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External Debt Position, Export Performance, and Economic Growth in Developing Countries: The Case of Korea

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EXTERNAL DEBT POSITION, EXPORT PERFORMANCE, AND ECONOMIC GROWTH IN DEVELOPING COUNTRIES: THE CASE OF KOREA

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INTRODUCTION

Most developing countries have been claiming that a massive inflow of resources from the North is needed to stimulate more rapid economic development and eradicate widespread poverty in the South. Some industrialized countries, however, have rejected this claim and instead emphasize the importance of self-help and well-functioning market mechanisms to promote development.

This controversy on the contribution of foreign capital inflows to developing countries has been taking place in both economic literature and debates among economic theorists and statisticians. Based on balance of payments data for the fifties and sixties, it has been argued that there was no strong relationship among foreign capital inflows, domestic savings, and economic growth.

Many Asian nations have grown quite rapidly compared to other developing countries. The growth rates for some Asian countries are unmatched in the developed world today (Table I) While not conclusive, these growth rates suggest that foreign capital inflows seem to have been efficiently utilized in many countries of the Asian region, and therefore suggest that a significant and positive relationship existed between foreign inflows and the economic growth that occured in the seventies. However, Table I also shows considerable differences of the growth performance between low and middle income Asian countries. For low income Asian countries (Bangladesh, Nepal, Burma, India, Sri Lanka, and Pakistan), growth has been comparable to that of other poor non Asian developing countries while for the middle income Asian countries (Thailand, Philippines, Malaysia,

Table I. Average Annual Growth Rate in Gross Domestic Product by Income Group, 1970-78.

	Growth Rate (%)	Sample
Low income Asian countries	3.5	6
All low income countries	3.6	38
Middle income Asian countries	8.0	8
All middle income countries	5.7	51
Latin American countries	5.4	15
Industrialized countries	3.2	18

Source: World Bank, World Development Report, 1980 (Washington, D.C.; World Bank, 1980), pp. 112-13.

Note: Korea 9.9%, Hong Kong 8.0%, Phillipines 6.3%, Indonesia 8.0%, Singapore 8.6%, Thailand 7.1%, Malaysia 7.8%, China 7.7%.

Korea, China, Hong Kong, Singapore, and Indonesia), growth has been considerably higher than the average growth rate of all middle income countries and two and one half times more rapid than that of the industrialized countries. These differences seem to imply a more effective use of foreign capital inflows in middle income Asian countries.

Aside from the controversy, the difficulty of dealing with the capital inflows in developing countries stems from the fact that a large number of countries are involved in debt obligation problems. Moreover, one complication in the controversy is the fact that the external debt of the developing countries has risen faster than their exports, especially in the time of world recession.

Among these countries, Korea seems to have been associated more closely with foreign factors for both economic growth and external debt than any other developing countries.

My study, in chapter 1, describes the Korean economy which has experienced various structural changes during its rapid growth period of the past two decades commencing in the early 1960s. Of these, changes in the manufacturing structure,

export increases, and the increase of gross domestic investment are most salient. The grand pattern of Korean economy has moved from the aid receiving and import substitution stage to the stage of loan and export-oriented policy. This second stage policy has been effective until now and substantially contributed to economic growth. However, the excessive imports which were necessary in response to the growth of industrial structure have put the Korean economy in an continuing deficit situation in its current account.

At the time when all of the oil-importing developing countries suffered from the twin oil price hikes during the 1970s, Korea used outward policies to successfully overcome that situation. These policies were the successful negotiation for inducing foreign capital and sustaining the increase of exports.

To shed some light on the concern for external debt problems, chapter 2 begins with a description of the process through which Korea has acquired its external debt over the past 10 years. It then analyzes the burden of external debt.

Based on the discussion of economic growth and assessing the trends in its debt burden, the study of the functional relationship between growth and foreign factors will be empirically estimated in chapter 3 and some implications will be drawn for the outlook of Korea's external debt and economic growth.

