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THE BALANCE OF PAYMENTS ADJUSTMENT

POLICY IN KOREA

- DEVALUATION VS UNIFORM EXPORT SUBSIDY AND IMPORT TARIFF -

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE
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DOCTOR OF PHILOSOPHY

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By

Kwang Doo Kim

Dissertation Committee:

John H. Power, Chairman
Nae Hoon Paul Chung
Burnham O. Campbell
Youngil Lim
Marcellus Snow

ABSTRACT

Economists have suggested a variety of policies for the adjustment of balance of payments. The broad policies of adjusting internal demand or changing the foreign exchange rate to adjust the balance of payments have been categorized as expenditure changing and expenditure switching. Expenditure changing comes from varying the level of national income mainly through monetary and/or fiscal policy. Expenditure switching uses the foreign exchange rate to divert domestic and foreign expenditure between home and foreign goods. A change in uniform rates of export subsidy and import tariffs is often said to be identical with a foreign exchange rate change in its effects on the balance of payments.

The main purpose of my study is to search for the most satisfactory policy tool to attain a more favorable balance of payments adjustment. I set the hypothesis that changing the foreign exchange rate is the best among these alternative policy tools. I compare the policy effects of monetary and/or fiscal policies with those of the foreign exchange rate change through a theoretical analysis. The opinion that the foreign exchange rate change and a uniform change in rates of export subsidy and import tariffs are identical is analyzed theoretically as well as tested empirically using Korean data.

They are identical on three assumptions: First, the subsidy-tariff scheme must be applied to all international transactions, not only to merchandise transactions. Second, the elasticities of exports and imports with respect to subsidy and tariff changes must be equal to the elasticities of exports and imports with respect to

foreign exchange rate change. Third, there must not be any inefficiency or corruption in the bureaucracy controlling the subsidy and tariff.

Even if the second and third assumptions are met, the first is denied by the existence of international capital movements and the debt service transactions associated with them. In this case, the interest rate differential between local and foreign financing and the potential gap between the social and private cost of foreign borrowing plays the essential role in comparing the effects of the two policies.

The theoretical discussion shows that the change of foreign exchange rate is better than monetary and/or fiscal policy as long as the foreign sector's fluctuations are not temporary phenomena. It is also found that changing the foreign exchange rate is better than the uniform subsidy-tariff scheme, when the latter is applied only to merchandise transactions, because of the foreign capital flow and its effects on merchandise transactions.

The empirical test using Korean data for the period from 1962 to 1973 supports the theoretical conclusion of the advantage of changing the foreign exchange rate over the subsidy-tariff scheme. A non-uniform subsidy-tariff scheme, the subsidy on exports exceeding the tariff on imports, has been applied to merchandise transactions in Korea. The effects of foreign capital inflow on imports, which is the main point in the theoretical discussion are supplemented by the fact that the elasticities of several categories of exports with respect to foreign exchange rate change are higher than those with respect to the subsidy-tariff. The empirical findings show that the

balance of payments would have improved by 3.5 billion dollars more with the use of exchange rate policy than with the use of the uniform subsidy-tariff scheme during the period studied.

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I. INTRODUCTION

Since the Korean government adopted an outward looking industrialization strategy in 1962, Korea's exports have shown a very remarkable rate of increase, a 40% annual rate on the average between 1962 and 1974. But imports have shown a rapid increase too. The trade deficit increased from 0.37 billion dollars in 1962 to 2.2 billion dollars in 1974. This foreign exchange gap has been filled by foreign savings. As a result, debt service payments have grown reaching \$0.610 billion in 1974 or about 14% of total export earning.

As long as foreign borrowing can continue, the deficit also can last without any restraint on the economy. But foreign lenders are shrewd enough to have some indicators by which they decide whether or not to continue their loans to a country. The experiences of such countries as Argentina and Brazil in the early 1960's show that any decline in confidence in a country's debt servicing capacity may have a snowballing effect, reducing the country's possibilities for further borrowing. It is certain that a country will be faced with a great deal of difficulty if, because of default on its debt-service payment, it cannot borrow from foreign lenders.

These considerations point to the need to learn why the trade deficit gap has been growing and how to reduce it.

In the 1960's, Korea adopted an export expansion strategy for industrialization rather than import substitution. In reviewing the theoretical discussions and historical experiences, it is clear that the former is surely better than the latter. And an export subsidy scheme was established to encourage exports. Theoretically, this

subsidy scheme seems to be based on several types of infant industry arguments. As a result, Korean export performance has been splendid, but import substitution has been unsatisfactory.¹

I agree with those who favor an outward looking industrialization strategy. But I do not think the subsidy scheme which has been used in Korea as a policy tool is satisfactory, especially from the balance of payments standpoint.

The purpose of my study is to search for the most satisfactory policy tool to achieve a more favorable balance of payments both from theoretical analysis and empirical data of Korea. I set up the hypothesis that devaluation is the best among all possible policy tools in expanding exports and reducing imports via import substitution. There are opinions that "devaluation" and a "uniform export-subsidy, import tariff scheme" are identical.² If this subsidy-tariff scheme is applied to all international transactions and if export and import elasticities with respect to the official foreign exchange rate changes and subsidy-tariff changes are the same, they are identical. But in the real world, that scheme is generally applied to merchandise transactions only. In this case, they are quite different in their effects on the balance of payments even though the relevant elasticities are the same. The theoretical focus of my study will be on the comparisons between devaluation and monetary-fiscal policy as well as devaluation and the subsidy-tariff scheme which includes only merchandise transactions. The focus of my empirical analysis will be on the comparison between devaluation and the subsidy-tariff scheme using Korean data. Finally, I will test my hypothesis by showing the empirical results in a simulation with two policy tools.

FOOTNOTES

I

¹The discussions on this will be done at Chapter III.

²If the absolute change in the foreign exchange rate, the subsidy per dollar of exports and the tariff per dollar of imports are equal, the selling price of exports and the purchasing price of imports would increase by the same amount. The subsidy and tariff concept should be appropriately modified for transactions other than merchandise transaction.

II. FOREIGN BORROWING AND ITS IMPLICATIONS

A. The Need of Foreign Capital

Two Gap Model¹

Development is mainly a function of investment. But it also holds that such investment, which requires domestic savings, may not be sufficient to ensure that development takes place. It must also be possible to obtain from abroad the goods and services that are complementary to those available at home. In most developing countries, the structure of the economy is so simple that it can produce only a limited range of products when relying solely on domestic resources. In these circumstances an act of saving, by itself, even though it releases resources for investment purposes, may not make available the correct kind of resources.

Let us assume a two-commodity economy with an exportable, X, and an importable, M. To make the model fit the conditions of most LDCs, I assume that M cannot easily be produced locally (e.g., because of insufficient local markets, inefficiency of resources reallocation, and inadequate technical skills), or if it were produced locally, it would require a large input of imported M per unit of output. Production of one unit of X requires some portion of local inputs and some portion of foreign inputs. In the following discussion, the local input portion and the foreign input portion will be expressed by A_{xx} and A_{mx} respectively. Positive import substitution (an increase in A_{xx} relative to A_{mx}) is not satisfactorily underway, mainly because there are policy biases against it or import substitution has already been pushed to the limit of practicability.

These situations can be shown by a graphical exposition.

The series of parallel kinked output isoquants, Q_1, Q_2, Q_3 , reflect the limited degree and nature of substitution between the two inputs, local and foreign, in the production of X . Note that the angle of the ray OD is determined by the input of foreign materials per unit of X , A_{mx} . We assume that initially the quantity of X not consumed domestically, is OX_1 . From X_1 on the horizontal axis, the country can trade for M along the foreign offer curve, X_1AT , to the point of tangency with the highest possible output isoquant, Q_1 . At the optimum, then, the country trades $X_1 - X_2$ of X for OM_1 of M . The remaining savings of X , that is, OX_2 , and of M , that is, OM_1 , can then be utilized for producing output of Q_1 in the next period. In this range of savings, an increase in savings (in terms of X , i.e., local resources), for example, to OX_3 , does not allow the economy to attain a higher output isoquant because the foreign exchange constraint is binding (imports cannot exceed OM_1). A higher isoquant (e.g., Q_2) can be reached only if more foreign exchange is made available, so that with savings of OX_6 , from which OM_1 of imports can be earned, as at point E , and the foreign capital supplement of $M_2 - M_1$, such that imports can reach OM_2 at point F_1 . In such a situation, the growth rates of output and consumption are, therefore, constrained by the shortage of foreign exchange and not by insufficient local savings.

But this model is based on the assumption that A_{mx} is fixed and there is a limited maximum amount of export proceeds, which implies that the capacity to import is fixed in the absence of foreign capital inflow.

This assumption is not valid, however, when a country can reallocate resources and faces a sufficiently elastic demand for exports that it can readily convert domestic resources into import substitution and/or export expansion.

In Figure 1, Q_2^a is possible with no foreign capital inflow, if A_{mx} is lowered to A_{mx}'' through resource reallocation with savings of OX_3 . Or, Q_2^b can be attained with less foreign capital with A_{mx}' than with A_{mx} .

If the foreign offer curve shifts and intersects Q_2 at F_1' with expanded exports of $\overline{X_8X_3}$, Q_2 is attained without foreign capital inflow.

It is better to have both export expansion and import substitution in this context. The economy will attain a higher output level, Q_2' , with both import substitution, i.e., A_{mx}'' , and export expansion, i.e., the new foreign offer curve without introducing foreign capital.

But most of LDCs want a rapid growth of their income but are not capable of such transformation. Even in the best case, with both export expansion and import substitution underway, the economy needs a foreign capital inflow to attain Q_3 in the diagram.

I have been focusing my analysis on the foreign exchange constraint in relation to foreign capital inflow. But in many LDCs the saving constraint is also a determinant of foreign capital inflow. Thus, foreign capital inflow supplements the low domestic savings and hence helps fill the resource gap or "saving gap" and also provides foreign exchange and thereby helps fill the "foreign exchange gap." One gap may be greater than another ex ante: if the foreign exchange

gap is greater than the saving gap, foreign capital inflow becomes the means of permitting the required imports so that the full saving potential can be realized and the resources released via saving will not be left underutilized because of import bottlenecks. The amount of foreign capital inflow will be decided by the larger one, "foreign exchange gap" in this case. The necessary identity of the savings-investment and export-import gap ex post is brought about by a process of adjustment. I have focused my analysis only on the foreign exchange constraint for two main reasons. First, my major concern over the whole analysis in this study is on the foreign exchange constraint. Secondly, Korea has mobilized domestic resources via both monetary reforms and a powerful tax system very efficiently. Consequently, the foreign exchange constraint has been given more attention than the saving gap.

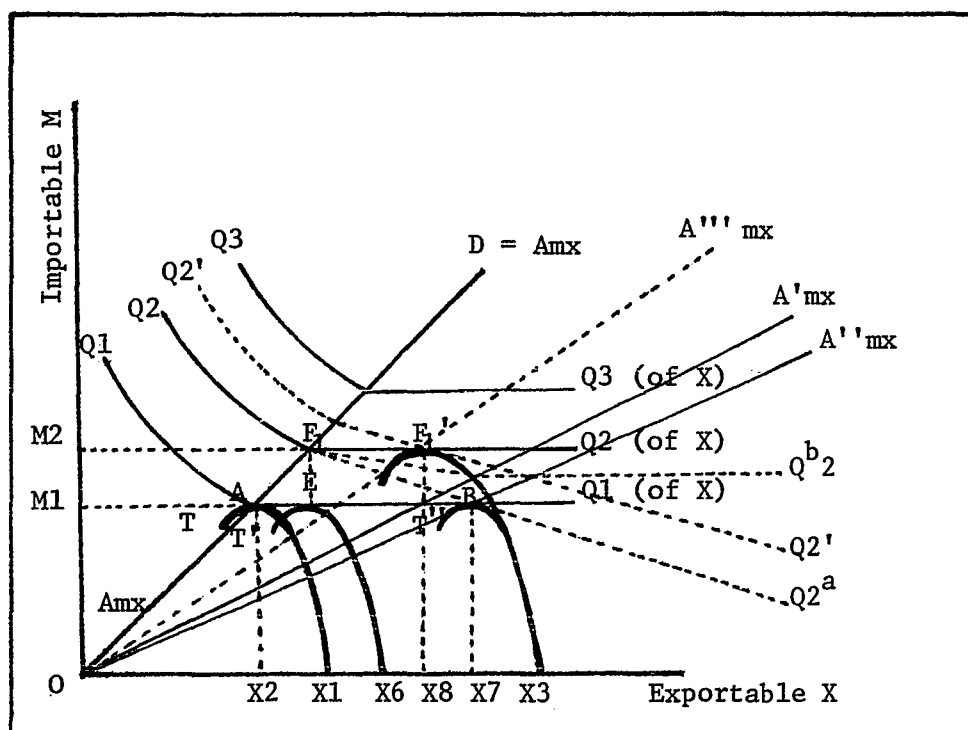


Figure 1. Graphical Exposition of the Two Gap Model²

As the above analysis shows, many LDCs can benefit from foreign capital inflow in their development process. But what worries me and some other economists⁵ is the consequential burden of debt-service payment of those borrowing countries. The notion of cumulative borrowing raises concern that some countries may have borrowed too much and be on the verge of default, which would disturb the concerned economy seriously.

B. Foreign Capital and Balance of Payments

1. Domar's Approach³

Domar concluded that the balance of payments of a borrowing country would turn adverse unless the rate of growth of total borrowing was equal to the rate of interest on outstanding loans.

Put into a formula,

$$R = \frac{A + i}{A + r}$$

where R is the borrowing country's balance of payments (the ratio of debits to credits), A is the rate of amortization, i is the rate of interest on outstanding loans, and r is the rate of growth of new loans. So long as i is less than r, R is less than 1, and the balance of payments remains favorable.

