>	<u>\$179</u>
Per capita income				
Share of Investment in GDP	14.4	20.2	12.8	19.2
Share of Exports in GDP	9.8	10.8	16.0	14.8
Share of Mfg. Exports in GDP	1.4	2.9	.5	2.3
Imports as Percent of GDP	17.6	15.8	16.1	14.8
Primary Share of GDP	52.8	33.5	55.4	35.3
Industry Share of GDP	14.4	24.9	11.7	23.1
Utilities Share of GDP	5.2	7.1	5.6	7.4

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Source: Westphal and Kim (1974), p. 91. The norms are those estimated from the Chenery-Syrquin large country sample.

and too quick to be attributed merely to high foreign capital inflows.<sup>1/</sup>

Sources of Growth: While it is apparent from the comparisons above that Korea's industrial development has clearly been export-led, this stands out even more dramatically when the sources of Korea's industrialization are compared with international norms. Using input-output tables, it is possible to measure the contributions of domestic demand expansion, export expansion, and import substitution to industrialization. Roughly speaking, the measure used here decomposes the increase of industry's share in GNP into these three sources, where import substitution is defined in terms of the changing share, for each industrial subsector, of imports in total supply.<sup>2/</sup>

The sources of Korea's industrialization from 1960 to 1968 are compared below with crudely estimated cross-country norms for the growth of per capita income from \$100 to \$200. (The estimates for Korea have unfortunately not been carried beyond 1968.) While import substitution contributed very little to Korea's industrialization, the growth of exports contributed more than twice the relative amount that is typically associated with the doubling of per capita income from \$100 to \$200. What makes this comparison all the more striking is that during this period Korea's per capita income increased by only 55 percent, in contrast to the 100 percent increase underlying the norm estimates.

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<sup>1/</sup> In relative terms, 1972 was a recession year in Korea, which explains the investment rate's proximity to the norm in that year; investment was more than 28 percent of GDP from 1969 to 1971.

<sup>2/</sup> The decomposition is that developed by Chenery (1969). See Frank, Kim, and Westphal (1975), pp. 86-96 for additional details.

TABLE 10

Sources of Industrialization

	<u>Domestic Demand Expansion</u>	<u>Export Expansion</u>	<u>Import Substitution</u>
Korea (1960-68)	60%	38%	2%
Large Country Norm	55	24	21
All Country Norm	50	18	32

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Source: Frank, Kim, and Westphal (1975), p. 95.

One may also use input-output data to calculate the contribution of each source, sector by sector, to changes in output quantities, rather than to changes in sectoral shares in GNP as above. Seven input-output tables spanning the period from 1955 to 1973 at roughly three-year intervals are available for Korea. But to insure that the analysis is meaningful, it is necessary to convert data for different years to constant (domestic or world) prices. This has so far been done only for the tables spanning 1955 to 1968, so that the analysis which follows is necessarily restricted to this period. In turn, data are not available at the same level of detail for 1955, so that parts of the analysis cover only 1960 to 1968.

The top half of Table 11 shows the sources of the growth of aggregate output decomposed to indicate separately the relative contributions of the primary, manufacturing, social overhead, and service sectors. Between 1955 and 1968, the growth of the manufacturing sectors was responsible for more than half of the growth of aggregate gross output. In

TABLE 11

Direct and Total Growth Contributions: 1955-1968

	<u>Domestic Demand Expansion</u>		<u>Export Expansion</u>		<u>Import Substitution</u>		<u>Total</u>
	<u>Direct</u>	<u>Total</u>	<u>Direct</u>	<u>Total</u>	<u>Direct</u>	<u>Total</u>	
<u>1955-1968: All Goods &amp; Services<sup>1/</sup></u>							
Primary Sectors	18.8%	16.3%	.7%	3.3%	-2.3%	-2.4%	17.2%
Manufacturing <sup>2/</sup>	42.6	38.5	8.4	12.9	2.2	1.8	53.2
Social Overhead	14.4	13.8	1.4	1.9	-.0	.1	15.8
Services	<u>13.2</u>	<u>11.9</u>	<u>.7</u>	<u>2.0</u>	<u>-.2</u>	<u>-.2</u>	<u>13.7</u>
All Sectors	<u>89.0</u>	<u>80.5</u>	<u>11.2</u>	<u>20.2</u>	<u>-.3</u>	<u>-.6</u>	<u>100.0</u>
<u>1960-1968: Manufactured Goods<sup>3/</sup></u>							
Exporting Sectors	10.2	8.7	11.5	13.0	.5	.5	22.2
Import Competing Sectors	23.6	22.4	.3	2.4	-1.8	-2.7	22.1
Nonimport Competing Sectors	44.1	39.7	1.1	6.0	6.2	5.7	51.4
XIC Sectors	<u>3.9</u>	<u>3.2</u>	<u>2.1</u>	<u>2.8</u>	<u>-1.7</u>	<u>-1.7</u>	<u>4.3</u>
All Manufactures	<u>81.7</u>	<u>74.0</u>	<u>15.1</u>	<u>24.3</u>	<u>3.2</u>	<u>1.7</u>	<u>100.0</u>

<sup>1/</sup> Based on data at constant domestic prices.

<sup>2/</sup> Includes "other."

<sup>3/</sup> Based on data at constant world prices.

Source: Westphal and Kim (1974), Table K.