CHAPTER 1 RECENT ECONOMIC DEVELOPMENT IN KOREA

1.1 Some Economic Experiences

In recent years the Korean economy has, to an extreme degree, exemplified the dual process of growth and rapid structural change. Major industry shifted from agriculture to manufacturing, and gross domestic product (GDP) increased at an annual rate of 8.9 percent. Agriculture, which had contributed over 43 percent of GDP in 1965, accounted for less than 16 percent in 1980, and the percentage of the labor force employed in agriculture and fisheries fell from over 60 percent to less than 34 percent (Figure 1).

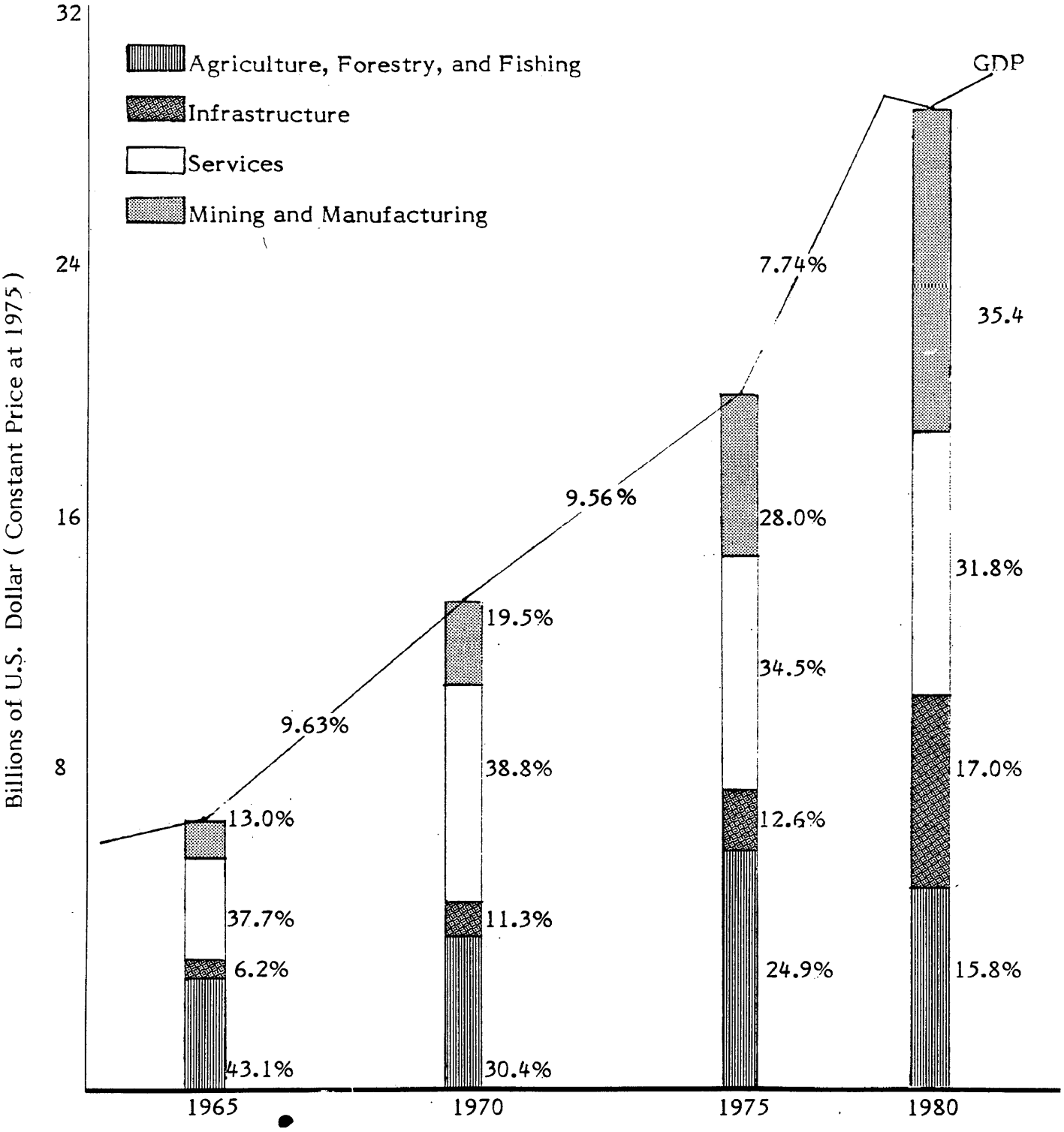

Figure 1: The Growth Rate of GDP and The Change of Industrial Structure.

Source: South Korea: a Country Study, Foreign Area Studies, The American University, Third edition, 1982; A Handbook of Korea, Korean Overseas Information; Service Ministry of Culture and Information Seoul, Korea, Third edition, Dec. 1979.

Before we discuss the more proximate casual factors of growth, we need to review briefly some recent development experiences of Korea which might be considered as a model case of economic development in developing countries.

During 1953 through 1958, the principle constraint on economic growth was the shortage of productive capacity. Demand for industrial commodities was generally in excess of domestic supply plus imports (so called "post war booms".) This gap had been narrowed by foreign aid. Large scale foreign aid supplied the imports needed for investment and consumption.[1]

Strictly speaking, during this period, there was not significant economic effect resulting from policy decisions which were recognized by the government. However, a number of new industries had started in an effort to provide substitutes for imports. These industries were supported by foreign aid which was largely substituted as intermediate inputs and raw materials for consumer goods (Table II). As long as abundant foreign aid was available, consumer goods industries and import substituting industries were able to expand.

Table II. Composition of Imports By Category of Final Demand (%), 1953 - 1960.

	1953	1954	1955	1956	1957	1958	1959	1960
Consumer Goods	70.4	59.2	34.3	34.8	40.5	36.5	23.6	24.6
Intermediate Goods and Raw Materials	22.4	21.0	39.5	42.4	41.0	47.0	48.5	49.6
The Investment Goods	3.4	13.6	16.8	11.1	9.6	9.7	13.7	11.7

Source: Bank of Korea, Economic Statistics Yearbook, 1960 and 1974. Compiled from "The Development Role of The Foreign Sector and Aid" Anne O, Krueger 1979. pp 72.

Although Korean government pursued the industrialization policy characterized as a policy of import substitution which was supported with foreign aid funds under the protection of tariff and quotas, the outputs of import substituting industries were overwhelmingly nondurable consumer goods instead of intermediate goods.[2] The main reason was because there was no market for the large amount of the durable goods.

During the period, Korean government had been anxious for rebuilding the capacity that had been destroyed in the war and maintaining a strong military force, and increasing private consumption. These objectives called for high levels of investment and of government and of private consumption. The high tendency for consumption of government and high investment for a certain industries which can be accomplished by the import privilege under the system of misguided exchange rate policy caused inflationary economy. As a result, the capital accumulation in this period was achieved through inflation, which, in turn, resulted in the distortion of resource allocation.

However, this growth pattern, stemming from constant imports in the form of aid began to fall apart in the late 1950s. One of the major factors influencing the introduction of the new policy was the change of the U.S. foreign aid policy.[3] The government, faced with decreasing revenue from counterpart fund resulting from the decreasing U.S. foreign aid, tried to increase revenues through raising tax rates. At the same time, the government tried to reduce expenditures and thus to keep revenues and expenditures balanced. Therefore, private consumption and investment demand were curtailed by these tightening fiscal and monetary policies. Furthermore, decreasing foreign aid resulted in a decline in imports and shortage of raw materials for the import-dependent industries.

Some evidence of the depressed state of raw materials imports for manufacturing and decreasing growth rate of manufacturing from 1958 through 1962 can

be gained from Table III. The Table shows that such imports were actually below the 1958 level for the three succeeding years and that the growth of manufacturing output declined steadily. But investment in manufacturing which was declining from the high levels of the mid-1950s was still apparently adding to capacity more rapidly than output was growing. In other words, despite the existence of considerable excess capacity in many areas of manufacturing, investment continued because the system of import controls and investment subsidies encouraged the build-up of idle capacity.

Therefore, we cannot assess the true impact of investment on manufacturing growth during the 1950s because it was somewhat distorted, even though the government began to impose strict import controls and end-user allocation systems in 1959. The investment rather generated the excess capacity in the consumer-goods industries.

Based on these facts, these problems of the manufacturing industries occurred during the period of 1958 through 1961 provoked considerable debate over the country's basic industrial structure and policies. One issue was the conflict between capital-intensive policy and unemployment policy, and the other issue was whether Korea should continue importing or produce domestically for intermediate and capital goods industries.

Meanwhile, after 1961, an expansionary policy was pursued to recover the economy from stagnation.

Korean government was faced with the problem of financing capital formation for rapid growth of economy in the face of gradual reduction in foreign aid. One solution was to negotiate for an increase in U.S. aid to Korea and normalize Korea-Japan relations. The second solution was to develop import-substitution industries by inducing foreign capital. The third alternative was to increase

Table III. Imports of Raw Materials for Manufacturing (in millions of U.S. dollars)

Raw material	1958	1959	1960	1961	1962
Raw rubber	4.5	6.7	7.6	5.8	5.9
Lumber	11.1	6.5	8.1	7.4	18.4
Pulp	1.7	2.7	3.4	5.0	8.3
Oil	2.7	2.5	2.5	3.9	3.9
Other	1.5	1.1	1.4	1.7	3.2
Chemicals	22.6	20.7	20.7	21.4	32.0
Papers	15.7	7.1	7.7	4.5	3.6
Textile yarns	12.7	15.8	18.1	18.8	28.8
Fabrics	48.8	43.9	46.4	42.1	50.2
Base metals	18.5	12.1	14.7	11.1	29.4
Total	139.8	118.9	130.6	121.8	184.8
Percent change from previous year		-15.0	9.8	-7.0	51.7
Growth rate of manufacturing		8.7	7.5	2.7	15.0

Source: Economic Planning Board, Economic survey 1963 (Seoul, 1963), pp. 52. Compiled from "Korean Development" by David C. Cole and Princeton N. Lyman. pp 157.

Note: Growth rate of manufacturing is derived from the GNP accounts in constant 1965 producers' prices.

export. These ideas which were obtained from the experience of the 1950s were major powerful instrument with which Korean economy sustained high economic growth thereafter.

The new military government relaxed the restraints on import quotas. As a result, the inflow of imported raw-materials jumped sharply in 1962 (see Table III). As a long-run measures they secured the expansion of investment in power and energy resources for industry, and adopted policies and incentives to increase exports.[4]

The response of exports was strongest in manufacturing. The absolute growth of commodity exports and the relative increase of the manufacturing share are indicated in Table IV. The share of manufactured goods rose from a range of 10 to 20 percent of total exports prior to 1960 to nearly half by 1963. It can be surmised from the above facts that as exports continue to rise as a proportion of GNP manufactured goods increase as a proportion on export demand can be expected to increase further.

One point which should be noted here is the competitiveness of Korean exports and the capability to expand exports quickly. This is the so called unbalanced structure of manufacturing, in other words, absence of capital-intensive intermediate-goods industries during the 1950s. If Korea had prolonged the period of import substitution and had invested more heavily in such industries during the 1950s and early 1960s, she would have had significant trouble accomplishing export-oriented policies in the 1960s due to high cost structure resulting from heavy investment in import substituting industries. However, the unbalanced structure of industries and the heavy dependency on imported input had been harshly criticized and cited as a harmful effect of foreign aid.

Table IV. Exports of Manufactured and Nonmanufactured commodities, 1955-1967 (in million of U.S. dollars)

	Manufactures		Nonmanufactures		Total	
Year	Amount	%	Amount	%	Amount	%change
1955	1.5	8.3	16.5	91.7	18.0	
1956	2.5	10.2	22.1	89.8	24.6	+36.7
1957	4.0	18.0	18.2	82.0	22.2	-9.8
1958	2.5	15.1	14.0	84.9	16.5	-25.7
1959	2.2	11.1	17.6	88.9	19.8	+20.0
1960	4.1	12.5	28.7	87.5	32.8	+65.6
1961	5.7	13.9	35.2	86.1	40.9	+24.7
1962	9.6	17.5	45.2	82.5	54.8	+34.0
1963	38.6	44.5	48.2	55.5	86.8	+58.4
1964	57.7	48.4	61.4	51.6	119.1	+37.2
1965	106.4	60.8	68.7	39.2	175.1	+47.0
1966	153.0	61.1	97.3	38.9	250.3	+42.9
1967	212.8	66.4	107.4	33.6	320.2	+27.9
1968	335.1	73.5	120.3	26.5	455.4	+42.2

Source: Economic Planning Board, Korea Statistical Yearbook, 1964 and 1967. Compiled from "Korean Development" by David C. Cole and Princeton N. Lyman. pp. 160.

1.2. Economic Growth

As can be seen in the rates of growth in Figure 2, Korea underwent a remarkable economic transformation and development between 1965 and 1981. Sustaining this growth was done mainly by the virtue of the expansion of investment and export.

1) Investment and Savings

Other things being equal, economic growth will be faster if the share of output devoted to capital formation is greater. But as can be seen in Figure 2, the relationship is not as close as might be expected in developing countries.[5]

There are several reasons why, in actual circumstances, the investment/growth relationship may be weak: (1) some investment serves to replace rather than augment a nation's productive capacity; (2) some investment (e.g., some infrastructure investments) may have only very long run consequences for the rate of growth; and (3) demand may be inadequate to call forth full production from available capacity. In the case of Korea, strong external demand has stimulated investment and consequent supply. In other words, Korea's expanding export volume generated rising demands for investment, and consequently the growth of investment was rapid. Starting at about 11 percent of GDP in the 1950s, gross domestic investment rose in current price to nearly 30 percent of GDP in the 1970s (Table V)

Investment demand, however, cannot by itself sustain economic growth. It must be matched by a rate of savings that is high enough to finance the investments desired. The basic problem was that Korea entered the period of rapid growth with a low rate of national savings compared with other countries at similar income or development levels. During the period of 1960-1970, domestic savings

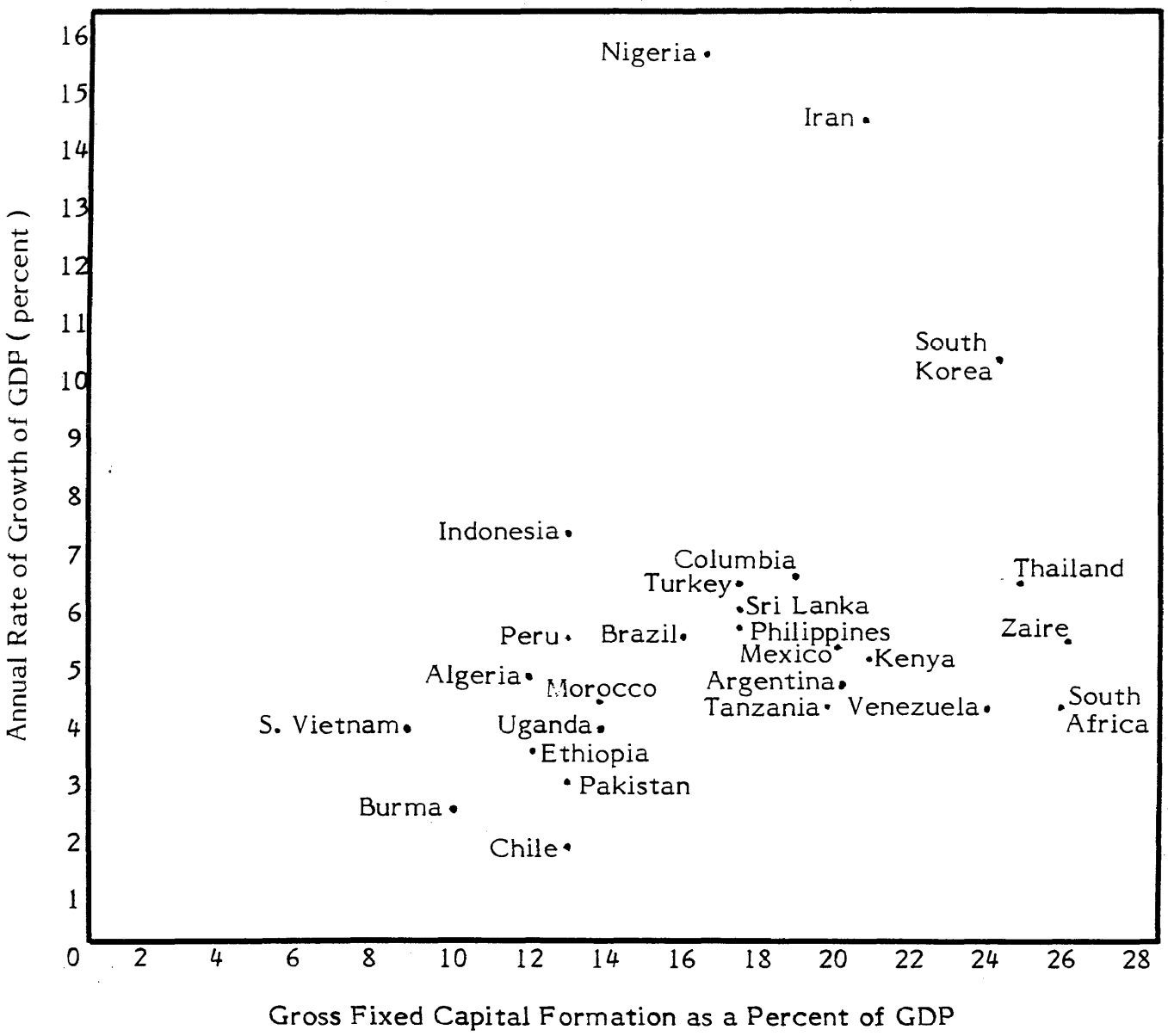

Figure 2. Relationship between Gross Fixed Capital Formation as a Percentage of GDP, 1969-73 Average, and Rate of Growth of Aggregate GDP,[a] 1970-74, for 26 Developing Countries.

Source: United Nations, "Yearbook of National Accounts Statistics 1975.
[a] Gross Domestic Product (GDP) equals GNP plus net factor payments abroad.

Table V. Average Annual growth Rate and As Percentage of GDP of Investment (GDI), Savings, and Exports

Annual Growth Rate	1950-60	1960-70	1970-80	
GDP	5.1	8.6	9.5	
Export	7.1	29.3	23.0	
GDI	0.6	23.6	13.4	
Gross National Savings/GDI	19.7	58.5	79.5	
Governments Consumption	3.0	5.5	8.3	
As % of GDP				1980
Export	2.8	11.3	29.6*	37.0
GDI	11.4	23.2	27.2*	31.0
Governments Consumption	12.8	10.5	10.9*	
Gross National Savings	1.0			23.0

*1970-1977

Source: 1) "World Tables" The Second Edition (1980), From the data files of the "World Bank"
2) "World Development Report 82" from the World Bank.

financed only 58 percent of investment (Table V). However, it was increased to 80 percent in the 1970s and its ratio to GDP reached closely to the level of other developing countries by 1970. The international comparison of average national saving's ratio and the share of investment in GDP explains well what has been the motivation for economic growth. In fact, from the lowest level of the savings ratio among LDC's in 1960, Korea achieved the highest level among LDC's in 1977 (Table VI).

Table VI. International Comparison of the Average National Saving's Ratio of GDP

	1960	1965	1970	1973	1977	1980
Developing Country	18.5	19.4	18.5	19.6	20.1	
Industrialized Country	21.7	22.8	22.2	23.8	22.2	
Middle Income Country	12.2	15.0	19.2	22.6	25.0	
Korea	1.4	7.5	16.3	22.1	25.6	23.0

Source: World Bank, World Development Report, 1982.

The role of government has not, however, grown proportionately. In 1974, government enterprises accounted only for 5 percent of fixed capital formation, down substantially from the 12-14 percent averages of the early 1960s. On the other hand, private and public enterprises accounted for 82 percent of fixed capital formation in 1974, up generally by 5-15 percent over the years of the early 1960s. The large portion of private savings was originated by exporters. However, as it will be explained later, these savings did not play an important role for stabilizing the money market.

2) Export Performance

Korean growth has been export-led and policy-makers have sought, generally successfully, to stimulate and assist this development. In 1960, exported goods and services were valued at less than $40 million, of which only 15 percent were manufactured products. The share of total exports in GNP at the current price was only 3.3 percent. According to the rank-order by country, during 1965-1973, Korea ranked as the fastest growing country in the world in terms of the rate of growth in exports (Table VII).

Table VII. Rank Order by Country (1965-1973): Korea

	Rank	Value (%)	Rank (The number of Nation)
GDP	7	10.9	141
Exports	1	34.4	124
GDI	5	18.4	129
GDP per capita	7	8.9	141
Average ICOR	11	2.2	125

Source: World Tables (World Bank), Comparative Economic Data, 1976.

* ICOR: Incremental capital - output ratio.

During the 1970-1977, average exports share of GDP reached almost 30 percent. As of 1975, the share of manufactured products in export grew to 74 percent. One noticeable thing is the growth of heavy industry in export. During the 1960-1968, heavy industry portion in the export expansion stayed on the level of 1.2 percent. But during the 1968-1973, that portion went up to 9.1 percent. As of 1982, it had reached 20 percent (Table VIII).

In addition to the types of commodities exported and the size and growth of the exported sector, a key indicator of development concerns the general structure of trade. It is not unusual among developing countries for one or a few commodities to comprise the great bulk of exports. Such a situation is vulnerable to disruptions in production and to wide fluctuations in demand. The 1973 U.N. study of industrialization and development examined concentration in exports for some thirty-five LDCs. It may be noted that Korea had the highest proportion of manufactured products in its total export among all countries surveyed. The number of items for Korean manufactured exports in 1969 numbered 71, a product mix exceeded only by Mexico (89) and approached by Brazil (68) (Table IX).

Table VIII. Composition of Export Commodity, 1982.

Total: U.S. $17.5 billion

Type of Commodity		% in Export
Machinery and Equipment (20.3%)	Electronic	12.9%
	Ships	3.5%
	Other	3.9%
Miscellaneous Manufactures (65.4%)	Metal Products	4.5%
	Iron & Steel	11.1%
	Footwear	5.2%
	Textiles & Fibers	32.2%
	Other	12.4%
Nonmanufactures (14.3%)	Chemicals	4.3%
	Food Beverages & Tobacco	7.3%
	Other	2.7

Source: Korean Economic Planning Board, Major Statistics of Korean economy, 1981. Seoul, 1981; and International Monetary Fund, Direction of Trade Statistics, Washington, May 1981. Compiled from South Korea; A Country Study, 1982.

Altogether, these export figures reveal an exceptional achievement in terms of: (1) a large export volume; (2) a large structural change of export industrial group; (3) a large proportion of manufactured products in export; and (4) a large growth rate.

While these export figures as a whole attributed to economic growth, there was a drawback which reflected a loss of monetary control. Export financings which were supplied at a relatively low nominal rate of interest, for example, of 7 percent (a negative real rate of interest) in comparison to a standard nominal bank lending rate of 15.5 pecent in 1973, made the central bank to lose the control over the monetary base. These excessive financial subsidies to exporters, in turn,

yielded a high rate of inflation. The inflationary economic situation made the term structure of finance short. After 1965, although the government succeeded in raising short term deposit and lending rates of interest to take account inflationary expectations, it does not seem to have made it easy to channel the increased flow of savings to long-term finance for plant and equipment expenditures. Rather, the business sector remained quite vulnerable to short-term cyclical fluctuations. Hence, the failure to develop domestic long-term sources of finance has forced Korea development to rely on foreign financial resources. In short, the very success of that export policy added to the inflationary pressures, paradoxically encouraged a continued inflow of foreign capital.

CHAPTER 2 EXTERNAL DEBT

Approaching the 1960s, international capital market had been rebuilt, and some developing countries had built up a considerable 'semi-industrial' base and borrowing capacity. According to this movement, the external debt of all developing countries grew from about $8 billion in 1955 to $16 billion in 1960 and some $35 billion in 1965. By 1977 it totalled $210 billion but the rate of economic growth in the 1970s was only about 8-9 percent per annum, compared to 11-12 percent per annum in the 1960s and 14 percent in the 1950s.

The borrowing of developing countries in the mid-1970s was largely used as an adjustment to higher oil prices and to ride out the recession, but for some countries it was a means of postponing adjustment. The ongoing delay of strong recovery in industrial countries and high interest costs of borrowing have worsened the financial situation of countries with high levels of external debts. Recent postponement of repayments by Mexico, Brazil, and several other countries has exemplified such difficulties and drawn worldwide attention to foreign debt obligations.

Table IX. Export concentration in selected LDCs (1969).

Higher Income Developing Countries ($375 per capita, 1972)	No. commodities exported	No. Manufactured exports	Concentration index	Values of manufactured exports as % of total
Argentina	103	54	.271	7.0
Brazil	120	68	.333	6.2
Chile	49	22	.711	73.0
Cyprus	55	27	.296	9.5
Dominican Republic	33	12	.544	1.6
Guatemala	36	13	.508	1.6
Guyana	28	12	.492	14.7
Jamaica	55	30	.506	19.2
Lebanon	79	46	.392	17.5
Mexico	110	89	.110	19.2
Panama	45	21	.541	10.0
Tunisia	66	28	.210	14.9
Middle Income Developing Countries ($200-375 per capita, 1972)				
Egypt	76	45	.410	11.3
Honduras	25	6	.662	0.9
KOREA	101	71	.276	77.1
Morocco	82	42	.297	6.6
Philippines	75	43	.297	5.0
Thailand	77	38	.243	2.9
Lower Income Developing Countries (under $200 per capita, 1972)				
Afganistan	17	8	.584	18.7
Central African Rep.	17	4	.351	36.5
Ethiopia	34	13	.534	2.2
Kenya	69	37	.313	10.1
Sri Lanka	37	18	.627	3.5
Tanzania	44	16	.213	2.4
Uganda	26	9	.503	14.7

Source: Export data from UN's, "Industrial Development Survey, Vol. 5 (New York, 1973), pp. 53-54; income groupings by "World Bank Atlas", 1974 classification.

2.1 The Increase of External Debt in Korea

As has already been noted, Korea's economic expansion was accompanied by deficits in its current account balances, which were significantly affected by changing world conditions. Prior to 1967, Korea's borrowing of funds from abroad were negligible. However, starting with the Second Economic Development Plan (1967-71), Korea actively sought to borrow from abroad. the nation induced a total of $2.5 billion in foreign capital during the five years ending in 1971. The amount of new foreign loans increased dramatically in 1972, the first year of the Third Development Plan. At the end of 1972, Korea's external debt was estimated to be $3.5 billion, of which long-term debts represented $2.9 billion, as shown in Table X. Nevertheless, Korea succeeded in maintining international reserves at a level which was considered sufficient enough to defend itself against external vulnerability arising from unanticipated events.[6]

Ongoing deficits in the current account and continuing additions to international reserves resulted in steady foreign capital inflows into Korea. The rate of increase in foreign debt averaged 24.5 percent during 1972-81. At the end of 1981, the amount of gross external debt is estimated to have been $32.5 billion. The long-term debt was about 65 percent of the total debt, which amounted to $20.8 billion. On the other hand, the inflow of direct investment was negligible. Until 1973, foreign investments accounted for less than $100 million per year, but they have averaged $100 million since. