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AN ANALYSIS OF SHARES IN KOREA'S IMPORT MARKET, 1960-1973

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By

Dal Hyun Kim

Dissertation Committee:

John H. Power, Chairman
Lee-Jay Cho
Fred C. Hung
Yeong-Her Yeh
James E.T. Moncur

ABSTRACT

While the growth performance of the Korean economy over the two decades, 1953-1973, was impressive, a continuing problem has been a large trade deficit and corresponding heavy dependence on external resources. This suggests the importance of looking at the import side of the trade balance to see what can be learned about its role in the continuing trade deficit.

This study is concerned with sources of Korea's import growth. The favorable internal environment of Korea contributed to the export expansion of developed countries in Korea's import market. However, the success of these exports to Korea depended also on other factors such as competitiveness among sources of supply, condition of loans and grants, and suppliers' credit terms. In this study, an attempt has been made to analyze the effects of demand and supply factors on the actual export expansion of the four major suppliers in Korea's import market: the United States, Japan, West Germany, and the United Kingdom. The main analytical device used was Constant-Market-Share (CMS) analysis.

According to CMS analysis, the inter-country variation in export performance can be explained by two factors, the commodity compositional effect, depending on demand factors and the competitiveness effect, depending on supply factors. The competitiveness effect seems to be the more important of the two during the period 1960-1973. Among the four countries, Japan (and also the United Kingdom to a small degree) has shown the best performance. The competitiveness effect is the

major factor explaining its good export performance in total products. Breaking down the analysis to a disaggregated level, the empirical results reveal that Japan has shown better export performance in almost all groups except industrial supplies (primary) and other commodities.

One can say that Japan has enjoyed positive competitiveness effects which means that Japan succeeded in capturing the higher shares in Korea's market over time. The negative competitiveness effects of other major suppliers (i.e., the United States and West Germany) reflect their failure to maintain their shares in Korea's market due to the deterioration in their relative competitiveness. Hence, the increase in Japanese shares in Korea has been at the expense of the United States and West Germany.

Owing to the importance of competitiveness in determining actual export growth to Korea, this study attempts further to examine the role of price competitiveness in determining the export expansion of individual commodities of major suppliers in Korea's market. The concept of elasticity of substitution is then employed in the analysis. The empirical results show that price competitiveness has some influence in determining the export expansion of these countries in Korea's market.

We interpret the positive competitiveness effect as an indication of an improved competitive position in a given country's exports in relations to those of others. But it is very difficult to pinpoint what the competitiveness is comprised of or what it means. Obviously, the price variable is important. But other factors such as the quality

and uniqueness of the goods, transport costs, the speed of delivery, after sales service, and commercial and financial ties and arrangements can also be important determinants of competitiveness. Therefore, it is quite obvious that the competitiveness of export commodities from different sources of supply is influenced by non-price as well as price factors.

Considering both price and non-price factors, Japanese goods seem to be preferable. Although the Korean government attempts to control imports for the improvement of balance of payments and also to diversify the import sources, it is difficult to accomplish such tasks because Korea is still in need of imports required for economic growth and industrialization, and imports from Japan are considered to be favorable at the present time since they promise a saving in foreign exchange.

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CHAPTER I

INTRODUCTION

1. Introduction

While the growth performance of the Korean economy over the two decades, 1953-1973, was impressive, a continuing problem has been a large trade deficit and corresponding heavy dependence on external resources. This has occurred despite an export growth performance unmatched among less-developed countries. This suggests the importance of looking at the import side of the trade balance to see what can be learned about its role in the continuing trade deficit. While some attention will be given to Korean economic growth, structural change and economic policies in influencing the demand for imports, the main emphasis will be on the supply side---the export behavior of Korea's principal trading partners: the United States, Japan, West Germany, and the United Kingdom.

The 1960's was an era of development in the Korean economy.¹ It was an epoch-making era in the sense that the nation attempted to maximize economic growth by utilizing the inflow of foreign capital, expanding exports and imports, increasing domestic saving, improving the industrial structure, and reducing government deficits. Although foreign exchange earnings derived from exports have grown rapidly as the country industrialized, Korea's export earnings have not kept pace with increasing imports. The result has been a persistent tendency towards external payment deficits.

In the period 1960-73, exports expanded at an annual rate of 38.9 percent. Total exports increased considerably from 32.8 million dollars in 1960 to 3,225 million dollars in 1973. The increasing role of exports during the last decade is also indicated by the fact that the ratio of exports to GNP increased from 6.3 percent in 1960 to 17.8 percent in 1973. In addition to the rapid growth of exports, the structure of export commodities has changed remarkably in the direction of manufactured goods from primary products.

In line with the increase of exports, the total amount of imports also increased considerably from 343.5 million dollars in 1960 to 4,240.3 million dollars in 1973--an annual rate of increase of 24.8 percent. Due to economic growth and industrialization the composition of import commodities changed in the direction of intermediate goods and capital goods from consumer goods. Further, the ratio of imports to GNP also increased from 17.0 percent in 1962 to 37.3 percent in 1973. This means that the country had to import more raw materials and capital goods as the economy has industrialized over time.

In spite of a surprising export expansion, the absolute gap between imports over exports has been widening in such a way that the trade deficit increased from 367 million dollars in 1962 to 1,015 million dollars in 1973. However, the trade deficits declined as a proportion of imports. The gap between commodity exports and imports has been filled by a favorable inflow of foreign capital. It appears that the balance of payments has emerged as the constraint to higher economic growth in the future.

Inflows of foreign investment and loans amounted to 350 million

Table 1
Exports, Imports, and Trade Deficits
(In Millions of U.S. Dollars)

Year	Exports	Imports	Trade Deficits
1960	32.8	343.5	- 310.7
1961	40.9	316.1	- 275.2
1962	54.8	421.8	- 367.0
1963	86.8	560.3	- 473.5
1964	119.1	404.4	- 285.3
1965	175.1	463.4	- 288.3
1966	250.3	716.4	- 466.1
1967	320.2	996.2	- 676.0
1968	455.4	1,462.9	- 1,007.5
1969	622.5	1,823.6	- 1,201.1
1970	835.2	1,984.0	- 1,148.8
1971	1,067.6	2,394.3	- 1,326.7
1972	1,624.1	2,522.0	- 897.9
1973	3,225.0	4,240.3	- 1,015.3

Source: Bank of Korea, Economic Statistics Yearbook 1974.

dollars during the period 1959-1966 while they amounted to 3,980 million dollars during the period 1967-73; this indicates that foreign capital inflows have increased rapidly since 1967. These inflows have contributed to accelerating economic growth by increasing domestic investment, and exports as well as imports. But it is evident that the country must finance its trade deficit from foreign capital sources and loans (1,015 million dollars in 1973).

The problem of trade balance can perhaps be put in sharper focus by concentrating on the balance with Korea's major trade partners. Most of the trade deficits came from trade with the United States and Japan--together both countries comprised more than 70 percent of the import trade.

In first half of the 1960's, the trade deficit with the United States was 51 percent while the trade deficit with Japan was only 27 percent. However, in the second half of the 1960's, the trade deficit with Japan increased considerably, representing 50 percent of the total trade deficit in 1970. In 1973, it represented 60.9 percent. The trade deficit with Japan increased as the volume of Korea's total trade increased. During the same period, the trade deficit with the U.S. declined remarkably to 21 percent on the average and for the first time Korea recorded a hundred million dollars trade surplus with the United States in 1972. Since the mid-60's, the absolute amount of the trade deficit with the United States has not significantly increased even though the volume of the total trade has increased.

The remaining share of Korea's trade deficit excluding Japan was 82 percent in 1961 but it decreased to 48 percent in 1969 and to

31 percent in 1973. Therefore, Korea's growing trade deficit has been closely associated with Japan. The reasons for Korea's persistent trade deficit with Japan are as follows: on the import side, 1) the trade deficit with Japan has been closely associated with the enlarged economic cooperation between Korea and Japan after diplomatic normalization; 2) partly because of geographical proximity, it is cheaper for Korea to import from Japan the intermediate goods and capital goods required for industrialization. On the export side, 1) Korea's export structure of commodities may not be favorable to Japan's import structure. For example, Korea's main items of export are primary products and more recently light manufactured goods; 2) most of Korea's export commodities not only can be produced in Japan, but Japan can also import these products from countries other than Korea.²

The balance of payments deficit problem has become one of the foremost concerns in Korea. The Korean government has sought to improve this serious situation by attempting to reduce imports and diversify sources of imports so as to reduce Korea's economic dependence on its major trading partners such as Japan and the United States. A particularly large part of the trade deficit has come from the deficit with Japan (more than 50 percent of total deficits for the period 1967-73).

2. Purpose of the Study

This study is an attempt to 1) analyze the past import performance behavior in Korea during the period 1960-1973, utilizing institutional and statistical approaches; 2) study the impact of industrialization policy on the structural change of Korea's imports; 3) investigate the cause-and-effects of import expansion from the

point of view of demand as well as supply, utilizing the constant-market-share model; 4) assess the responsiveness of consumers in Korea to changes in relative prices of imports from two competing sources, i.e., the elasticity of substitution between sources of imports; 5) derive some conclusions about the behavior of Korea's imports and the past performance of major suppliers in Korea's import market.

Patterns of causation in human affairs are exceedingly complex and are not fully understood, so that one cannot hope to give a complete or precise explanation of the past. What will be done here is to set out a series of hypotheses, and to show that they are consistent with the events we seek to explain.

The factors influencing the quantity of imports may be divided into supply and demand. Our aim is to isolate and measure the effects of the most important factors. A most serious limitation of much of this study is that it is confined to the more immediate supply and demand factors influencing imports and that the interaction of these factors is largely ignored.

This study will focus on Korea's import performance in order to investigate the causes-and-effects of import expansion in terms of demand and supply factors. The analysis of past import behavior will provide us the opportunity to evaluate the past performance and to derive some conclusions about the behavior of Korea's imports which will be useful for developing balance-of-payments policies in the future.

3. Plan of the Study

This study is divided into six chapters. The first chapter is concerned with posing the chronic trade deficit problem, the purpose of study and the plan of study. Chapter 2 deals with the structural changes in Korea's import demand for the period 1960-1973, with the most emphasis on the effect of industrialization and industrial policies. In addition, the interdependence between import and foreign investment is briefly discussed. Chapter 3 describes the theoretical framework which contains both a constant-market-share model and elasticity of substitution theory. While we discuss how these two theories are inter-related for the study, we also attempt to show limitations of these theories for the empirical analysis.

Chapter 4 shows empirical results of export expansion between sources of supply in Korea's import market by using the constant-market-share model. Exports from the advanced countries have been analyzed from the point of view of Korea's demand as well as supply. The constant-market-share (CMS) model will be applied to split the ex post growth of export of developed countries (in Korea's import market) into its components of the commodity composition, the pure share effect, and the interaction effect. Chapter 5 shows the analysis of price-quantity and elasticities of substitution between sources of supply for the specific individual commodities in Korea's import market; attempts will be made to measure the responsiveness of advanced countries' exports to the movements in relative prices of different groups of commodities. The last chapter describes the summary and conclusions for the whole study.

Footnotes

Chapter I

¹Economic Planning Board, Economic Survey 1970, Government of the Republic of Korea, (Seoul, 1970), pp. 143-145.

²Bank of Korea, "Structural Analysis of Trade between Korea and Japan," Monthly Economic Review, XXVIII (January, 1974), pp. 25-26.

CHAPTER II

STRUCTURAL CHANGE IN KOREA'S IMPORT BEHAVIOR, 1960-1973

1. Economic Growth and Imports

A. Two Phases of Post-War Growth and Pattern of Trade

Korea's industrialization up to 1960 was due to import substitution and the growth of domestic demand. Korea started out with import substitution in nondurable consumer goods and their inputs. By the late 1950s, she had replaced virtually all such imports. Prior to 1960, Korea applied a system of incentives characteristic of countries following inward-looking policies. Tariffs and quantitative restrictions provided high levels of protection against imports and, in the absence of export subsidies, there was a bias against exporting manufactured goods. Protection of manufactured goods in the domestic market also penalized the primary sector through the high prices of manufactured inputs and exchange rates that reduced the domestic currency equivalent of foreign exchange earnings.

Import substitution in nondurable consumer goods and in the intermediate products used in their manufacture did not offer sufficient possibilities for rapid growth. The smallness of domestic markets in Korea restricted the scope for, and raised the cost of, import substitution in intermediate products, machinery, and consumer durables. Thus, the possibilities for import substitution were much smaller in Korea than in countries such as India, Brazil, and Argentina while the economic cost of import substitution was more apparent.

In the 1950's, import substitution was a phase of transition

growth during which the economy had a marked internal orientation, supported by policies which encouraged production for the domestic market and discouraged exports. When import substitution termination tendencies appeared in 1961, there was a perceptible shift toward an external orientation. In the 1960's, growth emphasized the development of industries for the export of labor intensive goods under a liberalized market system. Termination of the import substitution (IS) phase may lead to the launching of a new growth phase, the export-oriented phase in which expanding industrial capacity becomes oriented toward the external market. Export-oriented phase here means a shift from traditional primary exports (for example, mining) to industrial exports (for example, labor intensive textiles and electronics).

The shift from a primary product base to an industrial export base in this phase produces two effects. The first effect is a reversal from the domestic orientation of the IS phase to a more externally oriented economy. This reversal is in a rising ratio of trade to GNP. The second effect of the shift to an industrial export base is rapid expansion of the country's own import capacity.² This transition growth must recognize that a country's import capacity is determined partly by foreign aid as well as by the country's export capacity. The economy's center of gravity will shift more rapidly toward the industrial sector in the outward orientation phase than in the IS phase, as measured by the relative value added contribution of industry and agriculture. Furthermore, the export-oriented phase is characterized by unusually rapid growth of per capita GNP. Finally, the termination of the IS phase and emergence of the outward orientation are accompanied by

organizational changes that relax the foreign trade oriented controls and emphasize an orientation toward free markets. A generally observed phenomenon is that developing countries usually start with import-substitution industries and later shift to export some of their products. The Republic of Korea has gone through this process.

The extraordinary import growth with a rapid increase in exports also seems to reflect the radical shift in industrialization policy from inward to outward orientation, which took place in 1962. For, as a matter of fact, the outstanding import performance in the 1960's has coincided with the implementation of gradual import liberalization and the introduction of positive export promotion. This industrialization through outward-looking policy brought about the increase in imports as well as the structural change in imports during the 1960's.

B. The Role of Imports

It is generally said that imports have a dual impact on the process of industrialization in developing countries; imports make it possible to bring in capital goods which are necessary in the industrialization process, and to expand the capacity of domestic supply by stimulating technological innovation. This is the positive aspect of imports. On other hand, imports have a negative impact on domestic industries competing with foreign importable goods and worsen the nation's balance of payments.

Although most developing countries have adopted protective policies because of these negative aspects in the past, they nevertheless tend to realize that imports may play a positive role in the process of economic development. Imports of raw materials may stimulate

investment in the manufacturing sector, which in turn expands the market, increases domestic productivity of labor, and finally contributes to an increase in the capacity for import substitution. Therefore, it is said that balance of payments deficits are natural and unavoidable phenomena in the early stages of development. In conclusion, we may say that the capacity to import depends significantly on foreign exchange earnings through exports. Thus an ideal way of economic development may be to increase exports and imports simultaneously.³

Two interrelated aspects of the relation between imports and economic growth are significant to the question whether imports can be sufficiently increased. One is the trend of total imports as compared with the growth of production in Korea. The other is the change in the composition of imports that has occurred because of changes in the domestic economy.

C. Industrialization and Trends of Import Structure in Korea

The Korean economy experienced quantitative expansion as well as qualitative and structural changes in the 1960's as economic growth was achieved. Thus, the weight of the manufacturing sector has been increased and the internal structure of the manufacturing sector has also changed during the same period. On the one hand, economic growth contributed to increased real income, thus rapidly increasing the demand for manufactured goods that are relatively more income-elastic. The rapidly increased demand for manufactured goods led to changes in the sectoral demand structure, which in turn changed the industrial structure. On the other hand, it is very common that changes in the supply structure cannot immediately reflect those in the demand structure in

the process of industrialization in developing countries. Korea was not an exceptional case. Therefore, changes in the import structure depended upon the divergence between demand for manufactured goods and domestic supplies.

Changes in Korea's trade structure might be regarded as the result and also the cause of industrialization; it is extremely important to investigate various factors that affected changes of trade structure in the past for the purpose of analysis of Korea's industrialization. When we had dealt with the past economic performance of growth and trade, it has been customary that the emphasis has been placed upon the export sector while the import sector has been regarded as a negative aspect for growth and trade. But it seems to me that the role of imports in the industrialization process has been extremely important especially in Korea which has a stagnant agricultural sector and poor natural resource endowment.

D. Dependency Ratio of Trade to GNP

As we mentioned earlier, the Korean economy has developed at a rapid rate of growth accompanied with the successful achievement of economic development plans in the 1960's. It may be said that there is no question about the development-stimulating effects of imports. Especially, in developing countries such as Korea which have poor natural resource endowment, a continuous high economic growth could not possibly be achieved without the aid of exports, imports and foreign capital inflow.

As we see in Table 2, the dependency ratio of trade to GNP was raised from 17.0% to 37.3% while the ratio of exports to GNP was

increased from 6.1% to 33.3%. From the above historical records, we may conclude that economic growth performance has been significantly dependent upon external transaction, especially imports. In other words, external transactions played a major role as the engine of growth. 1964 was the only year that the weight of the manufacturing sector in the GNP was greatly reduced; because the reduction of foreign exchange holdings lowered the import dependency ratio. This fact tells us that imports played a major role in the process of industrialization.

Korea had to increase imports of raw materials and capital goods in order to increase industrial production and the capacity to export in the process of economic growth.

2. Industrialization and Capacity to Import

While Korea's industrial and trade structure was greatly changed in the 1960's, it is a remarkable fact that higher economic growth was maintained under a rising import dependency ratio. The continuous increase in imports has been financed by both foreign aid and foreign capital. But foreign aid showed a tendency to decline over time, while foreign capital, both public and private, continued to increase. Therefore, it is shown that the burden of foreign-debt servicing tended to increase due to the increased inflow of foreign capital. Naturally, the prospect of continuously increasing imports may be the crucial problem that must be solved in the future.

Generally, the capacity to import may be the crucial constraint to economic growth in the industrialization process in the developing countries. Hence, the emphasis should be placed upon the maximization

of capacity to import and its efficient management. Korea has adopted the following strategies: 1) Korea has to maximize economic growth for a given capacity to import; 2) Korea has to maximize the capacity to import because Korea was to find her engine of growth in foreign trade.⁴

With a given capacity to import, the way to maximize growth is to reduce the ratio of imports to the total supply by import substitution. As we discussed above, gross import substitution has been accomplished only in sectors such as raw materials for construction and chemical industries. However, in other sectors, the import ratios tend to increase, resulting in negative gross import substitution (e.g., machinery). Import substitution for final goods has been achieved in the following sectors: cement, refined oil and fertilizer. Import substitution for raw materials and capital goods in other sectors still remain to be achieved.

In addition to import substitution, the way to increase the capacity to import could be accomplished through increasing foreign exchange earnings by export expansion. As A. O. Hirshman wrote, the final limit to capacity to import lies in export. Since 1962, exports expanded faster than imports, but there is still a deficit gap between imports and exports in absolute terms that requires further expansion of exports.

As discussed above, we find that increased economic growth in recent years was mainly dependent upon imports of raw materials and capital goods. This phenomena can be explained by the following factors: 1) the tempo of industrialization in Korea was very fast;

Table 2
 Ratios of Exports and Imports to GNP
 (Percent)

Year	Exports/GNP	Imports/GNP	Trade/GNP
1960	4.1	12.6	16.7
1961	6.3	14.8	21.1
1962	6.1	17.0	23.1
1963	5.6	16.3	21.9
1964	6.8	13.9	20.7
1965	9.6	16.0	25.6
1966	11.9	20.4	32.3
1967	13.7	22.6	36.3
1968	15.2	26.8	42.0
1969	15.9	26.9	42.8
1970	16.5	26.2	42.7
1971	17.8	29.1	46.9
1972	22.6	28.2	50.8
1973	33.3	37.3	70.6

Source: Bank of Korea, National Income Statistics Yearbook 1972 and Economic Statistics Yearbook 1974.

Note: GNP, Exports, and Imports are series at current market price.

2) the agricultural sector played a negative role in the development process; 3) there is a poor resource endowment. Those factors may explain why Korea had to import huge amounts of raw materials and capital goods for rapid industrialization.

3. Change in Import Structure and Its Characterization

A. Causes of Increased Imports

Our total imports increased from 422 million dollars in 1962 to 4,240 million dollars in 1973, representing a 25.2 percent annual average rate of increase during the period 1962-1973. Our trade deficit gap greatly widened from 367 million dollars in 1962 to 1,015 million dollars in 1973.

The expansion of our imports is due to the following:⁵ 1) Since there is a high import dependency ratio of raw materials and capital goods required for higher economic growth due to the poor natural resources and underdevelopment of industries producing intermediate goods, the expansion of investment and progress for industrialization led to the rapid expansion of imports. That is to say, import coefficients (dependency ratio of imports to intermediate goods inputs) in the manufacturing sector have increased since 1962; in 1968, the average import coefficient in the manufacturing sector already was 26.7 percent, 23 percent in the light manufacturing sector and 32.4 percent in the heavy and chemical industries.

On the other hand, the import dependency ratio of capital goods to gross domestic fixed investment increased from 25.3 percent in 1962 to 45.2 percent in 1973, as shown in Table 3.

Table 3

Import Dependency Ratio of Capital Goods
to Gross Domestic Fixed Investment
(in Millions of U.S. Dollars)

Year	Gross Domestic Fixed Investment (1)	Imported Capital Goods (2)	(2) / (1) = (3) (percent)
1962	374.0	94.7	25.3
1966	766.6	218.3	28.5
1971	2,080.2	807.1	38.8
1973	2,943.8	1,329.6	45.2

Source: Bank of Korea, Economic Statistics Yearbook 1974

As we see in Table 3, higher economic growth greatly depended upon imports of capital goods from the advanced countries.

2) In Korea, imports of major noncompeting items have increased because possible import substitution industries which could have provided a domestic supply of raw materials for the industrial sector developed slowly and grain imports tended to increase due to a stagnant agricultural sector. For example, import items that have import substitution potential are grain, raw cotton, molasses and feed stuff for animals. On the other hand, we also have some items with little or no import substitution potential such as raw wood and lumber, textile fibres (excluding raw cotton), raw sugar, and raw rubber.

Specifically, the composite weight of crude oil, raw wood and lumber, grain, raw cotton and raw sugar in our total imports was 29 percent on the average after 1969 and up to 1971 it exceeded the amount of net foreign exchange earnings of exports. Though the

weight declined between 1972 and 1973, these imports amounted to 73 percent of net foreign exchange earnings on the average in this period, as shown in Table 4.

3) Korea had very favorable external circumstances in that it was relatively easy to find sources of funds to finance imports from developed countries. Moreover, there was the positive participation of government policy to induce foreign capital and to bring about diplomatic normalization between Korea and Japan. We will discuss imports by sources of funds in a later section.

B. Import Structure by Industries

As Table 5 shows, the dependency ratios of imports tended to decline in both agriculture and mining sectors, while that of imports in manufacturing sector tended to increase in general from 1963. The dependency ratio of imports was higher in the light industries such as textiles in the first part of 1960's. The average dependency ratio of imports in all industries as a whole remained at 8 percent before 1970, but increased to 9.3 percent in 1973 due to the increasing weight of the heavy and petro-chemical industries which have a relatively low rate of import substitution.

C. Import Structure by End-Use of Commodities

In the 1960's the structural change of imports shifted away from intermediate goods toward capital goods and consumer goods. The share of intermediate goods in total imports decreased from 62.8 percent in 1962 to 47.5 percent in 1973, while the share of consumer goods and capital goods increased respectively from 14.7 percent and

Table 4
Trends of Major Noncompeting Commodities
(In Millions of U.S. Dollars)

	1969	1970	1971	1972	1973
Grain	250.3	244.8	304.0	282.7	444.1
Crude Oil	107.6	132.9	187.1	217.7	296.2
Raw Wood and Lumber	108.4	125.3	153.7	140.8	302.3
Raw Cotton	52.0	62.7	84.2	85.5	112.4
Raw Sugar	17.5	23.5	31.1	36.4	62.2
Sub-Total (A)	535.8	589.2	760.1	763.1	1217.2
Total Imports (B)	1823.6	1984.0	2394.3	2522.0	4240.3
A/B (Percent)	29.4	29.7	31.7	30.3	28.7
Foreign Exchange Earnings by Exports (C)	354.8	459.4	559.4	938.7	1899.5
A/C (Percent)	151.0	128.3	135.9	81.3	64.1

Source: Bank of Korea, Economic Statistics Yearbook 1970-74.

Table 5
 Dependency Ratio of Imports by Industrial Origin
 (Percent)

	1960	1963	1966	1970
Agriculture-Forestry	5.6	3.8	3.2	1.1
Mining	1.9	3.2	2.0	1.6
Beverages	12.2	11.4	7.0	10.9
Textiles	24.3	21.2	19.8	19.0
Other Light Industry	15.0	21.0	21.2	22.9
Chemical	24.9	20.2	27.2	30.5
Metal	15.2	28.1	27.5	32.0
Machinery	13.5	16.2	17.4	24.2
Construction	7.4	9.6	8.4	9.2
Electric	18.1	9.4	0.9	1.5
Average of Total Industry	8.4	8.0	8.0	9.3

Source: Bank of Korea, Input-Output Table for 1960, 1963, 1966, and 1970.

22.5 percent in 1962 to 21.1 percent and 31.4 percent in 1973. In consumer goods, grain imports have occupied the greatest portion, but the import of durable consumer goods (including household appliance) increased at a faster rate, due to the rapid growth of income. Although the composition of raw materials in total imports has declined, it still amounts to 47.5 percent. The share of intermediate goods for domestic use has greatly decreased due to the development of import substitution while the share of intermediate goods for export use has continuously increased at a rapid rate because of rapid export expansion between 1962 and 1973. (See Table 6.)

Lastly, imports of capital goods showed a tendency to increase in order to meet the huge demand for development investment accompanying the high economic growth mainly in the late sixties.

D. Import Structure by Major Trade Partners

Imports from the United States and Japan accounted for more than 70 percent of the total during the period 1960-1973. As we shall see the big trade partners in Korea's export market are the United States and Japan. It is also clear that both countries are also the biggest trade partners in Korea's import market. But there has been a contrast in trends in import market shares between the two countries. That is to say, while the share of imports from Japan in total imports increased from 25.9 percent in 1962 to 41 percent in 1973, the share of imports from the United States in total imports decreased considerably from 52.2 percent to 28.3 percent during the same period.

The expansion of imports from Japan was due to enlarged economic

Table 6
Composition of Korea's Imports by Industrial Use and Major Commodity Groups

	Amount (in Millions of U.S. Dollars)				Share (Percent)			
	1962	1966	1971	1973	1962	1966	1971	1973
Consumer Goods	62.1	106.7	559.2	896.5	14.7	14.9	23.3	21.1
Grain	40.1	61.3	304.0	444.1	9.5	8.6	12.7	10.5
Others	22.0	45.4	255.2	452.4	5.2	6.3	10.6	10.6
Intermediate Goods	265.0	391.4	1028.0	2014.2	62.8	54.6	42.9	47.5
Domestic Use	194.2	325.9	684.5	933.0	46.0	45.5	28.6	22.0
Export Use	70.8	65.5	343.5	1091.2	16.8	9.1	14.3	25.5
Capital Goods	94.7	218.3	807.1	1329.6	22.5	30.5	33.8	31.4
Machinery	36.1	97.8	350.7	547.8	8.6	13.7	14.6	12.9
Electric	26.3	24.0	167.2	360.2	6.2	3.3	7.0	8.5
Transport	5.4	46.6	167.5	248.7	1.3	6.5	7.1	5.9
Others	26.9	49.9	121.7	172.9	6.4	7.0	5.1	4.1
Total Imports	421.8	716.4	2394.3	4240.3	100.0	100.0	100.0	100.0

Source: Bank of Korea, Economic Statistics Yearbook 1963-74.

Note: Based on ECAFE Classification.

cooperation between Korea and Japan, together with the diplomatic normalization between the two countries in 1965. It was also due to the fact that Japan is a neighboring country from whom Korea could import the capital goods and intermediate goods required for industrialization at cheaper prices and lower transportation costs.⁶

The composition of imports from Japan has not changed very much over time. Manufactured goods have occupied the major portion of imports; by commodity group, import items from Japan are mainly machinery, chemical products and manufactured goods classified by raw materials (mainly textile products). But imports of grain from Japan have increased since 1965.

Imports of manufactured goods have been closely associated with Korea's industrialization. The higher economic growth accompanied by industrialization required the rapid expansion of imports such as machinery and transport equipment; their imports increased at the annual average rate of growth of 40 percent between 1962 and 1968 and their shares also increased from 17 percent in 1962 to 36 percent in 1968.

On the other hand, imports of chemical fertilizer, synthetic textiles, intermediate chemical products and durable consumer goods out of manufactured goods classified by materials was reduced due to import substitution.

Import trends of major items from Japan can be classified into three different periods, 1) during the period 1963-1965, major items of imports were machinery, chemical fertilizer, textile raw materials and metallic raw materials; 2) during the period 1966-1969, the import share of chemical products (mainly chemical fertilizer) and metallic

Table 7
Korea Import Markets by Major Countries

	Amount (in Millions of U.S. Dollars)				Share (Percent)			
	1962	1966	1971	1973	1962	1966	1971	1973
I. Major Developed Countries								
U.S.	220	254	678	1202	52.2	35.4	28.3	28.4
Japan	109	294	954	1727	25.9	41.0	39.8	40.7
West Germany	19	20	74	132	4.6	2.8	3.1	3.1
United Kingdom	6	2	56	69	2.9	2.0	1.3	1.6
Canada	2	3	39	83	0.5	0.4	1.6	2.0
Australia	-	6	38	90	-	0.8	1.6	2.1
II. Major Developing Countries								
Taiwan	7	11	39	55	1.7	1.5	1.6	1.3
Hong Kong	0.3	8	20	29	0.1	1.1	0.8	0.7
Philippines	13	21	44	39	3.1	2.9	1.8	0.9
Malaysia	-	10	62	132	-	1.4	2.6	3.1
Indonesia	-	1	41	153	-	0.1	1.7	3.6
Kuwait	-	-	65	83	-	-	2.7	2.0
III. Others	45.7	86	284	446	10.8	12.0	11.9	10.5
IV. Total	422	716	2394	4240	100.0	100.0	100.0	100.0

Source: Bank of Korea, Economic Statistics Yearbook 1963-1974

raw materials declined due to the development of import substitution, while the import share of machinery and textile raw materials tended to increase; 3) during the period 1970-1973, the composition of imports from Japan did not change very much except that grain increased in importance.

By end-use of commodity group, the major commodity group of imports from Japan was intermediate goods which occupies 60 percent on the average for the period 1963-1973. In the beginning of the 1960's, the import share of intermediate goods from Japan was not significant because the major share of intermediate goods had been imported from the United States financed by foreign grants-in-aid; it occupied only 28 percent during the period 1960-1964 but it also increased since 1965 and occupies 58 percent at the beginning of the 1970's.

The import share of consumer goods from Japan was less than 5 percent for the period 1963-1973 because Korea had imported mainly from the United States. However, in recent years consumer goods from Japan increased slightly due to the increased import of rice.

Lastly, the import share of capital goods from the United States was about 30 percent in 1960. The share of capital goods from Japan amounted to 41 percent on the average for the period 1960-1967, since the inflow of Japanese capital into Korea increased after the diplomatic normalization between Korea and Japan in 1965. The import share of capital goods from Japan increased remarkably from 26 percent in the period 1963-1965 to 43 percent in the period 1966-1969, but it declined to 36 percent in the period 1970-1973. It may be hypothesized that

imports of capital goods are closely associated with the inflow of Japanese capital. In 1969, the import share of capital goods from Japan financed by Japanese loans was almost 30 percent.

On the other hand, as mentioned earlier, the United States share of imports has continuously declined because foreign grants-in-aid from the United States have continuously decreased since 1962, and also because the other sources of funds from the United States have been remarkably reduced since then.

Imports from the United States were items such as textile products, crude materials, inedible, grain, chemical fertilizer, chemical products in 1962; but the import share of machinery increased considerably while the import share of chemical products declined greatly, owing to the establishment of import substitution of chemical fertilizers, in 1973.

Lastly, imports from Asian countries other than Japan have increased at a faster rate despite the relatively small amount of imports. Main items of import from these countries are crude oil, raw wood and lumber.

Imports from Western Europe increased at a rapid rate due to imports of machinery financed by their loans.

E. Import Structure by Sources of Fund

Imports expanded enormously due to increased demand for development purposes associated with economic development plan implementation. Imports by financing sources were as follows:

Firstly, imports with commercial funds (Korean Foreign Exchange plus Properties and Claims Funds from Japan: KFX plus PAC) totaled 179 million dollars or 42.4 percent of total imports in 1962 but they

Table 8
Korea Imports by Financing Sources

	Amount (in Millions of U.S. Dollars)				Share (Percent)			
	1962	1966	1971	1973	1962	1966	1971	1973
Total	421.8	716.4	2394.3	4240.3	100.0	100.0	100.0	100.0
Commercial	179.0	401.9	1615.6	3295.6	42.4	56.1	67.5	77.7
Official Aid	218.5	143.6	105.6	-	51.8	20.1	4.4	0
Foreign Loans	4.5	108.4	541.4	628.4	1.1	15.1	22.6	14.8
Relief and Others	19.7	62.5	131.8	292.9	4.7	8.8	5.5	6.9
PAC	-	4.1	20.2	23.3	-	0.6	0.8	0.6

Sources: Bank of Korea, Economic Statistics Yearbook 1974.

- Notes:
- a) Commercial=KFX + PAC.
 - b) Official Aid=AID + PL480 + others.
 - c) Foreign Loans=Public Loan + Private Loan + Foreign Investment.
 - d) Relief and Others=Relief Goods + Disposed of by UNF + Others
 - e) Imports financed with Properties and Claims Funds from Japan.

amounted to 3,295.6 million dollars or 77.7 percent of total imports in 1973. This shows that the reserve position for external payments based on Korea's net foreign exchange earnings has improved for over the last ten years. This favorable trend allowed Korea to increase imports smoothly without a foreign exchange bottleneck. (See Table 8.)

Secondly, imports under foreign aid decreased from 218.5 million dollars in 1962 (51.8 percent of total imports) to zero in 1973, due to the ending of United States aid.

Thirdly, imports financed with foreign loans increased from 4.5 million (1.1 percent of total imports) in 1962 to 628.4 million dollars (14.8 percent of total imports) in 1973, due to the inflow of foreign capital.

Lastly, imports financed with other funds showed a remarkable advance due to the increased imports of relief grains to cover drought damage.

4. Korea's Imports by Sources of Supply: Composition and Shares

The distribution of Korea's imports by sources of supply depends on the structure of commodity compositional requirements of imports due to economic development and industrialization, as well as the influence of other factors such as competitiveness among the sources of supply (i.e., the responsiveness of Korea's import demand to relative price changes which measures how rapidly buyers in Korea shift from one source of supply to another in response to changes in relative prices--known as price elasticities of substitution between sources of supply),⁷ cost of transportation, conditions of loans and grants, and suppliers'

credit terms.⁸ In the case of capital goods, for example, the most important fact is that only developed countries could produce and supply the machinery and transport equipment required by developing countries in the process of industrialization. It was, therefore, only to be expected that the share of developed countries in imports of developing countries would increase.

Table 7 shows that the case of Korea has been consistent with the above statement. In 1962, 86 percent of Korea's total imports came from four major developed countries, namely, the United States, Japan, West Germany, and the United Kingdom. But the share of this group of major developed countries in Korea's import market declined to 78 percent in 1973. However, it can be said that during the twelve-year period of 1962-1973, about three-fourths of Korea's import requirements came from developed countries, of which the United States was the most important supplier providing 52 percent in 1962, and dropping to 28 percent in 1973. On the other hand, Japan provided 26 percent of Korea's total imports in 1962 and increased her share to 40.7 percent in 1973. The United States and Japan together occupied 78 percent of Korea's total imports in 1962 and dropped to 69 percent in 1973, which still leaves them as the major suppliers in Korea's import market. West Germany ranked third with a more or less constant share at three percent during 1962-1973. The United Kingdom ranked fourth with a relatively constant two percent share during 1962-1973.

Imports from major developing countries constituted about five percent of Korea's total imports in 1962, and increased to twelve percent

in 1973. Their increase was absorbed mainly from the decreased shares of developed countries. Thus, we can say that the gain of developing countries and that of Japan, has been almost entirely at the expense of advanced countries, especially the United States.

Changes in import shares of suppliers in Korea's market provide us a rough idea of the success of Japan in acquiring a higher share, whereas the other three major suppliers (United States, West Germany and the United Kingdom), have failed to maintain their shares at the initial levels. Capturing a higher import share reflects a suppliers' relative competitiveness in Korea's import market.⁹ Japan has had a favorable competitive position relative to its major competitors (United States, West Germany, and the United Kingdom), and thus has come to play a major role in Korea's import market.

The expansion of Korea's import demand has also been partly influenced by compositional changes in Korea's import demand in relation to the composition of the suppliers' goods in Korea's market. It is, therefore, relevant to consider changes in commodity composition of Korea's imports, both in total and by sources.

Grouped according to the Standard International Trade Classification (SITC), the distribution of Korea's imports is spread out among ten groups. Manufactured goods (SITC 6 and 8), and machinery and transport equipments (SITC 7) accounted for 35 percent of total imports in 1962, and tended to increase their share to 49 percent of total imports in 1973.

The changing structure of imports through time shown in Table 9 indicates that imports of manufactured goods (SITC 6 and 8) which

Table 9
Imports by SITC Commodity Group
(In U.S. Millions of Dollars)

SITC Section	1962		1966		1971		1973	
	Amount	%	Amount	%	Amount	%	Amount	%
0. Food & Live Animals	48.7	11.5	72.4	10.1	399.5	16.7	569.6	13.4
1. Beverages & Tobacco	0.1	-	0.3	-	3.8	0.2	6.3	0.2
2. Crude Materials	89.7	20.6	153.9	21.5	462.7	19.3	910.5	21.5
3. Mineral Fuels & Lubricants	30.6	7.3	42.5	5.9	189.4	7.9	312.5	7.4
4. Animal & Vegetable Oils & Fats	3.9	0.9	5.5	0.8	21.3	0.9	37.9	0.9
5. Chemicals	94.3	22.4	134.6	18.8	201.0	8.4	343.9	8.1
6. Manufactured Goods	73.1	17.4	125.2	17.5	363.3	15.2	1772.9	18.2
7. Machinery & Transport Equipment	69.8	16.5	171.7	24.0	685.4	28.6	1156.8	27.3
8. Miscellaneous Goods	10.2	2.4	10.5	1.5	66.9	2.8	129.5	3.1
9. Not Classifiable	1.5	0.4	0.03	-	1.0	-	0.5	-
Total	421.8	100.0	716.4	100.0	2394.3	100.0	4240.3	100.0

Source: Economic Planning Board, Major Statistics of Korean Economy 1975.

comprised 20 percent of total imports in 1962, and maintained a more or less constant share at 21 percent in 1973. In contrast, the share of machinery and transport equipment (SITC 7) has risen from 16.5 percent in 1962 to 27.3 percent in 1973. The share of food (SITC 0) increased from 11.5 percent in 1962 to 13.4 percent in 1973, whereas the share of beverage and tobacco (SITC 1) seems to be constant. The very large portion of crude materials (SITC 2) has remained more or less constant at 21 percent between 1962 and 1973. Mineral fuels and lubricants maintained their share at about seven percent. Chemical imports were first in importance up to the first part of 1960's but their share dropped from 22.4 percent in 1962 to 8.1 percent in 1973. However, the import values of individual commodity groups have increased in absolute terms regardless of increased or decreased shares relative to total imports in the corresponding years.

The most striking change has been the rapidly increasing share of machinery and transport equipment. In 1962, the share of manufactured goods was about equal in importance to total imports for machinery and transport equipment. The rapid increase in demand for machinery and transport equipment due to industrialization and import substitution policy caused their share to rise more rapidly than total imports did during this period. On the other hand, the share of manufactured goods has remained constant.

Another change that deserves attention has been the rapid decrease in the share of chemical imports, mainly due to the sharp increase in the domestic supply of chemicals from the establishment of import substitution industries.

The import of crude materials has remained at about 21 percent during this period, but the absolute amount has increased due to rapid increases in demand for both domestic and export uses, both of which increased almost at the same rate.

5. The Interdependence of Korea's Imports and Foreign Resources

A. Economic Assistance and Korea's Imports

In the 1950's United States economic aid played an important role in sustaining the Korean economy and aiding in its reconstruction. During this period United States economic aid not only facilitated reconstruction but also enabled the establishment of many new import substitution industries. United States economic aid to Korea is shown in Table 10. But from the early 1960's the declining trend of United States aid was followed by a rapid increase in foreign capital inflow. Korea had almost no foreign debt prior to 1963. However, beginning in 1965, the Korean economy became increasingly dependent on foreign loans.

Economic growth has been explained in various ways. The most commonly accepted easy explanation is that economic growth in Korea is due to very high levels of foreign aid. Foreign aid has been important, especially from 1953 to 1963. Domestic savings were about three percent of GNP on the average during these years, while foreign savings (imports of goods and services less exports of goods and services financed mostly by foreign aid grants) were nine percent of GNP on the average. Approximately, three-quarters of total investment was financed by foreign aid. Commodity exports remained negligible throughout the period, while most

Table 10
U.S. Economic Aid to Korea
(In U.S. Millions of Dollars)

Year	Total	U.S.A.	
		Aid	PL 480
1960	245	225	20
1961	199	154	45
1962	232	165	67
1963	217	120	97
1964	149	88	61
1965	131	72	60
1966	103	65	38
1967	97	53	44
1968	106	50	56
1969	107	32	75
1970	83	21	62
1971	51	18	34
1972	5	5	-
1973	2	2	-
<hr/>			
Total (1960-73)	1,728	1,070	658

Sources: Economic Planning Board, Major Statistics of Korean Economy 1975 and Major Economic Indicators (1961-71) 1972.

imports were financed by United States grant-in-aid.¹⁰ In addition, Korea made almost no foreign-debt-service payments during the period because almost all the foreign aid it received in the previous years was in the form of grants-in-aid.

Official United States economic aid in Korea has been declining rapidly in recent years. It decreased from 245 million dollars in 1960 to two million dollars in 1973. The share of imports financed by foreign aid decreased from 62.3 percent in 1961 to 0.9 percent in 1972 and completely terminated in 1973. Such foreign aid programs are customarily tied to the importation of specific goods from the donor country, either PL 480 assistance program or generally so-called AID assistance programs (project and non-project assistance) which carry a larger list of procurable commodities. AID goods constituted raw and semi-manufactured materials such as pulp and raw rubber while imports of commodities under PL 480 comprised mainly raw cotton and wheat. Import substitution policies, especially in non-durable consumer goods industries, have been supported by the United States aid program. In the 1950's there were a few industrial plants for such industries as textiles, flat glass, cement, sugar refining, wheat flour milling, brewing, newsprint, and rubber. Many of them were wholly or partly financed by foreign grants-in-aid, and a large part of the raw materials except those for flat glass and cement were provided by United States economic aid.

The Korea-Japan Diplomatic Normalization Agreement of June 1965 was also important in increasing foreign capital inflows. According to the Agreement, Korea was to receive the Property and Claims Fund from Japan (PAC), totaling 500 million dollars (300 million dollars in grants

and 200 million dollars in public loans) up to 1976. In addition, the Japanese Government was to make available 300 million dollars for commercial loans to Korea. Initial grants and loans were received in 1966 and terminated in 1976.¹¹

The import share financed by the PAC fund in total imports of Korea fluctuated irregularly, ranging from 0.6 percent to 3.3 percent for the period 1966-1973. But the import share financed by the PAC fund in total imports from Japan tended to decline since 1970.

B. Foreign Capital Inflows and Korea's Imports

Beginning in 1965, foreign capital inflow took less the form of foreign aid and more the form of foreign loans. The period of decreasing reliance on foreign aid, 1965 to 1973, was also a period of rapid growth due to massive inflows of foreign capital with both an efficient use of foreign resources and an effective economic policy.

Throughout most of the 1960's, however, the government strongly encouraged the import of private capital as a major policy in dealing with the balance of payments. The Foreign Capital Inducement Law was promulgated in January 1960 at a time when the Development Loan Fund (DLF) of USAID was the only source of foreign loans to Korea. In early 1962, the Korean Government selected nine major projects in the First Five-Year Plan that required foreign capital. In July 1962, the Government enacted two supplements to the Foreign Capital Inducement Law. One is to provide procedures for imports of capital goods by using long-term export credit of capital exporting countries and the other established procedures for granting repayment guarantees on

foreign loans. In 1966 a new Foreign Capital Inducement Law revised and streamlined various past laws. The main rationale for the new Foreign Capital Inducement Law was to give more favorable treatment to foreign direct investment. The new law made no substantial changes affecting foreign loans.¹² Foreign capital inflow on an arrival basis during the period 1959-1973 amounted to 4.3 billion dollars. Out of the total capital inflow during the period under review, commercial loans occupied 55 percent on the average, as shown in Table 11. However, commercial loans are less favorable than public loans in terms of borrowing conditions such as interest rates and repayment period. Therefore, the Korean Government began to control commercial loans (especially cash loans) since 1970 and was able to reduce their share as well as the absolute amount.

Next, public loans occupied 36 percent on the average during the relevant period, though the share of public loans greatly decreased during the period 1968-1970. Public loans are generally superior to commercial loans in terms of borrowing conditions.

As we mentioned earlier, foreign investment has been encouraged by the Korean Government, as long as it does not conflict excessively with domestic industries, because it has important positive effects on economic development from both capital inflow and technological improvement.

Foreign direct investments increased rapidly with the help of government policy to encourage them, but accounted for only 8.7 percent of the total capital inflow between 1959-1973. The total amount of

Table 11

Foreign Investment and Loans (Arrival Basis)

(In U.S. Millions of Dollars)

Period	Total		Commercial Loans		Public Loans		Direct Investment	
	Amount	%	Amount	%	Amount	%	Amount	%
1959-66	349	100.0	184	52.7	141	40.4	24	6.9
1967	237	100.0	124	52.3	106	44.7	8	3.3
1968	358	100.0	268	74.9	70	19.6	19	5.3
1969	560	100.0	409	73.0	139	24.8	13	2.3
1970	548	100.0	367	67.0	115	21.0	66	12.0
1971	691	100.0	345	49.9	303	43.9	43	6.2
1972	730	100.0	326	44.7	324	44.4	79	11.0
1973	856	100.0	344	40.2	369	43.1	143	16.7
1959-73	4,329	100.0	2,367	54.7	1,567	36.2	395	8.7

Source: Economic Planning Board, Major Statistics of Korean Economy 1975

direct foreign investments during the period 1959-1973 was 395 million dollars on an arrival basis. Direct foreign investments were mostly from the United States and Japan. Direct investment by Japanese firms showed a marked increase and represented 67 percent of total foreign investment, with 27 percent from the United States.

In general, Japanese investment in Korea is in small-scale and labor-intensive industries such as textile and electronic industries, while American investment is in large-scale and capital-intensive industries including automobile and petrochemical industries.

Direct foreign investments by industry during the period 1959-1973 were mainly in the manufacturing sector, which received 88.3 percent of the total foreign investment. The principal industries are chemicals and pharmaceuticals, electronics and electric equipment, and machinery and textiles.

It seems quite clear that decisions on direct investment are based more on the long-term outlook for political and economic stability in the host country than on the basis of tax incentives, most of which do not affect the overall profitability of the mother company very much. Foreign direct investment from advanced countries can be important and helpful to the initiation and success of an export diversification strategy. Properly screened by host country agencies, foreign firms may be expected to fill several transition functions which are likely to be absent or undeveloped in domestic firms emerging from an import substitution milieu. 1) The major function is the capacity to adopt and transmit industrial technology appropriate for the shift to labor-intensive manufactured exports. 2) A second function is the propensity

to develop domestic sources of supply for intermediate and capital goods inputs, thus fostering a necessary concomitant export promotion. 3) A third function of the performance of foreign firms during the export promotion drive is their international market orientation, a perspective which makes possible the selection for manufacture of those products with strong world demand. Successful export promotion requires that each of these entrepreneurial qualities be inculcated in the prevailing behavioral attitude of the country's industrial entrepreneurship.¹³ These are the areas--of technological flexibility, the introduction of new, scarce entrepreneurial and managerial talents (with spill-over effects) and the specialized knowledge and sometimes command of international markets--which determines the kind of report card that direct foreign investment should get.

Both the United States and Japan are major suppliers of foreign capital inflow. On the one hand, the United States was responsible for 40 percent of the total capital inflow, in which public loans were more than half. On the other hand, Japan provided 32 percent of the total capital inflow, in which commercial loans took a larger portion, as we see in Table 12.

In 1965, a heavy proportion of the loans came from public sources overseas. Between 1968 and 1971 more than two-thirds of all foreign loans were commercial, mainly suppliers' credits for import of capital goods from the United States, Japan, the United Kingdom, West Germany, and France. As for the type of capital goods, suppliers credits accounted for over 75 percent of total capital inflow to Korea (see Table 13).

Table 12
Distribution of Foreign Capital by Country
(Percent)

	U.S.	Japan	Others	Total
Total Capital Inflow	40	32	28	100
Public Loans	61	21	18	100
Commercial Loans	31	26	43	100
Direct Investment	27	67	6	100

Source: Economic Planning Board, The Current State of Foreign Capital Inflow 1974

Note: As of 1973.

Table 13
Commercial Loan by Country
(In Millions of U.S. Dollars)

Country	1959-66	1967	1968	1969	1970	1971	1972	1973	1959-73
U.S.	45.1	19.5	89.1	158.6	153.6	98.9	65.7	150.0	780.5
Japan	60.0	45.8	87.6	88.3	82.5	62.9	101.9	68.5	597.5
West Germany	31.2	16.3	34.2	39.3	31.8	16.1	15.9	12.5	216.3
United Kingdom	0.5	0.7	12.1	16.4	28.1	51.9	57.4	31.5	-
Others	47.3	41.7	44.4	109.3	70.7	115.4	85.5	81.9	795.8
Total	184.1	124.0	268.4	408.9	366.7	345.2	326.4	344.4	2390.1

Source: Economic Planning Board.

Note: Arrival Basis.

The sources of public loans also shifted markedly, from a heavy reliance in the early 1960's on the U.S. AID grants and development loans on very soft terms to greater reliance in the later 1960's on Japanese, IBRD, and Asian Development Bank loans on relatively hard terms (see Table 14). The increasing emphasis on commercial loans and the shift of sources of public loans has considerably increased the cost of foreign capital imports.

Public loans from international financial organizations (IBRD, IFC, IDA, and ADB) have relatively no constraints such as specific countries to import from and requirements to import specified commodities. But the borrowing country may not be able to borrow this type of public loans if borrowing countries have an unhealthy economic perspective or uncertain economic policy. It is worthwhile to note that Korea tends to borrow more from international financial organizations. Public loans from international financial organizations increased from 7.3 million dollars in 1968 to 93 million dollars in 1973.

Table 15 shows the industrial allocation of foreign capital during 1959-1973: 46 percent of total capital inflow was allocated to the mining and manufacturing sector and 50 percent to the social overhead capital sector. Most of the foreign capital was allocated to finance the development of the manufacturing and social overhead sectors. Therefore, the manufacturing sector recorded the highest growth rate, so that it contributed to the remarkable annual growth rate of GNP and also to improve the industrial structure by shifting the center of gravity from the agricultural sector to the manufacturing sector. In

Table 14
Public Loan by Country
(In Millions of U.S. Dollars)

Country	1959-66	1967	1968	1969	1970	1971	1972	1973	1959-73
U.S.	95.3	71.8	41.9	104.7	86.4	140.1	187.3	159.9	887.4
Japan	13.8	24.4	16.7	21.1	13.1	101.9	63.5	101.8	356.3
West Germany	17.4	8.5	3.9	1.3	1.3	2.5	5.3	7.3	47.5
International Financial Organization	14.0	-	7.3	11.3	13.5	57.1	62.9	93.0	259.1
Others	0.3	0.9	0.4	0.5	1.0	1.8	5.4	6.5	168.8
Total	140.8	105.6	70.2	138.9	115.3	303.4	324.4	368.5	1567.1

Source: Economic Planning Board

Notes: a) International Organization includes IBRD, IDA, IFC and ADB.
b) Arrival basis.

Table 15

Allocation of Foreign Capital by Industrial Origin, 1959-1973
(in Millions of U.S. Dollars)

	<u>Public Loans</u>		<u>Commercial Loans</u>		<u>Direct Investment</u>		<u>Total</u>	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Agriculture, Forestry and Fishery	63	4.0	108	4.6	4	1.0	175	4.0
Mining and Manufacturing	407	26.0	1,238	52.3	348	88.3	1,993	46.0
Social Overhead Capital and Others	1,097	70.0	1,022	43.2	42	10.7	2,161	50.0
Total	1,567	100.0	2,368	100.0	394	100.0	4,329	100.0

Source: Economic Planning Board, Major Statistics of Korean Economy 1975.

conclusion, no one can deny that foreign capital contributed to the acceleration of economic growth in the Korean economy.

As soon as the role of foreign aid as an import source of funds was reduced, the new alternative was foreign loans. Foreign loans contributed to overcoming the shortage of foreign exchange due to Korea's imports. There are only two possible alternatives to meet the shortage of foreign exchange as demand for imports increased and foreign aid decreased as a major source of import funds. One is to expand ability to pay for imports by export promotion and the other is to introduce foreign loans to pay for imports. It implies that Korea has to pursue both internal and external financing of imports in the process of industrialization.

In summary, Korea imported most commodities from the United States with U.S. grants-in-aid up to Diplomatic Normalization between Korea and Japan in 1965 and shifted sources of supply from the United States to Japan after 1965. Korea's imports from both the United States and Japan accounted for 69 percent of total imports in 1973.

C. Foreign Firms and Korea's Imports

Since foreign firms brought with them capital, technology, production management and market facilities, the only remaining source of comparative advantage was the cheaper labor costs. Typically, foreign firms import semi-finished products as input for the labor-intensive processing, and then export to their home market the parts and components of the finished goods (see Table 16).¹⁴

It is important to note that a considerable number of the joint-venture firms are totally dependent upon their foreign partner companies for their exports. The overwhelming majority of the joint-venture firms rely on partner countries (including partner companies) for their imports of raw materials. This implies that the partner company's direct control of the joint firms would be possible if desired, especially in electrical machinery, miscellaneous manufacturing, metal products, and chemical products.

It is also true that there are some cases where foreign partners are obliged to supply the raw materials even beyond the joint investment contract period. This may especially be the case in joint ventureships in miscellaneous manufacturing, food and beverage, and non-electrical machinery.

Table 16

Supply of Raw Material, 1972

	<u>Value (Million Won)</u>		<u>Percentage Share</u>	
	Domestic Production	Imports	Domestic Supply	Imports
Local Firms	15,698	14,620	52	48
Joint Venture	2,688	8,904	23	77
Foreign Firms	-	16,208	-	100

Source: Korea Development Bank, Korean Industry Survey 1973

Joint venture activities of foreign firms reflect the motives underlying foreign investments in Korea, and the reciprocal influence of investments on the structure of imports of Korea. It is useful for the analysis to consider investment motives.

The motivations underlying the decisions of foreign firms to invest in Korea can be categorized as follows: 1) The securing, maintaining and/or developing of overseas markets--in many cases this also ensures channels for trade of other products and components produced or handled by the corporation so motivated; 2) the securing, maintaining, and/or developing of raw material including their subsequent primary processing; 3) the development of overseas low cost bases for export purposes, necessitated by competitive forces in the home market and international markets; 4) the securing, maintaining, and/or developing of regional bases, mainly to serve nearby markets; 5) the necessity or desire to complement other activities of the organization on a local or regional basis; and 6) such diverse motives as the capitalization of know-how, the protection of patent abroad; pollution control in the home country, and the like.¹⁵

Among all these six categories of investment motives, the securing, maintaining, and/or developing overseas markets is dominant. The bulk of foreign investment in Korea was implemented in order to prevent the loss of shares in Korea's market to other foreign firms contemplating the establishment of facilities in Korea behind tariff barriers. They were also established because it is cheaper to produce in Korea than to export to Korea. Further, it has been expected that investment in Korea would provide continued trading possibilities either through the

supply of components and raw materials and/or the provision of the needed machinery and equipments to establish the enterprise.¹⁶

Hence, the more the major suppliers of Korea's imports have invested in Korea, the more influence they have on the investment-induced import demand of Korea. Foreign investment, therefore, tends to have the reciprocal effect on the structural change in Korea's import demand from highly concentrated on raw materials towards that of consumer goods and capital goods. Also, the expansion of Korea's imports by sources during the period 1960-1973 can partly be explained by the expansion of foreign investment, especially the expansion of direct foreign investment and suppliers' credits.

D. Causes of Biased Import Sources of Supply

Korea's total imports amounted to 4.2 billion dollars in 1973; 40.7 percent of total imports was from Japan and 28.3 percent from the United States. In total, Korea's imports from both the United States and Japan amounted to 69 percent of total imports, thus indicating that Korea's import sources of supply have been biased towards two countries. In the recent publication "Survey for diversification of import sources of supply,"¹⁷ Korea Traders' Association strongly recommended that it is very urgent to diversify import sources of supply by the efficient use of "Consolidated Trading Company." The Korea Traders' Association undertook to survey 100 big foreign trade firms and investigated the supply capacity of exporting countries in order to examine the feasibility of diversifying the import sources of supply of important 50 items.

The survey results were: 1) Import share of capital goods out of total imports shows 26 percent in 1975, out of which 49 percent are from Japan and 26 percent from the United States; 2) import share of intermediate goods out of total imports is 58 percent, out of which 32 percent was from Japan and 18 percent from the United States. If we exclude crude oil from the category of raw materials, 46.3 percent of the intermediate goods was imported from Japan instead of 32 percent.

3) Import share of consumer goods out of total imports is six percent, out of which 30 percent was from Japan, and the import share of grain is ten percent, out of which 87 percent was from the United States. Korea's import sources of supply have been skewed toward both Japan and the United States. According to the analysis of the survey results,¹⁸ important factors resulting from the biased import sources of supply have been investigated. There are alternative explanations regarding the way Japan has succeeded in capturing Korea's import market other than the CMS analysis.

The most important factors are as follows: 1) Import price differentials in terms of F.O.B. (28.2 percent); 2) speedy delivery or delivery on time (24.6 percent); 3) better quality and standardization (16.2 percent); 4) transportation costs (8.2 percent); 5) availability of supply (7.8 percent); 6) tied loans of foreign capital (4.2 percent); 7) provision of technical assistance (3.2 percent).

Out of 50 important items, 34 have possibilities for diversification with respect to sources of supply, while the rest of them would be very hard to diversify. Twenty out of the 34 are commodities imported

from Japan. Fourteen are commodities imported from other countries. On the other hand, 16 items have little possibilities for diversification because 1) the main producing countries are biased towards a few countries by natural endowment, i.e., wheat, raw cotton, crude oil and raw sugar from the United States, Australia, Philippines, Middle East, and Taiwan; 2) considerable differentials of prices and transportation costs, i.e., Japan; 3) exporting countries are limited due to availability of supply, i.e., the United States and Japan.

In conclusion, it may be worthwhile to note that Korea's import sources of supply have been skewed toward both the United States and Japan due to 1) price differentials and transportation costs; 2) speed of delivery; 3) better quality and standardization; 4) very few producing countries; 5) limited number of exporting countries.

6. Conclusions

We have discussed, implicitly and explicitly, factors which affect structural change in Korea's imports. More emphasis has been placed on the effect of trade and industrialization policies towards the expansion of imports from four major suppliers, namely, the United States, Japan, West Germany and the United Kingdom.

The result of the analysis has shown that there have been two important factors that affected import expansion in Korea. One was the structure of commodity composition of imports, and the other was the relative competitiveness of the supplier. It has been shown that the effort toward industrialization and import substitution has induced a

rapid change in the commodity composition of Korea's imports in favor of machinery and equipments. This kind of change has been represented by a shift away from raw materials toward consumer goods and capital goods. The structure of commodity composition of imports in the initial period seemed to be in favor of the United States and West Germany. But Japan has succeeded in capturing a larger share in Korea's market. This success has been accounted for mostly by its favorable competitive position and policy of investing in Korea's market.

There is an alternative explanation regarding the way Japan has succeeded in capturing Korea's import market. A survey initiated by Korea Traders' Association indicates that the most important factors are as follows: 1) Price differentials and transportation costs; 2) speed delivery; 3) better quality and standardization; 4) biased producing countries; 5) limited number of exporting countries. This survey contains various factors which were not included in the CMS analysis and which may be helpful in explaining how Japan has succeeded in capturing Korea's import market. However, this survey did not introduce domestic factors such as industrialization policies which are an important determinant of commodity compositional effect.

In conclusion, we may say that both price and non-price factors are important determinants of Korea's imports. We will deal with this problem by using the CMS analysis and elasticity of substitution in Chapters IV and V respectively.

Footnotes

Chapter II

¹Bela Balassa, "Industrial Policies in Taiwan and Korea," Weltwirtschaftliches Archiv, Band 26, Heft 1 (1971), p. 61.

²Douglas S. Paauw and John C. H. Fei, The Transition in Open Dualistic Economy: Theory and Southeast Asian Experience (New Haven and London: Yale University Press, 1973), p. 98.

³Alber O. Hirshman, The Strategy of Economic Development (New Haven: Yale University Press, 1958), pp. 120-125.

⁴Bank of Korea, "Our Industrialization and Trend of Import Structure," Monthly Economic Review, XXIII, No. 12 (December, 1969), p. 42.

⁵Bank of Korea, "Economic Growth and Change of Trade Structure in Korea," Monthly Economic Review, XXV, No. 9 (September, 1971), pp. 20-22, and see Bank of Korea, "Analysis of Our Trade Structure," Monthly Economic Review, XXVIII, No. 11 (November, 1974), pp. 22-39.

⁶For the detailed analysis of bilateral trade between Korea and Japan, see Bank of Korea, "Structural Analysis of Trade between Korea and Japan," Monthly Economic Review, XXVIII, No. 1 (January, 1974), pp. 23-38.

⁷The empirical evidence of elasticity of substitution between source of supply is shown in Chapter V.

⁸The discussion of foreign loans and suppliers' credits is included in Section 5 of Chapter II.

⁹For statistical analysis of competitiveness effect on Korea's import expansion, see Chapter IV. In the case of value share, the positive correlation between the import share and relative competitiveness requires a prior assumption that elasticity of substitution between sources of supply is greater than one (in absolute value).

¹⁰Charles R. Frank, Jr., Kwang Suk Kim, and Larry Westphal, Foreign Trade Regimes and Economic Development: South Korea (New York: Columbia University Press, 1975), p. 2.

¹¹Ibid, p. 106.

¹²Ibid, pp. 101-106.

¹³International Labor Office, Sharing in Development: A program of Employment, Equity, and Growth for Philippines (Geneva: 1974), pp. 286-287.

¹⁴Sang Chul Shu, Foreign Capital and Development Strategy in Korea, in Conference on South Korea (September 8-10, 1975), The Center for Korean Studies, University of Hawaii; Chin Keun Park, A Study of the Joint-investment in Korea (Seoul: Korea Development Institute, 1974), pp. 18-20.

¹⁵Thomas W. Allen, Policies of ASEAN Countries Towards Direct Foreign Investment, SEADAG papers on problems of Development in Southeast Asia (Manila: 1973).

¹⁶Thomas W. Allen, Direct Investment of Japanese Enterprises in Southeast Asia, A Study of Motivations, Characteristics and Attitudes, The Economic Cooperation Center for the Asian and Pacific Regions (Bangkok: 1973).

¹⁷Korea Traders' Association, Survey for Diversification of Import Sources of Supply (Seoul: 1976).

¹⁸Ibid, pp. 67-73.

CHAPTER III

THEORETICAL FRAMEWORK

1. Introduction

This study is an attempt to analyze import behavior in Korea during the period of active industrialization. In order to explain import behavior we adopted the Constant-Market-Share (CMS) model and the elasticity of substitution theory, because the CMS model may help to explain which country and what factors influence the quantity of imports in Korea. Furthermore, this model helps to explain the causes-and-effects of imports expansion in terms of demand and supply. Also, the elasticity of substitution theory can assess the responsiveness of consumers in Korea to changes in relative prices of imports from two competing sources. These theoretical models will be utilized to carry out empirical analysis of the pattern of imports in Korea. The empirical analysis may be useful for policy-making designed to close the balance of payments deficit gap.

A comprehensive empirical analysis of the pattern of export growth of a country is an immensely complex proposition, for it involves a systematic examination not only of factor endowments, available technology and production functions, and government policies of the exporting country, but it also requires painstaking analysis as to the demand patterns, export market structure, state of competition among other countries, and so on. Conventional wisdom within the framework of the pure theory of international trade offers very little with which to guide the empirical analysis.

Theoretically, export growth, *ceteris paribus*, helps to close the balance of payments gap (if a country experiences a chronic unfavorable trade) just as a reduction in imports would help, along with capital inflow. It is with respect to the balance of payment adjustment problem that trade theory lends its force in explaining the demand for and supply of export goods of a given country during a given time period. The so-called elasticity "optimism" and "pessimism" controversy along with the income absorption problem are well known issues. It must be pointed out from the outset that the conventional trade theories work within a "functional" or "causal" framework, e.g., the balance-of-payments may be improved through devaluation only if certain elasticity conditions hold, which implies that the size of elasticities of supply and demand for imports and exports are functionally related to the improvement of balance-of-payments. Or, export performance of a country is a function of price competitiveness, of changes in demand structures, of changes in income and taste of importing countries, etc. The many factors that become "legitimate" candidates as explanatory variables to export growth performance over time makes the mode void of empirical content.

One empirical approach that is gaining popularity among economists studying export growth performance and other related areas is known as the Constant-Market-Share (CMS) Analysis. The CMS analysis offers a fresh approach in relating export performance to structures, import growth, and so on without really implicating those factors as necessarily "explanatory" variables. In this chapter the analytical framework of the CMS analysis is carefully developed. The first part of the

chapter is devoted to the development of a modified version of CMS analysis as the proposed analytical framework within which an empirical test is to be carried out in subsequent chapters. In the second part, the relationship between the CMS analysis and the more traditional "elasticity" approach is examined.

2. The Constant-Market-Share Model

A comprehensive analysis of the pattern of export growth of a country is a complex undertaking, involving examinations of factor availability, technology, market structure, demand patterns, and government policies in the exporting country, its customers, and its competitors. The constant-market-share analysis, however, offers a simplified method for examining a country's export growth.¹ The theory is based on the assumption that a country's export growth in the world market depends on the following observable factors: 1) the commodity concentration of exports; 2) the market concentration; and 3) the relative competitiveness of the country's exportable goods in the world market. Implied in the above assumption is that a country's exports may fail to grow as rapidly as the world average for these reasons: 1) exports may be concentrated in commodities for which demand is growing relatively slow; 2) exports may be going primarily to relatively stagnant regions; or 3) the country in question may have been unable or unwilling to compete effectively with other sources of supply.² In this section, we shall discuss a method of analysis designed to separate these effects. The conventional CMS models have been used to analyze export performance

among advanced countries in the world market. But in this study, we attempt to apply a modified CMS analysis to Korea's import market in order to examine import behavior in Korea. In a modified CMS analysis, there are four effects: 1) average growth effect; 2) commodity composition effect; 3) pure share effect and 4) the interaction effect. The conventional CMS analysis also contains four effects: 1) the average growth effect; 2) commodity composition effect; 3) market effect; and 4) competitive effect; the last two are different from those of a modified CMS analysis.

This section is devoted to developing a modified CMS model which will be utilized to undertake an empirical test of the export performances of major countries in K's import market. Several basic hypotheses remain to be tested in this empirical study. The first hypothesis is that Country J's export performance in the importing country K's market is jointly determined by both demand for imports and the supply of exports. The factors influencing demand for imports are related to the impacts of economic growth and industrialization in Country K, which tends to increase the import demand. In other words, the distribution of K's imports depends on the structure of commodity import requirements that are consistent with her economic growth and industrialization. On the other hand, the factors influencing supply relate to economic growth, domestic policies, and other conditions in the exporting country. In other words, the distribution of K's imports by sources of supply depends upon competitiveness among supplying countries in terms of

prices, wages, input costs, productivities, costs of transportation, conditions of loans and grants, supplier's credit terms, the pattern of export trade, and export aids, all of which are outside the control of importing country K. The second hypothesis is that whether an exporting country can maintain K's import market depends largely on 1) the responsiveness of K's consumers to changes in relative prices of their imports, i.e., elasticity of substitution in the importing country is greater than one, and 2) on ability of the exporting country to maintain the existing relative price of her export vis-a-vis the other competitors.

Several basic assumptions which are inherent to the crude model will be developed in this section. The most important assumption is that a country's export share in K's import market remains unchanged over time, except when the relative price changes. The validity of the results of CMS analysis is critically dependent upon the reasonableness of this assumption. The second assumption is that the elasticity of substitution is greater than one in absolute value. In other words, the validity of the interpretation of price competitiveness effects, thus depends upon the assumption of the elasticity of substitution being greater than one. If not, the validity of the interpretation of the competitiveness effect in terms of relative price competitiveness seems to be blurred; i.e., an increase in relative prices could lead to an increase in shares. In other words, the negative correlation between shares and relative prices seems to be invalid. The third assumption is that all the commodities within groups exported are homogeneous since the CMS analysis requires a constant ratio of quantity demanded

to avoid the income effects entering into the picture, thereby complicating the entire analysis. Elasticity of substitution will depend only on relative prices when the two commodities in question are so similar that the reaction of demand for each to all other economic variables is identical, yet at the same time are dissimilar enough to induce the purchase of some of both.

Let demand for exports in a given market from two competing sources of supply be described by the following relationship:

$$(3.1) \quad \frac{q_1}{q_2} = f \left(\frac{p_1}{p_2} \right)$$

where the subscript 1 refers to the focus country and 2 refers to his competitors. The quantity of exports of a particular good is indicated by q , and p refers to its price. This relationship is the basic form of the elasticity of substitution between two sources of supply.³ The computations of the CMS effects (the import growth effect, the commodity compositional effect, the pure share effect and the interaction effect) are made by using the value share due to the absence of reliable quantity data, although quantity shares would be preferable.

Equation (3.1) indicates that Country 1's share of the market in question will remain constant except as p_1 / p_2 varies. This establishes the rationale behind the constant norm and suggests that the difference between export changes implied by the constant share norm and actual changes in exports may be attributed to price changes, or in technical terms, the "price competitiveness effects." Thus, when

a country fails to maintain its shares in K's market, the competitiveness will be negative and will indicate price increases by the focus country somewhat greater than its competitors under the assumption that the elasticity of substitution exceeds one in the absolute value. From the constant norm above, the simplest form of the CMS model can be derived by treating total exports of the focus country as a single commodity destined to importing country K. That is to say, all commodities exported are homogeneous and easy to substitute.

The simplest form of the CMS model suggests that the export shares of a given country in K's market is a function of that country's relative price competitiveness vis-a-vis its competitors. The constant-market-shares norm will allow us to make several interesting calculations.⁵ Toward that end we will need the following definitions:

$$(3.2) \quad S^J = \frac{M^J}{M} = f\left(\frac{C^J}{C}\right) = f\left\{g\left(\frac{P^J}{P}\right)\right\}$$

$$f'\left(\frac{C^J}{C}\right) > 0 \quad \text{and} \quad g'\left(\frac{P^J}{P}\right) < 0$$

- S^J = the share of exporting Country J in the total imports of Country K
- M^J = total exports of Country J in Country K's import market
- M = total imports of Country K
- P^J = price index of Country J's exports

P = price index of Country J's competitors in Country K's import market

C^J = the price competitiveness of Country J

C = the price competitiveness of other supplier in Country K's import market

d = change in ...

We may say that $d S^J / d(P^J/P) < 0$, if

$$d S^J / d(C^J/C) > 0 \text{ and } d(C^J/C) / d(P^J/P) < 0 ;$$

implying that the increment in relative competitiveness of Country J, which comes from its relative price, leads to a higher market share.

The Equation (3.2) can be rewritten such that

$$M^J = S^J M$$

If Country J maintained its share in K's market, its exports would increase by $S^J \cdot dM$ but the exports of Country J to importing Country K actually increases by the following identity:

$$(3.3) \quad dM^J = S^J dM + dS^J M + dS^J dM$$

It divides the changes in Country J's exports in K's market into those associated with 1) the general increase (or decrease) in total imports of Country K ($S^J dM$); 2) the competitiveness effect ($dS^J M$) and 3) the interaction effect ($dS^J dM$). The first term ($S^J dM$) deals with the change in the export level of Country J in importing Country K due to the change in K's total imports while the share of Country J in

Country K (S^J) remains constant. The second term ($dS^J M$) gives the change in the export level of Country J due to the change in share while total imports of Country K remains constant. The third term ($dS^J dM$) gives the change in export level of Country J due to the interaction between the change in the share and the change in total imports of Country K.

Actually, the exports of any country are made up of a diverse set of commodities. The structure of a country's exports also affects its total export growth even in the absence of change in relative competitiveness. This leads to a more complex CMS model. For the commodity i , the expression analogous to the equation (3.2) can be written as follows:

$$(3.4) \quad S_i^J = \frac{M_i^J}{M_i} = f_i \left(\frac{C_i^J}{C_i} \right) = f_i \left[g_i \left(\frac{P_i^J}{P_i} \right) \right]$$

$$f_i' \left(\frac{C_i^J}{C_i} \right) > 0, \quad g_i' \left(\frac{P_i^J}{P_i} \right) < 0$$

i = a particular commodity class

J = the focus country exporting to Country K

With the same procedure as in the simple model, Equation (3.4) can be written as follows:

$$M_i^J = S_i^J M_i^J$$

$$dM_i^J = S_i^J dM_i^J + dS_i^J M_i^J + dM_i^J dS_i^J$$

The total change in exports of Country J in the K's market is given by the summation of all commodities, i.e.,

$$(3.5) \quad \sum_i dM_i^J = \sum_i S_i^J M_i + \sum_i M_i dS_i^J + \sum_i dM_i dS_i^J$$

$$\text{or} \quad dM_i^J = \sum_i S_i^J dM_i + \sum_i M_i dS_i^J + \sum_i dM_i dS_i^J$$

The interpretation of Equation (3.3) still holds true for Equation (3.5). The first term ($\sum_i S_i^J dM_i$) on the right hand side of the equation is the import growth effect measuring the changes in exports of Country J due to the import growth of Country K in each individual group of commodities. If the exports of Country J in each group grows by the same rate as the import growth of Country K for that particular group, the share of Country J in the K's market will remain constant. This can be proved mathematically as follows:

$$\begin{aligned} \sum_i S_i^J dM_i &= \sum_i \frac{M_i^J}{M_i} dM_i \\ &= \sum_i r_i M_i^J \end{aligned}$$

r_i = K's import growth of commodity i

M_i^J = value of Country J's exports of commodity i in the base year.

The second term in Equation (3.5) ($\sum_i dS_i^J M_i$) is known as the competitiveness effect measuring the change in Country J's exports in the K's market due to the changes in its share in individual groups of

commodities. The third term $(\sum_i dS_i^J dMi)$ is the interaction effect reflecting the value of export changes of Country J in K's market due to the interaction between the changes in K's import demand and the changes in Country J's share in K's market.

Equation (3.5) can be expanded in order to observe the favorable or unfavorable commodity concentration of exports of Country J in K's market as follows:

$$(3.6) \quad dM^J = S^J dM + (\sum_i S_i^J dMi - S^J dM) + \sum_i dS_i^J Mi \\ + \sum_i dMi dS_i^J$$

Equation (3.6) is called the three level analysis of CMS effects. Thus, with reference to Equation (3.6), Country J's changes in exports to K's market is explained by the growth of K's import demand (first term), favorable or unfavorable structural commodity concentration (second term), change in relative competitiveness (third term) and the interaction effect (last term). The first two terms (the import growth effect and the commodity compositional effect) are regarded as being determined by factors affecting the demand for imports in importing country K which in general, are outside the control of the exporting country. The last two terms (the pure share effect and interaction effect) are regarded to be within Country J's control since the gain or the loss in Country J's share in the K's market depends on its capability to keep up with the import demand in importing Country K.

3. Limitations of the Constant-Market-Share Model

Each of the relations derived so far to explain the total growth of exports of a country has been presented as an identity. If instead of using this CMS identity, we were required to establish theoretically the independent influences of commodity and geographical structure in the conventional CMS analysis as well as competitiveness without knowing actual export growth, the value of our theoretically-calculated export growth would not likely be the same as actual export growth. The difference would be some unexplained prediction of specification error, which in the CMS analysis is allocated to the competitiveness effect. Thus, whatever interpretation of the competitive effect is asserted in the context of the CMS analysis, this interpretation cannot be extended reliably in an ex ante theoretical analysis of export growth. In other words, as we have seen above, the CMS analysis is really a system of categorization and classification without deep roots in theory.⁶

It is further complicated by the necessarily arbitrary selection of a base period and the level of disaggregation of the commodity groups. This also complicates the interpretation of the commodity effect. The analysis is thus quite inflexible in the sense that its implications may apply only to the specified time period with the particular breakdown of the commodity groups. Possibly different conclusions will emerge on the relative importance of the various factors isolated if another choice of time period and level of aggregation is made.⁷ Another grave theoretical problem CMS analysis faces has to do with the homogeneity of goods involved.⁸ When commodities are very

homogeneous, relative prices are locked into a very small range of variation. Geographical market shares may be much more sensitive to demand-shift factors (not reflected by prices) in the markets of buyers who are relatively indifferent to the nationality of the supplier. Commodity market shares may be much more sensitive to supply factors such as a bumper crop or long strike, again not reflected by prices because of the homogeneity of the commodity. On the other hand, when commodities are not very homogeneous, i.e., differentiated by the nationality of the supplier, relative prices are likely to be only one of the arguments which enter the function for export shares. Other candidates include income and/or production in the importing country and prices. The basic underpinnings of CMS analysis are in doubt whether goods are homogeneous or not. As another theoretical point, we may note that the idea of constancy of market shares is of doubtful worth when consideration is given to differential impacts of economic fluctuations.⁹ This suggests that countries whose exports tend to be sensitive to domestic demand conditions will show apparent cyclical competitive effects: negative in the upswing and positive in the downswing. Since CMS analysis usually seems to be applied over only two or three periods (at most) in a given study, this possible cyclical variation has never been verified. The final critical problem has to do with the appropriate measure of relative competitiveness. In practice, the almost unanimous response has been relative price. But the theoretical grounds for this assumption has been questioned frequently in the literature.¹⁰ Relative price omits such factors as: quality improvement, improvements in

servicing, shortening of waiting lines, improved financing arrangements, and changes in discriminatory non-price trade policy. The interpretation of the competitiveness residual is therefore complicated by the nature of the general equilibrium system that lies behind it.

4. Relationship between Constant-Market-Share analysis and Elasticity of Substitution

It is inherent within the framework of CMS analysis that the export growth performance of a country and her share of an import market for a particular good would remain constant unless the relative price of exportable goods changes. This assumption makes the CMS analysis quite similar to the traditional elasticity approach in so far as evaluating the price competitiveness aspect of export growth performance. The underlying relationship between the CMS analysis and elasticity approach can be clarified by the following exposition.

We had to start with definitions of elasticity of substitution and an exposition of simple mathematical form. Indicating by q_1 and q_2 the quantities demanded from two sources of supply in a market and by P_1 and P_2 the corresponding prices, we shall assume that there is a functional relation between

$$(3.7) \quad q = \frac{q_1}{q_2} \text{ and } p = \frac{P_1}{P_2}; \quad q = f(P) \text{ or } \frac{q_1}{q_2} = q \left(\frac{P_1}{P_2} \right)$$

The elasticity of $\frac{q_1}{q_2}$ with respect to $\frac{P_1}{P_2}$ i.e.,

$$e = \frac{P}{q} \cdot \frac{dq}{dp} \quad \text{or} \quad \frac{\frac{P_1}{P_2}}{\frac{q_1}{q_2}} \cdot \frac{d\frac{q_1}{q_2}}{d\frac{P_1}{P_2}}$$

will be called elasticity of substitution. This definition coincides with that given by Allen and Hicks in the simplest case conceivable, i.e., the case where only two commodities are considered. The assumption from which it starts, i.e., the functional relationship Equation (3.7), is rather special. It has the advantage of being one of the simplest ways of describing two competing markets or two sources of supply. If the relation holds--albeit only approximately--it is a very easy way of describing some problems in such a market. Our statement does have a real meaning, which is that we cannot neglect, in a number of practical cases, the influence of competing prices. We have to know the dependence of demand on more than one price.

Let the elasticity of substitution be defined simply as the percentage change in relative quantities demanded divided by the percentage change in relative prices:

$$e = \frac{\frac{\partial(q_1/q_2)}{q_1/q_2}}{\frac{\partial(P_1/P_2)}{P_1/P_2}} = \frac{\partial(q_1/q_2)}{\partial(P_1/P_2)} \times \frac{P_1}{P_2} \frac{q_2}{q_1}$$

$$= \frac{\partial \log(q_1/q_2)}{\partial \log(P_1/P_2)}$$

where q_1 and q_2 are exports from two competing sources to some third market (say, Country K), and P_1 and P_2 are their respective prices. In the analysis of the elasticity of export substitution in a particular market, the *ceteris paribus* assumption holds with respect to money income and other prices in the importing country.

It is clear from the above elasticity of substitution equation that if q_1 and q_2 are absolute complements, no change can occur in q_1/q_2 and e will be zero. Whereas if q_1 / q_2 are perfect substitutes, the consumer will buy only the lower priced item, in which case e will be ∞ at $P_1=P_2$, and zero elsewhere. The actual elasticity of substitution between two different sources of imports is most likely to be somewhere between these two limits, depending upon the degree of substitutability of the two commodities concerned. In turn, substitutability is influenced by such factors as transport costs, market preference for the goods from one source of supply over another, a result of real or fancied differences in product quality or design, *ad infinitum*. It is the variation of substitutability that enables us to measure the extent of substitution.

Within the framework of conventional demand analysis the elasticity of substitution between two commodities can be examined. Let Country K's import demand for Country 1's and Country 2's exports be described by the following functions:

$$(3.8) \quad q_1 = f(p_1, p_2, y, p_n)$$

$$(3.9) \quad q_2 = g(p_1, p_2, y, p_n)$$

where y is money income in importing Country K, p_n is the general price level in K of the commodities other than 1 and 2, including perhaps the prices of competing imports. For the sake of simplicity, the demand function in Equations (3.8) and (3.9) may be written in the specific form of constant elasticity as follows:

$$(3.10) \quad q_1 = a p_1^{\alpha_1} p_2^{\alpha_2} y^{\alpha_y} p_n^{\alpha_n}, \quad \text{and}$$

$$(3.11) \quad q_2 = b p_1^{\beta_1} p_2^{\beta_2} y^{\beta_y} p_n^{\beta_n}$$

where α 's and β 's refer to elasticities of the respective variables. Dividing Equation (3.10) by Equation (3.11), we have

$$(3.12) \quad \frac{q_1}{q_2} = \frac{a}{b} \frac{p_1^{\alpha_1 - \beta_1}}{p_2^{\alpha_2 - \beta_2}} y^{\alpha_y - \beta_y} p_n^{\alpha_n - \beta_n}$$

The elasticity of substitution may now be conveniently expressed of money income y and other prices p_n are held constant:

$$(3.13) \quad \log \frac{q_1}{q_2} = a + b \log \frac{p_1}{p_2}$$

This implies that q_1/q_2 will be functionally related to p_1/p_2 only if the exponents of the price variables are equal, i.e.,

$$\alpha_1 - \beta_1 = \beta_2 - \alpha_2$$

or $\alpha_1 + \alpha_2 = \beta_1 + \beta_2$ is true in Equation (3.12)

the above relations assert that the sum of direct and cross price elasticities of demand be the same for each commodity.¹¹

The empirical test for the elasticity of substitution of the form (3.12) takes the following:

$$(3.14) \quad \log \frac{q_1}{q_2} = a + b_1 \log p_1 + b_2 \log p_2 + c \log y + d \log p_n$$

However, Equation (3.14) may be reduced back to the Equation (3.13) if $\alpha_y = \beta_y$ and $\alpha_n = \beta_n$ in Equation (3.12). That is, when the income elasticities of each commodity are the same and when the cross-price elasticities with respect to other goods are also the same. In these cases, the ratio of quantities imported will not be affected by the changes in income and other prices in importing Country K. Thus, income and other prices can be omitted in the measurement of elasticity of substitution. Whether the Equation (3.14) can be reduced to the Equation (3.13) therefore critically depends on the values of coefficient b_1 , b_2 , c , and d . The necessary values for b_1 and b_2 are that $b_1 = -b_2$ and the necessary values for c and d are $c = d = 0$.

The basic assumptions inherent from the above model can be summarized as follows: In the analysis of elasticity of substitution in a particular market 1) the algebraic sum of cross and direct price elasticities of demand for the two commodities must be equal; 2) the income and other price elasticities of demand for the two commodities must be equal.

5. Non-Price Factors

In Ginsburg's export-market-share model,¹² he focused in particular on such factors as prices, commodity characteristics, annual changes in import preferences, and variations in import demand among regional markets. He measured the various effects by the use of covariance technique,¹³ which investigated some untested variables while he attempted to incorporate into one analysis both price and non-price factors. His study definitely appears to be an improvement over earlier studies, which provided much useful information but still neglected many important factors, because of the difficulty of quantifying them and because of the lack of data. Therefore, we discuss some of these non-price factors separately, mainly in descriptive and non-quantitative terms.

The relative importance of price and non-price factors can probably best be studied through statistical or econometric analysis, and in the previous section we discussed some work along these lines. It is, however, very difficult to quantify the non-price factors. We cannot therefore present a well-rounded discussion of factors other than price changes and differences, but we attempted to gather some information about non-price factors that seemed to have a direct bearing on a country's competitive position.

While economic theory stresses the role of prices in determining the directions and commodity composition of trade, there remain a number of other influences on relative quantities and market shares such as distance (transport costs), trade restrictions, traditional commercial, industrial, and financial ties, credit terms,

shipment delays, ease of order, and various types of service. Trade theory in its search for the main tendencies at work generally ignores the multifaceted aspects of each transaction, some of which represent price and others, non-price factors. In our empirical work we treat some of these non-price factors separately, mainly in descriptive, nonquantitative terms. The importance of these non-price factors varies from one line of trade to another, but they undoubtedly have substantial influence upon international competition.

The tendency of international competition to equalize prices is subject to many frictions and interferences some of which tend to fragment markets or to isolate particular ones. Transport costs, including freight and insurance and sometimes extra packing costs, would create differences in f.a.s.¹⁴ export prices of products from different national sources of supply at each destination even if competition worked perfectly.

Tariffs and other restrictions on entry would create differences between f.a.s. export prices from foreign sources and f.o.b. prices from domestic suppliers, and in many cases also have a differential impact on alternative foreign sources. The combination of transport costs and discriminatory tariffs can create substantial price differences.

Quantitative restrictions, often imposed in addition to high tariffs, remained important in most developing countries. There were, as a result, instances of very large gaps between internal and world prices. The existence of such varying restrictions made it possible

for even the f.a.s. export prices of the same exporting firm in a developed country to vary from one destination to another.

The most important changes in tariffs affecting trade were those associated with the formation of the European Economic Community (EEC) and the European Free Trade Association (EFTA). They reduced not only their internal tariffs, but also adjusted their tariffs to outside countries toward a common external tariff. It is to be expected that the reductions in these inter-trade tariffs not only decreased the extent of disparities in prices among the members of each group, but also lowered in each member country the delivered prices of imports from each fellow member relative to prices from other non-member countries.

Preferential trade arrangements also extended beyond the membership of these two groups. The most extensive long-standing arrangements, those in the British Commonwealth, were of diminishing importance, but the EEC was expanding its preferential associations with African and certain less developed European countries.¹⁶

Other factors which, like import quotas, fragment markets geographically include arrangements among suppliers for each to avoid bidding in the others' market or for each to take his turn offering low bids. In some instances, it also appeared that firms would not bid against their licenses in a particular market, although there were also many cases in which they did compete.

Another factor which tends to weaken competitive forces in international markets are buy-domestic policies. Although the most widely publicized policy is that of the United States government, a similar

practice appears to be just as widely applied by most foreign governments, through informal administrative means. Most governments were reported in the OECD study of government purchasing¹⁷ to have few formal rules against purchasing foreign products. However, they do permit purchasing by selective tender, in which the invitation to bid is limited to selected suppliers, or by negotiation with suppliers, procedures which permit domestic suppliers to be favored without formal announcement of preferences. Sometimes there are cumbersome administrative or excessive bonding requirements, or even regulations precluding foreign bidding on government contracts.¹⁸

Reciprocity policies are not a monopoly of private firms. Similar agreements, sometimes formal, have been made between governments, or have been forced on private firms by their governments, and the amount involved may be larger than those involved in private arrangements. For example, a British agreement to purchase American military aircraft was accompanied by an American offer to facilitate the purchase of British defense equipment. A Belgian decision to purchase French, rather than American, military aircraft, and German, rather than French, tanks was attributed to the inclusion in each of the products chosen of components made in Belgium and, in one case, to a commitment for the purchase of other unrelated products from Belgium. A Danish purchase of Swedish aircraft was attributed to similar offset contracts.¹⁹

For developing countries, import-substitution policies often result in a market separation of domestic and world markets. The tying of aid also tends to shelter transactions from competitive forces and to result

in higher prices for the purchaser from the source of aid than from other countries.²⁰

Physical product differentiation ranges from almost incidental and accidental to purposeful and important differences in design. An example in the former category are price differences that arise from the use of 220-volt current in Europe and 110 volts in the United States. In the more deliberate category are differences in styling for consumer durables such as automobiles or in specifications for electrical generating equipment which, it has been alleged, some countries have designed to exclude competing goods from foreign suppliers.

In some lines, notably in communications equipment, the initial installation locks the purchaser to the products of a particular supplier, and there may be substantial differences between prices offered for the original installation and those offered for expansion or replacement equipment.

As we mentioned earlier, we know that it is difficult to quantify the non-price factors. But an alternative approach, which has obvious disadvantages of its own, is to ask firms engaged in international trade to assess the various factors that enable them to export or that cause them to import.

A pilot survey was made in 1964 to determine the feasibility of using a mail questionnaire to gain information about the role of prices in United States exports as this role was seen by large United States industrial firms.²³ The responding firms show the relative importance assigned by the firms to different factors accounting for their success

in exporting. Low prices received only 28 percent of the weight on the average. At the other extreme, firms did not feel that they could rely very heavily on the uniqueness of their goods; uniqueness received only a ten percent weight. Great importance (57 percent) was assigned to factors that enabled the United States firms to sell abroad even though their products were more expensive than those of foreign competitors; product superiority in one form or another accounted for the largest part (34 percent out of the 57 percent), with better after-sale service the leading runner-up (12 percent). There was, as would be expected, a greater emphasis on relative price in basic products (SITC 2 and 5) than in manufactured goods (SITC 6 and 7). Indeed, over half the firms reporting upon manufactured goods in SITC 6 and 7 did not attribute any of their export success to their ability to match foreign prices. This does not mean, of course, that they were unconcerned about the size of price differentials between their products and those of their foreign competitors. Firms selling transportation equipment, the returns suggested, placed more emphasis on relative prices than did other machinery producers.

We compared these results with more extensive surveys into reasons for imports conducted by the IFO Institute of Germany²⁴ and by the National Economic Development Council in the United Kingdom.²⁵

In the German survey, which was limited to imports of factory equipment in 1964, the responding firms²⁶ reported they made 63 percent of their purchases because the desired equipment was produced only abroad and another 12 percent, because of the superiority of foreign

equipment. Only 7 percent was purchased abroad for price advantages. The full distribution of reasons, when tabulated and compared with the United States returns covering the same products, agrees remarkably. About three-fourths of German imports (from all sources) and United States exports (to all destinations) are attributable to some degree of product differentiation. Under this general rubric there are substantial differences between the relative importance assigned by German importers and United States exporters to uniqueness versus types of product differentiation involving higher degrees of substitutability between domestic and foreign goods. To some degree the greater weight given by German importers to uniqueness may reflect differences in definition of judgment, but the direction of the difference is plausible. One would expect German importers to find the products they buy from the rest of the world unique compared with what is produced only in Germany more frequently than United States exporters would find the goods they sell as unique compared with the whole range of products available abroad.

The results of the U.K. study, which covered manufactured goods, were not summarized quantitatively. The findings, based on opinions surveys of users, consumers, and competing manufacturers, indicated that the relative importance of price differences varied from one product to another. For machinery: "The crucial factor determining the choice between a domestic of foreign purchase is what a machine can do or how economically and reliably it can do it; superiority in this sense outweighs quite large differences in price."²⁷ Price was, however, a "crucial"²⁸ factor in paper and paperboard, textiles and clothing,

some consumer durables (refrigerators and motorcycles), and iron and steel; but it was not clear that quality-adjusted price comparisons were the basis for these conclusions. Shortage of capacity also played a role in 1964 imports, particularly in chemicals.

6. Conclusions

What we have done in this chapter is to set out the theoretical framework of the CMS model and the elasticity of substitution between sources of imports and their interconnection in interpreting inter-country variation in export performance in K's import market. We can conclude with the following points:

The theoretical foundation of the CMS model is based on the assumption that import shares of any supplying country in the K's import market should be constant over time. The difference between the actual change of K's imports from any source and the change implied by constant share form is attributed to the effect of competition.

The actual change in imports from any source is divided into four parts. These are the change due to the: 1) average change in imports referred to as the import growth effect; 2) commodity composition referred to as the commodity compositional effect; 3) change in the country's shares referred to as the competitiveness effect, and 4) interaction of change in K's import demand and change in shares referred to as the interaction effect.

Due to the absence of reliable quantity data, value shares are used in the computation of competitiveness and interaction effects. This,

of course, depends on the assumption that the elasticity of substitution is greater than one. Otherwise, the negative correlation between shares and relative prices seems to be invalid.

The importance of elasticity of substitution between sources of imports in explaining the validity of CMS effects makes it worthwhile to measure them. So some theoretical foundation of elasticity of substitution is discussed. It has been shown that for a small importing country like Korea the estimated elasticity of substitution between imports from major developed countries tends to be unbiased.

Quantitative methods only capture price competitive and commodity composition effects but fails to explain non-price factors in this analysis. That is why we need to explain non-price factors separately.

Footnotes

Chapter III

¹This type of analysis was applied initially in the foreign trade context Tysznski, "World Trade in Manufactured Commodities, 1899-1950," The Manchester School, XIX (September, 1951), pp. 272-304. For a good theoretical evaluation of this model, see J.D. Richardson, "Constant-Market-Share Analysis of Export Growth," Journal of International Economics, I (May, 1971), pp. 227-239, and for an empirical application to Asian exports, see Seiji Naya and Udom Kerdpiwale, "Trade Policy and Problems of Export Expansion--the Case of Southeast Asia," in Structural Adjustments in Asian Pacific Trade (K. Kojima, ed.), Vol. 1 (Tokyo: Japan Economic Research Center, 1973). For two level analysis, see Seiji Naya, "Commodity Pattern and Export Performance of Developing Asian Countries to the Developing Areas," Economic Development and Cultural Change, 15 (July, 1967), pp. 420-37.

²For three level analysis, see Leamer, E.E. and Stern, R.M., Quantitative International Economics (Boston: Allyn and Bacon, 1970), Chapter 7; Lamfalussy, A., the United Kingdom and Six: An Essay on Economic Growth in Western Europe (Homewood: Richard D. Irwin, 1963), Chapter 5; Narvekar, P.R., "Competitiveness in Japan Export Performance," International Monetary Fund Staff Papers, Vol. VIII (November, 1960); Leamer, E.E. and Stern, R.M., Quantitative International Economics (Boston: Allyn and Bacon, 1970), p. 171.

³See basic assumptions in the Constant-Market-Shares Analysis shown above.

⁴Leamer and Stern, p. 172, footnote 2.

⁵There are three different measurements of CMS effects: one level, two level, and three level analysis. We will adopt three level analysis for this empirical study; for a good theoretical summary regarding the CMS analysis, see Richardson, J.D. Constant-Market-Shares Analysis of Export Growth, Ph.D. Dissertation (Ann Arbor: University of Michigan, 1970), pp. 7-11, and Leamer and Stern, pp. 172-176.

⁶For a similar comment about CMS analysis when applied to regional growth problem, see Houston, D.B. "The Shift and Share Analysis of Regional Growth: A Critique," Southern Economic Journal, XXXIII (April, 1967), pp. 578-79.

⁷ Leamer, E.E. and Stern, R.M., p. 176, footnote 6.

⁸ For extended discussion, see Leamer and Stern, Chapter 3, and Richardson, J.D. Constant-Market-Shares Analysis of Export Growth, Ph.D. Dissertation (Ann Arbor: University of Michigan, 1970), Chapter 3.

⁹ Adams, F.G., Eguichi, H., and Meyer zu Schlochtern, An Econometric Analysis of the International Trade of O.E.C.D. Member Countries (Paris: Organization for Economic Cooperation and Development, Department of Economics and Statistics, 1969), p. 36.

¹⁰ For example, see Fleming and Tsiang, p. 216, and Leamer and Stern, p. 175.

¹¹ Leamer, E.E. and Stern, R.M., p. 60, footnote 5.

¹² Alan L. Ginsburg, American and British Regional Export Determinants, Contributions to Economic Analysis, 64 (Amsterdam: North-Holland Co., 1969). For both price and non-price results, see A.L. Ginsburg's Chapters 3 and 4; a detailed analysis of the postwar results is described in Chapter 3 and of the interwar results in Chapter 4. Josef C. Brada and Larry J. Wipf, "The Export Performance of East European Nations in Western Markets," Weltwirtschaftliches Archiv, Band III, Heft 1 (1975).

¹³ This technique is due basically to Daniel B. Suits, and Alan L. Ginsburg developed this technique in application to analyze the export performance.

¹⁴ F.a.s. = free alongside ship, export packing and inland freight; f.o.b.--free on board.

¹⁵ See Lawrence B. Krause, European Economic Integration and the United States (Washington, D.C.: Brookings Institution, 1968), p. 58.

¹⁶ See *ibid.*, Chapter 6.

¹⁷ OECD, Government Purchasing in Europe, North America and Japan: Regulations and Procedures, 1966.

¹⁸ Robert E. Baldwin, "Nontariff Barriers: A Brief Study," Compendium of Papers on Legislative Oversight Review of U.S. Trade Policies, Vol. 1 (Senate Committee on Finance, 90th Congress, 2nd sess., February, 1968), p. 339.

¹⁹"America Expects Every Briton....," Economist (London, January 13, 1968), and "Nato Arms: Coordination Is a Mirage," ibid., (February 24, 1968).

²⁰A comprehensive analysis of the effects of aid tying is given in J. Bhagwati, "Tying of Aid," Problems and Policies of Financing, Vol. IV, UN Conference on Trade and Development, Second Session, New Delhi, 1968.

Estimates of Price Differentials resulting from the tying of aid are given in that report as well as others in the same volume and in Mahbubul Hag, "Tied Credits--A Qualitative Analysis," Capital Movements and Economic Development. Proceedings of a Conference held by the International Economic Association, London and New York (1967).

²¹The need to measure price and credit terms jointly has been discussed by Juster and Shay in connection with credit costs on United States automobile sale. See F. Thomas Juster and Robert Shay, Consumer Sensitivity to Finance Rates: An Empirical and Analytical Investigation, NBER Occasional Paper 88 (1964).

²²Gains Scored in Financing of U.S. Exports, Journal of Commerce (March 1964).

²³A questionnaire was prepared and sent out by the National Association of Business Economists to a selected list of its members in over 100 firms; see Irving B. Kravis and Robert E. Lipsey, Price Competitiveness in World Trade (New York: Columbia University Press, 1971), Appendix of Chapter 7.

²⁴Warum kauft die Industrie ausländische Ausrüstungsgüter?" IFO Schnelldienst (July 1966).

²⁵Imported Manufactures; An Inquiry into Competitiveness, 1965.

²⁶The survey went to 3,000 firms of which 27 percent responded. The goods included in the survey covered 41 percent of German machinery imports in 1964. Motor vehicles and office and farm machinery were excluded.

²⁷Ibid., p. 18.

²⁸Ibid., p. 28.

CHAPTER IV

EMPIRICAL RESULTS OF CONSTANT-MARKET-SHARE ANALYSIS

1. Introduction

As we have seen in Chapter II, the effort toward industrialization and import substitution during the period 1960-1973 has induced a rapid change in the commodity composition of Korea's imports in favor of capital goods and raw materials, and against consumer goods, especially non-durable consumer goods. Imports increased at an average annual rate of 27.3% during 1962-69 and at a rate of 13.2% during 1969-73. Imports increased at an average annual rate of 24.8% during 1962-73. Attempts to industrialize rapidly through import substitution and industrialization inevitably affected the expansion of Korea's imports during the period under consideration.

The discussion in Chapter II has shown that commodity composition and competitiveness have seemed to be the most important factors in explaining inter-country variation in export performance in Korea's import market. Total expenditures on imports reflect spending on individual groups of commodities which may be changed by various conditions in domestic and foreign supply and demand. These conditions have been induced by the economic policies of both Korea and the supplying countries as well as political and geographical ties between the trading partners.

This chapter attempts to empirically assess the importance of factors affecting the exports of individual countries to Korea's import

market, by using the constant-market-share model, discussed in Chapter III. The empirical result will enable us to see how Japan took effective action in enlarging its export share in Korea's import market.

2. Conceptual Problems in the Application of Constant-Market-Share Analysis

In examining the statistical analysis of a country's change in exports in a particular import market, there are many problems concerning the definitions and theoretical foundations of the CMS model. Those which are quite obvious and frequently cited in the subject of CMS analysis are as follows:

A. The Problem of the Appropriate Measure of Relative Competitiveness

In studying the relative competitiveness of any particular country, the most readily observed and frequently used measure of changes in competitiveness or in ability to export is relative market shares. Changes in market shares are the product of changes in relative prices and in relative quantities. Competitiveness in the sense of market shares may rise or fall as a result of an increase in a country's relative prices, depending upon whether the elasticity of substitution of its exports and those of the other countries is less or more than one. Hence, the use of market shares, in terms of value, to measure competitiveness will damage the implications for the standard interpretation of all the CMS effects in Equation (3-6). The sign and the size of the change in market share would thus have no value for explaining competitiveness unless

there is the assumption that the elasticity of substitution is greater than one.

The more appropriate measure of export share M^J/M is the quantity share, since it satisfies the requirement that shares vary directly with relative competitiveness regardless of the elasticity of substitution. However, in practice, CMS studies have incorrectly used export value shares because of the absence of reliable quantity data especially for the study of manufactured goods exported.

Most of Korea's imports are of the type of manufactured goods represented by machinery and transport equipment for which elasticity of substitution is presumably high. Hence value shares will be used in the application of CMS analysis. Since the shares depend on relative prices and relative quantities as mentioned earlier, which in turn are influenced by both demand and supply factors, the market shares of the focus country in Korea's market are said to be the result of the interaction between the demand and supply factors as well. On the demand side, a country's export share in Korea's market might grow because the taste of Koreans' shift toward its products, because its exports benefit from high income elasticity of demand in Korea, or because its exports benefit from a particularly rapid economic growth owing to the economic development plans. On the supply side are "changes in productivity and in monetary and fiscal policies which affect the level of prices and economic activities, government subsidies for exports and many other developments, both internal and external to the firms and industries."¹

The use of relative prices as an indicator of relative competitiveness, as it has been given in Equation (3.2) and Equation (3.4), can afford little indication of such other dimensions of competitiveness as the quality of the goods, distance (transport costs), trade restrictions, traditional, commercial, industrial, and financial ties, shipment delays, ease of order, and various types of services.² In total competitiveness, these factors can be as important as price factors. Some of these could conceivably be translated into monetary terms and incorporated into the prices of the products. However, it is a difficult task to measure them with quantitative precision. Thus, in empirical works these non-price factors are treated separately, mainly in descriptive, non-quantitative terms.³

B. The Problem of the Appropriate Interval of Structural Change

At the heart of the method of CMS analysis is the assumption that a country's export shares in Korea's market should remain unchanged over time. This assumption implies that, *ceteris paribus*, the structure of Korea's imports, both from the country and in total, should remain constant over the period of the study. The validity of the separation of the country's export change into the parts due to the average change in Korea's import demand, to change in commodity composition, to changes in pure share, and to the interaction of changes in Korea's import demand and changes in shares, depends on the validity of this assumption. When the CMS analysis is applied to the case of drastic changes in Korea's import structure, the validity of the interpretation will be

blurred. In general, the structure of Korea's imports, both from a country and in total, have changed over time. The assumed constant structure is considered to be a limiting case.

There is no definite way to choose the appropriate interval of structural change so as to represent the constant proxy. The arbitrary selection of a base period in the application of CMS analysis will complicate its interpretation. Possibly different conclusions will emerge on the relative importance of the various factors isolated if another choice of time period is made.⁴

Based on Equation (3.6), CMS analysis can be performed at various levels of commodity aggregation. The choice of a level of aggregation is also defined arbitrarily. Since each level of analysis is based on a different view of export competition, the choice of a level of analysis thus depends on whether the elasticity of substitution relationship is applicable to the particular submarket.⁵ The necessarily arbitrary selection of the level of disaggregation of the commodity groups leads to an equally arbitrary fluctuation in the resultant CMS analysis.

C. The Problem of the Definition of Commodity Groups Distinguished in the Analysis

A country's exports to Korea are composed of various types of commodities. In examining the country's export change in Korea's market, the problem is how to define the commodity group such that substitution between each group is difficult while the substitution within each group is easy.⁶ That is to say, the CMS analysis requires the homogeneity of the commodities within each group, and the country's exports are

differentiated by the groups of commodities. In practice, the grouping of commodities cannot satisfy the requirement just mentioned since its choice depends on the statistical data available, and the decision of the researcher. Thus, it is somewhat arbitrarily defined. This could lead to variation in the results of the CMS analysis since different groupings will alter the relative importance of various effects isolated.

3. Statistical Procedure of Constant-Market-Share Analysis

According to the theoretical foundations of the CMS model in Chapter III, the impact of changes in a country's exports in Korea's market is ascertained by four successive steps. Let us use Japan's exports as an example. First, we calculate the amount by which Japan's exports would have increased if Japan had shared proportionately in Korea's total imports. This amount is referred to as "the import growth effect" represented by the notation S_{dM}^J .

The magnitude of the import growth effect itself could not have any empirical significance in explaining the actual change of Korea's imports from Japan (Japan exports in Korea's market) since it assumes that Korea's imports have grown uniformly for all commodities. In other words, the import growth effect is derived by assuming the homogeneity of all commodities imported and treats total imports of Korea as a single commodity destined from a single source. The non-homogeneity of the commodities and various sources of supply causes this effect to be, by itself, empirically insignificant. However, it provides us with the

means to derive the commodity compositional component, which is an important factor in explaining a country's export performance in Korea's market.

Second, the effect of the differential commodity pattern of Korea's import expansion is determined by calculating the amounts by which Japan's exports of each commodity group would have changed if each group had changed by the same percentage as Korea's imports of the respective commodity group, and deducting from the total of these amounts the amounts by which each group would have changed if it had remained the same percentage of total imports of Korea. This amount is referred to as "the commodity compositional effect" represented by

$$(\sum_i S_i^J dM_i - S^J dM)$$

in the formulation. The result would be positive if Korea's import demand expansion were more than proportionate in the commodities in which Japan specialized in the base year, and if it were less than proportionate, the result would be negative.

Third, the sum of the amount derived by these two steps is deducted from the total increase in Korea's imports from Japan, and the remainder is assumed to be the effect of increased competitiveness of Japan's exports; for the sake of brevity, this amount will be referred to as the "net share effect" or competitiveness effect represented by the combined value of two components of competitiveness effect. The first one

$(\sum_i M_i dS_i^J)$ is referred to as the "pure share effect," and the other

$(\sum_i dM_i dS_i^J)$ is referred to as the "interaction effect." Thus, the last two steps are the computation of these two components of the "net share or competitiveness effect."

The pure share of Korea's imports of each commodity group distinguished in the analysis, assumes that Korea's import demand for each commodity group is constant at the initial level. When Japan can maintain its shares in each group of commodities, the change in Japan's export will be solely determined by the changes in Korea's import demand in total; i.e., the import growth effect, and there exists a zero net share effect. A positive pure share effect reflects the success of Japan in capturing a larger fraction of Korea's market over time and vice versa for a negative pure share effect. In order to enlarge its market shares, Japan must be able to compete effectively with other sources of supply, that is, it has to improve its relative competitiveness so as to induce higher demand for its export goods in Korea's market. Again, we must note that the sign and size of the change in market share will be used for the explanation of competitiveness if, and only if, there exists an elasticity of substitution greater than one. Hence, in the analysis shown below, it is assumed that the elasticity of substitution between sources of supply is greater than one. The increase in relative competitiveness, reflecting the reduction in relative price, leads to an increase in market shares, and hence the positive pure share effect. The reverse is true for the negative pure share effect.

The interaction effect is introduced in the analysis of the country's change in export value to Korea's market for the reason of consistency. Mathematically, this magnitude reflects the interaction between changes in the country's shares of each individual group of commodities distinguished in the analysis and changes in Korea's import demand for the same group of commodities. To achieve good performance, not only must the country keep up with Korea's import demand, but also increase its market shares in total imports of Korea. The country can benefit if it could increase its share of the rapidly growing import market. Such capacity is measured by the "interaction effect." Thus, the interaction effect is considered to be an additional measure of competitiveness, reflecting the "salability" of the focus country's exports in Korea's market in response to changes over time in Korea's import demand.

A positive interaction effect implies a benefit occurring to the focus country due to its success in moving its exports toward the more rapidly growing import commodities coupled with improvement in its relative competitiveness and/or to success in reducing export concentration in the declining commodities. A negative interaction effect implies a loss to the focus country due to failure to maintain its shares in the prosperous commodities and/or to failure to enlarge its market in the slow growing commodities. Empirically, zero interaction effects may also result. The interpretation for this is that even though the country can gain benefit from the interaction between changes in shares and change in Korea's import demand for some groups of commodities exported, reflected by the positive interaction effects for those groups, the

loss in exporting other groups, reflected by the negative interaction effects, may be so large that it fully offsets all positive benefits. Examples for this case will be shown in the statistical analysis of the actual change in exports to Korea's market of some selected countries below.

In making this analysis the countries being selected for the study are the four major suppliers of Korea, namely, the United States, West Germany, Japan, and the United Kingdom. Exports from other suppliers are grouped together and treated as total exports from a single source, represented by "others."

The basic data used are import statistics of Korea published in "Commodity Trade Statistics" by the United Nations. This is the most complete single source of data, which reports commodity-by-country data. Based largely on the trend of Korea's imports observed in Chapter II, it seems preferable to analyze the actual change in exports to Korea's market of the focus country during the period 1964/1965-1972/1973. Two years are selected for this study: Year I (the average of 1964 and 1965) is the base year and year II (the average of 1972/1973) is the subsequent year. Hence, the import value of two years, 1964/1965 and 1972/1973, are used. Two-year averages are used for each period to lessen the bias arising from yearly fluctuation in import value. It should be noted here that the classification of commodities is based on the Standard International Trade Classification (SITC) from the year 1964 to year 1973. In this analysis, the SITC 3 digit commodities in "Commodity Trade Statistics" are rearranged into

four groups: Consumer Goods, Industrial Supplies, Capital Goods, and Other Commodities, based on imports by broad economic categories made by the United Nations.⁷

According to the SITC three digit classification, total imports of Korea are classified into 46 groups of commodities. Fifteen groups are consumer goods, 22 groups are industrial supplies, seven groups are capital goods, and the last two groups are classified into other commodities. The major import commodities are given below for each group for the purpose of CMS analysis:

I. Total Imports

II. Consumer Goods:

IIa: Durable Goods

IIb: Non-durable Goods

III. Industrial Supplies:

IIIa: Primary

IIIb: Manufactured (semi- and finished)

IV. Capital Goods

V. Other Commodities

The value of total imports by economic classification is available in Commodity Trade Statistics. Therefore, imports from the United States, Japan, West Germany, and the United Kingdom are classified into those 46 groups combined together by their respective groups and subtracted from the value of total imports by economic classification. The residual is the import value by economic classification of other countries as a group. The import values are calculated by this procedure for the years required.

The 1964/1965 shares are used for the analysis of export change over the period. For each country, the computation of factors explaining the actual change in exports to Korea's market is made at seven disaggregated levels. The statistical formulations of these seven groups are as follows:

(4.1) Total Imports

$$\begin{aligned} d M^J = S^J d M^{\text{total}} &+ \left(\sum_{i=1}^{46} S_i^J d M_i^{\text{total}} - S^J d M^{\text{total}} \right) \\ &+ \sum_{i=1}^{46} M_i^{\text{total}} d S_i^J + \sum_{i=1}^{46} d M_i^{\text{total}} d S_i^J \end{aligned}$$

(4.2) Consumer Durable Goods

$$\begin{aligned} d M^J_{cd} = S^J_{cd} d M^{\text{total}}_{cd} &+ \left(\sum_{i=1}^5 S^J_{icd} d M^{\text{total}}_{icd} \right. \\ &\left. - S^J_{cd} d M^{\text{total}}_{cd} \right) + \sum_{i=1}^5 M^{\text{total}}_{icd} d S^J_{icd} \\ &+ \sum_{i=1}^5 d M^{\text{total}}_{icd} d S^J_{icd} \end{aligned}$$

(4.3) Consumer Non-durable Goods

$$\begin{aligned}
d M_{cnd}^J = & s_{cnd}^{total} dM_{cnd}^{total} + \left(\sum_{i=6}^{15} S_{icnd}^J d M_{icnd}^{total} \right. \\
& \left. - S_{cnd}^J dM_{cnd}^{total} \right) + \sum_{i=6}^{15} M_{icnd}^{total} dS_{icnd}^J \\
& + \sum_{i=6}^{15} dM_{icnd}^{total} dS_{icnd}^J
\end{aligned}$$

(4.4) Industrial Supplies (Primary)

$$\begin{aligned}
d M_{pr}^J = & S_{pr}^J dM_{pr}^{total} + \left(\sum_{i=16}^{21} S_{ipr}^J dM_{ipr}^{total} \right. \\
& \left. - S_{pr}^J dM_{ipr}^{total} \right) + \sum_{i=16}^{21} M_{ipr}^{total} dS_{ipr}^J \\
& + \sum_{i=16}^{21} dM_{ipr}^{total} dS_{ipr}^J
\end{aligned}$$

(4.5) Industrial Supplies (Manufactured)

$$\begin{aligned}
d M_{mf}^J = & S_{mf}^J d M_{mf}^{total} + \left(\sum_{i=22}^{37} S_{imf}^J dM_{imf}^{total} - S_{mf}^J dM_{mf}^{Total} \right) \\
& + \sum_{i=22}^{37} M_{imf}^{total} d S_{imf}^J + \sum_{i=22}^{37} d M_{imf}^{total} d S_{imf}^J
\end{aligned}$$

(4.6) Capital Goods

$$d M_k^J = S_k^J d M_k^{\text{Total}} + \left(\sum_{i=38}^{44} S_{ik}^J d M_{ik}^{\text{total}} - S_k^J d M_k^{\text{Total}} \right) +$$

$$\sum_{i=38}^{44} M_{ik}^{\text{total}} d S_{ik}^J + \sum_{i=38}^{44} d M_{ik} d S_{ik}^J$$

(4.7) Other Commodities

$$d M_x^J = S_x^J d M_x^{\text{total}} + \left(\sum_{i=45}^{46} S_{ix}^J d M_{ix}^{\text{Total}} - S_x^J d M_x^{\text{total}} \right) +$$

$$\sum_{i=45}^{46} M_{ix}^{\text{total}} d S_{ix}^J + \sum_{i=45}^{46} d M_{ix}^{\text{total}} d S_{ix}^J$$

Where S^J = the share of exporting country J of total imports of Korea

S_i^J = the share of exporting country for commodity i in Korea

M = total imports of Korea

M^J = total exports of country J in Korea's import market

d = change in (in the discrete form)

i = commodity i (i = 1, 2, 3, ... , 46)

J = exporting country

cd = consumer durable goods

cnd = consumer non-durable goods

Pr = primary in industrial supplies

mf = manufactured in industrial supplies

k = capital goods

x = other commodities

4. Empirical Results of Constant-Market-Share Analysis

We have discussed the commodity pattern and characteristics of Korea's imports from various major suppliers. Since these imports are exports of major suppliers, their export performance in Korea's import market will be evaluated. The main emphasis will be placed upon what factors explain the export performance. Finally, we would like to compare the results of export growth of the four major suppliers, United States, Japan, West Germany, United Kingdom, and of the other countries as a single group.

The summary of the empirical results of the constant-market-share analysis given in Table 17 which shows export performance of these countries in total export. Korea's imports grew at a compound rate of 25.84 percent from 1964/1965 to 1972/1973. This is called the average import growth effect. But Japanese exports increased by a compound rate of 28.77 percent per year, thus exceeding the average import growth effect by 3.86 percent per year. As the result of this growth differential, Japan's share in the total imports of Korea increased from 30.83 percent to 38.99 percent for the relevant period. Table 17 shows that Japan and the United Kingdom (and also other countries as a group) have gained at the expense of the United States and West Germany. The factors explaining the good performance of Japan's exports in Korea's import market have effects of both positive commodity composition and competitiveness, whereas the reverse sign for these effects is seen in the export performance of other developed countries. The commodity compositional effect shows a positive result of 87,042 thousand

U.S. dollars or 31.54 per cent of the actual export performance. It means that the growth pattern of Korea's import demand has been very favourable to the export structure of Japan for the relevant period. This has had the effect of increasing Japanese exports to Korea, whereas it has reduced export growth of other developed countries, especially the U.S.

In addition to a positive commodity composition effect, Japan also benefitted from a much stronger competitiveness effect of 188,903 thousand U.S. dollars or 68.46 per cent of the actual export performance. A sharp contrast with Japan's positive competitiveness effect is the negative value shown in this effect for the U.S. and W. Germany.

The favourable competitiveness effect of Japanese exports in Korea's import market consists of two components; the first component is the positive pure share effect (3,011 thousand U.S. dollars or 1.09 per cent of the actual export performance) reflecting the success of Japan in capturing a higher fraction of Korea's import market over time. It is safe to say that Japan had success in enlarging its share in Korea's import market because of the relative cheapness of its goods and other non-price advantages. The second is the positive interaction effect reflecting the success of Japan in diversifying and expanding her exports toward more rapidly growing items and in reducing its share in less rapidly rising imports. This second effect had an especially large role in the rapid export expansion of Japan (185,892 thousand U.S. dollars or 67.37 of the actual export performance). Thus Japan has taken a full advantage of the changing market opportunities available

to her.

The U.K.'s exports increased by a compound rate of 50.23 per cent per year, thus exceeding the average import growth effect by 35.77 per cent per year. Therefore, the U.K.'s share of Korea's total imports increased from 0.29 to 2.07 per cent for the period under consideration. But it is noticable that the U.K.'s exports to Korea remains a small fraction of Korea's total imports.

The U.K.'s performance differs from Japan's in that she had a small commodity compositional effect (5,474 thousand U.S. dollars or 9.14 per cent of the actual export performance), while she had a large competitiveness effect (5,474 thousand U.S. dollars or 90.86 per cent of the actual export performance). In the favourable competitiveness effect, the positive pure share effect indicated a small amount of 4,631 thousand U.S. dollars or only 7.73 per cent of the actual export performance, while the positive interaction effect was to the extent of 49,797 thousand U.S. dollars or 83.13 per cent of the actual export performance. Thus, the United Kingdom, though influenced also by both positive commodity compositional and pure share effects, mainly has been affected by the interaction effects, sharing the success of Japan in diversifying its exports structure toward the very rapidly growing commodities in Korea's import market.

W. Germany's exports grew at a compound rate of 21.07 per cent per year, thus falling short of the average import growth affect by -6.02 per cent per year. As the result of the negative growth differential, W. Germany's share in Korea's total imports decreased from 4.26 per cent in 1964/1965 to 2.19 per cent in 1972/1973. Her

poor export performance in Korea's import market is explained mostly by the unfavourable competitiveness effect. Even though the favourable commodity compositional effect indicates a positive value of 123,699 thousand U.S. dollars or 270.73 per cent of the actual export performance, this effect is too small to compensate for the loss due to the negative competitiveness effect of -169,389 thousand U.S. dollars or 370.73 per cent of the actual export performance. Hence W. Germany's export performance turned out to be negative to the value of -45,690 thousand U.S. dollars.

United States exports increased by a compound rate of 18.68 per cent per year during the period under review, thus falling short of the average import growth effect by 8.94 per cent per year. The U.S. shows the lowest growth rate of exports among the major suppliers in Korea's import market during the period under consideration. Hence the U.S. share of Korea's imports decreased from 45.63 per cent in 1964/1965 to 25.75 per cent in 1972/1973. The unfavorable export performance of the United States is explained by unfavorable commodity compositional effect which indicates a negative value of -353,549 thousand U.S. dollars or 52.60 per cent of the actual export performance and the competitiveness effect which also shows a negative value of -318,661 thousand U.S. dollars or 47.40 per cent of the actual export performance. It is safe to say that the growth pattern of Korea's import demand has been unfavourable to the export structure of the U.S. This has had the effect of reducing U.S. exports to Korea, whereas it has raised export growth of other developed countries such

as Japan, U.K. and other countries as a group. Likewise, the U.S. has failed to achieve a positive interaction effect (-36.53 per cent of the actual export performance) indicating a lack of success of the U.S. in diversifying and expanding her exports toward more rapidly growing items and in reducing its share in less rapidly rising imports. Furthermore, the U.S. also has failed to attain a positive pure share effect (-10.87 per cent of the actual export performance), indicating the lack of success of the U.S. in capturing higher fraction of Korea's import market over time. Thus, the U.S. has not taken full advantage of the changing market opportunities available to her because she has failed to have favourable export performance due to both unfavourable commodity compositional and competitiveness effects during the relevant period.

Finally, other countries' exports increased by a compound rate of 31.68 per cent per year, exceeding the average import growth effect by 7.79 per cent per year. Thus, the share of other countries of Korea's total imports increased from 18.98 per cent in 1964/1965 to 30.28 per cent in 1972/1973. The export performance of other countries as a group is explained by both favourable commodity compositional and competitiveness effect.

In summary, the export performance of different countries suggests that Japan, U.K., and other countries as a group have gained at the expense of the U.S. and W. Germany. However, Japan has shown the best export performance among them in terms of both absolute amount and share in Korea's import market. On the one hand, Japan's export growth

Table 17
Export Performance of Major Suppliers in Korea Import Market:
Total Imports from 1964/1965 to 1972/1973
(In Thousands of U.S. Dollars)

Country	Actual Growth (1)	Average Import Growth Effect (2)	Export Performance (3)=(1)-(2)	Commodity Compositional Effect (4)	Competitiveness Effect		
					Total (7)=(5)+(6)	Pure Share Effect (5)	Interaction Effect (6)
Total Imports based on Import Structure of 1964/1965:							
U.S.	675,010	1,347,220	-672,210	-353,549	-318,661	-73,087	-245,574
Japan	1,186,050	910,105	275,945	87,042	188,903	3,011	185,892
W. Germany	80,204	125,894	- 45,690	123,699	-169,389	- 6,899	-162,490
U.K.	68,569	8,667	59,902	5,474	54,428	4,631	49,797
Other Countries	942,424	560,367	382,057	137,339	244,718	72,344	172,374
Proportionate Share of Import Increase (%):							
U.S.			-100.00	- 52.60	- 47.40	-10.87	- 36.53
Japan			100.00	31.54	68.46	1.09	67.37
W. Germany			-100.00	270.73	-370.73	-15.10	-355.63
U.K.			100.00	9.14	90.86	7.73	83.13
Other Countries			100.00	35.95	64.05	18.93	45.12

Source: United Nations, Commodity Trade Statistics.

Notes: a) Computed from Equation (4.1).
b) See text for definitions and computational procedures.

Table 18

Export Performance of Major Suppliers in Korea Import Market:
Durable Consumer Goods from 1964/1965 to 1972/1973

(In Thousands of U.S. Dollars)

Country	Actual Growth (1)	Average Import Growth Effect (2)	Export Performance (3)=(1)-(2)	Commodity Compositional Effect (4)	Competitiveness Effect		
					Total (7)=(5)+(6)	Pure Share Effect (5)	Interaction Effect (6)
Based on Import Structure of 1964/1965:							
U.S.	16,799	62,852	- 46,053	- 10,173	- 35,880	- 2,432	- 33,448
Japan	121,588	64,914	56,674	14,378	42,296	2,660	39,636
W. Germany	13,643	42,242	- 28,599	- 8,011	- 20,588	- 1,354	- 19,234
U.K.	10,145	1,057	9,088	- 193	9,281	666	8,615
Other Countries	22,376	13,486	8,890	3,999	4,891	460	4,431
Proportionate Share of Import Increase (%):							
U.S.			-100.00	- 22.09	- 77.91	- 5.28	- 72.63
Japan			100.00	25.37	74.63	4.69	69.94
W. Germany			-100.00	- 28.02	- 71.98	- 4.73	- 67.25
U.K.			100.00	- 2.12	102.12	7.32	94.80
Other Countries			100.00	44.98	55.02	5.18	49.84

Note: Computed from Equation (4.2).

Table 19
Export Performance of Major Suppliers in Korea Import Market:
Nondurable Consumer Goods from 1964/1965 to 1972/1973
(In Thousands of U.S. Dollars)

Country	Actual Growth (1)	Average Import Growth Effect (2)	Export Performance (3)=(1)-(2)	Commodity Compositional Effect (4)	Competitiveness Effect		
					Total (7)=(5)+(6)	Pure Share Effect (5)	Interaction Effect (6)
Based on Import Structure of 1964/1965:							
U.S.	293,106	369,412	- 76,306	- 37,832	- 38,474	- 3,279	- 35,195
Japan	30,089	10,387	19,702	5,565	14,137	2,448	11,689
W. Germany	1,138	467	671	1,009	- 338	51	- 389
U.K	661	354	307	416	- 109	12	- 121
Other Countries	105,088	49,462	55,626	30,841	24,785	769	24,016
Proportionate Share of Import Increase (%):							
U.S.			-100.00	- 49.58	- 50.42	- 4.30	- 46.12
Japan			100.00	28.25	71.75	12.43	59.32
W. Germany			100.00	150.37	- 50.37	7.60	- 57.97
U.K.			100.00	135.51	- 35.51	3.90	- 39.41
Other Countries			100.00	55.44	44.56	1.38	43.18

Note: Computed from Equation (4.3).

Table 20
Export Performance of Major Suppliers in Korea Import Market:
Total Consumer Goods from 1964/1965 to 1972/1973
(In Thousands of U.S. Dollars)

Country	Actual Growth (1)	Average Import Growth Effect (2)	Export Performance (3)=(1)-(2)	Commodity Compositional Effect (4)	Competitiveness Effect		
					Total (7)=(5)+(6)	Pure Share Effect (5)	Interaction Effect (6)
Based on Import Structure of 1964/1965:							
U.S.	309,905	432,264	-122,359	- 48,005	- 74,354	- 5,711	- 68,643
Japan	151,677	75,301	76,376	19,943	56,433	5,108	51,325
W. Germany	14,781	42,709	- 27,928	- 7,002	- 20,926	- 1,303	- 19,623
U.K.	10,806	1,411	9,395	223	9,172	678	8,494
Other Countries	127,464	62,948	64,516	34,840	29,676	1,229	28,447
Proportionate Share of Import Increase (%)							
U.S.			-100.00	- 39.23	- 60.77	- 4.67	- 56.10
Japan			100.00	26.11	73.89	6.69	67.20
W. Germany			-100.00	- 25.07	- 74.93	- 4.67	- 70.26
U.K.			100.00	2.37	97.63	7.22	90.41
Other Countries			100.00	54.00	46.00	1.91	44.09

Note: Table (18) + Table (19)

Table 21

Export Performance of Major Suppliers in Korea Import Market:
Industrial Supplies-Primary from 1964/1975 to 1972/1973

(In Thousands of U.S. Dollars)

Country	Actual Growth (1)	Average Import Growth Effect (2)	Export Performance (3)=(1)-(2)	Commodity Compositional Effect (4)	Competitiveness Effect		
					Total	Pure Share	Interaction
					(7)=(5)+(6)	Effect (5)	Effect (6)
Based on Import Structure of 1964/1965							
U.S.	105,911	377,868	-271,957	-118,730	-153,227	-32,720	-120,507
Japan	44,624	51,690	- 7,066	579	- 7,645	- 499	- 7,146
W. Germany	273	---	273	---	273	73	200
U.K.	1,810	---	1,810	---	1,810	323	1,487
Other Countries	550,534	273,593	276,941	118,151	158,790	32,824	125,966
Proportionate Share of Import Increase (%)							
U.S.			-100.00	- 43.66	- 56.34	-12.03	- 44.31
Japan			-100.00	8.19	-108.19	- 7.06	-101.13
W. Germany			100.00	---	100.00	26.74	73.26
U.K.			100.00	---	100.00	17.84	82.16
Other Countries			100.00	42.66	57.34	11.85	45.49

Note: a) Computed from Equation (4.4).
b) --- Means 'nil' or 'negligible'

Table 22
Export Performance of Major Suppliers in Korea Import:
Industrial Supplier: Manufactured from 1964/1975 to 1972/1973

(In Thousands of U.S. Dollars)

Country	Actual Growth (1)	Average Import Growth Effect (2)	Export Performance (3)=(1)-(2)	Commodity Compositional Effect (4)	Competitiveness Effect		
					Total (7)=(5)+(6)	Pure Share Effect (5)	Interaction Effect (6)
Based on Import Structure of 1964/1965:							
U.S.	46,593	295,627	-249,034	- 80,783	-168,251	-36,428	-131,823
Japan	584,182	414,901	169,281	63,762	105,519	- 6,073	111,592
W. Germany	22,317	10,822	11,495	10,496	999	3,314	- 2,315
U.K.	15,355	1,081	14,274	212	14,062	1,492	12,570
Other Countries	167,090	113,104	53,986	6,312	47,673	37,698	9,975
Proportionate Share of Import Increase (%)							
U.S.			-100.00	- 32.44	- 67.56	-14.63	- 52.93
Japan			100.00	37.67	62.33	- 3.59	65.92
W. Germany			100.00	91.31	8.69	28.83	- 20.14
U.K.			100.00	1.49	98.51	10.45	88.06
Other Countries			100.00	11.69	88.31	69.83	18.48

Note: Computed from Equation (4.5).

Table 23
Export Performance of Major Suppliers in Korea Import Market:
Total Industrial Supplies from 1964/1965 to 1972/1973
(In Thousands of U.S. Dollars)

Country	Actual Growth (1)	Average Import Growth Effect (2)	Export Performance (3)=(1)-(2)	Commodity Compositional Effect (4)	Competitiveness Effect		
					Total (7)=(5)+(6)	Pure Share Effect (5)	Interaction Effect (6)
Based on Import Structure of 1964/1965:							
U.S.	152,504	673,495	-520,991	-199,513	-321,478	-69,148	-252,330
Japan	628,806	466,591	162,215	64,341	97,874	- 6,572	104,446
W. Germany	22,590	10,822	11,768	10,496	1,272	3,387	- 2,115
U.K.	17,165	1,081	16,084	212	15,872	1,815	14,057
Other Countries	717,624	386,697	330,927	124,463	206,463	70,522	135,941
Proportionate Share of Import Increase (%)							
U.S.			-100.00	- 38.30	- 61.70	-13.27	- 48.43
Japan			100.00	39.66	60.34	- 4.05	64.39
W. Germany			100.00	89.19	10.81	28.78	- 17.97
U.K.			100.00	1.32	98.68	11.28	87.40
Other Countries			100.00	37.61	62.39	21.31	41.08

Note: Table (21) + Table (22)

Table 24

Export Performance of Major Suppliers in Korea Import Market:
Capital Goods from 1964/1965 to 1972/1973

(In Thousands of U.S. Dollars)

Country	Actual Growth (1)	Average Import Growth Effect (2)	Export Performance (3)=(1)-(2)	Commodity Compositional Effect (4)	Competitiveness Effect		
					Total (7)=(5)+(6)	Pure Share Effect (5)	Interaction Effect (6)
Based on Import Structure of 1964/1965:							
U.S.	212,438	152,428	60,010	- 19,384	79,394	1,750	77,644
Japan	404,863	367,721	37,142	918	36,224	4,558	31,666
W. Germany	41,425	173,308	-131,883	18,123	-150,006	- 8,743	-141,263
U.K.	40,598	11,918	28,680	- 704	29,384	2,138	27,246
Other Countries	92,595	86,542	6,053	1,046	5,007	300	4,707
Proportionate Share of Import Increase (%)							
U.S.			100.00	- 32.30	132.30	2.92	129.38
Japan			100.00	2.47	97.53	12.27	85.26
W. Germany			-100.00	13.74	-113.74	- 6.63	-107.11
U.K.			100.00	- 2.45	102.45	7.45	95.00
Other Countries			100.00	17.28	82.72	4.96	77.76

Note: Computed from Equation (4.6).

Table 25

Export Performance of Major Suppliers in Korea Import Market:
Other Commodities from 1964/1965 to 1972/1973

(In Thousands of U.S. Dollars)

Country	Actual Growth (1)	Average Import Growth Effect (2)	Export Performance (3)=(1)-(2)	Commodity Compositional Effect (4)	Competitiveness Effect			
					Total (7)=(5)+(6)	Pure Share Effect (5)	Interaction Effect (6)	
Based on Import Structure of 1964/1965:								
U.S.	163	837	- 674	1,547	- 2,221	24	- 2,245	
Japan	711	2,600	- 1,889	- 266	- 1,623	- 78	- 1,545	
W. Germany	1,408	2,364	- 956	- 1,228	272	- 238	510	
U.K.	---	---	---	---	---	---	---	
Other Countries	4,741	1,221	3,520	- 51	3,571	292	3,279	
Proportionate Share of Import Increase (%)								
U.S.			-100.00	299.53	-329.53	3.56	-333.09	
Japan			-100.00	- 14.08	- 85.92	- 4.13	- 81.79	
W. Germany			-100.00	-128.45	28.45	-24.90	53.35	
U.K.			---	---	---	---	---	
Other Countries			100.00	- 1.45	-101.45	- 8.30	93.15	

Note: a) Computed from Equation (4.7)
b) --- means 'nil' or 'negligible'

to Korea has been affected greatly by a positive commodity compositional effect that depends on the import structure of Korea, which in turn tends to be somewhat within the control of Korea since it is the effect of economic development and industrialization. Even though the commodity compositional effect is outside the control of Japan, the growth pattern of Korea's import demand has been very favourable to the export structure of Japan. On the other hand, Japan's export growth to Korea has also been influenced greatly by a competitiveness effect that depends on the ability of Japan to keep up with the growth in Korea's import demand, which in turn seems to be mostly controlled by Japan. This success is considered to be within her control, since the main device is the improvement in her relative competitiveness which depends on economic conditions and policies in Japan. In other words, the relative cheapness of Japanese goods induced Korea's import demand to shift toward them under the assumption that the elasticity of substitution between sources of supply is greater than one. However, the success of Japan in keeping up with Korea's import demand has been influenced by many factors, such as the competitiveness among the sources of supply, costs of transportation, various conditions of loans, grants and suppliers' credit terms. From the empirical results, we find that the expansion of Korea's imports by sources of supply depends on the structure of Korea's imports as well as the ability of the exporting country in keeping up with the growth in Korea's import demand.

In the empirical results of CMS analysis, the interaction effects

showed greater magnitudes in all commodity groups. We can explain this as follows: in a rapidly growing economy like Korea, the interaction effects may be extraordinarily large because volume and structure of imports have been changing very rapidly, resulting in the drastic changes in share and volume of imports (in both total and individual groups). The total change in imports in each group over the period of study was very large in comparison with the initial volume. This phenomena explains the greater interaction effect.

Since the empirical results above are based on all products classified into 46 items, the numerical values of factors accounting for major suppliers' export expansion may have been influenced more by certain commodity groups than others. In order to examine the relative strength of export performance in different groups, 46 commodities are regrouped into six groups such as consumer durable goods, consumer nondurable goods, industrial supplies (primary), industrial supplies (manufactured), capital goods, and other commodities. Applying the analysis for these groups separately via Equation (4.2) to Equation (4.7), the empirical results of them are given in Table 18, Table 19, Table 21, Table 22, Table 24, Table 25 respectively. The aggregation of the results from these tables yields the export performance in total for the countries concerned, but we computed the export performance in total by using Equation (4.1). Table 20 shows the analysis of export performance of consumer goods by adding the respective effects in Table 18 and Table 19 together, while Table 23 shows the analysis for the group of industrial supplies

by combining the results of Table 21 and Table 22. The separation of the analysis of export performance in Korea's market of the focus countries into six groups mentioned earlier is quite interesting, since Korea's import growth rates for each group is different. The analysis at the disaggregated levels provides the opportunity to observe the distribution of the country's export performance over those groups.

Although the average growth effect and actual export growth of major suppliers differs by commodity groups, the empirical results clearly reveal that Japan's export performance in Korea's import market was better than the other three major suppliers in almost all commodity groups. This shows that the relative strength of Japanese exports in Korea's market is quite broad.

First, in consumer durable goods, Japan had a very good export performance due to both the favorable commodity compositional (14,378 thousand U.S. dollars or 25.37 per cent of the actual export change) and competitiveness effect (42,296 thousand U.S. dollars or 74.63 per cent of the actual export change) as shown in Table 18. Similarly in consumer non-durable goods, Japan has a favorable export performance due to both the favorable commodity compositional (5,565 thousand U.S. dollars or 28.25 per cent) and competitiveness effects (14,137 thousand U.S. dollars or 71.75 per cent of the actual export change) as shown in Table 19. Combining the export performance of total consumer goods (both durable and non-durable), the empirical result indicates a favorable export performance (76,375 thousand U.S. dollars) due to both the favorable commodity compositional and competitiveness effects shown in Table 20.

Second, in industrial supplies (primary), Japan had a poor export performance due to the unfavorable competitiveness effect (-7.645 thousand U.S. dollars or -108.19 per cent of the actual export change) relative to the favorable commodity compositional effect (579 thousand U.S. dollars or 8.19 per cent of the actual export change) as shown in Table 21. On the other hand, in industrial supplies (manufactured), Japan has had a favorable export performance due both to the large commodity composition (37.67 per cent of the actual export performance) and to the interaction effect (65.92 per cent of the actual export performance), relative to the small negative value of pure share effect (-3.59 per cent of the actual export performance) as shown in Table 22. Combining the export performance of industrial supplies (both primary and manufactured), the good export performance in the latter is so large that it can fully offset the poor performance of the former. Hence the empirical result indicates a favorable export performance (162,215 thousand U.S. dollars) in total industrial supplies to Korea's market as shown in Table 23.

Third, in capital goods, Japan had a good export performance (next to the U.S.) due to both the positive values of commodity compositional (918 thousand U.S. dollars or 2.47 per cent of the actual export change) and competitiveness effects (36,224 thousand U.S. dollars or 97.53 per cent of the actual export change), as shown in Table 24. But the most influential factor was the competitiveness effect.

Finally, in other commodities, Japan had an extremely poor export

performance (-1,889 thousand U.S. dollars of the actual export performance), since she had negative values for both commodity composition and competitiveness effects. But these groups consist of only a small fraction of Japan's exports as well as of Korea's total imports.

It is worthwhile to say that the commodity composition effect has been favorable for Japan's export expansion during the period under review, excluding the other commodities group. Nevertheless, Japan has been very successful and the favorable competitiveness effect explains Japan's positive export performance in almost all commodity groups.

The United Kingdom and other countries as a group have had good export performances in all groups for the relevant period as shown in Tables 18-25. However, the United Kingdom has very small shares and amounts of Korea's total imports, though they have been growing rapidly for the last decade. Similarly, exports of other countries as a group are concentrated in industrial supplies and other commodities, which do not compete very much with the four major suppliers.

The United States' poor export performance is influenced equally by the unfavorable commodity composition and competitiveness effects in the following groups: consumer durable, consumer non-durable, industrial supplies (primary), industrial supplies (manufactured). In contrast, in the other commodities group, the poor export performance of the United States is explained only by the strong

unfavorable competitiveness effect. It is noticeable that the United States has the best export performance only in capital goods, where the favorable competitiveness effect is large enough to more than offset the unfavorable commodity compositional effect as shown in Table 24.

Finally, in consumer durable goods, W. Germany's poor export performance is explained by both the commodity compositional and competitiveness effects as shown in Table 18. On the other hand, in capital goods, her poor export performance is affected mainly by the negative value of the competitiveness effect while in other commodities, her poor export performance is explained mostly by the negative value of the commodity compositional effect as shown in Table 25.

5. Conclusions

We have presented the empirical results of the export performance of the major suppliers competing in Korea's import market. The constant-market-share analysis suggests that the inter-country variation in export performance could be explained by two factors: i.e., commodity compositional effect and competitiveness effect (pure share effect and interaction effect). Japan has had a very good export performance in almost all groups among major suppliers, since the growth pattern of Korea's import demand has been relatively favorable to the export structure of Japan. But of the factors explaining export performance, the competitiveness effect has been most

influential relative to the commodity compositional effect as shown in the empirical results. This finding implies that a large part of export growth is in the control of the exporting country. Japan (also the United Kingdom to a small degree) is the country that has succeeded in enlarging its share in Korea via improvement in her relative competitiveness over time. The commodity groups that are most important to Japan's export growth and her improvement of competitiveness are industrial supplies (especially manufactured) and capital goods. Because of the relative cheapness of Japanese products, it is expected that Korea's import demand will shift from other sources of supply to them. The higher Japan's share in Korea's imports, the more import dependence of Japanese goods, the more Japan's influence in controlling Korea's import market. The negative competitiveness effect for other competing major supplies reflects their failure to take full advantage of market opportunities in expanding their exports in Korea's market. It can be predicated that the opportunity for the United States, W. Germany and even the United Kingdom to enlarge their shares in Korea's market seems to be blurred since Japan has had a more controlling influence in the import demand of Korea.

Of the factors explaining Japanese export performance, its positive competitiveness effect has been very influential. In the above discussion, the positive competitiveness effect has been interpreted as an indication of an improved competitive position in a given country's exports in relation to those of others. It is,

however, very difficult to pinpoint what the competitiveness is comprised of or what it means. Obviously, price is an important variable. But other factors such as the quality and uniqueness of the goods, distance (transport costs), the speed of delivery, after sale service, and commercial and financial ties and arrangement can be important determinants of competitiveness.

From Korea's point of view, the good export performance of Japan in Korea's market means that a growing share of Korea's imports have been supplied by Japan. Also Japan has had an effective policy for export promotion to replace other sources of supply in a given market.

Footnotes

Chapter IV

¹Kravis and Lipsey, Price Competitiveness in World Trade. (New York: Columbia University Press), 1971. p. 40.

²Ibid., pp. 41-42.

³It should be stressed that the non-price factors that bear upon the saleability of a country's exports are meant to describe the supply side of the phenomenon under study. The relative importance of the price and non-price factors in determining the export demand in Korea will be shown in the empirical work on the elasticity of substitution between sources of supply of Korea's imports, See Chapter V.

⁴Leamer and Stern, op. cit., p. 176.

⁵Ibid., Footnote 6.

⁶I. Little, T. Scitovsky and M. Scott, Industry and Trade in Some Developing Countries, (London: Oxford University Press, 1970).

⁷Food and beverage are included in consumer goods for the sake of the convenience, the original U.N. classification regarded it as one independent category.

⁸Seiji Naya and Narongchai Akrasanee, Thai-Japanese Economic Relations: Trade and Investment, (Bangkok: 1974), p. 39.

CHAPTER V
EMPIRICAL RESULTS OF ELASTICITY OF SUBSTITUTION
BETWEEN SOURCES OF SUPPLY

1. Introduction

One of the most important questions in international trade theory and policy is the responsiveness of the volume of trade to price changes. Numerous studies in the postwar period have established and verified the fact that the demand for manufactured goods is elastic, depending on the method of estimation, the countries involved, and the period covered. It is, however, a major shortcoming of most estimates that they are concerned with demand for manufactured products as a whole. Elasticity estimates for individual commodities are rare.¹

Nowadays, economic policy makers in a large number of countries are concerned with the problem of balance of trade deficits. To tackle such problems, recent empirical research efforts on international trade have focused their attention on the study of imports and exports of commodities at a disaggregated level. In this way, estimates of price elasticities of imports and exports of individual commodities or their groups become readily available so that, in the light of such quantitative information, the task of policy makers with regard to the formulation of their trade policies is greatly facilitated. Furthermore, it should become clear that, irrespective of their obvious contribution to economic policy-making, the studies at issue provide useful quantitative information as to the range of the numerical

magnitude of price elasticities of importable and exportable commodities for economically less developed, developing and advanced countries.

The results of the CMS analysis in Chapter IV have shown that competitiveness has been the most important factor in explaining the inter-country variation in export performance of sources of supply in Korea's import market, and Japan is the only country which has had a favorable competitive effect. The relative strength of Japan is Korea's market, as explained in the previous chapter, depends on the assumption that buyers in Korea respond well in shifting from other sources to Japanese goods when there is an improvement in Japan's relative competitiveness.

In this chapter, we will deal first with the statistical problem in the estimation of elasticity of substitution. Second, we will discuss statistical procedures of price-quantity analysis; and the construction of price and quantity indexes will be discussed. Third, we will attempt to analyze the price quantity relationship of Korea's imports. Fourth, we will measure the elasticity of substitution between Japan and its competitors, i.e. the United States, West Germany, and United Kingdom in Korea's import market for some selected commodities. In other words, we will show the empirical results of elasticities of substitution for some selected imported commodities. Finally, we will derive conclusions from the empirical results.

2. Statistical Problems in the Estimation of Elasticity of Substitution

Under the two assumptions mentioned above, the least square regression of

$$\log \frac{q_1}{q_2} = a + b \log \frac{p_1}{p_2}$$

may yield biased estimates of elasticity of substitution, unless the supply elasticities are infinite. This is due to the fact that the error term in the regression equation is correlated with the price ratio. If the supply elasticities are infinite, the prices will be determined solely by the exporting countries. The disturbance in Korea's import demand for any country's export has no influence on the prices. This implies that the error term in the regression equation is independent of the price ratio. Thus, the estimates of elasticity of substitution are unbiased, i.e., they are good estimates of the true elasticity of substitution: $e = \alpha_1 - \beta_1 = \alpha_2 - \beta_2$.

The assumption of infinite elasticities of supply of Korea's imports seems to be reasonable since Korea is a small and insignificant importer in the viewpoint of Japan, the United States, and West Germany, the three countries being selected to estimate the elasticity of substitution in the Korea's market. Hence, on statistical grounds, the estimated elasticities in this study can be regarded as unbiased, under the assumption of infinitely elastic supply curve. The disturbances in the demand function will cause only a parallel shift in the demand

function such that the relationship between relative quantities and relative prices is also shifted,

It is expected that the estimates of elasticity of substitution have a greater negative value and are more significant statistically than the estimated demand elasticities.³ This is consistent with the theory since the demand elasticity is approximated by α_1 or β_2 (both negative) whereas the elasticity of substitution is approximated by $\alpha_1 - \beta_1$ or $\beta_2 - \alpha_2$ which is more negative than α_1 or β_2 .

Whatever the mathematical form used, a higher coefficient of correlation is generally obtained when the dependent variable is relative export (or import) quantities rather than export (or import) values.

Elasticities of substitution derived from the regression of relative quantities on relative prices are subject to several types of measurement problems. If the relative prices and quantities reflect demand as well as supply changes, the elasticities will typically be biased toward zero. If quantity change is derived from value and price changes, as is almost universally the case, errors in value measurement, probably more frequent and larger, bias it toward one.⁴

The elasticity measure is also affected by the choice of index number and base periods. A fixed base-price index, such as we use, implies a quantity index with given year weights. A base year near the end of the period produces results different from those of an early year base.

Another foreign trade parameter used frequently in analytical work, the price elasticity of demand for a country's exports of a

product, can be derived as a weighted average of the elasticities of substitution with respect to each rival exporter. Harberger⁵ gives this relationship as $Ex = \sum_i S_i b'_i x_i$, where Ex is the elasticity of demand for exports of country x ; i , one of the countries for which elasticities of substitution with respect to x are available; and S_i , the share of country i in the total exports of x and other included countries.

Several problems are encountered in studies in which elasticities of demand are estimated from least-square regressions of quantity exported on relative prices and income. In large part, the least-squares estimates obtained do not appear to be statistically significant. J.J. Polak, for example, investigated export and import demand relationships for 25 countries for the years 1924-1938. He concludes that "not much importance (can be) attached to the price coefficients (and that) in less than half of the export equations could a price elasticity with the proper sign found."⁶ Other investigators have shown that such least-squares estimates are also likely to be biased. Orcutt demonstrates that estimates based on regressions of quantity on price have a downward bias.⁷ In a study of import demand Harberger shows that such estimates should be considered lower limit. By assuming plausible values for income elasticities of demand, Harberger generates ranges of price elasticities that are unanimous in lying overwhelmingly above the old least-squares estimates.⁸

Because of the problems encountered in obtaining the usual

least-squares estimates, elasticities of substitution between exports of the country J and country F are estimated. This approach yields estimates that are statistically significant for a wide range of products and that appear to be relatively unbiased. Since exchange rate and balance of payments stability conditions are expressed in terms of elasticities of demand, a formula is developed to translate the estimated elasticities of substitution into elasticity of demand. In this way the probable effectiveness of devaluations in correcting balance of payments deficits can be judged.

In Orcutt's well-known survey,⁹ the two focal sources of bias in the measurement of price elasticities in international trade are the "simultaneity" problem and errors in observation. While some efforts have been made toward assessing the quantitative importance of the first problem,¹⁰ few efforts have been made in this direction for the second problem.

David Richardson¹¹ outlines several adjustments to a large body of data designed to measure elasticities of substitution in world trade, and the quantitative difference these adjustments make for the elasticities. Not all adjustment are to the data per se. In particular, the frequent and inappropriate use of f.o.b. unit values in estimation studies is challenged by comparing results to those obtained using c.i.f. unit values for the same set of observations. The result of these modest adjustments is striking: estimates of the elasticity of substitution are increased substantially and become considerably firmer. The results below suggest two conclusions with respect to

these considerations: 1) measurement error in the price variable or in price proxies can be reduced in demand studies when data are collected on a c.i.f. basis so as to more closely approximate the price to the buyer, and 2) even unit values can perhaps be made more reliable price proxies by comparatively simple adjustment.

3. Statistical Procedures of Price-Quantity Analysis

A. The construction of Price and Quantity Indexes

In the absence of adequate price data for measuring the role of price in international trade, economists commonly have turned to the use of unit value indexes as proxies for prices. By definition, unit values are value per unit of quantity within detailed export or import classifications. Since the classifications must in total cover every item of trade, they can not be narrowly specified unless their numbers are increased far beyond any practical limit. As a result of lack of close specification, therefore, there is a belief that a change in unit value may fail to represent a change in price. An increase in a country's export unit values, for example, may simply reflect a shift toward higher quality goods or a superior mix, instead of an increase in export prices.¹²

None of the studies of Korea's imports has attempted to construct a unit value index for imports by commodity group and by sources. Since the analysis in this chapter requires this type of index, we then put some effort to construct price and quantity index for 27

selected commodities imported from Japan, the United States, West Germany, and the United Kingdom. The indexes computed will be used for the analysis of price-quantity relationship in the later part.

B. The Price Index Formula

The Paasche price index is considered to be the most convenient for the computation of international price indexes since the trade data are usually collected in values and quantities. Using the Paasche formula the only unit values required are those of the base year; i.e. P_0 in the formula. P_t q_t is represented by the import (or export) value of that commodity from import statistics. Owing to this advantage, the price indexes constructed in this chapter are based on the Paasche formula.

C. The Selection of Commodity Groups

Although we used import classification by broad end-use in the previous chapter, further insight into our import problems can be obtained by disaggregating imports by commodity class. However, recent users of this technique have not employed a detailed commodity breakdown because of the need to minimize the massive amount of computations required. Therefore, we selected 27 imported commodities according to each three-digit category of SITC classification and a Paasche unit value index of imports was constructed for each commodity category selected.

The selected commodity groups are as follows:

- (1) SITC 231 Crude Rubber
- (2) SITC 242 Wood in the rough or roughly squared
- (3) SITC 513 Inorganic chemicals: elements, oxides and halogen salts
- (4) SITC 514 Other inorganic chemicals
- (5) SITC 541 Medical and pharmaceutical products
- (6) SITC 581 Plastic materials, regenerated cellulose and artificial resins
- (7) SITC 599 Chemical materials and products, n.e.s.,
- (8) SITC 641 Paper and paperboard
- (9) SITC 651 Textile yarn and thread
- (10) SITC 678 Tubes, pipes and fittings of iron or steel
- (11) SITC 684 Aluminium
- (12) SITC 695 Tools for use in hand or in machine
- (13) SITC 698 Manufactures of metal, n.e.s.
- (14) SITC 711 Power generating machinery, other than electric
- (15) SITC 715 Metalworking machinery
- (16) SITC 717 Textile and leather machinery
- (17) SITC 718 Machines for special industries
- (18) SITC 719 Machinery and appliances and machine parts, n.e.s.
- (19) SITC 722 Electric power machinery and switchgear
- (20) SITC 723 Equipment of distributing electricity
- (21) SITC 724 Telecommunication apparatus
- (22) SITC 729 Other electrical machinery and apparatus

- (23) SITC 731 Railway vehicle
- (24) SITC 732 Road motor vehicle
- (25) SITC 861 Scientific, Medical, Optical measuring
and controlling instruments
- (26) SITC 862 Photographic and cinemagraphic supplies
- (27) SITC 892 Printed matter

Based on the imports classification by end-use as used in the previous chapter, we can regroup them into three broad categories: consumer goods, industrial supplies, and capital goods.

- (1) Consumer goods: SITC 861, 862, 892
- (2) Industrial Supplies: SITC 231, 242, 513, 514, 541,
581, 599, 641, 651, 678, 684,
695, 698
- (3) Capital goods: SITC 711, 715, 717, 718, 719, 722,
723, 724, 729, 731, 732

These groups are selected for the study because of their high relative shares in imports of Korea, and because of the competitiveness in supply among Japan, the United States, West Germany and United Kingdom in each individual group.

The data used here are Korea's import statistics contained in Commodity Trade Statistics published by United Nations for the years 1962-1973, using 1970 as the base year.

D. The Construction of Quantity Index

By definition, the value equals the product of price and quantity. Hence, the value index may be computed by this formula;

$$(5.1) \quad \text{Value index} = \frac{\sum P_t q_t}{\sum P_o q_o} \quad (100)$$

Introducing the "cross valuation" $P_t q_t$ or $p_o q_t$ into the index formula, the value index can be rewritten in terms of the product of the price and quantity indexes as follows:

$$\begin{aligned} (5.2a) \quad \text{Value index} &= \frac{P_t q_t}{P_o q_t} \cdot \frac{P_o q_t}{P_o q_o} \quad (100) \\ &= \text{Paasche price index} \cdot \text{Laspeyres quantity index (100)} \\ &= P_{Pa} \cdot q_{La} \quad (100) \end{aligned}$$

$$\begin{aligned} (5.2b) \quad \text{or Value index} &= \frac{P_t q_o}{P_o q_o} \cdot \frac{P_t q_t}{P_t q_o} \quad (100) \\ &= \text{Laspeyres price index} \cdot \text{Paasche quantity index (100)} \\ &= P_{La} \cdot q_{pa} \quad (100) \end{aligned}$$

Since the price indexes constructed in this chapter are of the Paasche form, what interests us is Equation (5.2a). The construction of the quantity indexes can be performed in the same way as that of

the price indexes, but that procedure is time-consuming. The alternative way is to use Equation (5.2a); that is, dividing the value index by the price index.¹³ The assumption underlying this operation is that changes in prices of items not covered in the construction of price indexes are parallel to those of the items covered.¹⁴

Thus, regardless of the type of formula, the quantity indexes are computed indirectly from this relationship:

$$(5.3) \quad \text{Quantity index} = \frac{\text{value index}}{\text{price index}} \quad (100)$$

$$= \frac{V}{P} \quad (100)$$

4. Estimates of Elasticities of Substitution Between Sources of Supply of Korea's Imports: Disaggregated Analysis

This section will be devoted to showing the empirical results from the estimates of the elasticity of substitution between sources of supply. The empirical evidence would seem to confirm and support the negative correlation between prices and quantities of 27 commodities selected and to prove that the assumption of elasticity greater than one of substitution between sources of supply in Korea's imports, as used in Chapter IV, seems to be valid.

The basic form we used in estimating quantity-price relationships relates the percentage change in relative imports during the years to the percentage change in relative prices, i.e., to the percentage

change in Japan's price competitiveness, including a constant term.

That is,

$$(5.4) \quad \text{Log} \frac{q_F}{q_J} = a + b \log \frac{p_F}{p_J}$$

Where the subscript F represents the United States, or West Germany or United Kingdom, and J refers to Japan. q_F/q_J is the index of relative import quantities (the ratio of foreign to Japan's export quantity). p_F/p_J refers to the index of Japan's price competitiveness; that is, the ratio of foreign to Japan's prices. This is the log-linear regression form. The coefficient of the price variable in Equation (5.4), the quantity-price regression, is the familiar elasticity of substitution.

We begin with the price-quantity relationship for 27 commodity groups. The annual observations used extend over the period 1962-1973, thus providing time series that are shorter than we would have liked but hopefully not too short to give meaningful results (Table 26).

In addition to the analysis of total imports by country in Chapter II, we have made more detailed studies of Korea's imports by country of origin and by commodity class in this section.

In order to investigate Japan's price competitiveness of Korea's imports between sources of supply, we designed various combinations in the regression equations between rival countries; i.e., U.S./Japan, West Germany/Japan, and United Kingdom/Japan for the same commodity group as long as data was available.

Table 26
Selected Estimates of Elasticity of Substitution
between Sources of Supply of Korea's Imports, 1962-1973

SITC	Commodity Category	Constant	Elasticity Substitution	R ²
231	Crude Rubber	U.S./Japan 1.59 (2.71)	-3.27 (-1.24)	0.13
242	Wood in the Rough or Roughly Squared	U.S./Japan -5.16 (-1.17)	2.90 (0.66)	0.04
513	Inorganic Chemicals: Elements, Oxides and Halogen Salts	U.S./Japan -0.17 (-0.64)	*** -2.25 (-6.39)	0.80
514	Other Inorganic Chemicals	U.S./Japan 0.29 (0.63)	** -1.60 (-2.71)	0.42
541	Medical and Pharmaceutical Products	U.S./Japan 0.54	** -0.46 (-2.17)	0.32
		West Germany/ Japan	*** -0.69 (-4.07)	0.62
581	Plastic Materials, Regenerated Cellulos and Artificial Resins	U.S./Japan 0.36 (0.76)	** -1.57 (-2.07)	0.30
599	Chemical Materials and Products, n.e.s.	U.S./Japan 0.31 (1.99)	*** -0.95 (-4.67)	0.69
		West Germany/ Japan	** -0.99 (-2.11)	0.31

Table 26 (Continued)

SITC	Commodity	Category	Constant	Elasticity Substitution	R ²

641	Paper and Paperboard	U.S./Japan	0.49 (2.85)	-0.71 (-3.78)	0.59
				*	
651	Textile Yarn and Thread	U.S./Japan	2.41 (2.35)	-2.60 (-1.39)	0.16
				**	
678	Tubes, Pipes and Fittings of Iron or Steel	U.S./Japan	3.89 (1.36)	-6.48 (-2.47)	0.38

684	Aluminum	U.S./Japan	0.46 (1.56)	-2.14 (-2.87)	0.45
				*	
695	Tools for Use in Hand or in Machine	U.S./Japan	0.53 (1.23)	-0.60 (-1.09)	0.11

698	Manufactures of Metal, n.e.s.	U.S./Japan	-0.54 (-1.48)	-1.46 (-3.70)	0.58
				*	
711	Power Generating Machinery, Other than Electric	U.S./Japan	0.59 (2.47)	-0.69 (-1.67)	0.22
				**	
		West Germany/ Japan	0.24 (0.81)	-1.95 (-2.71)	0.42

Table 26 (Continued)

SITC	Commodity Category		Constant	Elasticity Substitution	R ²
				*	
715	Metalworking Machinery	U.S./Japan	-0.26 (-0.62)	-0.94 (-1.70)	0.23
		West Germany/ Japan	0.35 (0.84)	-0.95 (-1.74)	0.23
				**	
717	Textile and Leather Machinery	U.S./Japan	-1.08 (-4.19)	-1.16 (-2.08)	0.30
		West Germany/ Japan	-0.04 (-0.13)	-1.01 (-1.79)	0.24
				**	
718	Machines for Special Industries	U.S./Japan	-0.18 (-0.73)	-1.12 (-2.06)	0.30
		West Germany/ Japan	-0.01 (-0.03)	-1.84 (-5.29)	0.74
				**	
719	Machinery and Appliances (Other than Electrical) and Machine Parts, n.e.s.	U.S./Japan	-0.16 (-0.62)	-1.01 (-2.12)	0.31
		U.K./Japan	-0.14 (-0.43)	-0.63 (-3.02)	0.48

Table 26 (Continued)

SITC	C o m m o d i t y	C a t e g o r y	Constant	Elasticity Substitution	R ²
722	Electric Power Machinery and Switchgear	U.S./Japan	0.06 (0.25)	*** -1.15 (-5.78)	0.77
		West Germany/ Japan	-0.83 (-2.93)	-3.14 (-3.92)	0.61
723	Equipment of Distributing Electricity	U.S./Japan	-0.77 (-2.33)	** -0.65 (-2.66)	0.42
724	Telecommunications Apparatus	U.S./Japan	0.01 (0.02)	-0.51 (-1.18)	0.12
		West Germany/ Japan	0.51 (1.05)	-0.95 (-0.75)	0.05
729	Other Electrical Machinery and Apparatus	U.S./Japan	-0.59 (-2.68)	*** -0.62 (-3.44)	0.54
		West Germany/ Japan	0.78 (1.36)	-0.99 (-3.32)	0.52
731	Railway Vehicle	U.S./Japan	1.14 (3.81)	*** -0.99 (-3.38)	0.53

Table 26 (Continued)

SITC	Commodity	Category	Constant	Elasticity Substitution	R ²
				**	
732	Road Motor Vehicle	U.S./Japan	0.53 (0.52)	-0.88 (-1.93)	0.27

861	Scientific, Medical, Optical Measuring and Controlling Instruments	U.S./Japan	-0.09 (-1.18)	-0.90 (-11.08)	0.93

		West Germany/ Japan	0.01 (0.02)	-1.07 (-3.68)	0.58

862	Photographic and Cinemagraphic Supplies	U.S./Japan	-0.23 (-1.49)	-0.91 (-4.23)	0.64

892	Printed Matter	U.S./Japan	-0.04 (-0.27)	-0.31 (-0.27)	0.32

Source: United Nations, Commodity Trade Statistics

Notes: a) The value in paranthesis below each coefficient refers to t-statistics.

- b) *** refers to be significant at 1 percent level.
 ** refers to be significant at 5 percent level.
 * refers to be significant at 10 percent level.

Estimates were made for 27 commodity groups in total. But there are 38 estimated elasticities of substitution between sources of supplying countries; 27 items out of 38 items are estimates of elasticities of substitution between Japan and the United States; ten items are those between Japan and West Germany; one item is that between Japan and the United Kingdom.

All the estimates of elasticity of substitution have a negative sign except SITC 242, and 17 items out of the total are greater than one in absolute value. Nine items have an elasticity of substitution of around unity, and 11 items have an elasticity of substitution of less than one. The estimated elasticities of substitution are statistically significant at a level ranging from 10 per cent to 1 per cent, in most commodity groups (32 out of 38 commodity groups in total) except the following six commodity groups: SITC 231 (U.S./Japan), 242 (U.S./Japan), 695 (U.S./Japan), 724 (U.S./Japan), 724 (W. Germany/Japan), 892 (U.S./Japan).

Two factors may help to explain the failure to obtain significant, negative estimates for their manufactured exports in Korea's import market: 1) there is the problem of deriving index numbers that adequately measure price and quantity changes, 2) the commodity composition of the manufactured exports is different for each country.

The correlation coefficients are fairly low (only 14 items of 38 items have correlation coefficients greater than 0.5, and 13 items have correlation coefficients, ranging from 0.3 to 0.4, and finally 11 items show lower correlation coefficients between 0.1 and 0.2).

Low correlation coefficients imply that the non-price factors have more influence in determining import demand in Korea's market than the price factors between rival countries. In other words, the low correlation coefficients between relative quantities and relative prices make it clear that factors omitted in our analysis, including income, capacity utilization, and non-price elements of competitiveness, had significant influences on the export shares of supplying countries in Korea's import market.

The positive constant terms signify the extent of the non-price preference of Korea for the United States', West Germany's and United Kingdom's (competing countries) exports. The positive constant terms may be interpreted as a rising trend in the competing countries exports relative to those of Japan that is attributable to factors other than relative prices. These non-price factors include changes in commercial policies, buyer preferences, supply availabilities (at fixed prices), and others. They also include any effects on relative exports of the competing countries that are attributable to price changes in Japan or for excluded products. 1) In the competition between Japan and the United States, 15 of the regression equations show a positive value for the constant terms. This implies that the non-price factors make United States goods more preferable relative to Japan's goods from the consumer's point of view in Korea in 15 of the total commodity groups. 2) In the competition between Japan and West Germany, 7 regression equations show a positive value for the constant terms. This indicates that the non-price factors make West Germany's goods more preferable to Japan's goods from the

consumer's point of view in Korea. On the other hand, the negative constant term measures the non-price preference for Japanese goods. Thus, the remaining 16 groups had a negative value indicating Korean consumers' preference for Japanese goods.

Estimated elasticities of substitution which are negative and greater than one in absolute value imply that if the relative price competitiveness of Japan is improved, either by lowered prices or raising foreign prices (those of the United States, West Germany and United Kingdom), Japan will experience a greater import demand in Korea than other countries.

5. Estimates of Elasticities of Substitution between Sources of Supply of Korea's Imports: Price and Non-Price Factors

In the previous section, we showed the empirical results of elasticity of substitution between sources of supply, in which the basic form is that the relative import quantities are only a function of relative prices. The empirical results from the basic regression form confirmed and supported the influence (to certain extent) of relative prices in the determination of import demand. However, it was proved that relative prices are not enough to explain import demand as a single independent variable as shown by the low correlation coefficients in Table 26. This implies that the non-price factors may have a significant influence in addition to the price factor between sources of supply.

Therefore, we attempted to modify the regression form by introducing an additional independent variable, foreign resources, into the regression form. The modified regression form is as follows:

$$(5.5) \quad \log \frac{q_S}{q_J} = a + b \log \frac{p_S}{p_J} + c \log \frac{F_S}{F_J}$$

Where the subscripts S represents the U.S. and J refers to Japan, q_S/q_J is the index of relative import quantities, p_S/p_J refers to the index of Japan's price competitiveness. Finally, F_S/F_J is the ratio of foreign resources between the U.S. and Japan,¹⁶ which contributed to enhance economic growth and to increase imports in Korea in the 1960's. Here we are concerned with the role of foreign resources in the determination of import demand as a non-price factor in the modified form of the regression equation.

Estimates were made for 27 commodity groups. Twenty one items out of the total showed a priori signs; negative signs in relative prices and positive signs in foreign resources. The magnitudes of the 10 relative price coefficients are greater than one. Next, three price coefficients are around unity, and eight price coefficients are less than unity. In the estimated magnitudes of the relative foreign resources coefficients, two coefficients are greater than unity and one coefficient is around unity. Finally, 18 coefficients are less than unity. The magnitudes of the relative price coefficients are mostly greater than those of the relative foreign resources coefficients,

Table 27

Selected Estimates of Elasticity of Substitution between Sources of Supply in
Korea's Imports: Price and Non-Price Factors, 1962-1973

SITC	Commodity	Category	Constant	Relative Prices	Foreign Resources	R ²
231	Crude Rubber	U.S./Japan	0.15	-1.82 (-0.85)	1.04** (2.68)	0.52
513	Inorganic Chemicals: Elements, Oxides and Halogen Salts	U.S./Japan	-0.72	-1.29 (-3.39)	0.69** (3.32)	0.91
581	Plastic Materials, Regenerated Cellulose and Artificial Resins	U.S./Japan	-0.76	-1.21** (-2.14)	0.75** (3.13)	0.66
599	Chemical Materials and Products, n.e.s.	U.S./Japan	0.16	-0.91*** (-4.47)	0.95 (1.16)	0.73
641	Paper and Paperboard	U.S./Japan	0.25	-0.75*** (-4.16)	0.19* (1.47)	0.67
651	Textile Yarn and Thread	U.S./Japan	0.15	-1.83** (-1.92)	1.45*** (5.51)	0.81
684	Aluminium	U.S./Japan	-0.33	-1.21* (01.57)	0.54** (2.16)	0.64
695	Tools for Use in Hand or in Machine	U.S./Japan	-0.29	0.57* (-1.37)	0.62*** (2.94)	0.54
698	Manufactures of Metal, n.e.s.	U.S./Japan	1.41	-1.21*** (-3.83)	0.55** (2.77)	0.77

Table 27 (Continued)

SITC	Commodity	Category	Constant	Relative Prices	Foreign Resources	R ²
711	Power Generating Machinery, Other than Electric	U.S./Japan	0.25	-0.46 (-1.00)	0.21 (1.08)	0.31
715	Metalworking Machinery	U.S./Japan	-1.18	-1.04*** (-3.36)	0.65*** (4.79)	0.78
717	Textile and Leather Machinery	U.S./Japan	-1.16	-1.09* (-1.71)	0.07 (0.30)	0.31
718	Machines for Special Industries	U.S./Japan	-0.69	-0.72* (-1.61)	0.43** (2.78)	0.62
719	Machinery and Appliances and Machine Parts, n.e.s.	U.S./Japan	-0.79	-0.97*** (-3.15)	0.47*** (3.81)	0.74
722	Electric Power Machinery and Switchgear	U.S./Japan	-0.48	-1.18*** (-7.33)	0.40** (2.52)	0.87
723	Equipment of Distributing Electricity	U.S./Japan	-0.93	-0.53** (-2.06)	0.21 (1.18)	0.49
724	Telecommunication Apparatus	U.S./Japan	-0.51	-0.66* (-1.70)	0.38* (2.03)	0.40
732	Road Motor Vehicle	U.S./Japan	0.13	-0.99** (-2.48)	0.48** (2.05)	0.50
861	Scientific, Medical, Optical Measuring and Controlling Instruments	U.S./Japan	-0.21	-0.89*** (-11.66)	0.09 (1.60)	0.94

Table 27 (Continued)

SITC	Commodity	Category	Constant	Relative Prices	Foreign Resources	R ²
862	Photographic and Cinematographic Supplies	U.S./Japan	-0.30	-1.04*** (-2.99)	0.86 (0.48)	0.65
892	Printed Matter	U.S./Japan	-0.08	-0.31* (-2.05)	0.03 (0.23)	0.32

NOTES: (a) The value in parenthesis below each coefficient refers to t-statistics.

(b) *** refers to be significant at 1 per cent level

** refers to be significant at 5 per cent level

* refers to be significant at 10 per cent level

SOURCES: (a) United Nations, Commodity Trade Statistics

(b) Economic Planning Board, Major Economic Statistics of Korean Economy 1975

The coefficients of the elasticity of substitution for the relative prices and the foreign resources are statistically significant at a level, ranging from 10 per cent to 1 per cent in most of commodity groups (19 of 27 commodity groups and 15 of 27 commodity groups respectively),

The multiple correlation coefficients are improved compared to the basic regression form, because of the introduction of foreign resources. Sixteen items of the total have correlation coefficients greater than 0.5 and five items of the total are between 0.3 and 0.4. This implies that the foreign resources of the U.S. and Japan had significant influence on Korea's imports. As we explained above, the negative constant terms measures the non-price preference for Japanese goods in all commodity groups.

In conclusion, the modified form of regression provides us with a better explanation than the basic form; showing the influence of both price and non-price factors (especially non-price preference for Japanese goods and coefficients of relative foreign resources) on Korea's imports.

6. Conclusions

Knowledge of these elasticities is important for a number of problems of international trade: 1) what is the influence of a given change in exchange rates on the volume of employment and on the balance of payments, or 2) what decline in internal prices is necessary in

order to effectuate a given payment in foreign currency?

In fact, the possibility of regulating, either by changes in exchange rates or by price changes, the balance of payment or volume of employment depends greatly on the values of elasticities referred to. The classical view that it is easy, for example, to restore equilibrium in the balance of payment by a change in exchange rates is valid only if these elasticities are high. With low elasticities quite different things may happen. The equilibrium in the balance of payments may become an indifferent or an unstable equilibrium.

This chapter is concerned mainly with the presentation of estimates of Korea's import demand functions, disaggregated by commodity groups, for the period 1962-1973. In conclusion, the study reveals that Japanese goods tends to be more favored by Korea's import demand than those from the United States, West Germany, and United Kingdom. The empirical results of the estimates of elasticity of substitution for 27 selected samples of commodity groups indicate that the assumption of the elasticity of substitution more than unity as used in the analysis of CMS model in Chapter IV is reasonable. The implication of this chapter is consistent with that of Chapter IV, i.e., the increase in competitiveness of Japanese goods makes Japan's exports in Korea's market expand by a greater degree than that of its major competitors. This success is at the expense of other exporting countries, of which the United States and West Germany provide the primary empirical evidence. Needless to say, estimated disaggregated

import demand functions are more useful than aggregate functions, both to the academician and the decision-maker, so that the effect required to obtain data at the higher level of disaggregation was justified,

Footnotes

Chapter V

¹See, however, B.A. Devries, "Price Elasticities of Demand for Individual Commodities Imported into the United States," IMF Staff Paper, (April 1951), pp. 397-419; James E. Price and James B. Thornblade, "U.S. Import Demand Functions Disaggregated by Country and Commodity," Southern Economic Journal, (July 1972), Mordechai E. Krinin, "Disaggregated Import Demand Functions--Further Results," Southern Economic Journal, (July 1973).

²See Equation (3.12), Section 4, in Chapter III. This relation asserts that the sum of direct and cross price elasticities of demand be the same for each commodity. Since the exponents of price variables are equal, q_1/q_2 will be functionally related to p_1/p_2 .

³Many empirical studies supports this conclusion. See H.S. Cheng, "Statistical Estimates of Elasticities and Propensities in International Trade: A Survey of Published Studies," IMF Staff Papers, Vol. VIII (April 1959).

⁴C.F. Guy H. Orcutt, "Measurement of Elasticities in International Trade," Review of Economics and Statistics, (May 1950); G.D.A MacDougall, "British and American Exports: A Study Suggested by the Theory of Comparative Costs, Part II," Economic Journal, (September 1952); Raymond E. Zelder, "Estimates of Elasticities of Demand for Exports of the United Kingdom and United States, 1921-38," Manchester School of Economic and Social Studies, (January 1958), p. 34.

⁵Arnold C. Harberger, "Some Evidence on the International Price Mechanism," Journal of Political Economy, (December 1957). The formula underestimates Ex if some of the commodities exported by x can be substituted for commodities not covered by the b'_{xi} .

⁶J.J. Polak, An International Economic System (London: George Allen and Unwin, 1954), p. 160.

⁷Guy H. Orcutt, "Measurements of Price Elasticities in International Trade," Review of Economics and Statistics, XXXIII (May 1950), pp. 117-132.

⁸Arnold C. Harberger, "A Structural Approach to the Problem of Import Demand," American Economic Review, XLIII (May, 1953), p. 153.

⁹G. Orcutt, "Measurement of Price Elasticities in International Trade," Review of Economics and Statistics, 32 (May 1950), pp. 117-32.

¹⁰D.J. Morgan and W.J. Corlett, "The Influence of Price in International Trade: A Study in Method," Journal of the Royal Statistical Society, Series A, 114 (1951), pp. 307-52; A.C. Harberger, "A Structural Approach to the Problem of Import Demand," American Economic Review: Papers and Proceedings, 43 (May 1953), pp. 148-60.

¹¹David Richardson, "On Improving the Estimate of the Export Elasticity of Substitution," The Canadian Journal of Economics, V, No. 2 (August 1972), pp. 349-57.

¹²Irving B. Kravis and Robert E. Lipsey, Price Competitiveness in World Trade, (New York: Columbia University Press, 1971), p. 169.

¹³In the alternative way, an quantum index of imports can be constructed for each commodity group by deflating the value of imports by the unit value index.

¹⁴Robert E. Lipsey, Price and Quantity Trends in Foreign Trade of United States, (New Jersey: Princeton University Press, 1963), p. 81.

¹⁵For the direct way to compute quantity index, see Thomas H. Wonnacott and Ronald J. Wonnacott, Introductory Statistics for Business and Economics, (John Wiley and Son, 1972), pp. 541-43.

¹⁶Foreign resources from the United States included both U.S. grants-in-aid and U.S. loans and investment during the period 1962-1973, and foreign resources from Japan included both PAC (Property and Claims Fund from Japan), and Japan's loans and investment in Korea. Therefore, the relative foreign resources is the ratio of foreign resources between the U.S. and Japan.

CHAPTER VI

SUMMARY AND CONCLUSIONS

1. Summary

This study is concerned with Korea's import growth by sources of supply during the period 1960-1973. Analysis of Korea's imports showed that there was a substantial increase in import values during this period. The rapid expansion of imports was due mainly to the following factors: 1) Rapid economic growth and industrialization required a huge amount of capital goods and raw materials which were not readily produced domestically, 2) Imports of the following major non-competing items increased for both domestic and export uses because Korea could not provide a domestic supply of raw materials (crude oil, raw wood and lumber, textile fibres, raw cotton, raw sugar, and raw rubber) for the industrial sector and grain imports tended to increase due to stagnation in the agricultural sector, 3) Very favorable external circumstances made it relatively easy to finance imports from developed countries. Together with the positive participation of government policy to induce foreign capital and diplomatic normalization between Korea and Japan, sources of funds from abroad were generally available.

The favorable internal environment of Korea contributed to the export expansion of developed countries in Korea's import market. However, the success of these exports to Korea depended also on other factors such as competitiveness among sources of supply, condition of loans and grants, and suppliers' credit terms. In this study, an attempt has been made to analyze the effects of demand factors and

supply factors (i.e. competitiveness) on the actual export expansion of the four major suppliers in Korea's import: The United States, Japan, W. Germany, and the United Kingdom. The main analytical device used was the constant-market-share analysis.

2. Conclusions

According to the CMS analysis, the inter-country variation in export performance can be explained by two factors, the commodity compositional effect, depending on demand factors and the competitiveness effect, depending on supply (or competitive) factors. The competitiveness effect seems to be the more important of the two during the period 1960-1973. Among the four countries, Japan (and also the United Kingdom to a small degree) has shown the best performance. The competitiveness effect is the major factor explaining its good export performance. Breaking down the analysis to a disaggregated level, the empirical results reveal that Japan has shown better export performance in almost all groups except industrial supplies (primary) and in "other" commodities. But "other" commodities is almost negligible in terms of its absolute amount and share of Korea's imports.

One can say that Japan has enjoyed positive competitiveness effects which means that Japan succeeded in capturing higher shares in Korea's market over time. The negative competitiveness effect of other major suppliers (i.e. the U.S. and W. Germany) reflect their

failure to maintain their shares in Korea's market due to the deterioration in their relative competitiveness. Hence, the increase in Japanese shares in Korea has been at the expense of the U.S. and W. Germany.

Owing to the importance of competitiveness in determining actual growth in exports to Korea, this study attempts further to examine the role of price competitiveness in determining the export expansion of major suppliers in individual commodities in Korea's market. The concept of elasticity of substitution is employed in this analysis. Since there is no price data available for individual commodities distinguished by sources of supply, price indexes (actually unit value indexes) are constructed for the 27 individual group of commodities (SITC three digits) selected.

The regression in log-linear form of relative quantities on relative prices indicates the elasticities of substitution between Japan's exports and those of the United States, W. Germany, and the United Kingdom for the individual groups of commodities being selected. The empirical results show that the elasticities of substitution are greater than one for at least 17 of 38 equations designed to measure price competitiveness between different countries for the 27 individual groups of commodities. Nine equations have elasticities of substitution around unity, and 11 equations have coefficients of less than one. This means that price competitiveness has some influence in determining the export expansion of these countries in the Korea's market. The responsiveness of relative quantity changes to a one per cent

improvement in a country's relative price competitiveness are shown by the magnitude of the elasticities of substitution. 37 out of 38 equations have negative signs on the coefficients. This means that the quantity indexes have an inverse relationship with price indexes, also indicating that there must be substitution between exports of the particular commodities from different sources of supply.

We interpreted the positive competitiveness effect as an indication of an improved competitive position in a given country's exports in relation to those of others. But it is very difficult to pinpoint what the competitiveness is comprised of or what it means. Obviously, the price variable is important. But other factors such as the quality and uniqueness of the goods, distance (transport costs), the speed of delivery, after sales service, and commercial and financial ties and arrangement can also be important determinants of competitiveness.

Therefore, it is quite obvious that the competitiveness of export commodities from different sources of supply is influenced by non-price as well as price factors. Some non-price factors can be quantified and are reflected in the true price of products, such as transport costs and quality of the products. Japanese goods have relatively low prices as compared to those of the U.S., W. Germany, and the United Kingdom not only because of low costs of production (e.g. low wage cost), but also because of lower transport costs in the shipping of goods and of the speedy delivery due to the shorter distances as compared to the United States, W. Germany, and the United Kingdom. As for quality, Japanese goods are regarded to have low quality and

less durability as compared to those of the U.S., W. Germany, and the United Kingdom; especially for machinery and electric appliances. However, the advantage of low prices seems to induce higher quantities demanded for Japanese goods in Korea. The other non-price factor that makes Japanese goods more preferable is the availability of long-term credit and grants-in-aid (i.e. Properties and Claims Fund from Japan; PAC) for the purchase of durable goods. Among the four major suppliers, there is competition between and substitution of capital goods and industrial supplies (manufactured), but industrial supplies (primary) and consumer goods have relatively less competition and substitution among them.

Considering both price and non-price factors, Japanese goods seem to be preferable. Although the Korean government attempts to control imports for the improvement of balance of payments and also to diversify the import sources of supply to reduce the heavy dependence on Japanese imports, it is very difficult to accomplish such a goal because Korea is still in need of imports required for economic growth and industrialization and imports from Japan are considered to be favorable at the present moment since they promise a saving in foreign exchange.

Japan pursued aggressive export expansion in Korea's import market during the period 1960-1973. This showed the effectiveness of Japan's export promotion policy in increasing its share relative to that of other competing countries. Furthermore, this study also showed that Japan's share of exports increased with the increase in Korea's total

imports.

To a certain extent, the aggressive Japanese policy for export expansion has probably been at the expense of domestic producers as well as foreign suppliers. Japan has not only been increasing its share, but may also have had an influence in increasing Korea's total imports. Positive policy measures may be needed to protect domestic producers from Japan's aggressive export promotion. The competitive capability of domestic producers should be promoted through various domestic policies.

In the future, when industrialization is fully accomplished and import substitution goods produced in Korea will have succeeded in improving their quality, it is expected that there should be analysis not only of competition between export goods of developed countries, but also between domestic goods and foreign goods. Future studies can be done when import substitution industries are more established and the data on these goods become more readily available.

APPENDIX A

SITC APPROXIMATION TO END-USE GROUPS

I. Total Imports: 001 951

II. Consumer Goods

a) Durable

1. Household Goods: 657, 863, 864, 891, 894, 897, 899

2. Electric Appliance: 724, 725

3. Road Motor Vehicle and Cycles 732, 733

4. Furniture 821

5. Manufactures of Metal for Household 696, 697, 698

b) Non-Durable (include Food and Beverage)

6. Dairy Products: 022, 023

7. Fish and Meat: 031, 011, 013

8. Cereal and Preparations: 041, 042, 043, 044, 045, 046,
047, 048

9. Fruits and Vegetables: 051, 052, 053, 054, 055

10. Coffee, Tea and Spices: 071, 072, 073, 074, 075

11. Other Food and Beverages: 001, 061, 062, 081, 091, 099,
111, 112

12. Toilet and Cleaning Articles: 553, 554

13. Clothing and Footwear: 656, 831, 841

14. Printed Matter, Office and Stationary Supplies: 892, 895

15. Others: 421, 629, 893

III. Industrial Supplies

a) Primary

- 16. Animal and Vegetable Crude Materials: 211, 212, 221,
231, 291, 292
- 17. Fuel Wood and Charcoal and Wood in the Rough: 241, 242
- 18. Textile Fibres: 261, 262, 263, 265, 267
- 19. Crude Fertilizers and Crude Minerals: 271, 273, 274,
275, 276
- 20. Metallic Ores and Metal Scrap: 281, 282, 283, 284
- 21. Fuels and Lubricants: 321, 331

b) Manufactured (semi- and finished)

- 22. Wood Shaped, Cork, Raw and Waste: 243, 244
- 23. Synthetic and Regenerated Fibres: 266
- 24. Petroleum Product: 332
- 25. Animal and Vegetable Oils: 411, 422, 431
- 26. Chemicals: 512, 513, 514, 521, 531, 532, 533, 599
- 27. Medicinal and Pharmaceutical Products: 541
- 28. Leather and Leather Manufactures: 611, 612, 613
- 29. Materials of Rubber: 621
- 30. Paper and Paperboard: 251, 641, 642
- 31. Textile Yarn Fabrics: 651, 652, 653, 654, 655
- 32. Cement and Construction Materials: 661, 662, 663, 664,
665, 667
- 33. Iron and Steel: 671-679

- 34. Non-ferrous Metals: 681-689
- 35. Fertilizers: 561
- 36. Other Construction Materials: 691, 693, 694, 723, 812
- 37. Others: 551, 571, 581, 862

IV. Capital Goods

- 38. Metal Manufactures: 692, 695
- 39. Non-electric Machinery for Agricultural Use: 712
- 40. Non-electric Machinery for Industrial Use: 711, 714,
715, 717, 718, 719
- 41. Electric Machinery: 722, 726, 729
- 42. Locomotive and Rolling Stock: 731
- 43. Aircraft and Ships: 734-735
- 44. Scientific and Optical Instruments: 861

V. Other Commodities

- 45. Tobacco Manufactures: 121, 122
- 46. Wood and Cork Manufactures and Miscellaneous: 631, 632,
633, 931, 941, 951

APPENDIX B (Continued)

APPENDIX TABLE 2 COMMODITY COMPOSITION OF KOREA'S IMPORTS BY END-USE GROUPS (PER CENT)

	TOTAL		U. S.		JAPAN		WEST GERMANY		UNITED KINGDOM		OTHERS	
	1964-1965	1968-1969	1972-1973	1964-1965	1964-1965	1972-1973	1964-1965	1968-1969	1972-1973	1964-1965	1968-1969	1972-1973
I CONSUMER GOODS	18.40	22.22	20.51	31.02	40.94	42.74	4.08	15.73	11.91	13.76	6.01	17.56
1A DURABLE	2.48	7.29	5.77	1.45	3.63	2.34	2.43	13.39	9.50	12.35	3.56	16.33
1 HOUSEHOLD GOODS	.25	1.30	1.61	.05	.37	.45	.58	1.00	3.28	.03	.12	.20
2 ELECTRIC APPLIANCE	.09	1.27	1.90	.18	1.14	.52	1.07	1.45	3.11	12.13	4.40	10.07
3 ROAD MOTOR VEHICLE & CYCLE	.07	3.07	1.71	1.44	1.44	.76	.06	6.34	2.14	1.19	.72	5.55
4 FURNITURE	.02	.06	.05	.03	.10	.05	.03	.03	.07	.03	.00	.00
5 MANUFACTURES OF METAL FOR HOUSEHOLD	.24	.78	.48	.12	.56	.25	.51	1.34	.89	.03	.31	.50
1B NONDURABLE	15.91	14.92	14.73	29.76	37.30	40.40	1.24	5.33	2.40	.40	.45	1.23
6 DIARY PRODUCTS	.55	.32	.06	1.02	1.02	.16	.05	.03	.02	.03	.00	.00
7 FISH AND MEAT	.02	.04	.41	.04	.00	.43	.00	.03	.00	.00	.10	.00
8 CEREAL AND PREPARATION	13.44	11.00	10.75	27.80	33.07	38.17	.11	3.26	1.01	.03	.00	.06
9 FRUITS AND VEGETABLES	.10	.06	.14	.14	.36	.13	.32	.30	.14	.03	.39	.03
10 COFFEE, TEA & SPICES	.01	.08	.13	.03	.05	.15	.00	.07	.01	.03	.00	.00
11 OTHER FOOD & BEVERAGES	1.19	1.04	2.21	.55	1.55	.91	.22	.42	.12	.03	.09	.17
12 TOILET AND CLEANING ARTICLE	.17	.16	.16	.14	.08	.06	.10	.19	.24	.03	.27	.44
13 CLOTHING AND FOOTWEAR	.09	.03	.46	.08	.02	.01	.06	.93	.16	.03	.00	.00
14 PRINTED MATTER, OFFICE & STATIONARY SUPPLIES	.22	.47	.15	.13	1.09	.14	.46	.33	.24	.03	.00	.00
15 OTHERS	.08	.28	.23	.03	.32	.17	.12	.43	.43	.40	.07	.00
II INDUSTRIAL SUPPLIES	67.40	47.61	56.05	62.22	39.69	31.48	74.58	46.51	55.17	12.95	14.61	25.34
IIA PRIMARY	24.75	20.41	23.93	29.15	21.97	18.71	5.93	3.53	3.97	.00	.00	.27
16 ANIMAL & VEGETABLE CRUDE MATERIALS	2.13	1.54	2.13	3.35	2.23	2.84	.79	.73	1.08	.00	.00	.08
17 FUEL OIL & CHARCOAL & COKE	4.50	5.93	6.65	1.74	1.32	2.36	.50	.38	.18	.00	.30	.00
18 TEXTILE FIBRE	11.18	4.39	4.26	20.15	10.28	4.88	2.47	.87	.78	.03	.60	.18
19 CRUDE FERTILIZERS & CRUDE MINERALS	1.04	1.17	.63	1.55	1.82	1.42	.15	.22	.16	.03	.00	.00
20 METALLIC ORES & METAL SCRAP	1.05	2.32	2.34	2.19	5.80	6.61	.08	.58	1.00	.00	.00	.00
21 FUELS AND LUBRICANTS	4.82	5.03	7.41	.12	.00	.57	1.91	.73	.73	.00	.00	.00
IIIB MANUFACTURED	42.64	27.20	33.11	33.06	17.71	12.77	68.68	43.01	51.19	12.95	14.61	25.08
22 WOOD SHAPED, CORK, RAN	.07	.17	.04	.73	.01	.12	.25	.05	.02	.00	.00	.00
23 SYNTHETIC AND REGENERATED	1.97	1.31	1.93	.05	.43	1.33	5.87	2.65	3.69	.00	.19	.00
24 PETROLEUM PRODUCT	2.15	.16	.14	2.35	.19	.23	2.47	.53	.53	.00	.38	.64
25 ANIMAL & VEGETABLE OILS	.08	.56	.03	1.73	1.29	2.65	.08	.39	.29	.03	.00	.00
26 CHEMICALS	5.20	4.60	5.48	3.56	2.35	2.51	7.45	7.33	9.84	3.84	3.05	13.54
27 MEDICAL & PHARMACEUTICAL PRODUCTS	1.01	.76	.45	1.10	.47	.28	.37	.36	.22	1.67	4.22	2.35
28 LEATHER AND LEATHER PRODUCTS	.01	.04	.32	.02	.00	.13	.04	.03	.66	.00	.00	.00
29 MATERIALS OF RUBBER	.03	.04	.04	.00	.05	.00	.04	.05	.08	.03	.30	.00
30 PAPER AND PAPERBOARD	2.59	1.84	2.13	4.01	4.55	2.04	.87	.57	1.50	.03	.25	18.74
31 TEXTILE YARN, FABRICS	5.40	6.46	6.34	1.65	.56	4.63	13.34	14.34	9.07	1.53	.31	1.72
32 CEMENT AND CONSTRUCTION MATERIALS	.39	.57	.53	.26	.27	.15	.09	1.04	1.15	.00	.30	.33
33 IRON AND STEEL	4.58	4.70	7.13	1.05	.47	.32	10.05	9.65	16.55	4.23	1.49	.60
34 NONFERROUS METALS	1.51	1.05	.94	1.05	1.57	.62	1.43	.98	1.36	.03	.37	.38
35 FERTILIZERS	14.74	1.30	.42	13.48	1.35	.33	22.65	1.65	.15	.03	.55	.54
36 OTHER CONSTRUCTION MATERIALS	.53	1.50	1.00	.26	1.14	.39	.90	1.34	1.48	1.63	3.87	3.40
37 OTHERS	1.45	1.57	1.81	1.14	2.94	1.24	1.23	1.33	3.41	.02	.44	1.22
IIIC CAPITAL GOODS	14.02	30.07	25.20	5.91	19.31	25.73	21.12	37.71	32.83	71.97	79.36	55.41
38 METAL MANUFACTURES	.73	.55	.31	.89	.12	.14	.65	.94	.57	.03	.73	.68
39 NON-ELECTRIC MACHINERY FOR AGRICULTURAL USE	.09	.15	.05	.02	.12	.01	.17	.24	.07	.03	.00	.17
40 NON-ELECTRIC MACHINERY FOR INDUSTRIAL USE	8.53	17.28	13.37	3.23	11.84	6.95	13.36	22.15	21.09	42.12	64.53	61.86
41 ELECTRIC MACHINERY	2.54	4.84	6.24	.91	4.11	10.61	3.53	5.79	6.49	21.39	17.22	6.65
42 CONDUCTIVE AND SELLING STOCK	.34	1.82	.58	.21	2.10	.06	.44	2.13	.21	.05	.14	.53
43 AIRCRAFTS AND SLIPS	1.39	4.29	.40	.30	.56	7.45	2.05	5.08	3.63	6.93	.00	.00
44 SCIENTIFIC AND OPTICAL INSTRUMENTS	.40	.51	.46	.31	.43	.49	.64	.75	.63	.57	1.00	.82
IV OTHER COMMODITIES	.16	.07	.22	.04	.04	.02	.20	.03	.07	1.31	.00	1.67
45 TOBACCO MANUFACTURES	.00	.07	.21	.02	.04	.01	.00	.03	.06	.00	.00	1.67
46 WOOD, CORK MANUFACTURES, & MISCELLANEOUS	.16	.00	.01	.04	.00	.00	.19	.00	.01	1.30	.00	.00
V TOTAL IMPORTS	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

APPENDIX B (Continued)

APPENDIX TABLE .3 COMMODITY SHARE OF KOREA'S IMPORTS BY END-USE GROUPS
(PER CENT)

	TOTAL		U. S.		JAPAN		WEST GERMANY		UNITED KINGDOM		OTHERS	
	1964-1965	1966-1969	1972-1973	1964-1965	1966-1969	1972-1973	1964-1965	1966-1969	1972-1973	1964-1965	1966-1969	1972-1973
I CONSUMER GOODS	100.00	100.00	100.00	78.05	54.60	53.65	6.84	29.68	22.05	3.16	1.22	2.49
1A DURABLE	100.00	100.00	100.00	34.05	14.76	10.46	35.17	59.74	64.20	22.09	3.45	6.23
1 HOUSEHOLD GOODS	100.00	100.00	100.00	11.86	6.50	7.19	70.71	32.33	79.18	.00	.44	.36
2 ELECTRIC APPLIANCE	100.00	100.00	100.00	0.62	26.79	11.13	31.31	47.91	63.78	52.42	13.09	13.41
3 ROAD MOTOR VEHICLE & CYCLE	100.00	100.00	100.00	67.44	11.07	11.44	20.57	72.05	40.42	5.10	.35	9.44
4 FURNITURE	100.00	100.00	100.00	07.07	44.41	27.35	.00	25.54	54.01	.03	.00	.00
5 MANUFACTURES OF METAL FOR HOUSEHOLD	100.00	100.00	100.00	23.74	21.33	13.31	06.11	72.49	71.43	.03	1.80	3.01
1B NONDURABLE	100.00	100.00	100.00	65.99	74.07	70.57	2.41	14.99	6.36	.10	.13	.24
6 DIARY PRODUCTS	100.00	100.00	100.00	82.07	93.41	63.36	2.93	.00	13.95	.03	.03	.00
7 FISH AND MEAT	100.00	100.00	100.00	80.30	.30	26.99	.00	.03	.03	.00	.75	.00
8 CEREAL AND PREPARATION	100.00	100.00	100.00	64.34	34.45	91.42	.27	13.97	3.66	.03	.00	.01
9 FRUITS AND VEGETABLES	100.00	100.00	100.00	04.32	31.01	24.06	.00	.30	36.19	.03	.00	.00
10 COFFE, TEA & SPICES	100.00	100.00	100.00	79.46	19.34	29.08	.00	34.19	2.95	.03	.00	.00
11 OTHER FOOD & BEVERAGES	100.00	100.00	100.00	21.87	25.00	10.62	5.92	9.67	2.24	.03	.23	1.10
12 CLOTHING AND CLEANING ARTICLE	100.00	100.00	100.00	37.73	15.07	13.17	32.05	48.74	57.31	.03	7.62	6.44
13 CLOTHING AND FOOTWEAR	100.00	100.00	100.00	42.53	28.91	1.00	22.08	46.99	13.97	.03	.00	.00
14 PRINTED MATTER, OFFICE & STATIONERY SUPPLIES	100.00	100.00	100.00	27.55	08.37	24.58	04.50	26.07	01.52	.03	.30	.00
15 OTHERS	100.00	100.00	100.00	.03	33.24	20.04	43.69	63.08	73.69	19.83	1.23	.03
II INDUSTRIAL SUPPLIES	100.00	100.00	100.00	42.12	24.71	14.99	34.11	40.95	39.00	.01	1.39	1.36
IIA PRIMARY	100.00	100.00	100.00	53.73	31.91	20.12	7.35	7.20	6.47	.03	.00	.03
16 ANIMAL & VEGETABLE CRUDE MATERIALS	100.00	100.00	100.00	72.24	42.96	34.36	11.51	19.11	19.76	.03	.00	.12
17 FUEL OIL & CHARCOAL & OTHERS	100.00	100.00	100.00	17.62	9.11	9.14	3.45	2.70	1.65	.03	.00	.00
18 TEXTILE FIBRE	100.00	100.00	100.00	62.27	69.36	29.46	6.71	3.21	7.17	.03	.00	.12
19 CRUDE FERTILIZERS & CRUDE MINERALS	100.00	100.00	100.00	67.63	46.00	39.33	4.80	8.13	7.76	.00	.03	.00
20 METALLIC ORES & METAL SCRAP	100.00	100.00	100.00	94.06	74.14	67.02	2.41	13.66	15.46	.00	.00	.03
21 FUELS AND LUBRICANTS	100.00	100.00	100.00	1.15	.30	2.00	12.25	6.09	3.67	.03	.00	.00
IIIB MANUFACTURED	100.00	100.00	100.00	35.38	19.20	10.91	49.65	60.27	66.26	1.29	2.43	2.42
22 BOND SHAPED, CORK, RAW	100.00	100.00	100.00	55.38	1.90	68.89	21.53	12.05	17.54	.03	.00	.03
23 SYNTHETIC AND REGENERATED	100.00	100.00	100.00	2.02	9.76	13.04	91.81	85.02	74.52	.03	.03	.00
24 PETROLEUM PRODUCT	100.00	100.00	100.00	50.22	8.69	13.27	35.35	32.45	22.60	.03	.61	4.21
25 ANIMAL & VEGETABLE OILS	100.00	100.00	100.00	89.24	08.20	81.49	2.79	29.13	13.70	.03	.00	.00
26 CHEMICALS	100.00	100.00	100.00	30.85	15.19	11.41	43.68	60.71	67.58	3.14	3.00	6.94
27 MEDICAL & PHARMACEUTICAL PRODUCTS	100.00	100.00	100.00	49.21	18.81	16.00	11.27	20.30	18.18	7.62	25.13	15.65
28 LEATHER AND LEATHER PRODUCTS	100.00	100.00	100.00	.03	.00	10.00	91.04	72.71	70.61	.00	.00	.00
29 MATERIALS OF RUBBER	100.00	100.00	100.00	.03	32.75	.00	41.91	47.37	81.78	.00	.00	.00
30 PAPER AND PAPERBOARD	100.00	100.00	100.00	70.51	73.02	24.49	10.32	13.14	27.53	.03	.02	.30
31 TEXTILE YARN, FABRICS	100.00	100.00	100.00	14.03	2.58	1.87	77.21	92.97	60.74	1.13	.22	.79
32 CEMENT AND CONSTRUCTION MATERIALS	100.00	100.00	100.00	30.93	13.96	7.40	51.95	75.82	83.33	.03	.00	1.61
33 IRON AND STEEL	100.00	100.00	100.00	16.50	2.99	1.15	67.70	85.66	90.55	3.91	1.44	.24
34 NONFERROUS METALS	100.00	100.00	100.00	21.91	44.31	22.39	31.28	38.96	57.02	.03	.31	1.16
35 FERTILIZERS	100.00	100.00	100.00	42.83	30.92	20.33	47.37	51.36	14.14	.03	1.32	3.71
36 OTHER CONSTRUCTION MATERIALS	100.00	100.00	100.00	23.03	22.51	9.99	52.14	54.03	57.22	13.41	11.04	9.03
37 OTHERS	100.00	100.00	100.00	26.07	35.51	17.68	41.00	35.62	73.33	.00	1.40	2.06
III CAPITAL GOODS	100.00	100.00	100.00	19.24	19.03	26.29	46.43	52.56	50.79	21.23	11.95	6.40
38 METAL MANUFACTURES	100.00	100.00	100.00	57.76	6.50	12.01	29.40	70.87	70.53	.03	5.34	6.00
39 NONELECTRIC MACHINERY FOR AGRICULTURAL USE	100.00	100.00	100.00	29.42	24.30	6.82	56.15	65.49	55.63	.03	.00	3.65
40 NONELECTRIC MACHINERY FOR INDUSTRIAL USE	100.00	100.00	100.00	17.14	19.64	13.38	44.20	51.94	61.46	21.03	15.27	10.13
41 ELECTRIC MACHINERY	100.00	100.00	100.00	12.34	25.15	42.76	42.77	50.15	30.07	35.83	16.10	3.33
42 LOCOMOTIVE AND ROLLING STOCK	100.00	100.00	100.00	24.10	34.21	2.84	57.59	49.08	14.33	11.60	.35	2.88
43 AIRCRAFTS AND SLIPS	100.00	100.00	100.00	10.02	3.91	47.71	46.06	55.45	37.16	21.21	.30	.00
44 SCIENTIFIC AND OPTICAL INSTRUMENTS	100.00	100.00	100.00	36.05	24.72	27.40	49.79	61.38	54.01	5.27	6.79	5.23
IV OTHER COMMODITIES	100.00	100.00	100.00	11.92	16.79	3.20	37.07	16.56	12.60	33.66	.00	21.30
45 TOBACCO MANUFACTURES	100.00	100.00	100.00	31.33	18.54	2.35	33.33	10.20	11.64	16.66	.00	24.79
46 WOOD, CORK MANUFACTURES, & MISCELLANEOUS	100.00	100.00	100.00	11.73	.00	15.38	37.05	.00	26.23	33.89	.00	.00
V TOTAL IMPORTS	100.00	100.00	100.00	45.61	29.64	29.74	30.82	41.72	38.99	4.26	4.33	2.91

APPENDIX B (Continued)
APPENDIX TABLE 4 COMMODITY GROWTH RATE OF KOREA'S IMPORTS BY END-USE GROUPS
(PER CENT)

	TOTAL	U. S.	JAPAN	S. G.	U. K.	OTHERS
	1964- -1965	1972- -1973	1964- -1965	1972- -1973	1964- -1965	1972- -1973
I CONSUMER GOODS	27.19	22.17	42.15	24.11	50.70	14.50
IA DURABLE	36.75	21.60	43.58	23.58	63.99	42.41
1 HOUSEHOLD GOODS	48.66	42.60	59.27	.00	.00	45.44
2 ELECTRIC APPLIANCE	33.52	37.37	42.13	14.08	14.35	41.16
3 ROAD MOTOR VEHICLE & CYCLE	32.89	10.71	43.44	43.56	.00	42.66
4 FURNITURE	36.71	23.30	.00	.00	.00	27.83
5 MANUFACTURES OF METAL FOR HOUSEHOLD	14.57	27.34	15.53	.00	.00	37.63
IB NONDURABLE	24.87	22.41	36.93	34.94	31.27	23.25
6 DIARY PRODUCTS	.90	4.12	18.50	.00	.00	4.20
7 FISH AND MEAT	61.07	47.32	.00	.00	.00	82.18
8 CEREAL AND PREPARATION	25.03	22.64	52.43	.00	.00	21.15
9 FRUITS AND VEGETABLES	29.57	17.57	.00	.00	.00	24.91
10 COFFEE, TEA & SPICES	61.22	35.71	.00	.00	.00	60.15
11 OTHER FOOD & BEVERAGES	33.64	24.52	21.90	.00	23.13	35.92
12 TOILET AND CLEANING ARTICLE	24.81	11.66	32.31	.00	.00	19.59
13 CLOTHING AND FOOTWEAR	49.71	.17	33.54	.00	.00	56.94
14 PRINTED MATTER, OFFICE & STATIONERY SUPPLIES	21.13	19.07	20.53	.00	.00	25.05
15 OTHERS	12.02	.00	44.45	.00	.00	15.84
II INDUSTRIAL SUPPLIES	23.07	10.16	25.03	29.46	51.75	33.94
IIA PRIMARY	25.41	13.13	23.63	.00	.00	31.33
16 ANIMAL & VEGETABLE CRUDE MATERIALS	25.83	18.54	32.59	.00	.00	34.75
17 FUEL WOOD & CHARCOAL & COKE	30.89	30.89	15.01	.00	.00	32.30
18 TEXTILE FIBRE	13.78	.94	14.61	.00	.00	34.04
19 CRUDE PETROLIUM & CRUDE MINERALS	74.36	17.59	30.35	.00	.00	32.41
20 METALLIC ORES & METAL SCRAP	30.82	32.47	67.02	.00	.00	63.13
21 FUELS AND LUBRICANTS	31.19	34.18	16.74	.00	.00	37.19
IIB MANUFACTURED	21.46	6.79	25.10	29.32	52.32	25.62
22 WOOD SHAPED, CORR. RAW	19.57	22.10	17.01	.00	.00	12.92
23 SYNTHETIC AND REGENERATED	25.57	49.74	22.95	.00	.00	33.12
24 PETROLEUM PRODUCT	6.21	16.40	15.23	.00	.00	.72
25 ANIMAL & VEGETABLE OILS	29.12	23.70	45.60	.00	.00	19.61
26 CHEMICALS	20.73	14.15	32.24	36.69	.00	19.65
27 MEDICAL & PHARMACEUTICAL PRODUCTS	15.80	1.73	22.23	25.72	.00	19.50
28 LEATHER AND LEATHER PRODUCTS	67.91	.00	62.11	.00	.00	61.93
29 MATERIALS OF RUBBER	29.33	.00	37.44	.00	.00	14.84
30 PAPER AND PAPERBOARD	21.35	10.74	35.61	.00	1.15	16.06
31 TEXTILE YARN, FIBRES	27.91	2.60	24.71	22.78	.00	47.63
32 CERMENT AND CONSTRUCTION MATERIALS	29.67	11.91	15.12	.00	.00	19.75
33 IRON AND STEEL	31.37	3.24	35.03	3.05	.00	26.52
34 NONFERROUS METALS	29.00	15.56	24.73	.00	.00	10.63
35 FERTILIZERS	18.50	27.11	31.40	.00	.00	4.13
36 OTHER CONSTRUCTION MATERIALS	33.77	33.13	34.41	20.06	.00	23.79
37 OTHERS	20.65	15.73	25.91	.00	.00	11.47
III CAPITAL GOODS	23.16	37.74	34.23	17.40	47.64	31.95
38 METAL MANUFACTURES	16.51	3.61	24.95	.00	.00	12.47
39 NON-ELECTRIC MACHINERY FOR AGRICULTURAL USE	18.29	.10	14.20	.00	.00	14.66
40 NON-ELECTRIC MACHINERY FOR INDUSTRIAL USE	31.44	24.15	24.47	22.11	44.48	24.44
41 ELECTRIC MACHINERY	37.34	40.16	40.16	6.40	47.50	51.62
42 LOCOMOTIVE AND RAILING STOCK	32.39	3.10	15.01	13.47	.00	21.95
43 AIRCRAFTS AND SLIPS	37.06	58.47	34.34	.00	.00	24.81
44 SCIENTIFIC AND OPTICAL INSTRUMENTS	27.54	24.10	24.56	25.27	.00	24.47
IV OTHER COMMODITIES	29.80	13.14	16.33	24.38	.00	45.86
45 TOBACCO MANUFACTURES	48.67	15.53	75.11	92.59	.00	101.23
46 WOOD, CORR. MANUFACTURES, & MISCELLANEOUS	4.15	.77	6.47	.00	.00	19.97
V TOTAL IMPORTS	25.81	18.68	28.77	21.07	50.22	31.67

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