Note: Figures may not reconcile due to round-off error. Growth contributions between 1955 and 1960 (1960 and 1968) were first calculated at the 29 (118) sector level and then aggregated before converting to percentages.

turn, the growth of manufactured exports directly accounted for 15.8 percent (8.4 divided by 53.2 expressed as a percent) of the increase in manufactured output. The estimates shown under the total column for each source include the indirect contribution due to induced changes in intermediate demand. Thus the expansion of exports, not just in manufacturing but throughout the economy, contributed 24.2 percent (12.9 divided by 53.2) to the growth of manufactured output, which means that there were strong backward linkages from exports. In contrast, import substitution, by which is meant a fall in the share of imports in total domestic supply, accounted directly for little more than two percent of the growth of manufacturing. Its total contribution was even less, indicating that import substitution generated indirect demands on sectors having higher than average requirements for imported intermediate imports.<sup>1/</sup>

In the bottom half of Table 11, the growth of manufactured output is decomposed according to the classification of sectors by trade category employed in Tables 3 and 5 above. Unfortunately, the data required for this do not extend back to 1955. More than half the growth of output in the exporting sectors was due to export expansion, while these sectors were the source of more than 75 percent of the growth of manufactured exports and 20 percent of the growth of manufacturing. Nonetheless, the expansion of domestic demand played a major part, as may be seen either by its contribution to the growth of all manufacturing output, which is nearly 75 percent, or by the total magnitude of the contribution of the nonimport competing sectors, in which exports were less than ten percent of output in 1968. Only among the sectors that had achieved nonimport competing status by 1968 was import substitution the source of more than ten percent of output growth.

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<sup>1/</sup> Also see the section below entitled "Pattern of Industrialization."

The figures presented above amply demonstrate that the growth of exports has played a dominant role in Korea's development, accounting for roughly 20 percent of the growth of aggregate output between 1955 and 1968 when backward linkage effects through the demand for intermediate inputs are included. There is every indication that its contribution has been even greater since 1968 (see Table 16 below). And, these estimates understate the full contribution of export growth, for the only indirect contribution included is that due to the derived demand for domestically produced intermediate inputs. Two additional macro-economic indirect effects may be distinguished: a multiplier effect due to increased consumption and investment out of the additional income earned through export and export-related activities; and, a foreign exchange effect due to increased production made possible by a rise in foreign exchange receipts. These effects are most dramatic where factors of production would have otherwise been unemployed, but they also operate by increasing allocative efficiency whenever the domestic resource cost, at shadow prices, of exports is less than the shadow priced value of foreign exchange receipts. Furthermore, either current or future consumption may be increased, the latter through increasing the rate of investment.

The magnitude per se of the indirect effects associated with any pattern of export expansion, or for that matter import substitution, is of secondary importance.<sup>1/</sup> The issue of paramount concern is how Korea's industrialization strategy has affected the growth of GNP and other development objectives in comparison to alternative strategies that might have been followed. To answer the question requires conducting counter-factual experiments testing alternative strategies using a sophisticated general equilibrium model that has been validated against the observed history. This has not yet been attempted for Korea. Furthermore,

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<sup>1/</sup> See the section below entitled "Pattern of Industrialization."

there may be additional indirect effects from exporting that would be hard to capture in such a model, for example the exploitation of economies of scale through increased market size and the motivation that competition in foreign markets provides for technological change.

Further research is required to gauge whether Korea has benefitted in the latter directions as a result of following an export-led strategy. On the other hand, though it is presumptive rather than conclusive, there is ample evidence to suggest that the allocation of resources resulting from Korea's having followed an export-led strategy is generally efficient. From this one can argue that the overall effects of Korea's export-led industrialization would have been hard to improve upon under an alternative strategy. The evidence is reviewed below.

Factor Utilization: Korea has been relatively successful in finding employment for its labor force, which has grown at an average rate of 3.2 percent per annum since 1960 (see Table 1). While only a crude measure, this is indicated by the fall in the unemployment rate from a peak of 8.3 percent in 1962 to its current level of 4.1 percent. It is very likely that there would have been serious unemployment, at least in urban areas, had not exports of light, labor-intensive manufactures grown so rapidly. At least, this is the inference that can reasonably be drawn from estimates of the share of

employment due to exports. Table 12 presents estimates taken from a recent study based on input-output data. The indirect employment included in the "total" estimates accounts only for that required in the domestic production of intermediate goods used in exports, so that multiplier and foreign exchange effects on employment are neglected. Even so, exports are seen to have accounted for more than one quarter of manufacturing employment and close to ten percent of total employment in 1970. The contribution of export expansion to increased employment is even more impressive. The same study finds that between 1960 and 1970, the growth of exports was responsible for 38.3 percent of the growth of employment in manufacturing and 32.7 percent of the growth of total employment.<sup>1/</sup>

Korea has also been successful in increasing the degree of capacity utilization within the manufacturing sector. The most reliable statistics showing the trend of capacity utilization rates are based on electricity usage data and define 100 percent capacity utilization to be equal to plant operation 24 hours a day, 365 days a year. On this basis, the unweighted average capacity utilization rate within manufacturing as a whole is estimated to have increased at an annual compound rate of 7.2 percent, from 17.7 percent in 1962 to 31.9 percent in 1971 (the survey from which these results are taken does not extend beyond 1971).<sup>2/</sup> In terms of the measure used,

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<sup>1/</sup> Both estimates are inclusive of indirect employment generated by exports.

<sup>2/</sup> See Kim and Kwon (1976), Table 2, U<sub>1</sub> series.

TABLE 12  
Percent of Employment Due to Exports

	<u>1960</u>	<u>1966</u>	<u>1970</u>
<u>Manufacturing Sectors</u>			
Direct Employment in Exports	2.9	13.6	18.9
Total Employment Due to All Exports	5.8	19.0	25.9
<u>All Sectors</u>			
Direct Employment in Exports	2.4	3.4	5.1
Total Employment in Exports	3.7	6.7	9.1

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Source: Cole and Westphal (1975), Table 1.

Note: The "A" employment estimates given by Cole and Westphal for 1960 have been converted to correspond to the "B" estimates for 1966 and 1970 by applying the ratio of the "B" to the "A" estimate for 1966 to the corresponding figure for 1960.

31.9 percent capacity utilization (on average, roughly the same as single shift operation throughout all of industry) is quite high by international standards. While it is not possible to state whether and by how much the expansion of exports contributed to the increase in capacity utilization, there is little doubt it played a significant role.