This analysis suggests the possibility of a borrowing country's accumulation of foreign debt via borrowing for the payment of interest. But this seems to be an extreme case. This analysis seems to be appropriate in the case of lending for the borrowing country's consumption.

But when loans are contracted for productive purposes, each loan should be able to pay its own way, producing new exports or saving on old imports, sufficient to pay its debt service.

If the foreign capital is not used efficiently in the sense of foreign exchange earning or saving, the accumulative borrowing is still a possibility. But if we focus on the efficient use of borrowing funds, a different approach seems to be needed.

2. Kindleberger's Approach⁴

Kindleberger compared new borrowing not with old interest, but with new imports for production purposes, and old interest with the increase in exports and decrease in imports arising from the productivity of old imports financed by the foreign borrowing incurring the old interest.

Let subscripts 0, 1, 2 and so on indicate time, L stands for new borrowing, X and M for exports and imports, and i for interest. The balance of payments at the several stages (amortization being left out) should be as follows:

(Stage I)

$$\frac{M_0 + \Delta M}{X_0 + L_0}$$

where $L_0 = \Delta M$ is assumed.

(Stage II)

$$\frac{M_0 + i L_0 - \Delta M_{L_0} + M}{X_0 + \Delta X_{L_0} + L_1}, \text{ etc.}$$

Thus $i L_0$ (the interest on the original borrowing) should not be matched against L_1 (the borrowing of the next period) but with " $+\Delta X_L$ " and " $-\Delta M_{L_0}$ " (the increase in exports and decrease in imports made possible by the productivity of L_0), and new borrowing can be used to finance new imports of goods, not to pay interest on old debt.

This analysis must be qualified for cases in which project has a long period of gestation. Here it is necessary to borrow the interest until production gets underway, because its productivity does not produce exports or import substitutes immediately. This implies that the real amount of foreign capital borrowed is more than the face amount by the accumulated interest to the period of production. In this case, it is expected that the borrowing country will ultimately be able to achieve increased productivity which it can direct into export-increasing or import-reducing activities. If not, the case will turn out to be similar to the borrowing for consumption.

This approach suggests that foreign borrowing, if it is used efficiently in terms of export expansion and import substitution, helps the borrowing country develop through expansion of capital and productive capacity. But it also implies that the borrowing country should borrow to pay interest on old borrowings, if old loans are not able to pay their own way. And if this inefficient use of foreign borrowing continues for long, the cumulative lending and the possibility of default emerge.

Up to now, I have discussed the need for foreign capital and its possible consequences on the balance of payments of borrowing countries. The discussion shows us that export expansion and/or import substitution are required to attain higher growth rates of income without cumulative foreign borrowing which may lead to possible default. A combination of export expansion and import substitution is better than either export expansion or import substitution alone in minimizing the cost of balancing foreign exchange budget in terms of equalizing the cost of earning foreign exchange with the cost of saving it at the margin.

There has been considerable concern⁵ in recent years that a number of developing countries might, under current trends in the volume and terms of new lending, be faced with difficulties in servicing their foreign debt. Now I am faced with the question of which level of foreign debt is dangerous for the concerned economy.

3. Debt Servicing Capacity

How can it be judged that a country has borrowed too much and is on the verge of default? There seems to be a short hand indicator; the debt service ratio.

This ratio is defined as the ratio of service on debt to export earnings. The rationale for the use of this ratio as an indicator of a country's debt servicing capacity is that an increase in the debt service ratio indicates increased vulnerability to foreign exchange crises.

But the debt service ratio in itself is not a very satisfactory indicator of a country's ability or lack of ability to pay its debts. The ratio is merely an indicator of the proportion of foreign exchange earnings which are free to purchase imports. A country with good credit standing may be able to finance a high debt service ratio, for a time at least, through a high level of borrowing.

The historical behavior of debt service ratios and instances of default also indicates the ability of some countries to tolerate high debt service ratios. Mexico did not face default in 1967 despite debt service ratio of 39%. On the other hand Bolivia defaulted with a debt service ratio of 16% in 1931.⁶

As Kindleberger has indicated, interest should be related to the increase in exports and the decrease in imports. Equally or more

important in the background are the capacity to transform resources from one sector to another, the productivity of new investment, and the marginal propensity to save out of increased income. Where a country maintains an overvalued currency, with domestic inflation in excess of currency depreciation, the outlook for its ability to maintain service on its debt is dim.

But the debt service ratio does help us in grasping the overall situation faced by an economy's foreign sector. The average of this ratio for 69 LDCs was 8.1 percent in 1970 (Table 1), and only 9 countries had ratios in excess of 15 percent.⁷ Over time, the ratio has been increasing rather rapidly, since the average of the ratio was 5.7 percent in 1965 and only 5 of the 69 countries then had a ratio of more than 15 percent.

Table 1. Sixty-nine Developing Countries: Average of Debt Service Ratios, 1965 and 1970

(In percent)

	Debt Service Export of Goods and Services (1965)	Debt Service Export of Goods and Services (1970)
Average	5.66	8.06
Standard deviation	5.41	6.42
First quartile	1.90	3.60
Second quartile	4.20	5.60
Third quartile	6.30	9.90

Source: Pierre Dhonte. "Describing external debt situation,"
I.M.F. Staff Paper, May, 1975.

Table 2. Thirteen Rescheduling Cases: Values
of Debt Service Indicators

(In percent)

Country	Year of Renegotiation (t)	Debt Service
		Trend exports of goods and services (t-1)
Argentina	1962	20.1
Brazil	1961	36.9
Chile	1965	21.1
Egypt	1966	12.6
Ghana	1966	33.7
India	1968	20.5
Perus	1968	10.7
Philippines	1970	4.0
Turkey	(1959	21.3
	(1965	19.6
Uruguay	1965	6.0
Yugoslavia	(1966	16.2
	(1971	8.5

Source: Ibid.

If a country cannot service its debt as scheduled on a contract, it can default on her debt in an outright manner or it can seek a rescheduling of the payments. Rescheduling of the payments would depend largely on the attitudes and generosity of the lender. It has been arranged by such institutions as International Monetary Fund (IMF), International Bank for Reconstruction and Development (IBRD) or Donor Consortium. Of the 13 rescheduling cases between 1959 and 1971, 8 had

ratios above 15 percent in t-1 that is, one year before the year of rescheduling (Table 2). The rescheduling cases as a whole thus display high debt service ratios.

The debt service ratio of Korea from 1969 to 1974 are shown in Table 3. The ratio had been increasing up to 1972 and began to drop from 1973. The extraordinary rapid growth rate of exports in 1973, around 75 percent a year, must have greatly contributed to the downward trend of the ratio. This downturn trend beginning in 1973 incurs some need to study the relationship between the debt service ratio and economic growth, which has not been done in Korea yet. Compared to those 69 LDCs summarized in Table 1 as of 1970 and 1965, Korea seems to have very high debt-service ratio, for example, 17 percent in 1970. Considering the low net foreign exchange earning content out of export earnings, around 60 percent, 13.52 percent of the debt service ratio in 1974 cannot be said to be safely low. According to the formula in Frank and Cline (1971), the critical ratio of debt service to export earnings in 1976 will be about 16 percent.⁸ If this figure should be exceeded by the actual debt service ratio, a rescheduling of the debt payments will be likely.

The disadvantage of default on the foreign debt or rescheduling is that Korea might subsequently experience difficulty in obtaining new loans and hard terms on the new loans, even though new loans are available. This possibility would lead to the shortage of necessary foreign resources due to the import control imposed by the foreign exchange shortages, which will install a lot of inflexibility in the economy as well as lower the economic growth rate accompanied by a higher unemployment rate and underutilized capacity. To avoid these

Table 3. Debt Service Ratio of Korea

(Unit: \$ mil.)

	Export Earnings	Service Payments	Ratio (%)
67	358.6	38.556	10.75
68	500.4	60.402	12.07
69	702.8	102.692	14.61
70	1003.8	170.451	16.98
71	1352.0	234.0	17.31
72	1807.0	354.7	19.63
73	3256.9	504.4	15.49
74	4515.0	610.3	13.52

Source: Major Economic Statistics, 1976.
Economic Planning Board, Seoul, Korea.

undesirable consequences, the Korean government has pushed the export oriented policy more strongly. The only way of escaping from the ill consequences of rescheduling or default was extremely rapid growth of exports. But the government authorities have not, it seems to me, considered the cost of earning foreign exchange via exports compared to the cost of saving foreign exchange via import substitution at margin enough to minimize the cost of balancing foreign exchange budget. I have no direct evidence on the cost comparisons supporting my view except the discussions in the following chapter. This is another interesting topic for further study.

There seem to be several possible explanations on the cause of a high debt-service ratio with the two gap approach and other discussions in mind: too ambitious an income growth rate, inefficient import substitution, insufficient export expansion, or any combination of these factors.

It is the time to turn to the Korean scene. I will take the income growth as a goal and focus on import substitution and export expansion performances in relation to the foreign exchange rate regime, which reflects trade policy.

FOOTNOTES

II

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III. FOREIGN EXCHANGE RATE REGIME AND BALANCE BALANCE OF PAYMENTS IN KOREA

A. Outward Looking Industrialization Strategy

1. History of Industrial Policy Development¹

There are three distinct phases of Korean industrial policy over the period from 1945 to 1973. The first phase, which began with Korea's liberation from Japan at the end of World War II and continued through 1960, may be characterized as the phase of easy import substitution. The second phase covered only a short period from 1960 to 1963, and was a transitional one between import substitution and export promotion. The period beginning in 1964 can be taken as the third phase, in which an export-oriented industrialization strategy was pursued in earnest.

At the conclusion of World War II, Korea was partitioned along the 38th parallel. This left the Republic of Korea with a majority of the peninsula's population, its most productive agricultural land, and the bulk of its light industry. On the other hand, most of the heavy industry and more than 90 percent of the electricity generating capacity were in the North. The Korean War (1950-53) destroyed most of the industrial facilities located in the Republic of Korea. Between partition and approximately 1955, therefore, economic activity in the south was dominated by adjustments to partition and then to the dislocations caused by the war. During 1954-60, however, the post-Korean war reconstruction and industrialization programs were carried out with United States and United Nations assistance.

During the reconstruction period, the government controlled imports so as to favor import substitution industries. In addition to

high tariff walls, the government increasingly relied on quantitative restrictions in the late fifties in order to offset the progressive inflation of the Won, Korea's currency. A complex structure of multiple exchange rates was also developed to avoid balance of payments difficulties during this period. On balance, the structure of incentives during this period appears to have been biased against exports although there existed some export promotion schemes.

The second phase covers the three years following the Student Revolution in April, 1960. This was a period of social, political and economic instability notable for a number of attempts at liberalization and reform. The military government that took control of the economy in 1961 tried to complete the task of unifying the exchange rate begun by the preceding civilian government. The attempt to establish a unified exchange rate in 1961 was not, however, successful in promoting export expansion, because multiple exchange rates appeared again during 1963 and early 1964, and the new rates were lower than the earlier free market price of foreign exchange for export earnings.

The third phase covers the period from 1964 to the present. The exchange rate reform in 1964 and subsequent policy reforms made the export-oriented industrialization strategy effective in an operational sense. The Won was devalued from 130 Won to a dollar to 255 Won in May, 1964, and a unified exchange rate system was set.

Trade controls were gradually relaxed following the 1964 exchange rate reform. The system was further liberalized in 1967 when a switch was made from the so-called "positive" list system (under which only those commodities listed in the trade program could be imported) to the "negative" system (under which all commodities not listed are

automatically approved). Tariff reform was undertaken in the latter part of 1967 and again in early 1973 to reduce the average tariff on imports.

The government initiated an export subsidy scheme to maintain a pegged official exchange rate and flexible effective exchange rates on exports as well as on imports. Government supports to exporters during this period included: preferential credit, indirect tax exemptions on inputs into export production and export sales, a 50 percent reduction in income tax on export earnings, tariff exemption on imported raw materials and equipment for export production, and wastage allowances on imported raw materials for export production.

But the strong incentive via indirect subsidies to export expansion resulted in relatively less favorable incentives for import substitution.

2. Import Substitution vs. Export Expansion as an Industrialization Strategy

As noted above, Korea started out with an industrialization strategy based on a policy of import substitution, but changed her strategy to export promotion in the early 1960's. The change in industrialization strategy was begun by the military government that came into power in 1961.

The change of strategy seems to have been wise. Export expansion contributes to economic development by providing foreign exchange for the required imports as well as by increasing national income. But import substitution, too, can play the same role by saving foreign exchange and raising national income. Then why was export expansion strategy preferred to import substitution? Some of

the answers seem to be in the following arguments by Power:²

Beyond the first stage in an import substitution strategy--the expansion, behind protection, of finished consumption goods production to the limits of the domestic markets--lies the necessity of developing production of intermediate goods, capital goods, and raw materials; or expanding exports; or both. It is a simple matter to formulate and implement a policy of protection for the first stage. Often this happens almost inadvertently, as was suggested above. But the crude policies of protection that may serve adequately in the first stage, and the economic structure that they encourage, are likely to become barriers to growth in subsequent stages mainly because of three inefficiencies; economic inefficiency (misallocation of resources); technical inefficiency (failure to minimize cost); and the saving gap (failure to achieve an adequate rise in domestic saving). And even before the first stage is completed, barriers to growth taking the form of balance of payments difficulties and inflation may arise, because of a rising import bill of materials, parts and equipment to sustain production in the protected industries, and because of a resistance on the part of unprotected sectors and income groups (e.g., agriculture and labor) to any deterioration of their terms of trade.

Moreover, the elimination of bias for imports can permit specialization according to comparative advantage.³ In particular, exports of manufactured goods help firms to reduce their costs by using large scale production methods, assuming economies of scale exist. Export industries can participate in the international division of the production process through the manufacturing of parts and components for assembly abroad. In addition to all of these, familiarity with foreign markets provides incentives for technological change and product improvement.

Many developing countries which have adopted a policy of bias toward import substitution will be constrained by the limited size of their domestic markets. When the early stage is over, those countries

typically have turned to import substitution in durable consumer goods and machinery and in the intermediate inputs used in the production thereof. The industries producing these types of goods are generally more capital and technology intensive than the nondurable consumer goods industries and usually require higher levels of output for efficient operation. In this later stage, therefore, difficulties are encountered due to the small size of the domestic market and the technological and capital requirements of the industries in question.

Following the shift in industrialization strategy in the early 1960's, Korea attained a rapid economic growth. Commodity exports increased at a rate of over 40 percent per year during 1962-1974. The growth rate of gross national product also accelerated from an average annual rate of 4 percent during the earlier period to about 10 percent during the latter period. The acceleration in growth rate was mainly led by the rapid growth of the manufacturing sector, which expanded mainly via export expansion. As a policy tool for the export-led growth, government authorities set up an extensive export subsidy scheme. Import controls were administered mainly for supporting this export subsidy scheme. As a whole, the foreign exchange rate regime has been export subsidy oriented.

3. The Argument for Export Expansion via Export Subsidy

The traditional comparative cost theory is essentially a simplified form of static general equilibrium theory. The optimum pattern of production and trade for a country is determined from a comparison of the opportunity cost of producing a given commodity with the price at which the commodity can be imported or exported. In

equilibrium, no commodity is produced which could be imported at lower cost, and exports are expanded until marginal revenue equals marginal cost. If we follow this doctrine and take market prices as valid indicators of opportunity costs, there seem to be very limited opportunities for Korea to develop via export expansion.

But if we interpret "comparative advantage" in a dynamic setting in which the quality of factors of production, the factor supplies, composition of demand, and technologies may change over time, external economies and economies of scale may exist, and the market prices of commodities and factors may differ from their opportunity cost, Korea can enjoy some good export opportunities by appropriate government policies.⁴

The notion of an "infant export industry" makes very good sense in this context and thus justifies the grant of export subsidies. The subsidies would align market prices of commodities and factors to their dynamic opportunity costs in production. The expanded production activities in the export industries promoted by the subsidies would not only improve the quality of the factors of production through experience and training on the job but would result in more competitiveness in the international market due to the economy of scale. Local resources would be reallocated toward the export sector of the economy as the export industries expand with the granted subsidies. The possible difference between private recoupments and social benefits due to the existence of the external economy would be eliminated by the subsidies. With all of these possible favorable effects of the export subsidies, the infant export industry can be expected to grow up and to contribute to the improvement of the balance of payments via

export expansion.

The cost of export subsidies should be considered, however. The infant may never grow up and the export industry may never compete on world markets. The financing of the subsidies would impose some burden on some sectors of the economy and would install an imbalance in the structure of the economy. Therefore, alternative measures should be compared with export subsidies from several aspects. Their effects on the balance of payments are compared in this study. Korea has adopted the export subsidy scheme along with an imbalancing import tariff scheme.

Now we turn to some of the details of this export subsidy and import tariff scheme.

B. Export Subsidy and Import Tariff Scheme and Foreign Exchange Rate Regime

1. Export Subsidy Scheme

The following are the main components of Korea's export incentive system:⁵

- (1) Exemptions from customs duties on imported materials and capital equipment used for export production. These exemptions (including partial reductions) from legal tariffs were increasingly important throughout the 1960's. Total exemptions amounted to 42.6% of total collections in 1962; while after 1966, the value of exemptions continuously exceeded that of collections.
- (2) Exemptions from business activities and commodities taxes and reduction by 50% of income taxes on profits from foreign exchange earning activities. In addition

to these, a special accelerated depreciation method was permitted for exporters starting in 1966.

- (3) The granting of preferential interest rates and higher credit priority to exporters. There have been a variety of arrangements under which exporters received more immediate access to loan funds and lower interest rates than did most other producers. The incentives through preferential loans also extended to a series of arrangements to give exporters preferential access to foreign exchange loans. Because banking has been under virtual government control, interest rate differentials and credit availability have been used as instruments to affect resource allocation more generally. Thus, sectors producing for the home market were materially affected as well. With limited availability of bank loans for non-exporters, domestic suppliers were often forced to borrow from the non-institutional financial market where interest rates have been more than twice those of bank loans.
- (4) An export-import linkage system that permitted exporters to import goods on the prohibited list for their own use or for resale in the domestic market. Exporting was the necessary condition for obtaining government sanction to sell in the profitable domestic market. Thus, the extreme case of "export to import" occurred in some cases. Because imports are subject to quotas or high tariffs the export-linked, duty free imports were very profitable.

- (5) Wastage allowance on imported raw materials. As already described above, exporters and suppliers to exporters were given the automatic right to duty-free imports of intermediate products up to stated limits. The limits administratively established for each commodity were based on technical input-output relationships and included an allowance for wastage of the input. This wastage allowance exceeded "normal" wastage through loss, damage, and other causes, and that portion of the allowance not used in production could be sold domestically, often at a high profit since the imports involved were either limited by quotas or subject to high duties.
- (6) Preferential electricity and transportation rates. There have been 30% discounts on railway freight rates for exported minerals and an equal discount on electricity charges granted to exporters for whom power costs were a large share of total manufacturing costs.
- (7) Restrictions on entry granted in new export markets. It is necessary to invest in cultivating a new market, and these costs can be significant in international markets for exporters. Any exporters breaking into a new foreign market may find that the private returns to this activity are less than the actual social returns, because other firms can exploit the market opened up by his own expenditures. On the basis of this element of externality, the Government granted sole export rights to the initial exporter.

Table 4. Amounts of Direct and Indirect Subsidies to Exports (1962-1973)

Total Direct, Indirect Subsidy to Exports and Average Per Dollar										
Official Exchange Rate (W/S) (A)	Average Export Dollar Premium (W/#) (B)	Direct Subsidy (W mil)	Internal Tax Exemptions (W.mil)	Custom Duties Exemptions (W.mil)	Interest Rate Subsidies ¹ (W.mil)	Total Exports Subsidies (W.mil)	Total Exports ² (\$ mil)	Won Subsidies per dollar exports (C)	(D)=(B+C)	(E) Ratio D/A (%)
1962	130.0	-	566	310	255	47	1,178	54.8	21.5	16.5
1963	130.0	39.8	354	527	571	248	1,700	86.8	59.4	45.7
1964	214.3	39.7	350	992	1,197	719	3,258	119.1	67.1	31.3
1965	265.4	-	-	2,838	2,692	1,330	6,860	175.1	39.2	14.8
1966	271.3	-	-	5,021	5,333	2,571	12,925	250.3	51.6	19.0
1967	270.7	-	-	7,724	8,224	4,935	20,883	334.8	62.4	23.1
1968	276.6	-	-	11,127	19,261	7,395	37,783	486.2	77.7	28.1
1969	288.2	-	-	17,207	22,551	9,690	49,448	658.3	75.1	26.1
1970	310.7	-	-	26,827	35,613	15,280	77,720	882.2	88.1	28.4
1971	347.7	-	-	41,852	54,330	20,455	116,637	1,132.2	103.0	29.6
1972	391.8	-	-	47,453	87,197	17,648	152,298	1,675.9	90.9	23.2
1973	398.3	-	-	64,845	210,788	24,119	299,752	3,270.8	91.6	23.0

Note: 1. Interest rate subsidies were calculated by estimating the average interest rate on all outstanding loans to business, which was taken as an estimate of the equilibrium interest rate, and taking the subsidy element of all loans at less than equilibrium rate as interest rate subsidies. 2. Military goods sales abroad are included.

Source: Bank of Korea, Ministry of Finance, USAID/Korea.

Among all of these components, the benefits from the export-import linkage system, the wastage allowances, the preferential electricity and transportation rates and the grant of sole export rights have not been quantified yet due to the difficulties of data classification. When all quantifiable values are summed up, the total sum of direct and indirect subsidies to exports can be estimated, as shown in Table 4.

2. Import Tariff Scheme

The original tariff structure was set up to protect domestic industries and to reduce the imports of non-essential goods as well as to increase government revenues. It went into effective operation at the beginning of 1950.

The basic structure of tariff rates was as follows:

- (1) No duties on food grains and non-competitive material imports required for industrial, educational, cultural, and sanitation facilities;
- (2) A 10 percent duty on essential goods for which domestic production was small relative to demand and on unfinished goods not produced in Korea;
- (3) A 20 percent duty on unfinished goods produced in Korea;
- (4) A 30 percent duty on finished goods not produced in Korea;
- (5) A 40 percent duty on finished goods produced in Korea;
- (6) 50 to 90 percent duties on semi-luxury goods; and
- (7) More than 100 percent duty on luxury goods.
- (8) Some special cases of tariff exemptions.

This basic structure of tariff rates remained the same, however, up to 1967 which is lower rates on raw materials than on semi-finished goods, and lower rates on non-competitive finished goods than on

competitive finished goods.

An import licensing system and a quota system were operating together with the tariff scheme to prevent the import of nonessential goods.

The attempt at trade liberalization in 1967 through the change from a positive list system of import controls to a negative list was accompanied by tariff reform. The tariff reform was presumably intended to simplify the system along lines suggested by Ronald McKinnon. In his consultant's report (1967),⁶ McKinnon suggested a low uniform tariff rate of about 20 percent for most imports and a higher rate (maximum 90 percent) on a selected group of industries that needed to be protected.

However, the basic idea of a low, uniform tariff combined with modestly higher rates for the protection of a selected, small number of industries was not implemented with the result that the new customs law was much the same as the old.

The basic rates in the new law are compared with the old rates by major section of BTNC (Brussels Tariff Nomenclature Classification) in Table 5.

Imports of raw materials for the production of exports, capital goods for export production and other major industries, and capital goods imports by foreign owned enterprises were exempt from custom duties. Since these exemptions were substantial and growing, mainly because of increased exports and increased tariff exemptions related to exports, the legal tariff structure did not have the same significance as it might have had in other countries. Tariff exemptions exceeded tariff collections from 1966 and continuously the gap has

Table 5. Changes in Legal Tariff Rates Before
and After Tariff Reform, 1967

(simple average rate)

BTN Section	Old Rate (percent)	New Rate (percent)
1. Live animals and animal products	32.5	38.4
2. Vegetable products	38.5	36.8
3. Animal & vegetable fats and oils	39.6	42.3
4. Prepared foodstuffs, beverages, spirits, vinegar and tobacco	84.3	95.1
5. Mineral products	15.9	25.2
6. Products of the chemical and allied industries	27.6	29.7
7. Artificial resins and plastic materials	32.4	34.5
8. Raw hides and skins, leather, fur skins and articles thereof	55.2	58.1
9. Wood and articles of wood	40.1	44.2
10. Paper making material, paper and paper- board and articles thereof	43.0	54.2
11. Textiles and textile articles	59.0	71.0
12. Footwear, headgear, umbrellas, sunshades, whips, riding-crops, etc.	74.3	82.9
13. Articles of stone, plaster, cement, asbestos, mica, etc.	48.9	53.8
14. Real pearls, precious stones and metals	43.7	36.1
15. Base metals and articles thereof	32.9	35.6
16. Machinery and mechanical appliances	27.4	30.6
17. Vehicles, aircraft, vessels, etc.	39.6	36.2
18. Optical, photographic cinematographic, measuring, checking and precision instruments and apparatus, etc.	44.4	40.4

Table 5. (Continued) Changes in Legal Tariff Rates Before
and After Tariff Reform, 1967

(simple average rate)

BTN Section	Old Rate (percent)	New Rate (percent)
19. Arms and ammunition	54.7	37.7
20. Miscellaneous manufactured articles	78.9	81.9
21. Works of art, collectors' pieces and antiques	0	0
Total number of items	(2,044)	(3,019)

Note: BTN-Brussels Tariff Nomenclature

Source: Official Tariff Tables, 1964 and 1968

Table 6. Legal, Actual Tariff and Tariff Equivalents on Imports (1962-1973)

YEAR	Official Exchange Rate W/\$ (A)	TOTAL AMOUNT OF ACTUAL, LEGAL TARIFF AND TARIFF EQUIVALENTS (W. mil)						Total Amount of Imports (\$ mil) (H)	TARIFF COLLECTED & LEGAL TARIFF PER DOLLAR % IMPORTS (W)		RATIO TO OFFICIAL EXCHANGE RATE	
		Tariff Collected (B)	Tariff Exempted (C)	Export Premium 1 (D)	Foreign Exchange Tax (E)	Tariff Collected & Tariff Equivalents (F) ²	Legal ³ Tariff & Tariff Equivalents (G=C+F)		Tariff Collected (I=F/H)	Legal ³ Tariff (J=G/H)	Tariff Collected (K=I/A)	Legal ³ Tariff (L=J/A)
1962	130.0	6,847	2,919	-	79	6,926	9,845	421.8	16.4	23.3	12.6	17.9
1963	130.0	6,708	5,464	3,455	-	10,163	15,627	560.3	18.1	27.9	13.9	21.5
1964	214.3	8,509	7,236	4,728	-	13,237	20,473	404.4	32.7	50.6	15.3	23.6
1965	265.4	12,847	9,682	-	-	12,847	22,529	463.4	27.7	48.6	10.4	18.3
1966	271.3	18,003	20,295	-	-	18,003	38,298	716.4	25.1	53.5	9.3	19.7
1967	270.7	25,413	32,374	-	-	25,413	57,787	996.2	25.5	58.0	9.4	21.4
1968	276.6	37,881	66,411	-	-	37,881	104,292	1,462.9	25.9	71.3	9.4	25.8
1969	288.2	44,724	86,240	-	-	44,724	130,964	1,823.6	24.5	71.8	8.5	24.9
1970	310.7	50,924	107,054	-	-	50,924	157,978	1,984.0	25.7	79.6	8.3	25.6
1971	347.7	52,187	130,423	-	-	52,187	182,610	2,394.3	21.8	76.3	6.3	21.9
1972	391.8	59,106	173,427	-	-	59,106	232,533	2,522.0	23.4	92.2	6.0	23.5
1973	398.3	82,371	319,609	-	-	82,371	401,980	4,240.3	19.4	94.8	4.9	23.8

- Note: 1. Estimated by Multiplying average export premium per dollar by total exports.
2. F = B+D+E
3. "Legal" refers to the value of tariff collections if there were no exemptions.

Source: Ministry of Finance, B.O.K. USAID/Korea.

been widening.

In early 1973, another tariff reform became effective, which increased administrative authority to adjust the tariff rates within 100 percent of the legal rate.

Table 6 summarizes the tariff scheme in relation to the official foreign exchange rate.

3. Foreign Exchange Rate Regime

The export subsidy and import tariff scheme in Korea is not uniform as I discussed above. Consequently, the real effective exchange rate on imports is unfavorable to import substitution which is well contrasted with such a high real effective exchange rate on exports as to promote export supply. The low real effective exchange rate on imports is mainly due to the tariff exemption which have been a major part of export subsidies.

But the tariff exemptions are not uniformly applied to all imports. High rates of tariff have been imposed on the import of consumption goods for domestic market. The nominal tariff rate on those consumption goods was 95.3 percent in 1968, whereas the rate on the raw and intermediate goods, except construction materials, was 47.6 percent and the rate on machine and transportation equipment was 57.5 percent in the same year.⁷ This seems to imply that import substitution in the consumption goods industry has been pushed by the tariff scheme.

In Table 7, it is shown that effective exchange rates on exports are higher than those on imports. In 1962, the official exchange rate (purchasing power parity adjusted) was 226.6 Won per dollar, while the effective exchange rate on imports was 255.1 Won

Table 7. Purchasing Power Parity Effective Exchange Rate on Exports and Imports
(1962 - 1973)

YEAR	NOMINAL EXCHANGE RATE			WHOLESALE PRICE INDEX & PURCHASING POWER PARITY INDEX (1965 = 100)			PURCHASING POWER PARITY ADJUSTED EXCHANGE RATE		
	Official Exchange Rate	Nominal Effective Exchange Rate		Korea	Major Trading Countries ³	Purchasing Power Parity Index ⁴	Official Exchange Rate	Effective Exchange Rate	
		Exports ¹	Imports ²					Exports	Imports
1962	130.0	151.5	146.4	56.0	97.6	174.3	226.6	264.0	255.1
1963	130.0	189.4	148.1	67.5	98.3	145.6	189.3	275.8	215.7
1964	214.3	281.4	247.0	90.9	98.5	108.4	232.3	305.0	267.6
1965	265.4	304.6	293.1	100.0	100.0	100.0	265.4	304.6	293.1
1966	271.3	322.9	296.4	108.8	102.8	94.5	256.4	305.1	280.0
1967	270.7	333.1	296.2	115.8	104.0	89.8	243.1	299.1	266.0
1968	276.6	354.3	302.5	125.2	105.6	84.4	233.5	298.8	255.1
1969	288.2	363.3	312.7	133.7	108.8	81.4	234.6	296.5	254.5
1970	310.7	398.8	336.4	145.9	112.8	77.3	240.2	308.3	260.1
1971	347.7	450.7	369.3	158.5	114.2	72.1	250.7	325.0	266.1
1972	391.8	482.7	415.2	180.7	117.2	64.9	254.3	313.3	269.3
1973	398.3	489.9	417.7	193.3	133.9	69.3	276.0	339.5	289.4

- Note: 1. Official exchange rate plus export subsidies and subsidy equivalents per dollar in Table 4.
2. Official exchange rate plus tariffs and tariff equivalents on a dollar of imports.
3. An average of wholesale price indexes in the United States and Japan, weighted by Korea's annual trade volume with the respective countries.
4. Major trading countries' WPI divided by Korean WPI.

Source: Table 4, Table 6, Bank of Korea

per dollar and on exports was 264 Won per dollar. In 1973, the official exchange rate (PPP adjusted) was 276 Won/dollar, effective exchange rate on imports was 289.4 Won/dollar and on exports was 339.5 Won/dollar.

The important thing I can find here is that export subsidy and import tariff are not uniform. And it is also true that the subsidy was not uniform among exports just as the tariff was not uniform among imports. The export subsidies, for instance in 1968, were different among industries. The effective subsidy rate on manufacturing export industries was 13.5 percent, whereas the rate on primary export industries was -9.3 percent.⁷ Export subsidy has been always greater than import tariff. Therefore the Korean export subsidy and import tariff scheme can be said to have been biased toward export expansion and to have relatively neglected import substitution mainly in intermediate and capital goods.

Table 8 indicates percentage components of effective exchange rates on exports and on imports.

The proportion of subsidies has been increased in the real effective exchange rate on exports whereas the tariff and tariff equivalent proportion have been decreased in the real effective exchange rate on imports. This tendency is a natural consequence as long as tariff exemptions are a tool for export subsidies. The implication seems to be that tariff structure has been losing its uniqueness in terms of its own purpose and incorporated into the extended export subsidy scheme except for the case of consumption goods.

With its extensive export subsidy scheme, Korea could have enjoyed such positive effects of export-oriented growth as expanded

Table 8. Comparison of Purchasing-Power-Parity Effective Exchange Rates for Exports and Imports
1962 - 1973

YEAR	Purchasing Power Parity Effective Exchange Rate			Percentage Components of Effective Exchange Rate on Exports			Percentage Components of Effective Exchange Rate on Imports	
	Exports (A)	Imports ¹ (B)	Ratio C=(A)/(B)	Premia (D)	Subsidies (E)	Official Exchange Rate (F)	Tariff and Tariff Equivalents (G)	Official Exchange Rate (H)
1962	264.0	255.1	1.03	0.0	14.1	85.9	11.2	88.8
1963	275.8	215.7	1.28	21.3	10.3	68.7	12.2	87.8
1964	305.0	267.6	1.14	14.1	9.7	76.2	13.2	86.8
1965	304.6	293.1	1.04	0.0	12.8	87.2	9.4	90.6
1966	305.1	280.0	1.09	0.0	15.9	84.1	8.4	91.6
1967	297.4	266.0	1.12	0.0	18.2	81.8	8.6	91.4
1968	298.8	255.1	1.17	0.0	21.9	78.1	8.5	91.5
1969	295.6	254.5	1.16	0.0	20.6	79.4	7.8	92.2
1970	308.3	260.1	1.19	0.0	22.1	77.9	7.6	92.4
1971	325.0	266.1	1.22	0.0	22.9	77.1	5.9	94.1
1972	313.3	269.3	1.16	0.0	18.8	81.2	5.6	94.4
1973	339.5	289.4	1.17	0.0	18.7	81.3	4.6	95.4

Note: 1. Tariffs and Tariff equivalents all together

Source: (Table 4), (Table 6), (Table 7)

market size, improved skills, technological transfers, and the overall spur to efficiency which results from international competition. But one of the most remarkable negative facts seems to be that about half of the materials imported for export production were those items classified as "competitive" imports during the period of 1966 and 1973. The share of imports for export production in total commodity imports steadily increased from about 14 percent in 1966 to 38 percent in 1973. Their import value was equivalent to about 40-50 percent of the total value of commodity exports during 1966-1973.⁸ This implies that the apparent value added content of exports was less than 60 percent, although the actual import content of exports might have been smaller due to the official wastage allowances which leaked out large amounts of duty free imported raw materials to the domestic market.

This contrast seems to stem from the foreign exchange rate regime which is biased for exports and against import substitution in raw materials, intermediate and capital goods. Therefore, I need to investigate the unfavorable side somewhat in detail to have a balanced evaluation of the present subsidy scheme as a policy tool.

C. Foreign Exchange Rate Regime and Import Substitution

1. Negative Import Substitution

Import substitution can be defined as a change in the ratio of imports to domestic demand. Even though there occurred an increase in the domestic supply of imported commodities, there would be negative import substitutions if domestic demand for the commodities increased proportionally more than the supply increment.

Table 9 shows that there has been negative import substitution during the period of 1963-1973. Less than 20 percent of domestic

Table 9. Imports/Domestic Demand

(ratio)

299 Sectors	1963	1973
1. Rice, barley, wheat	0.27	0.253
2. Other agriculture	0.086	0.17
3. Forestry	0.16	0.24
4. Fishery	0.0085	0.042
5. Coal	0	0.998
6. Other mining	0.08	0.29
7. Processed food	0.0875	0.11
8. Beverage and Tobacco	0.006	0.033
9. Fibre spinning and textile fabrics	0.109	0.176
10. Finished textile products	0.0194	0.126
11. Wood products and furniture	0.043	0.07
12. Paper products	0.15	0.16
13. Printing and publishing	0.007	0.026
14. Leather products	0.027	0.17
15. Rubber products	0.04	0.086
16. Basic chemicals	0.43	0.4
17. Other chemical products	0.21	0.24
18. Chemical fertilizer	0.407	0.131
19. Petroleum and coal products	0.462	0.04
20. Non-metallic mineral products	0.13	0.18
21. Iron and steel	0.336	0.6
22. Steel products	0.567	0.17
23. Non-ferrous metal products	0.28	0.437
24. Finished metal products	0.3	0.3138
25. Machinery	0.494	0.75
26. Electrical machinery	0.459	0.43
27. Transportation equipment	0.35	0.414
28. Miscellaneous manufacturings	0.24	0.347
29. Transportation and storage	0.1255	0.12
30. Scrap and unclassifiable	0	0.103
Simple Average	0.19613	0.2542

Source: I-O Tables, 1963, 1973, The Bank of Korea

demand was imported in 1963, whereas more than 25 percent was imported in 1973.

Demand increase must have outweighed supply increase during the period. The trend might be considered as the result of trade liberalization brought together with outward-looking industrialization strategy. Both of exports and imports may increase rapidly as outward-looking industrialization goes on. Or the level of imports in 1963 might have been too low in an optimal sense due to the import substitution policy which was in effect up to 1960 and continued in the transitional period to 1963. Or the policy bias against import substitution, except consumption goods, might have contributed to the negative import substitution. It is not clear without more study on each of them which one is the real reason for the trend. But I assume the policy bias as the real, or at least the main, reason for the trend.

Now let us turn to exports.

2. Import Deepening Change in Exports

Import content analysis can be applied to the export sector to see the trend of intermediate import content of exports. The intermediate import content of exports was analyzed recently by using an input output table. The following table is based on a study by the Korean Development Institute.⁹

As shown in Table 9, the intermediate import content of exports has been increasing from 16.28% in 1960 to 25.66% in 1970.

The study argued that the import deepening change was caused more by demand shift than by import deepening technological change reflected in the I-O coefficient changes. This argument implies that the major factors inducing the import deepening change are the change in

Table 10. Intermediate Import Content of Exports

	t =1960	1963	1966	1968	1970
(1) Intermediate Import Content of Exports with Time t Composition Produced by Time t I-O Coefficients	.1628	.2133	.2140	.2582	.2566
(2) Intermediate Import Content of Exports with 1970 Composition Produced by Time t I-O Coefficients	.2351	.2510	.2374	.2754	.2566
(2) - (1)					
(3) Changes of Intermediate Import Content due to Composition Change	.0693	.0377	.0234	.0172	0
(percentage of (3) to (1))	(42.57%)	(17.68%)	(10.94%)	(6.66%)	
(2) of 1970 - (2) of t					
(4) Changes of Intermediate Import Content due to Import Coefficients Changes	.0215	.0056	.0192	-.0188	0
(percentage of (4) to (1))	(13.21%)	(2.63%)	(8.97%)	(-7.28%)	
(3) + (4)					
(5) Total Intermediate Changes	.0908	.0433	.0426	-.0016	0
(percentage of (5) to (1))	(55.78%)	(20.31%)	(19.91%)	(-0.61%)	

Source: Suh Suk Tai. Import Substitution and Economic Development in Korea, KDI Press. Seoul, Korea. 1975.

demand composition and in the import content of final demand.

The change in demand composition towards an import deepening direction indicates the relative expansion of foreign material intensive industries and the relative contraction of less foreign material using industries. The main reason for the expansion of foreign material intensive industries must be the more favorable cost condition of using foreign materials. As long as foreign materials are cheaper than domestic materials, the foreign material intensive industries will have advantage over the domestic material intensive industries. The import deepening technological change within an industry is also a possibility in this situation. A domestic material intensive industry, for instance, may change its technology to a foreign material intensive one. But the result in Table 10 implies that there has been technological inflexibility in the production function of some Korean industries. The cost condition of using foreign materials largely depends on the foreign exchange rate regime.

Both domestic demand and exports have reached higher dependence on imported materials and goods. And the export promoting, seemingly import substitution neglecting foreign exchange rate regime seems to be one of the major factors to be blamed for the import deepening change.

D. Comments

Korea chose an outward-looking industrialization strategy and has enjoyed rapid economic growth. She promoted export expansion by setting up an extensive export subsidy scheme. Consequently, exports have increased very fast and export industries have improved their efficiency.

But the foreign exchange rate regime was distorted in favor of exports, because the tariff structure was used as a tool for the export subsidy scheme. Consequently import substitution except consumption goods has been relatively neglected.

In the development process, export and import substitution both can play positive roles. If there is a policy tool which can promote both export expansion and import substitution and fewer distortions within each, it will be better than one which either expands exports or accelerates import substitution.

The Korean export subsidy and import tariff scheme has been successful in promoting export expansion, but has not shown satisfactory performance in import substitution. Therefore, it is meaningful to search for better alternative policy tools both for promoting exports and for inducing import substitution via reduction of imports, where it is economical to do so.

FOOTNOTES

III

¹Korean Traders Association, Korean Trade History, Seoul, Korea, 1972. Kwang Suk Kim, Korea's Trade and Foreign Exchange Policy, Korea Development Institute, Seoul, Korea, 1975.

²J. H. Power, "Import Substitution as an Industrialization Strategy," The Philippines Economic Journal, Vol. V, No. 2, 1966.

³B. Balassa, "Trade Policies in Developing Countries," American Economic Review, May, 1972.

⁴H. B. Chenery, "Comparative Advantage and Development Policy," American Economic Review, March, 1961.

⁵Kwang Suk Kim, 1975, op. cit.

⁶R. I. McKinnon, "Tariff and Commodity Tax Reform in Korea: Some Specific Suggestions," prepared for USAID/Korea, Seoul, Korea (mimeo), 1967.

⁷Kwang Suk Kim, 1975, op. cit. It should be considered that the large part of raw, intermediate and capital goods are related to exports and exempted from the tariff duty. Thus, the actual tariff rates on these goods will be lower than the nominal rates. The imports of consumption goods are hardly related to exports. Thus, the actual rates will be almost the same as the nominal rates for the consumption goods. The "nominal rates" are used in contrast to the "effective rates." The effective rates include the tariff rates on inputs used for the production of the related commodities. In this study, the nominal rates are the same as the legal rates. However, they may differ.

⁸Won Tack Hong, Factor Supply and Factor Intensity of Trade in Korea, Korea Development Institute, Seoul, Korea, 1975. (See Table A.20, A.21).

⁹Suk Tai Suh, Import Substitution and Economic Development in Korea, Korea Development Institute, Seoul, Korea, 1975.

IV. BALANCE OF PAYMENTS ADJUSTMENT POLICIES
- A SEARCH FOR THE BEST POLICY TOOL -

A. Monetary Policy, Fiscal Policy and Flexible Foreign Exchange Rate

1. Income, Foreign Borrowings, Foreign Exchange Reserve

The broad policies of adjusting internal demand or the foreign exchange rate to adjust the balance of payments have been categorized into expenditure changing and expenditure switching.

Expenditure changing comes from varying the level of national income mainly through monetary and/or fiscal policy. Expenditure switching uses the foreign exchange rate to divert domestic and foreign expenditure between home and foreign goods.

With the aid of a Keynesian style short-run model,¹ it can be shown that changing foreign exchange rate is better than monetary and/or fiscal policy mainly in three respects.

First, monetary and/or fiscal policy helps to restore balance of payments equilibrium. But the government needs foreign exchange reserves enough to finance the payment deficit during the long adjustment period. The restoration of external balance requires a longer time with the monetary and fiscal policy than it does with foreign exchange rate variation, due to the former policy's indirect effects and potential time lags. The cost of holding foreign exchange reserve should be considered.²

Second, (with foreign borrowings fixed) expenditure reducing by monetary and/or fiscal policy to eliminate a balance of payments deficit will result in a fall of the national income.³

Alternatively, to keep the income level from falling, the economy would have to bring in additional foreign capital which will

impose some inflexibility on the economy in the form of debt-servicing obligations.

2. Short-Run vs Long-Run Adjustment

The use of a proper monetary and/or fiscal policy may enable a nation to achieve improvements in the balance of payments, if the nation can afford to neglect the three problems pointed out above. But the question whether they are capable of achieving any more than a short-run or temporary favorable effect on balance of payments arises.

The question we have to ask, first of all, is what is the basic cause of the balance of payments deficit. If the cause is a temporary one and deep-seated corrective market forces are at work but slowly, then temporary measures may do a good job.

But, if the basic cause of the deficit is that a country's cost and price structure is permanently out of line with the rest of the world, this basic cause should be eliminated. Without eliminating the basic cause, any policy measure cannot have lasting favorable effects on the balance of payments.

The foreign exchange rate directly links domestic price and cost structures to the world's. So its flexibility can keep the domestic price structure in line with the world's. Therefore, a change of the foreign exchange rate should be used to have lasting effects on the balance of payments instead of monetary and/or fiscal policy.

3. Devaluation Controversies

Exchange-rate adjustment is the most efficient weapon for correcting payments disequilibrium. But there are divergent opinions regarding its cost and side effects.

(A) A Need for Resource Mobility, Complementary
Aggregate Demand Policies and Symmetric Price Flexibility⁴

Devaluation restricts import demand and stimulates exports; but it increases domestic demand for import substitutes and restricts potential domestic supply by diverting resources to export production. Therefore, devaluation may not be successful, if other components of effective domestic demand are not reduced by some complementary policies when the economy enjoys full employment and full capacity. In this situation, the foreign exchange rate change should be accompanied by restrictive monetary and fiscal policies to avoid inflationary pressures. Furthermore, resources must be mobile so as to permit their transfer from the non-traded to the traded goods sectors in response to the change in relative prices. To avoid inflation completely, prices and wage rates must be flexible symmetrically for upward and downward movements.

(B) Uncertainty Problem⁵

Under a fixed exchange rate supported by monetary and fiscal policy, there is no uncertainty as to the future exchange rate. This implies that there is no hedging cost in the sense of the discount or premium on forward exchange. But a continuing policy of exchange rate adjustment and the accompanying price structure change will create uncertainty for the future exchange rate and traders will bear a hedging cost to avoid exchange risk.

This argument ignores, however, the uncertainty that would be created in domestic markets. Monetary and fiscal policy would have to change direction and magnitude very often to maintain the foreign exchange price fixed with regard to international price

changes. Those swings of expenditure changing policies will disturb domestic markets so often that traders will, also, have to bear a hedging cost in futures market, or assume the risk.

(C) Tax on Labor⁶

Devaluation raises domestic price levels. In Korea it is a tax especially on labor, because wage increase does not follow the price increase. But it is not really the devaluation that taxes: devaluation merely makes explicit the tax that has been concealed in the scarcities that existed before the devaluation. In the absence of the devaluation, the present generation would have to be taxed by other policies that would force a reduction in absorption of resources, or future generations would be forced to share in the tax by the repayment of foreign debt which would be accumulated by an inappropriate foreign exchange price, or by the loss of reserves.

(D) Increase in External Debt⁷

Devaluation increases the burden of external debt expressed in domestic currency. The domestic value of debt service does rise. The government as debtor must collect more in tax revenues, and private debtors must raise prices on their products or economize on local costs to meet foreign claims against them.

But the increase in debt burden is not real. It must be paid in foreign exchange and has not risen in those terms. And prices of tradeables have not changed in terms of foreign exchange. Moreover, the devaluation will stimulate exports and reduce imports by encouraging efficient domestic competition against imports. Consequently the proportion of debt service to national product and debt service ratio in international currency will be reduced.

(E) Destabilizing Speculation⁸

One devaluation will increase the expected chance of successive devaluations. A currency with such prospects is said to be easy prey for destabilizing speculation. Speculators attack a currency because it is vulnerable, as indicated by a discrepancy between the decreed parity and relative prices, world versus domestic, of tradeables in commodity and capital markets, and not because a decreed parity has changed. They search for a currency that is futilely resisting a substantial reluctant adjustment.

The foreign investors would prefer, other things being equal, a stable exchange rate for transfer of capital and earnings. A stable rate is not inviting, however, when it is likely to be protected by bans on profit repatriation, by repudiation of loan contracts, or by especially severe taxation of foreign enterprise. Measures in defense of an overvalued currency become more painful to the investor than devaluation. Those measures will raise the interest cost of foreign savings to an extent that will compensate for the risks.

(F) An Obstacle to Central Planning⁹

Devaluation impairs the government's central planning powers. A continuous excess demand for foreign exchange will bring traders to the planning government authority and give the authority opportunities to scan and control the flows of goods and capital.

If government bureaucrats are highly capable, fully knowledgeable and respectably honest, government intervention in trade might be as efficient as a market system. But governments incapable of efficient administration and operated by corrupt

bureaucrats are hardly qualified to optimize international trade by detailed intervention.

(G) The Real Cost of Devaluation¹⁰

The possible loss of real income by a worsening of the terms of trade that devaluation often (not necessarily) brings about can be the real cost of devaluation. The chances for a deterioration of the terms of trade after a devaluation increase as supply elasticities (exports and imports) become larger and demand elasticities smaller. The export demand elasticity should be very large for Korean products, because her market share in the world market is negligible. Thus, it is expected that the terms of trade would not deteriorate badly, even though the supply elasticities are large. And this should be weighed against the possible underutilization of resources which would put the economy below the production possibility curve with unemployment in the absence of devaluation. With the policies for restricting the aggregate demand, unemployment and underutilization of resources are really possible. The potential reduction of output might outweigh the possible worsening of the terms of trade.

(H) Inflationary Effects¹¹

Many charge that devaluation accelerates inflation. The primary effect of a devaluation is to increase the price (in terms of the home currency) of imported foreign materials and exportables. As prices of imported materials increase, the cost of some production may go up and hence other product prices may rise as well. As the price level increases, labor will ask for higher wages.

When there is resource immobility between the traded and non-traded goods sectors together with the downward inflexibility of wage and prices, it is also possible that price will go up in the process of resource reallocation via devaluation which expands traded goods sectors.

But the inflationary potential should be weighed against other possibilities in the absence of devaluation. First of all, unemployment is likely to be increased with alternative aggregate demand restricting policies. In this case, the trade-off between unemployment and inflation should be carefully considered. It is also possible that foreign capital inflows due to the interest rate differentials would result in the accumulation of foreign exchange reserves when the domestic interest rate is higher than the foreign rate. By devaluation, the interest rate gap can be eliminated, and the inflationary foreign capital inflow will cease. In this respect, the inflationary effects of devaluation should be weighed against the inflationary foreign capital inflow.

Those who worry about a devaluation's potential inflationary consequences should also consider the possible increase of unemployment and inflationary foreign capital inflow in the absence of devaluation.

B. Foreign Exchange Rate and Uniform Export Subsidy--Import Tariff Scheme

Some suggest that a uniform export subsidy and import tariff scheme has the same effect on balance of payments as that of devaluation, if the subsidy-tariff scheme is applied to all international transactions.

This is true apart from the efficiency of administration and possible corruption problem, and possible differences in elasticities of exports and imports with respect to these two schemes.

1. Private and Social Cost of Foreign Borrowings

In real practice, a subsidy-tariff scheme is not applied to all international transactions, but only to merchandise trade. I will compare devaluation with this realistic case. Under conditions of differential rates of inflation and differing degrees of monetary restraint among countries, social and private real rates of interest may diverge and lead to too much or too little foreign borrowings.

Let us assume that the U.S. dollar is the international reserve and that the world economy is one in which rates of inflation may vary from country to country but remain fairly steady within each country.

Under these assumptions, I can say that the real social cost of foreign borrowing in a country like Korea is the nominal rate of interest on foreign-currency-denominated foreign borrowings less the expected rate of inflation of prices of internationally traded goods. The nominal rate of interest must be so adjusted because repayment of a loan represents a future cost, either as foregone imports, or as additional exports to save or earn the necessary foreign exchange. If the prices of internationally traded goods go up, then the cost of servicing the loan is reduced by the amount of price inflation.

Symbolically,

$$r_s = r_n - r_{ip}$$

where

$$\begin{aligned} r_s &= \text{real social cost of foreign borrowings} \\ r_n &= \text{nominal rate of interest on foreign borrowings} \\ r_{ip} &= \text{the expected rate of price inflation of} \\ &\quad \text{internationally traded goods} \end{aligned}$$

The private real interest cost to the local borrower, however, may be quite different. The nominal rate of interest on foreign borrowing must be adjusted by the expected local rate of price inflation and the expected rate at which the local currency devalues. The local borrower repays the loan in terms of local currency which must be converted into dollars at the future foreign exchange rate. Hence, the real cost of repayment declines when the local price level increases and increases when the local currency is devalued. The formula, for the real private interest cost of the loan r_p is,

$$r_p = r_n - r_{dp} + r_e$$

where r_{dp} is the expected rate of domestic price inflation and r_e is the expected rate of local currency devaluation.

The equation for real private cost of foreign borrowing is based on the following analysis of the real interest rate. The analysis below will show why there is no need for separation of exporters from businessmen in the local market.

(A) The Real Interest Rate in a Closed Economy

$$r_{lp} = i - r_{AP} \tag{1}$$

i is money rate of interest, r_{AP} is actual rate of price increase and r_{lp} is real interest rate of local borrowings.

But in decision making of lending and borrowing, the actual rate is substituted for the expected rate of price increase. The expectation will be based on the price increase rates of the previous several years.

$$r_{lp} = i - r_{dp} \quad (2)$$

(B) The Real Interest Rate in an Open Economy

In an open economy where local and foreign traders can be distinguished, the choice of policy tool to deal with external disturbances plays a role in formulating the real interest rate equations.

(1) Under a flexible exchange rate system where the foreign exchange rate changes in approximately the same proportion as the purchasing power parity index:

(a) For the borrowers who sell their products in local market only:

(1) Local financing case:

$$r_{lp} = r_{ln} - r_{dp} \quad (3)$$

where r_{lp} and r_{ln} is real and money interest rate of local borrowings.

(2) Foreign financing case:

$$r_p = r_n - r_{dp} + r_e \quad (4)$$

(b) For the exporters:

(1) Local financing case:

$$r_{lp} = r_{ln} - (r_{ip} + r_e) \quad (5)$$

(2) Foreign financing case:

$$r_p = r_n - (r_{ip} + r_e) + r_e \quad (6)$$

Under this system, the expected rate of devaluation is based mainly on the differential between the rate of domestic price increase and the rate of the major trading country's price increase. Therefore it can be expected that $(r_{ip} + r_e)$ is approximately equal to r_{dp} . The real rate of interest is approximately the same for both local and foreign traders.

(2) Under export subsidy and an import tariff scheme with a pegged foreign exchange rate:

In this case the export subsidies per dollar of exports divided by the official foreign exchange rate plays the same role as the rate of devaluation.

Therefore, the real interest rate is approximately the same for both exporters and local traders for the same reasons discussed above.

(3) Under a monetary and fiscal policy scheme with a fixed foreign exchange rate and without export subsidies:

(a) For the borrowers who sell at local markets only:

(1) Local financing case:

$$r_{lp} = r_{ln} - r_{dp} \quad (7)$$

(2) Foreign financing case:

$$r_p = r_n - r_{dp} \quad (8)$$

(b) For exporters:

(1) Local financing case:

$$r_{lp} = r_{ln} - r_{ip} \quad (9)$$

(2) Foreign financing case:

$$r_p = r_n - r_{ip} \quad (10)$$

But this policy scheme will continuously change r_{1n} and the rate of domestic price increase, so that the economy can maintain a favorable balance of payments situation. So the context of this discussion will be different from the former two cases, (1) and (2) above.¹²

If the real private cost of foreign borrowing is less than the real social cost, then foreign borrowing will be excessive, if local borrowers incur debt up to the level at which the real rate of return equals the real private cost of foreign borrowings.

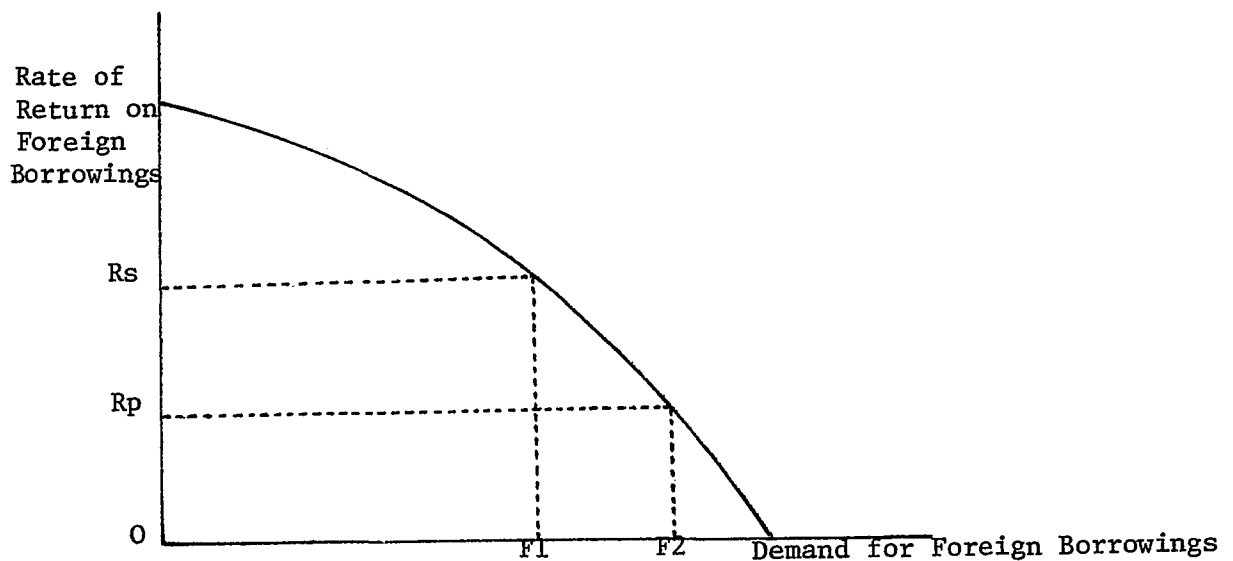


Figure 2. Demand for Foreign Borrowings

In Figure 2, the optimal level of foreign borrowing is F_1 , at which point the real social cost of foreign borrowing equals the rate of return from the use of the borrowings. But the actual level of foreign borrowing will tend toward F_2 , the level at which the rate of return equals the private cost of foreign borrowing and which exceeds the optimal level.

The social and private cost of foreign borrowing will thus be equal only, if $r_e = r_{dp} - r_{ip}$, or verbally, if the expected rate of local currency devaluation equals the expected rate of domestic inflation less the expected rate of inflation of prices of internationally traded goods.

This excessive foreign borrowing will put inflationary pressure on the economy through increased money supply via the accumulation of foreign exchange. Moreover, it will result in the inefficiency of consumption over time, which can be shown in terms of Fisherian analysis of consumption, investment and interest rates.¹³ In a two period closed economy model, the optimal level of savings and investment will be determined at the equilibrium point where the interest rate, the return on capital, and the marginal rate of substitution over time in consumption are all equal. In an open economy model in which foreign capital is available at a rate of interest less than the equilibrium interest rate, foreign borrowing can increase consumption in both periods, if social real rate of interest is equal to the private real rate of interest. But social real rate of interest will not be equal to the marginal rate of substitution and rate of return on capital, if it diverges from the private real rate of return. Consequently, the divergence between the private and social

real interest rate on foreign borrowings would result in non-optimal consumption over time.

2. Foreign Capital Inflow and Related Imports

Local businessmen are faced with two sources of financing: local financial institutions and intermediaries, and foreign lenders. The choice will depend on the borrowing cost, other things being equal.

The real private cost of foreign borrowing is r_p , where $r_p = r_n - r_{dp} + r_e$. The real private cost of local borrowing is r_{lp} , where $r_{lp} = r_{ln} - r_{dp}$ and r_{ln} is the nominal rate of interest on local borrowings.

If r_p is lower than r_{lp} , borrowers will prefer the foreign financing source, and vice versa. The gap between r_n and r_{ln} can be covered by r_e . In case $r_n < r_{ln}$, a positive r_e will be able to equate r_p to r_{lp} and vice versa.

When r_{lp} is higher than r_p and r_e does not fill the gap, foreign lenders will be drawn by the differential between their domestic rates of interest and borrowing country's rate of interest. The local borrowers will be also drawn by the differential between foreign loan's interest rate and local loan's rate.

Many of the foreign borrowings takes the form of trade credit. Many advanced countries have ample credit facilities, and standard thirty to ninety day financing for exports of consumer goods, raw materials and intermediate goods can easily be either extended to longer periods or renewed each ninety days. Official guarantees by advanced countries on longer term supplier credit--one to five years--for exports of machinery and other equipment are easily available, too.

Private exporters in advanced countries have no risk in supplying such credits to those importers in LDCs, because their own government is providing the guarantee. For LDCs' importers, supplier credits bearing lower interest rate than the rate they have to pay in local financing are attractive and profitable, as long as the foreign exchange rate change does not exceed the interest rate differential. Sometimes a very unfavorable trade credits are taken, short in term and bearing interest rates that are higher than normal international interest rates. It is also possible that the trade credits do not comply best with the economy's requirements in terms of productivity.

A suggestion might say that government authority distinguish the good ones from the bad ones. But the administrative problems of distinguishing "good" from "bad" commercial loans are formidable and are made even more so by various insurance programs for export credits on the part of advanced countries, which blur the distinction between "good" and "bad" commercial loans.

As long as the interest rate differential is not offset by expected foreign exchange rate changes, it is quite natural that those local businessmen have strong incentives to draw on foreign source of finance, even though the composition of imports may be distorted by easy credit terms.

Consequently, there remain two bad effects. First, low cost foreign loans relative to local commercial loans may be a form of negative protection to the local producers of capital goods, and raw and intermediate goods. Second, low cost foreign loans favor those sectors that are relatively heavy users of foreign capital and raw and intermediate goods.

I have shown up to now the fact that an inappropriate exchange rate may result in excessive borrowing of foreign capital and consequently hurts import-competing local industries. In addition, an earlier study has shown that the trade deficit in Korea has been related to capital inflow.¹⁴ It was found that before 1967 the pattern of trade deficit in Korea was mainly related to the pattern of long-term capital inflow, and after 1967 the trade deficit pattern has been related mainly to the short-term capital inflow pattern.

C. Devaluation vs Subsidy-Tariff Scheme

We know easily that a flat tariff on imports together with identical rate of flat subsidy on exports would be equivalent to devaluation for commodity transactions, if there are no elasticities differences. But capital transactions and service items in current account would continue to take place on the basis of the non-devalued official exchange rate. Therefore, real interest rates in terms of local currency would remain low and the social opportunity cost of foreign borrowings would continue to be greater than the private real interest cost of foreign loans. And the private real cost of foreign loans will be continuously lower than the private real cost of local loans. While a subsidy-tariff scheme may help maintain a realistic exchange rate for exports and imports, the demand for foreign loans would continue to exceed optimal level.

The divergence between social and private costs of foreign borrowings would induce foreign traders to raise trade credit and to exploit the advantage of trade arbitrage. In many cases, funds are supplied by the exporter or the exporter's bank to allow the importer

a temporary delay in payment for goods received. This flow is appropriately called trade credit. Trade credit is always related to imports of goods and materials from the exporting countries. Using more trade credit would lead to more imports. In some cases, the funds may appear to be financing trade in this fashion when in fact they are used differently. Even though traders have ample funds to finance their import bill, it would be profitable for them to use trade credit and invest their funds in the domestic financial market, because the domestic real interest rate is higher than the real interest rate on foreign credit. This is a pure interest arbitrage transaction involving borrowing in one country at a relatively low interest rate and investing at a higher rate in another country. This is appropriately termed trade arbitrage. Trade credit and trade arbitrage are mainly used to exploit the profit from the interest differential between domestic and foreign financial markets. The imported goods and materials via trade financing are, therefore, not likely to comply best with the importing country's requirements in terms of productivity. Some distortions in the composition of imports might be brought out by the imports induced by the interest differential.

Increased imports via using profitable foreign credit would directly hurt local import competing industries, because the costs of production of the imported commodities in advanced countries are likely to be cheaper due to the economy of scale already achieved there. The existence of an interest differential is, therefore, a kind of negative protection to the local import competing goods producers. Also those foreign credit facilities with lower costs

hurt local producers indirectly, because low cost foreign loans favor those sectors that are relatively heavy users of foreign materials and goods.

As long as the divergence between real interest rates on foreign and domestic loans operates as a disadvantage to local import competing producers and as an incentive to borrow foreign capital which includes several forms of trade credit and trade arbitrage which will bring in more foreign goods, devaluation is better than a subsidy-tariff scheme on merchandise transactions in promoting both export expansion and import substitution. Moreover, the existence of an interest rate differential would impose an inflationary pressure on the economy with monetary expansion via foreign exchange accumulation and would result in the inefficiency of consumption over time. Therefore, a foreign exchange rate change is required, for it could eliminate the interest rate differential.

As was noted above in Chapter III, Korea adopted a distorted export subsidy and import tariff scheme. Consequently, export expansion was successful at the expense of unsatisfactory import substitution in raw materials and in intermediate and capital goods. The theoretical discussions above imply that the Korean experience is partly a natural result of using a subsidy tariff scheme instead of foreign exchange rate changes, and partly also the result of the distortions created by non uniformity in the subsidy-tariff scheme.

We turn now to a test of the theoretical implications with Korean data.

FOOTNOTES

IV

¹R. M. Stern and J. D. Richardson, "An IS-IM Exposition of Policies for Internal and External Balance," presented at the annual meeting of the Western Economic Association, University of California, Davis (mimeo), 1970.

²E. C. Suss, "A note on reserve use under alternative exchange rate regime," I.M.F. Staff Paper, July, 1976. This study shows that reserve use, in general, has declined under the present period of managed floating exchange rate.

³T. Scitovsky, Money and the Balance of Payments, Chapter 13, Rand McNally and Company, 1970. He says "Restrictive monetary, fiscal policies alone could, if drastic enough, restore payments equilibrium; but only by reducing domestic employment and output as well."

⁴Ibid., Chapter 13.

⁵R. M. Stern, The Balance of Payments, Chapter 5, Aldine Publishing Company, Chicago, Ill., 1973.

⁶E. S. Shaw, Financial Deepening in Economic Development, Chapter 7, Oxford University Press, New York, 1973.

⁷R. M. Cooper, Currency Devaluation in Developing Countries, Essays in International Finance, No. 86. Princeton: International Finance section, Princeton University, 1971.

⁸International Monetary Fund, Annual Report, Chapter 4, 1967.

⁹H. G. Johnson, Money, Trade and Economic Growth, pp. 25, George Allen and Unwin, Ltd. 1962.

¹⁰T. Scitovsky, op. cit.

¹¹E. S. Shaw, op. cit.

¹²Korean Case. The Korean system is assumed to belong to the "(2)" category in the above discussion. In Table 7, there are effective exchange rates on exports which are purchasing power parity adjusted. The year of 1965 was set as a base year. The following table shows the deviation of the effective foreign exchange rate on exports from the base year in percentage terms.

Year	Deviation (%)
1962	-13
1963	- 9
1964	0
1965	0
1966	0
1967	1.8
1968	1.9
1969	2.6
1970	1.2
1971	6.7
1972	2.9
1973	11

The years of 1962, 1963, 1973 show large deviations. The fact that the foreign exchange rate reform was effective in 1964 explains the deviation of the first two years. The very large deviation in 1973 is most likely due to the excessive subsidy on exports.

As long as the deviation is not zero, it would be ideal to distinguish the foreign borrowings for export activities from the borrowing for local sales activities. Accordingly, r_{ip} would be used for the real private cost of foreign borrowings of exporters and r_{dp} for local sales businessmen. But it is not possible, as of now, to distinguish one from the other with the Korean data.

As the second best choice, I accept my assumption's validity and will use r_{dp} in the estimation for both of them. With the shown trends of deviations, I do not expect there will be significant biases in the estimated results.

¹³I. Fisher, The Theory of Interest, Macmillan, New York, 1930.

J. Hirschleifer, Investment, Interest and Capital, Prentice-Hall, New Jersey, 1970.

¹⁴H. Y. Rhee, The Structural Change of Korean Balance of Payments, (1961-1972), Korea Development Institute, Seoul, Korea, 1973.

V. EMPIRICAL ANALYSIS

A. Introduction

In this analysis, I am going to use an econometric model to test the theoretical implication I have discussed, namely, that it would have been better for Korea's balance of payments if she had employed foreign exchange rate adjustments instead of a subsidy-tariff scheme as a policy tool for the outward looking industrialization strategy.

Therefore, my empirical work is focused on comparing two policy tools: devaluation of foreign exchange rate and uniform rate of subsidy-tariff scheme. The analysis is partial in that it deals with the foreign sector only.

The equation system is a complete one with nine endogenous variables and nine equations. I tried to represent the unique character of the operation of Korea's economy in the equations. All equations in the system are identified.

There are two systems of estimated coefficients corresponding to the two policy tools. All endogenous variables were observed values in estimating the coefficients, but are predicted values in estimating the balance of payments effects of the two policy tools. The two stage least squares method was employed in estimating the coefficients and time series processor package.

B. Variables

(a) Endogenous Variables

X : Exports (\$ mil)

XGM : Exports of manufacturing goods (\$ mil)

M : Imports (\$ mil)
 MC : Imports of consumption goods (\$ mil)
 MK : Imports of capital goods (\$ mil)
 MIX : Imports of raw and intermediate goods for exports (\$ mil)
 MID : Imports of raw and intermediate goods for domestic
 use (\$ mil)
 FCL : Foreign commercial loan (\$ mil)
 EIF : Expected real rate of interest on foreign loan¹
 (percent per annum)

(b) Exogenous Variables

(A) Policy Variables

OR : Purchasing power parity (PPP) adjusted official
 foreign exchange rate
 ERM : Effective foreign exchange rate on imports
 (= OR + SM, where SM = Tariff and/or tariff
 equivalents per dollar of imports)
 ERX : Effective foreign exchange rate on exports
 (= OR + SX, where SX = Subsidy and/or subsidy
 equivalents per dollar of exports)

(B) Other Exogenous Variables

XGP : Exports of primary goods (\$ mil)
 XH : Foreign exchange reserves (\$ mil)
 YNA : Non-agricultural gross national product (W bil)²
 I : Gross Investment (W bil)
 DC : Domestic consumption (W bil)
 M₀ : Imports of grain plus non-classified imports
 (\$ mil)

FPL : Foreign public loan (\$ mil)

FDI : Foreign direct investment (\$ mil)

C : Constant terms. (Vector of ones)

There are twelve exogenous variables including three policy variables and twelve observations, from 1962 to 1973.

In the estimation of current account coefficients, the purchasing power parity adjusted real effective exchange rate on exports, imports and PPP adjusted official exchange rate was used. But in the estimation of foreign commercial borrowing, the nominal official foreign exchange rate was used. The reason is clear. In merchandise trade, the real effective price of foreign exchange plays a role. But in foreign commercial borrowing it does not, because Korean Won is exchanged for dollars at the nominal official exchange rate at the time of exchange through the Central Bank.

C. Estimated Results

I present here two systems of results: one without dummy variables and the other with dummy variables for various years for reasons explained below. The former will be shown with the sign of (A) and the latter with (B). Asymptotic t values are given in the parentheses below the corresponding coefficient estimates. Asymptotic F values are also given below the corresponding estimated equations. We note that the two stage least squares method gives asymptotic t and F values only, and that for a sample size as small as mine this constitutes a major difficulty in applying t and F-tests to coefficient

estimates and estimated equations. I do not report the Durbin-Watson values here because they have a very limited meaning due to the small sample size. The empirical findings reported below should be understood with qualification in this context.

(a) Exports

$$X = XGM + XGP \quad \dots\dots (1)$$

$$XGM \quad \dots\dots (2)$$

$$(A) \quad XGM = -2275.15 + 3.298 \quad SX$$

$$(-0.95) \quad (0.29)$$

$$+5.896 \quad OR + 1.41 \quad YNA$$

$$(0.684) \quad (4.14)$$

$$\dots\dots (2) - (A)$$

$$R^2 = 0.8755, F = 18$$

Elasticities:

$$\sigma_{XGM \cdot SX} = 0.12$$

$$\sigma_{XGM \cdot OR} = 1.026$$

(B) XGM; Dummy on 62, 63

$$XGM = -8649.37 + 1.18 \quad YNA$$

$$(-3.81) \quad (5.35)$$

$$+ 28.02 \quad OR + 20.62 \quad SX$$

$$(3.5) \quad (2.44)$$

$$+1095.80D \quad \dots\dots (2) - (B)$$

$$(3.72)$$

$$R^2 = 0.96, F = 40$$

Elasticities:

$$\sigma_{XGM \cdot SX} = 0.72$$

$$\sigma_{XGM \cdot OR} = 4.9$$

In equation (1), XGP is exogenous because its supply elasticity with respect to price change is very low and random factors play a greater role in its variation.

In equation (2), I assume that world demand conditions do not significantly affect Korea's volume of exports, because the market share Korea took is very small.

YNA represents the supply capacity of Korean manufactured goods exports. It is taken as exogenous.⁴

Dummys on 1962, 1963 reflects the fact that the foreign exchange system was effectively set up from 1964 and the outward-looking industrialization policy became active from that year. Consequently, both exporters and government officials became more export-oriented beginning in 1964.

The results are improved with the dummy variables. For years of 1962 and 1963 the dummy has a value which is asymptotically significant at the 95 percent level.

(b) Imports

$$M = M_0 + MC + MK + MIX + MID \dots\dots\dots (3)$$

$$MC \dots\dots\dots (4)$$

$$(A) \quad MC = -66.35 + 0.08 DC + 0.14 XH \dots\dots (4) - (A)$$

$$(-3.5) \quad (2.3) \quad (2.3)$$

$$R^2 = 0.96, F = 11.5$$

$$(A)' \quad MC = -63.7 + 0.09 DC - 0.16 OR$$

$$(-0.6) \quad (2.06) \quad (-0.51)$$

$$-0.986 SM + 0.15 XH \dots\dots (4) - (A)'$$

$$(-0.42) \quad (2.19)$$

$$R^2 = 0.96, F = 47$$

Elasticities:

$$\sigma_{MC \cdot OR} = -0.29$$

$$\sigma_{MC \cdot SM} = -0.14$$

Equation (3) is an identity. In the equation (3), M_0 is given as an exogenous variable, because non-classified imports are too small to make any significant difference in the results and imports of grain respond to random factors such as weather so often that statistical fit is very difficult. DC reflects expenditure factors and OR and SM reflect relative price factors. XH reflects the foreign exchange reserve position. It is assumed that government control on the imports of consumption goods was relaxed if the foreign exchange reserve position became more favorable. This assumption is based on the fact that the accumulation of foreign exchange reserve will bring inflationary pressure on the economy via an increase in money supply. To avoid the foreign exchange inflation, the government usually loosens its control on imports of consumption goods. The estimated results on XH support this view.

$$MK \quad \dots\dots (5)$$

$$(A) \quad MK = 34.4 - 0.325 \quad OR$$

$$(0.12) \quad (-0.27)$$

$$+ 0.29 \quad FCL + 2.28 \quad FDI$$

$$(0.55) \quad (2.22)$$

$$+ 1.0 \quad I \quad \dots\dots (5) \quad \dots (A)$$

$$(1.47)$$

$$R^2 = 0.97, \quad F = 59$$

Elasticities:

$$\sigma_{MK \cdot OR} = 0.133$$

(B) MK; Dummy on 1970

$$MK = 161.73 - 0.86 OR$$

$$(0.8) \quad (-1.1)$$

$$0.38 FCL + 2.52 FDI$$

$$(1.06) \quad (3.63)$$

$$+ 0.96 I - 170.4 D \dots\dots (5) - (B)$$

$$(2.1) \quad (-3.08)$$

$$R^2 = 0.99, F = 106$$

Elasticities:

$$\sigma_{MK.OR} = 0.353$$

As the institutional nature of foreign capital markets indicates, foreign borrowing affects MK. Foreign direct investments are usually accompanied by imports of physical capital goods. The high coefficient for FDI implies linkage effects. Most capital goods enter duty free. Therefore, the official exchange rate is the most relevant exchange rate to use. The level of investment is also a determinant of the imports of capital goods.

The dummy in 1970 reflects the government's establishment of a special task force to scrutinize companies that imported great amounts of foreign capital with government guarantees and failed to provide the required matching domestic investment. The reports of the task force resulted in a surprisingly heavy punishment of those firms. Some of the owners transferred their companies to government management. Consequently, some of the foreign loan-tied-imports of capital goods that were already agreed seem to have been cancelled or suspended temporarily by the embarrassed businessmen.

MIX: (6)

$$(A) \quad MIX = -10.158 - 0.1134 FCL + 0.54 XGM$$

$$(-0.38) \quad (-0.85) \quad (14.99)$$

$$..... (6) - (A)$$

$$R^2 = 0.98, F = 329$$

(B) Dummy on 1973

$$MIX = -11.25 + 0.2443 FCL$$

$$(-0.92) \quad (3.55)$$

$$+ 0.353 XGM + 405.1 D$$

$$(13.06) \quad (8.17)$$

$$..... (6) - (B)$$

$$R^2 = 0.99, F = 1595$$

XGM is a determinant of MIX as long as the import contents of export commodities are positive. MIX may be defined as a ratio to XGM. Foreign borrowings, especially trade credit, is another determinant of MIX. MIX is always duty free and OR does not affect MIX, because XGM for which MIX is used absorbs the increased burden on MIX. FCL appears with the wrong sign without the dummy variable.

The dummy for 1973 reflects the international raw material crisis of the year. It was the year of panic purchasing of raw materials for exports to accumulate inventories as a hedge against raw material scarcity and possible sharp increases of raw material prices. Government authorities prompted the hurried purchasing by export commodities producers with special foreign exchange loans.

MID: (7)

$$(A) \quad MID = 200.448 + 0.3306 FCL$$

$$(1.078) \quad (1.42)$$

$$- 0.266 \text{ ERM} + 0.233 \text{ DC}$$

$$(-0.35) \quad (2.4)$$

$$R^2 = 0.96, F = 60$$

Elasticities:

$$\sigma_{\text{MID} \cdot \text{ERM}} = -0.161$$

(B) Dummy on 72

$$\text{MID} = 194.45 + 0.161 \text{ FCL} - 0.54 \text{ ERM}$$

$$(1.96) \quad (1.24) \quad (-1.31)$$

$$+ 0.35 \text{ DC} - 136.23 \text{ D} \dots\dots (7) - (B)$$

$$(5.29) \quad (-4.6)$$

$$R^2 = 0.99, F = 163$$

Elasticities:

$$\sigma_{\text{MID} \cdot \text{ERM}} = 0.27$$

DC is a final demand factor which determines the derived demand for MID. ERM is a relative price factor. FCL is also related to MID due to the foreign capital market's institutional character.

The dummy for 1972 reflects the critical financial situation during the year. For imports of raw materials and intermediate goods for domestic use, some portion of the total import value is required to be deposited in advance when letters of credit are opened. Usually it has been around 50%. This advance deposit requirement imposes a financial burden on importers. Those domestic market oriented firms could not compete with exporting firms in the access to bank money, so they had been accustomed to borrowing from the non-institutional money market with high interest rates. In 1972,

available loanable funds were very scarce and interest rates soared in the non-institutional money market. With these financial difficulties, the domestic market dependent firms were forced to maintain lower inventories of materials and lower levels of production. To rescue those financially troubled companies, the government announced the President's emergency decree for economic stability. The decree froze all the repayment of debts for three years. Consequently, the non-institutional money market disappeared temporarily. But commercial banks did not supply new loans to those companies enough to compensate for the disappearance of the non-institutional financing source. So those companies had great difficulties in financing during the transition period during which new financial orders were established. Under these circumstances, MID was abnormally low.

(c) Capital Accounts

$$FS (= \text{Foreign Savings}) = FCL + FPL + FDI \quad \dots (8)$$

$$FCL \quad \dots (9)$$

$$(A) \quad FCL = -110.873 - 0.139 (X_{-1} - M_{-1})^5$$

$$(-3.35) \quad (-2.285)$$

$$+ 0.9523 I - 46.72 EIF$$

$$(7.9759) \quad (-0.35)$$

$$\dots (9) - (A)$$

$$R^2 = 0.98, F = 117.729$$

Elasticities:

$$\sigma_{FCL \cdot EIF} = 0.02$$

(B) Dummies on 67, 70, 71

$$\text{FCL} = -120.225 - 0.26 (X_{-1} - M_{-1})$$

$$(-7.72) \quad (-7.3)$$

$$+ 0.8275 I - 261.16 \text{ EIF}$$

$$(13.82) \quad (-3.5)$$

$$-58.11 D \dots\dots (9) - (B)$$

$$(-4.1)$$

$$R^2 = 0.99, F = 364$$

Elasticities:

$$\sigma_{\text{FCL} \cdot \text{EIF}} = 0.11$$

Equation (8) is an identity. The FCL equation reflects the two gap approach and the financing cost factor.

The foreign exchange reserve plays a role as a buffer for variations of exports and imports during a year. During a balance of payments deficit the foreign exchange reserve will finance some of the imports. In the next year, some extra foreign capital will be induced to restore the foreign exchange holding to desired level. It can take the forms of cash loans and/or suppliers credit. Cash loans give inflationary effects via an increased money supply, whereas supplier's credit does not have any monetary side effects. So supplier's credit would be preferred. Therefore, the last year's volume of trade deficit affects this year's foreign commercial loans. The estimated coefficient on $(X_{-1} - M_{-1})$ support my view.

I reflects investment activities in relation to domestic saving. If investment increases, domestic saving also increase, for income level go up through the investment's multiplier effect.

But the investment saving gap get larger in absolute amount, as long as saving coefficient is constant. Therefore, increment of I would need more foreign financing.

EIF is the borrowing cost factor.

Dummys in this equation reflect businessmen's sensitiveness to the social and political situation. In 1967, students went to the streets to fight against those businesses that introduced foreign capital. In 1970, the Government, with a political attack from minority party and mounting public worries about the repayment of foreign debt, critically punished by withholding credit and foreign exchange those companies which were heavily dependent on foreign capital and unsoundly managed. This sanction gave its effects through 1971. Social and political antagonism against foreign capital had negative effects on the introduction of foreign capital as businessmen respond to it very sensitively. The estimated coefficients on the dummy variables support my view.

D. Simulations

(a) The basic commercial policy variables in this analysis are:

- a. The official exchange rate, (OR)
- b. Subsidies and subsidy equivalents per dollar of exports, (SX),
- c. Tariffs and tariff equivalents per dollar of imports (SM).

All these variables were computed on a purchasing-power-parity basis.

The rate at which devaluation of official exchange rate

takes place affects the real private cost of servicing foreign loans as well as export performance and import demand. The more rapid the rate of devaluation, the greater is the local cost of financing foreign loans and the lower is the demand for foreign commercial loans.

The rate at which the increase of subsidy on exports and tariff on imports take place affects only export performance and import demand, because they are limited to merchandise transactions only.

(b) The interpretation of the empirical results will be done with equation, $FS = M - X$ (10), where M, X, FS are predicted values based on two systems of parameter estimates corresponding to two different policy tools. The balance of accumulated foreign savings in the final year of the covered period will be used for comparisons.

(c) The Equation Sets for Simulation

All original equations given above have been transformed to the ones using elasticities instead of coefficients when it is necessary.

(A) With no dummies

$$XGM = -2275.15 + 0.12 SX + 1.026 OR + 1.41 YNA$$

$$MC = -63.7 + 0.09 DC - 0.29 OR - 0.14 SM + 0.15 XH$$

$$MK = 34.4 - 0.133 OR + 0.29 FCL + 2.28 FDI + 1.00 I$$

$$MIX = -11.25 + 0.2443 FCL + 0.353 XGM + D_{73}$$

$$MID = 200.448 + 0.3306 FCL - 0.161 ERM + 0.233 DC$$

$$FCL = -110.873 - 0.139 (X_{-1} - M_{-1}) + 0.9523 I - 0.02 EIF$$

(B) With dummies

$$XGM = -8649.37 + 0.72 SX + 4.9 OR + 1.18 YNA + D_{62, 63}$$

$$MC = -63.7 + 0.09 DC - 0.29 OR - 0.14 SM + 0.15 XH$$

$$MK = 161.73 - 0.353 OR + 0.38 FCL + 2.52 FDI + 0.96$$

$$I - D_{70}$$

$$MIX = -11.25 + 0.2443 FCL + 0.353 XGM + D_{73}$$

$$MID = 194.45 + 0.161 FCL - 0.27 ERM + 0.35 DC - D_{72}$$

$$FCL = 120.225 - 0.26(X_{-1} - M_{-1}) + 0.8275 I + 0.11$$

$$EIF - D_{67, 70, 71}$$

In equation system (A), MIX has a dummy variable. MIX without the dummy showed the wrong sign on FCL.

In equation system (B), MC does not have a dummy variable since XH well reflected the import control change.

(d) Results of Simulations

Korea's foreign exchange rate has been divided into three categories: official foreign exchange rate, effective foreign exchange rate on exports and effective foreign exchange rates on imports. Each has a different level due to the non-uniform export subsidy and the import tariff. The export subsidy has been always higher than the import tariff.

First, I simulated the policy effects of the uniform export subsidy and the import tariff scheme by changing the import tariff to the same level as the export subsidy. So only SM and ERM changed in the equations.

The result shows that the balance of payments would have improved by 195.832 million dollars, if the uniform export subsidy and import tariff had been used by the equation system of (A). With

the equation system of (B), the improvement would have been 345.44 million dollars. EIF does not change so that there are no financial effects.

Second, I simulated the official foreign exchange rate change effects by increasing the official foreign exchange rate to the effective rate on exports and eliminating the exports subsidy and the import tariff. So OR, SM, SX, ERM and EIF change in the equations. ERM changes because ERM has been lower than ERX and the newly increased OR affects both exports and imports.

The results show that the balance of payments would have improved by 1,071.82 million dollars with the use of exchange rate policy instead of the distorted subsidy tariff scheme in equation system of (A). Within this 31.247 million was the financial effect. With equation system (B) the improvement would have been 3,894 million dollars,⁶ with 164 million dollars as the financial effect through the change of EIF.

Out of total foreign capital inflow during the covered period of 5,231.04 million dollars, 1,071.82 million dollars constitutes around 20 percent and 3,894 million dollars constitutes a whopping 74 percent.

The foreign exchange rate change would have accounted for an improvement of 164 million dollars through EIF effects which the subsidy-tariff scheme does not allow. Only after 1966 did foreign commercial loans begin to flow in significantly. It is evident that foreign commercial loans will become larger in absolute amount and in relative proportion to the total foreign capital inflow as the

scale of economy grows. The EIF effect on imports cannot be neglected in this context. Additionally, the elasticity of exports to the official exchange rate change was far greater than that to the export subsidy change, while they were same on imports. That is why devaluation shows far more efficiency over the subsidy-tariff scheme in improving the trade balance than I had expected. Devaluation could have saved around 3,549 million dollars more than uniform export subsidy and import tariff scheme. Within the amount of 3,549 million dollars, 164 million was the EIF effect which the latter does not have.

FOOTNOTES

V

¹"Expected" concept involves inflation expectancy and "devaluation" expectancy which is based on the past experience.

EIF = nominal rate - last year's domestic inflation
 + expected rate of devaluation
 (= Dev-1 + Dev-2 + Dev-3/3)

²1965 constant price

³Elasticities were estimated by following formula:

$$\sigma_{q.p} = \frac{\Delta Q}{\Delta P} \times \frac{P_1 + P_2/2}{Q_1 + Q_2/2}$$

where P : independent variable

Q : dependent variable

$\frac{\Delta Q}{\Delta P}$: is represented by coefficients of independent variable in the equations related

⁴YNA and XGM might be simultaneously determined. In this respect, YNA might be said not to be wholly exogenous.

⁵X₋₁ is X_{t-1} and M₋₁ is M_{t-1}. They are predetermined variables.

⁶XGM constituted most of the difference. The elasticity of XGM with respect to OR in equation system of (B) was far higher than the one with equation system (A).

VI. CONCLUSION

Export expansion, import substitution and inflow of foreign capital all play a positive role in the economic development process of less developed countries. The choice of balance of payments adjustment policy is important in the sense that all three of the above variables are directly affected differently with different policy tools.

When the debt service problem is not a serious one in an economy, the economy can attain a higher growth rate with a given inflow of foreign capital by increasing exports or/and reducing imports via import substitution.

When a country has difficulty in servicing its foreign debt, export expansion and import substitution would help to keep the economy from the possible default and consequent disruption.

Therefore, a satisfactory balance of payments adjustment policy tool can accelerate the growth of an economy in the former case and save the economy from the undesirable consequences of excessive foreign debt in the latter case.

Several policy tools such as monetary policy, fiscal policy, a foreign exchange rate change, and a uniform export subsidy-import tariff scheme are available to us. It is true that all of these tools are used together as a policy package in real practice. My concern is which will be the major weapon and which will be complementary, supporting weapons.

It seems to me that there has been a general agreement among economists that a foreign exchange rate change is better than monetary and fiscal policy in balance of payments adjustment as long as the

foreign sector's fluctuations are not temporary and random phenomena. But there seems to have been some confusion about the character of the uniform export subsidy and import tariff scheme. In promoting exports and reducing imports via import substitution, the uniform subsidy-tariff scheme has often been assumed to have the same effects as foreign exchange rate change.

This assumption is valid on three conditions: First, the scheme must be applied to all international transactions, not only to merchandise transactions. Second, the elasticities of exports and imports with respect to subsidy and tariff change must be equal to the elasticities of exports and imports with respect to foreign exchange rate change. Third, there must not be any inefficiency or corruption in the bureaucracy. Setting the third condition aside, the first and second conditions are not generally met in real practice. The scheme is usually applied to merchandise transactions only and the relevant elasticities might be different. Through the theoretical discussions, it was found that foreign exchange rate change is better than the uniform subsidy-tariff scheme due to the financial flow and its effects on merchandise transactions, if only first condition is not met. The elasticity condition would be met, if the subsidy tariff scheme is consistently used along the same guidelines as that of foreign exchange rate change and really uniform. The third condition is really difficult to meet, especially in a low income society.

Korea has been successful in her export promotion with an extensive export subsidy scheme. But there have been negative aspects also; such as high debt service ratio and negative import substitution. It was shown that the Korean export subsidy scheme has been sacrificing

the unique purpose of the tariff scheme by using the latter as the former's tool. Consequently, the Korean foreign trade policy regime has been distorted in favor of exports at the cost of import substitution.

If overall, including both exports and imports, the situation could be improved by using a more satisfactory policy tool, it would be good for the Korean economy in lowering the debt-service ratio or/and accelerating the economic growth rate. With the partial equilibrium model, the empirical study showed that the use of exchange rate change could have saved more than three billion dollars, while the uniform export subsidy and import-tariff scheme could have saved only a little more than three hundred million dollars.

Theoretically, the advantage of the foreign exchange rate change over the uniform subsidy and import tariff scheme was supported by the empirical analysis. The effect of financial flow on imports, which is the main point the theoretical discussion emphasized, was supplemented by the fact that the elasticities of exports with respect to foreign exchange rate change were higher than those with respect to the subsidy-tariff.

There are many complexities in the real world. So if the empirical model were extended to a general equilibrium context, including all exogenous variables as endogenous ones, the results might be different. I regret that I could not do it in this study due to constraints of time and data. I hope to undertake a more general analysis subsequently.

APPENDIX

DATA SET

YEAR	X	XGM	M	MC	MK
1962.00	56.7000	15.3000	421.000	18.8000	69.8000
1963.00	84.4000	43.6000	560.400	21.6700	115.600
1964.00	120.900	62.3000	404.400	12.8200	69.5000
1965.00	180.500	112.400	463.400	16.6000	73.1000
1966.00	255.700	159.700	716.400	21.8000	171.700
1967.00	358.600	251.200	996.200	35.5300	310.200
1968.00	500.400	386.900	1462.90	78.4500	533.000
1969.00	702.800	555.100	1823.60	108.270	593.200
1970.00	1003.80	839.400	1984.00	123.200	589.500
1971.00	1352.00	1162.80	2394.00	166.000	685.400
1972.00	1807.00	1584.30	2522.00	157.000	762.000
1973.00	3256.90	2872.80	4240.00	258.000	1157.00
1	2	3	4	5	6
MI	FCL	OR	ERM	ERX	XGP
291.600	2.60000	226.600	255.100	264.000	41.4000
314.600	25.0000	189.300	215.700	275.800	40.8000
260.000	19.5000	232.300	267.600	305.000	58.6000
319.600	41.5000	265.000	293.100	304.600	68.1000
461.500	133.200	256.400	280.000	305.100	96.0000
573.800	151.200	243.100	266.000	299.100	107.400
721.600	312.500	233.500	255.100	298.800	113.500
870.900	482.700	234.600	254.500	296.500	147.700
1025.44	473.500	240.200	260.100	308.300	164.400
1237.70	479.800	250.700	266.100	325.000	189.200
1320.00	528.800	254.300	269.300	313.300	222.700
2381.00	605.800	276.000	289.400	339.500	384.100
7	8	9	10	11	12
Y	YNA	M	XH	DC	I
622.400	394.540	40.1000	166.800	608.500	80.9800
722.600	417.930	107.230	129.600	677.500	133.400
770.300	417.160	60.7300	128.900	713.200	112.400
805.850	496.200	54.4400	138.300	744.800	122.000
948.100	612.800	61.3000	235.800	835.600	206.150
1095.30	751.240	76.5700	347.200	964.300	242.500
1275.70	912.400	129.350	387.700	1101.35	341.600
1556.60	1109.80	250.330	549.500	1283.60	464.200
1773.50	1277.20	244.780	583.500	1483.60	482.670
1987.90	1413.40	304.000	534.500	1698.80	508.010
2135.80	1530.10	283.000	693.800	1816.40	446.700
2549.80	1886.60	444.000	1034.20	1986.00	668.500
13	14	15	16	17	18

APPENDIX (Continued)

DATA SET

FPL	FDI	EIF	MIX	MID
1.80000	0.600000	0.267	0.0	291.600
40.3000	4.80000	0.222	0.0	314.600
14.8000	0.700000	0.287	6.90000	253.100
5.00000	5.60000	-0.0034	10.4000	309.200
73.1000	13.4000	0.04	101.100	360.400
105.620	7.60000	-0.0158	135.200	438.600
70.2200	19.2000	0.0285	213.000	508.600
138.930	12.6600	0.0538	297.200	573.700
115.330	66.1100	0.0975	386.300	639.140
303.400	42.8300	0.1008	506.300	731.400
324.430	78.8000	0.075	687.600	633.400
386.460	143.320	0.0362	1555.50	825.500
19	20	21	22	23

Sources: Economic Statistics Yearbook 1974 (BOK)
Major Economic Statistics 1976 (EPB)
Monthly Economic Statistics (monthly by BOK)

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