Comparative Advantage: It is not easy to assess the impact of exports on the efficiency of factor use. The determinants of comparative advantage are many and complex. They include elements such as the natural resource endowment, labor skills, learning-by-doing and other dynamic phenomena, and which are either difficult to quantify or have not been quantified with sufficient precision in Korea's case. Nonetheless, to the degree that Korea's comparative advantage during the 1960s may be said to have been in labor

intensive as opposed to capital intensive activities, a partial assessment is possible. Table 13 gives average labor-capital ratios for exports and for the replacement of imports by domestic production. These ratios are weighted averages, in which the weights are proportional to each sector's share in exports and imports respectively. For comparative purposes, the weighted average factor intensity of domestic output is also shown in the table. Furthermore, since these estimates are based on input-output statistics, both direct and total factor intensity measures can be presented. However, for technical reasons having to do with the estimation procedure as well as for substantive reasons, the direct factor estimates are both the most reliable as well as the most relevant owing to the fact that many important intermediate inputs are tradable.<sup>1/</sup>

On examining these estimates, one finds that manufactured exports were substantially more labor intensive than imports of manufactures in every year. On the other hand, total exports were more capital intensive than the bundle of total imports. The contrast is to be explained by the complementarity of capital and natural resources, where the latter are excluded as a factor of production in the calculation. The effect of Korea's natural resource endowment on the composition of its trade in primary products leads it to export relatively capital intensive minerals and import highly labor intensive agricultural products.

The labor-capital ratios, by sector, on which these estimates are based are those for a single year -- 1968. Thus, changes over time in the estimated factor intensity of a particular aggregate are due solely to changes in its composition. Comparing direct factor intensity estimates across years, one may conclude that Korea's manufactured exports became increasingly more labor intensive over time while its manufactured imports

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<sup>1/</sup> See the section below entitled "Pattern of Industrialization."

TABLE 13

The Factor Intensity of Trade

	Labor-Capital Ratios			
	(Man-years per million won)			
	<u>1960</u>	<u>1963</u>	<u>1966</u>	<u>1968</u>
<u>Direct Factor Requirements</u>				
Manufactured Products				
Domestic Output	2.97	2.89	2.67	2.64
Exports	2.72	3.02	3.24	3.55
Imports	2.09	1.93	1.98	2.33
All Goods & Services				
Domestic Output	4.39	4.59	4.46	4.12
Exports	3.25	2.52	2.41	2.10
Imports	4.53	4.87	4.05	4.29
<u>Total Factor Requirements</u>				
Manufactured Products				
Domestic Output	5.43	5.41	5.03	5.14
Exports	3.74	3.71	4.09	4.29
Imports	2.77	2.40	2.40	2.74
All Goods & Services				
Domestic Output	4.39	4.59	4.46	4.12
Exports	3.42	3.05	3.25	3.15
Imports	3.78	3.66	3.26	3.48

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Source: Westphal and Kim (1974), Table 0.

tended to become more capital intensive. In fact, whereas Korea's manufactured exports were less labor intensive than average manufacturing in 1960, they were more labor intensive by 1968. Manufactured imports were more capital intensive than average manufacturing throughout the period.

At least between 1960 and 1968, the shifts over time in the composition of manufactured exports and imports, when translated into changes in direct labor-capital ratios, thus suggest that Korea was following its comparative advantage within the manufacturing sector, where unskilled labor was abundant and capital scarce. However, largely because of the growth of agricultural imports, it cannot be said that total exports were becoming more labor intensive relative to total imports. These conclusions hold almost equally when one examines the total factor intensity estimates. They do not imply, however, that resources were being allocated inefficiently within the primary sector. The relative abundance of some minerals led to the export of these, and it was probably efficient to import foodgrains given Korea's poor climate and land.

Another study, Hong (1976), investigates the factor intensity of trade up to 1973. Once allowance is made for differences in estimation methods and in the presentation of results, Hong's estimates for manufactured products over the period 1960 to 1968 are consistent with those given above. However, his investigation strongly indicates that there has been an appreciable increase in the capital intensity of manufactured exports after 1968, both in absolute terms and relative to factor proportions in manufacturing as a whole, and equally with respect to the direct and total factor intensity measures. In part, this is due to capital deepening in the manufacturing sector and rapid increases in labor productivity, as Hong documents by using capital-labor ratios, by sector, specific to each year. Additionally, particularly after 1970, it may also be traced to increased exports of cement, steel, fertilizer, and textiles and various items based on petrochemical derivatives. Either directly or indirectly, all of these products require capital

intensive production methods in plants subject to severe economies of scale. In the latter connection, given the constraint that the domestic demand for these commodities is to be met through domestic production, temporary exports can be efficient as it permits the construction of larger plants without experiencing initial excess capacity and therefore reduces the cost of realizing greater economies of scale. Even without such a constraint, exports of cement, steel, and fertilizer during the first half of the 1970s may well have been in Korea's dynamic comparative advantage. It is less clear that the same conclusion holds in regard to the realization of the backward linkage from textiles and plastic products through to the domestic production of petrochemicals.

Trends in the aggregate labor-capital ratio and factor productivities within manufacturing deserve brief mention. Using data from Hong's study, these trends are summarized in Table 14. The labor-capital ratio in manufacturing rose almost continuously during the first half of the 1960s, and then fell almost continuously through 1972, again rising in 1973. In turn, both the output-capital and output-labor ratios were rising continuously during this entire period: the output-capital ratio rose by 1973 to more than twice its value in 1960, while the output-labor ratio increased by nearly 100 percent. (Output is here measured by value added.) Total factor productivity thus about doubled between 1960 and 1973. The sources of increased aggregate factor productivity include both changes in the composition of the aggregate and increased factor productivity at the micro level. The former reflects increased economic efficiency through changes in the allocation of resources while the latter

constitutes "pure" productivity change, which in turn may be due to changes in technique and the scale of production or to technological progress at the micro level (as well as increased factor utilization). There have unfortunately been no sufficiently detailed investigations to distinguish between these sources in the Korean Case.

TABLE 14  
Factor Use in Manufacturing

	<u>1960</u>	<u>1966</u>	<u>1970</u>	<u>1973</u>
Value Added (million 1970 US\$)	392.8	804.5	1,803.0	3,215.6
Employment (thousand persons)	477	958	1,448	2,020
Capital Stock (million 1970 US\$)	772.0	1,273.2	2,137.8	2,808.5
Labor-Capital Ratio	.62	.75	.68	.72
Value Added-Capital Ratio	.51	.63	.84	1.14
Value Added-Labor Ratio	.82	.84	1.25	1.59

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Source: Hong (1976), capital stock, Table A.22; employment, Table 7.6; value added, Table A.27.

Incentives and Efficiency: Additional evidence regarding the efficiency of Korean resource allocation may be found by examining the magnitude and structure of industrial incentives, including both protection measures which distort the structure of domestic prices vis-a-vis world market prices and subsidy measures which increase factor remuneration without directly affecting product prices. Much of the literature on trade and development presumes that any substantial deviation of the exchange rate from a unified equilibrium (read, "free trade") rate and large deviations in protection and subsidies among industries cause resources to be allocated inefficiently. There are many reasons to question this view: the protection of infant industries, the need to raise revenue from tariffs,

and the ability to achieve social and political goals through manipulation of the price mechanism argue in favor of some divergence between world market and domestic prices. World market prices, however, provide a standard against which the effects of incentive policies can be appraised. Large divergences from world market prices suggest the possibility, when other justifications are lacking, that allocation of resources is inefficient.

A detailed quantitative assessment of incentive policies is required to reach meaningful conclusions regarding their impact on efficiency. Fortunately, here we may rely upon the effective incentive study for 1968 reported upon in a previous section. There it was observed that nominal and effective protection rates were very low by international standards, while effective subsidy rates were also low. Equally important, effective incentive rates exhibit a relatively small dispersion among sectors in Korea, with those on export sales being somewhat less variable than those on domestic sales.<sup>1/</sup> As is widely known, effective incentive rates measured ex post reflect both differential factor remuneration rates and comparative efficiency differences across sectors, so that it can not be ascertained without further evidence whether, for example, a high effective incentive rate is associated on the margin with higher than average profits or inefficient production. But, low and relatively uniform rates obviously leave very little room for much of either excess profits or inefficiency.

One can examine the correlation between effective incentive rates and corresponding measures of resource allocation to obtain some insight into the meaning of the former. In particular, an appropriately signed and significant correlation may indicate that incentives affected the allocation of resources, whereas lack of correlation may imply that effective incentive rates reflect

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<sup>1/</sup> See Westphal and Kim (1974), Section 3.

relative inefficiency. This is particularly so in the Korean case, for incentive policies were quite stable between at least the four years from 1965 to 1968. In turn, the mobility and educational level of the Korean labor force, the rapid pace at which the capital stock was increased, and the absence of any clear evidence to the contrary suggest that resources were quite free to move toward profitable activities.

Table 15 gives rank correlation coefficients between various measures of effective incentive rates and resource allocation. Neither the share of exports in output nor the growth contributions of exports are significantly related to effective protection. However, export trade shares and growth contributions are significantly and positively related to effective rates of subsidy. The result is striking, for it demonstrates the importance of tax and credit preferences among the various export incentives during the later 1960s and suggests that export incentives had a positive influence on the expansion of exports.

Imports prompt the opposite conclusion. Since the correlation between the share of imports in total supply and effective incentives is significant and positive, it suggests that import substitution had progressed least in those sectors where the level of effective incentives to domestic sales was highest. The correlations between effective incentives to domestic sales and growth contributions are not significant, though they are negative, which is what one would expect if import substitution had progressed least in sectors where incentives were greatest. In effect, effective incentives to domestic sales seem to reflect relative efficiency while effective subsidies to exports seem to reflect profit incentives.<sup>1/</sup>

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<sup>1/</sup> The rank correlation coefficient across sectors between the effective subsidy rates on exports and on domestic sales is 0.19.

TABLE 15

Rank Correlation Coefficients Between  
Effective Incentive Rates and Resource Allocation

	<u>Share of Exports in Output in 1968</u>	<u>Percentage Growth Contribution of Exports: 1960-68</u>
Effective Protection to Exports	-.16	-.15
Effective Subsidy to Exports	.29	.26
	<u>Share of Imports in Domestic Supply in 1968</u>	<u>Percentage Growth Contribution of Import Substitution: 1960-68</u>
Legal Protection on Domestic Market	-.27	.03
Nominal Protection on Domestic Market	.30	-.19
Effective Protection to Domestic Sales	.32	-.14
Effective Subsidy to Domestic Sales	.40	-.14

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Source: Westphal and Kim (1974), Table L.

Notes: The correlation coefficients were calculated at the 92 commodity producing sector level, where time series data on resource allocation are available. Coefficients equal to or greater than .16, .20, and .27 (absolute value) are significant at the .10, .05, and .01 levels respectively under a two-tailed test.

Pattern of Industrialization: The pattern of an economy's industrialization is both directly and indirectly affected by the growth of manufactured exports. Indirect effects depend upon backward linkages from exports to the domestic production of intermediate inputs. In turn, the economy's comparative advantage in producing tradable inputs determines whether potential backward linkages to their production should be exploited. By increasing the domestic use of particular tradable inputs, exporting may add to the economy's comparative advantage in their production, but the relationship is by no means straightforward and there are other determinants of comparative advantage to be considered as well. The link between exporting a product and producing its tradable intermediate inputs is thus by no means automatic, and each backward linkage must be considered separately. In this sense, the composition of exports is most fruitfully looked at in terms of the value added in its constituent processing activities. Similar remarks obviously apply to the link between substituting for the imports of a particular product and producing its tradable intermediate inputs.

Because the direction of causality is grossly oversimplified, if not misleading, the total measures of growth contributions presented in previous sections are of limited interest compared to the direct measures. Moreover, there is nothing inherently "good" or "bad" in the finding that, in Korea, exports appear to have had stronger backward linkages than did import substitution. In turn, the total factor intensity measures presented previously are not relevant to assessing the efficiency of the observed pattern of exporting and import substituting

activities in Korea, though a comparison of direct and total measures of factor intensity may reveal something about the efficiency with which backward linkages were exploited.

These observations are particularly relevant in the Korean context, where there is an apparent anomaly in the relationship between the shares of manufactured exports and industrial output in GDP. Returning to Table 9, one finds that Korea's share of manufactured exports in GDP for 1972 exceeds the norm by a far greater spread than does the share of industry in GDP; the spread in the first case is on the order of 15 percentage points, while that in the second case is on the order of two or three percentage points. This is largely explained by the observed role and pattern of import substitution, which in turn is partly and indirectly related to the pattern of export growth.

The share of domestic value added (direct and indirect) in Korea's manufactured exports has been roughly 50 percent over most of the past decade.<sup>1/</sup> This is not a consequence of the export incentive system, for it is neutral as between the use of imported and domestically produced intermediate inputs (of the same quality) in the production of exports, except insofar as wastage allowances on imported inputs provide

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<sup>1/</sup> See Frank, Kim and Westphal (1975), p. 81 ff. Data limitations make it virtually impossible to assess trends in the domestic value added content of exports; on this point, see Cole and Westphal (1975).

a bias in favor of their use.<sup>1/</sup> It is of course true that unrestricted access to and tariff exemptions on imported inputs lead to a bias in favor of using imported inputs unless somehow offset. However, the Koreans have used the device of the "domestic L/C," which gives the full range of export incentives to producers of intermediate goods supplied to exporters, to negate this bias. Suppliers of exporters are thus permitted access to intermediate inputs at world market prices, the same as exporters.<sup>2/</sup> By avoiding excessive subsidies to backward integration from exports, this system appears to have induced only those backward linkages that permitted efficient production.<sup>3/</sup>

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1/ Until recently, export incentive policies have discriminated against purchases of domestically produced machinery and equipment through tariff exemptions and easy access to low interest rate credits tied to the purchase of imported capital goods. This has been thoroughly documented by Rhee and Westphal (1976) for textile machinery. In turn, Frank, Kim, and Westphal (1975, pp. 117-119) estimate that the difference between the high interest rate on domestic commercial credit and the interest rate charged on suppliers' credits to purchase imported capital goods increased the total purchase cost (i.e., including the discounted value of interest payments) of indigenous capital goods by roughly 20 percent in the late 1960s. Recently, having recognized the retarding effects of these policies on the domestic capital goods sector, the government has abolished tariff exemptions for exporters on their capital goods imports and has established a relatively large fund to provide medium term domestic credit at an interest rate near the world market level.

2/ This feature of the incentive system is incorporated in the effective incentive estimates presented previously. Effective incentive rates on domestic sales are a weighted average of those on sales to exporters and on all other sales; nominal protection rates pertain to sales other than to exporters. In turn, the estimates of nominal export incentives in Table 2 include incentives both to exporters and to suppliers of exporters.

3/ There are some instances, for example petrochemicals, where a case can be made that inefficient production has been established in part to supply exporters. However, additional import substitution incentives have been granted in such cases.

The high import content of Korea's exports stems in the first instance from the types of products being exported. Some, such as natural-fiber-based textile products, plywood, and steel products, require raw materials -- cotton, wool, roundwood, iron ore, anthracite coal -- that cannot be obtained in sufficient quantity locally, except at very high cost if at all. In several of these cases, import substitution for intermediate inputs has been carried back as far as possible given Korea's poor natural resource endowment. Thus, for example, natural-fiber yarns are produced domestically, as is steel. In turn, there are a few products, including silk textiles, cement, ceramics, and a range of primary products, for which the import content of exports is very low owing to Korea's having the requisite natural resource base. However, many exports, such as petrochemical-based products (until recently) or electronic assembly (even now), require intermediate inputs for which the Korean market has been too small for efficient scale production or for which sophisticated and costly technological know-how is needed. Thus, for most export products, but subject to its natural resource endowment, what Korea has exported has been the output of the labor intensive processing stages. In short, with only a few possible exceptions, Korean producers appear to have followed the dictates of comparative advantage in exploiting potential backward linkages from exports. However, it is by no means appropriate to characterize Korean exports as resulting largely from bonded processing.

Taken together, the important role of export growth in Korea's industrialization and the observed structure of backward linkages from exports to domestically produced intermediate products help explain why import substitution has played such a subordinate part. This is not to

say that no potential backward linkages from exports have been exploited through import substitution, but the rapid change in the composition of exports has offset the import substitution that has occurred, with the result that the share of domestic value added in aggregate exports has remained roughly constant. In turn, at the aggregate level, there has not been a great deal of import substitution indirectly related to domestic final demand.

Nonetheless, hidden by the aggregate figures given in Table 11 is the important role played by import substitution in some sectors, which was offset in the aggregate by negative import substitution (i.e., a rising ratio of imports to domestic supply) in other sectors.<sup>1/</sup> This may be seen in Annex Table 2 which presents various indices relevant to gauging the structural change that has occurred within Korea's manufacturing sector.

At a yet more disaggregated level, between 1960 and 1968, import substitution contributed substantially (i.e., greater than 20 percent) to the growth of 12 out of the 80 manufacturing sectors distinguished in the analysis from which these estimates are drawn.<sup>2/</sup> Among these were sectors

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<sup>1/</sup> Also obscured is the role played by the government's policy with respect to imports of consumer durables and other "luxury" consumption goods. Imports of items such as automobiles, refrigerators, television sets, and other electrical and electronic appliances are for the most part prohibited, so that the latent domestic demand for these products is satisfied only after domestic production is initiated. Thus, the government has managed to delay their purchase in significant quantities until they are produced locally, which gives rise to a pattern to which the term "import substitution" should not, strictly speaking, be applied. The mathematics of the sources of growth calculation recognizes this distinction indirectly by assigning a very low weight to these sectors in the aggregate import substitution estimate as a result of their initially small share in domestic demand.

<sup>2/</sup> For the source of this and the following statements, see Westphal and Kim (1974), pp. 110-1 and Tables M and N.

producing fertilizers, petroleum products, sewing machines, electrical equipment and products, drugs, steel ingots, paper and paperboard, basic inorganic chemicals, and cast and forged steel (listed in order of the relative contribution of import substitution). Furthermore, import substitution played an even larger role in a number of industries over shorter intervals. Nonetheless, over eight years import shares actually increased, leading to negative import substitution, in 39 of the manufacturing sectors (and eight out of 12 primary sectors). In turn, export expansion was the source of more than 20 percent of output growth for 20 manufacturing sectors. Included among these were sectors producing various textile products at different levels of fabrication, miscellaneous manufactured products, lumber and plywood, apparel and accessories, electronics and electrical equipment. But, at the same time, the contribution of domestic demand expansion exceeded 80 percent in 53 out of the 80 manufacturing sectors. Thus the importance of domestic demand growth observed in the aggregate carries over to the individual sectors as well.

The pattern of manufacturing growth from 1960 to 1968 is clearly one of widespread export expansion, concentrated in the labor intensive sectors, coupled with selective import substitution, primarily in sectors producing basic intermediate products. A more recent study, S.T. Suh (1975), analyzes the sources of growth through 1973. The results of his study are unfortunately not comparable with the estimates presented above for the period through 1968, partly because a different sector classification and level of aggregation are used, but more importantly because the estimates are all based on data in current prices. His study nonetheless documents the continuation of the same pattern: widespread export expansion and selective import substitution. Suh's results equally indicate the beginnings of a trend toward an increase in the relative importance of the heavy industrial sectors in

the growth of manufacturing, both with respect to the domestic market and exports.<sup>1/</sup> This is brought out in the table below.

TABLE 16

Direct Growth Contributions: 1960 - 1973

	<u>Domestic Demand Expansion</u>	<u>Export Expansion</u>	<u>Import Substitution</u>	<u>Total</u>
<u>1960 - 1968</u>				
Light Industry	56.9%	10.8%	-1.0%	66.7%
Heavy Industry	<u>25.8</u>	<u>1.2</u>	<u>6.3</u>	<u>33.3</u>
Total Industry	<u>82.7</u>	<u>12.0</u>	<u>5.3</u>	<u>100.0</u>
<u>1968 - 1973</u>				
Light Industry	40.1	21.8	-.8	61.1
Heavy Industry	<u>30.3</u>	<u>9.1</u>	<u>-.6</u>	<u>38.9</u>
Total Industry	<u>70.4</u>	<u>30.9</u>	<u>-1.4</u>	<u>100.0</u>
<u>1960 - 1973</u>				
Total Industry	73.1	26.8	0.1	100.0

Source: S.T. Suh (1957), Table 5.5.

Note: Based on data at current prices. Totals may not reconcile due to round-off error.

The sectors experiencing relatively substantial import substitution between 1968 and 1973 included fiber spinning and textile fabrics, rubber products, chemicals, iron and steel, finished metal products, and nonelectrical machinery. With the exception of the last two industries, import substitution was concentrated in the production of intermediate goods, and took place largely in 1968 to 1970. Much of this import substitution was due to the production of basic steel products and petrochemical derivatives in medium scale plants. Among the sectors classified as heavy industry, those contributing most to the expansion of exports

<sup>1/</sup> In Korean parlance, the heavy industrial sectors include nonelectrical and electrical machinery as well as transport equipment and basic intermediate products.

over 1968 to 1973 were chemicals, steel products, finished metal products, and electrical machinery and appliances.

Korean entrepreneurs have shown themselves to be highly responsive to opportunities to export, with notable examples being the rapid rise of wig exports in the early 1960s and later the quick expansion of electronics and footwear exports. Similarly, miscellaneous manufactures, the structure of which is continually changing, have long been a dynamic export sector. The structure of import substitution has also undergone continual change as new sectors are developed, often under government initiative. Thus, after the initial round of import substitution in the light consumer goods industries, which was more or less completed by the early 1960s, import substituting investment concentrated first on fertilizer and cement, then on petrochemical derivatives and electrical appliances, and more recently on basic petrochemicals, iron and steel, and transport equipment.

The rapid growth of foreign exchange receipts from exports has been a key factor that has made possible the selectivity of import substitution, which in turn largely explains the small part it has played in the aggregate. Furthermore, the pursuit of an economy's comparative advantage is a matter not only of the composition of exports and imports but also of their size relative to domestic production and consumption. The shares of both exports and imports in GDP were abnormally low at the end of the Korean War, and to pursue its comparative advantage has required that Korea increase the shares of both to atypically high levels. Import substitution is naturally small in the aggregate when the share of imports is rising. In turn, selective import substitution has permitted the concentration of scarce investment resources in one or a few sectors at a time

and thereby enabled greater exploitation of economies of scale and of the linkages among closely interrelated activities.<sup>1/</sup> Thus, at least in some areas, import substitution has been delayed until demand was sufficient to support efficient scale plants. This is not to deny, however, that import substitution in other areas, most notably petrochemicals and automobiles, was probably premature, as it certainly appears to have been if learning-by-doing and other "external economy" phenomena are neglected.

### Conclusion

There are two aspects to the relevance to policy making in other developing countries of Korea's successful experience with export-led industrial development. The first of these concerns overall development performance and will be dealt with only in summary fashion. The second involves the question of how to promote exports effectively and efficiently.

Korea's overall development performance since the policy reforms in the first half of the 1960s has indeed been striking, and not merely on the narrow grounds of GNP growth rates alone. As was noted previously, Korea does not have a serious unemployment problem, either among skilled or unskilled labor. In turn, the distribution of income in Korea is not markedly unequal. In fact, surveys reveal that the distribution of consumption expenditure among Korean households tends to be more nearly equal than it is elsewhere in the world and that this distribution does not appear to have deteriorated over time.<sup>2/</sup> Exports have thus proven to be a powerful engine of GNP growth and, due to their

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<sup>1/</sup> In the context of a planning model, Westphal (1971) documents the potential gains from following such an investment pattern.

<sup>2/</sup> See Frank, Kim, and Westphal (1975), Chapter 11 for details regarding this and the following points. Adelman (1974) and Renaud (1976) survey the evidence regarding the distribution of income in Korea in greater detail.

labor intensity, they have contributed greatly to rapid employment growth, which in turn has doubtless been a major factor in maintaining a relatively even distribution of consumption.

But it would be a mistake to attribute Korea's successful development performance solely to its having followed an export-led industrialization strategy. Other factors have been at work also. The most obvious of these is the high level of foreign assistance, particularly during the 1950s and early 1960s, which helped build the infrastructure for subsequent growth. And, foreign capital inflows from all sources continued to be substantial thereafter. Given that the gross capital-output ratio has averaged about 2.5 since 1960, the average foreign capital inflow of roughly 10 percent of current price GNP over the past 15 years yields a contribution to the GNP growth rate of about four percentage points a year. Since the average rate of GNP growth has been about ten percent since 1960, without foreign savings the growth rate might have been closer to six percent. However, more relevant than this crude calculation is the fact that foreign capital inflows were used efficiently, as is partly reflected in the very low gross capital-output ratio achieved in Korea relative to other developing countries. In turn, the availability of private foreign capital to Korea has to some degree been a response to its favorable export performance, so that one must be careful not to overstate the importance of "exogenous" capital inflows.

Political factors have been very important. Korea has had a strong government motivated and able to impose far-reaching economic policies including frequent devaluations of the currency and tax measures which maintained government savings at high levels until the aftermath of the rise in energy prices. In turn, where the government has intervened in labor markets, it has generally been to counter organized labor,

which as a result is not a powerful interest group as it is in many other developing countries. But, at the same time, real wages have been permitted to rise in response to labor market conditions, so that in the fifteen years since 1960 the average real wage in mining and manufacturing has increased 5.5 percent per annum (see Table 1).

Equally important are the "initial conditions" at the start of Korea's rapid industrialization. Thus, part of the growth of industry and exports may be interpreted as a return to "normalcy" after the removal of foreign domination and the disruption of war. But this interpretation is valid only through the early 1960s. In turn, with respect to the determinants of income distribution, Japanese colonial occupation resulted in the virtual destruction of the landed aristocracy which had ruled Korea prior to the Japanese takeover. A complete and equalizing land reform was initiated by the United States occupation government after World War II and completed by the Korean government in 1952. This, along with the economic dislocation caused by two wars and the departure of the Japanese, produced a relatively egalitarian distribution of assets throughout the society. Additionally, Korea inherited from its Confucian past a culture in which a very high value is placed on education. Through parents' efforts, and despite the fact that public expenditures on education in Korea have been low by international standards, it has one of the highest literacy rates in the world and a very high proportion of secondary school and university graduates. The large investment in human capital has resulted in a highly skilled labor force obtained without great expenditure of public resources.

The key fact thus remains that economic policies have made a large contribution in fostering what appears to be an efficient

allocation of resources. Certainly none of the available evidence, most of which has been reviewed in the preceding sections, is inconsistent with the hypotheses that policy has made a substantial difference for Korea's performance and that overall resource allocation has been efficient, though with a few possible exceptions in particular sub-sectors. In short, given Korea's poor natural resource endowment and assuming that its comparative advantage lie in labor intensive activities, Korea provides an almost classic case of an economy following its comparative advantage and reaping the gains predicted by conventional economic theory.

With respect to the promotion of exports, the most important lessons from Korea's experience appear to be that exports respond to incentives while efficiency in resource allocation can be assured by operating close to a free trade regime. Both of these conclusions require further scrutiny. Nothing has so far been said about "institutional" incentives to exports, while much deserves to be said. This concluding section will end with a brief discussion of the balance between price and institutional incentives. In turn, the evidence presented above regarding the efficiency of Korean resource allocation is only presumptive, not conclusive. And, the Korean government has relied upon infant industry protection as well as subsidies to foster the selective development of import substituting industries. But what is unique in this regard is the pressure brought to bear by the government for infant industries to begin exporting, either directly or indirectly as suppliers of exporters, very quickly after their establishment. "Infant industry" is a less apt characterization than "infant exporter."

It is not easy to gauge the importance of institutional incentives to the rapid growth of Korea's exports. Perhaps the most difficult of these to appraise are the government assisted export marketing efforts. The government-subsidized Korea Trade Promotion Corporation was founded in 1964 to promote Korea's exports and do market research. It has since established offices in a number of important trading centers abroad. The government also authorized the Korean Traders' Association (a private organization of exporters) to collect one percent of the value of total c.i.f. imports as an export promotion fund. And, it requires its embassies abroad to participate actively in export promotion and has sent special trade missions to a number of foreign countries as well. How to market exports effectively is an important question, which makes the absence of any serious research on the part played by the Korean government's marketing assistance particularly unfortunate.

In a complementary direction, the government established annual export targets broken down quarterly and in considerable detail by commodity, market, and domestic exporter starting in 1962. Export targets have generally been met, and indeed exceeded, for the export promotion campaign has had high priority, as may be seen in the following. Adjoining the Minister of Commerce and Industry's office is an "export situation" room laid out so that potential target short-falls may be found at a glance. A large staff maintains almost daily contact with the major exporters and it is not uncommon for the Minister to intercede in the event of possible difficulties in meeting targets. In turn, Korea's President receives a monthly briefing regarding current export performance and prospects. The emphasis on export promotion was given further expression in 1969 when exporters began to

be graded into four classes on the basis of export performance, with the highest export achievements bringing the national medal of honor, public Presidential commendation, and a number of more material benefits including relaxation of tax surveillance.

It would be naive to conclude from this that targets independently set by the government determined actual export levels via a command-type system, for the targets were meant to be indicative and as such were set jointly by the government and the various exporters' associations. Furthermore, export targets were by-and-large exceeded, even when revised upwards during the course of a year. Though both adequate export incentives and export targets were part of Korea's overall export promotion policy, which makes it impossible unambiguously to separate the effects of each, it is very clear that failure to provide adequate incentives would have severely retarded export growth. In this sense, export incentives were a necessary condition for Korea's phenomenal export performance. Were export targets also a necessary condition? This is a question about which there is considerable debate among knowledgeable specialists.

Possible evidence that export targets may have had a part in stimulating exports in some sectors comes from the effective incentive study in 1968. It will be recalled that several important exporting sectors appeared to operate as cartels and received higher incentives to sell on the domestic market than to export. Under the circumstances, exporting can of course be explained in terms of discriminating monopoly, but equally the government may have encouraged the formation of cartels in these industries to promote exports through using the export

targeting system. In fact, export subsidies such as the wastage allowance rate sometimes appear to have been jointly negotiated between government and business simultaneously with export targets. (It is notable in this regard that there is no evidence of excess profits in these industries.) But, whether exports from these sectors would have been less in the absence of export targeting is a matter of speculation. And, in any event, these industries together accounted for no more than 20 percent of Korea's manufactured exports in 1968.

With respect to most exports, the targets complemented incentives without which rapid export growth would not have been possible. One important function filled by the export targeting system was to keep the government well informed regarding export performance so that timely changes could be made in incentives, often including ad hoc assistance to individual exporters. The other function of the export targeting system and its trappings was to publicize the importance attached by the government to exports: export incentives were well advertised and access to them was immediate. An atmosphere was thus created in which businessmen could be certain that the incentive system would reward efforts to export. Businessmen responded by taking the substantial risks of expanding production and capacity for export.

ANNEX TABLE 1

Effective Incentive Rates for Industry Groups in 1968

	<u>On Domestic Sales</u>		<u>Effective Protection</u>			<u>Effective Subsidy</u>		
	<u>Legal Protection.</u>	<u>Nominal Protection</u>	<u>Domestic Sales</u>	<u>Exports</u>	<u>Total Sales</u>	<u>Domestic Sales</u>	<u>Exports</u>	<u>Total Sales</u>
Agriculture, Forestry, & Fishing	36.5%	17.0%	18.5%	-16.1%	18.1%	22.5%	-9.9%	22.1
Mining & Energy	<u>12.2</u>	<u>8.9</u>	<u>4.0</u>	<u>-1.0</u>	<u>2.9</u>	<u>5.1</u>	<u>3.0</u>	<u>4.7</u>
Total Primary	<u>35.1</u>	<u>16.5</u>	<u>17.8</u>	<u>-7.6</u>	<u>17.1</u>	<u>21.6</u>	<u>-2.7</u>	<u>20.9</u>
Beverages & Tobacco	140.7	2.2	-19.3	-1.9	-18.6	-25.8	14.5	-24.2
Processed Food	61.5	2.9	-18.2	-2.7	-17.0	-25.2	2.3	-23.0
Construction Materials	32.2	3.9	-11.5	-5.2	-11.3	-16.9	5.9	-15.9
Intermediate Products I	36.6	2.8	-25.5	31.0	-19.5	-29.7	43.4	-21.9
Intermediate Products II	58.7	21.0	26.1	-0.2	24.2	19.6	17.5	19.5
Nondurable Consumer Goods	92.3	11.7	-10.5	-1.9	-8.5	-20.6	5.4	-14.7
Consumer Durables	98.3	38.5	64.4	-4.7	51.0	38.2	2.4	31.3
Machinery	52.6	29.9	44.2	-12.7	42.9	31.5	5.2	30.9
Transport Equipment	<u>62.4</u>	<u>54.9</u>	<u>163.5</u>	<u>-53.1*</u>	<u>163.9</u>	<u>158.7</u>	<u>-22.8*</u>	<u>159.1</u>
Total Manufacturing	<u>67.6</u>	<u>12.2</u>	<u>-1.4</u>	<u>3.1</u>	<u>-0.9</u>	<u>-8.9</u>	<u>12.4</u>	<u>-6.5</u>

Source: Westphal and Kim (1974), Tables 2.A and 2.B.

\*Denotes that value added in exports at prices (inclusive of subsidy elements) actually paid and received by producers is negative.

ANNEX TABLE 2

Structural Change: 1960 - 1968

	Domestic Demand Composition		Shares in Total Commodity:						Direct Contribution to Sector's Growth <sup>1/</sup>	
	1960	1968	Output		Exports		Imports		Export Expansion	Import Substitution
			1960	1968	1960	1968	1960	1968		
Agriculture, Forestry & Fishing	43.1%	31.5%	46.8%	32.8%	32.9%	4.5%	21.4%	16.3%	-0.1%	-7.9%
Mining & Energy	1.8	1.8	2.7	2.4	25.5	6.2	1.0	1.1	15.9	-3.9
Total Primary	44.9	33.3	49.5	35.2	58.4	10.7	22.4	17.4	1.2	-7.6
Processed Food	12.0	10.1	12.5	11.4	10.4	7.7	9.4	3.8	7.8	1.8
Beverages & Tobacco	5.4	5.4	6.1	6.4	2.2	2.3	1.1	.0	4.0	2.2
Construction Materials <sup>2/</sup>	.8	1.9	.9	2.2	.9	1.4	.4	.4	5.6	8.0
Intermediate Products I <sup>2/</sup>	10.2	14.5	8.9	15.0	4.9	24.6	16.1	16.1	17.0	14.8
Intermediate Products II	14.3	15.8	11.9	13.6	12.5	13.2	27.3	24.3	10.4	5.0
Nondurable Consumer Goods	9.0	7.4	8.0	10.8	7.3	34.9	13.8	2.7	36.2	6.8
Consumer Durables	.8	1.7	.5	1.4	.1	3.3	2.2	3.7	23.2	-4.4
Machinery	1.8	5.6	1.0	1.7	1.7	1.5	6.4	20.8	8.0	-49.0
Transport Equipment	.6	4.2	.6	2.4	1.7	.3	.8	10.7	.2	-41.9
Total Manufacturing	55.1	66.7	50.5	64.8	41.6	89.3	77.6	82.6	15.1	3.2

<sup>1/</sup> Growth contributions were first calculated at the 118 sector level and then aggregated before converting to percentages.

<sup>2/</sup> Intermediate products I are those at the lowest level of fabrication, for example yarn rather than cloth or steel ingots rather than steel sheet and bars. They are also referred to in the text as basic intermediate products.

Source: Westphal and Kim (1974), Tables H, J, and K.

Notes: Based on data at constant world prices.

Totals may not reconcile due to round-off error.

The classification of industries used here is that developed by Balassa and Associates (1971).

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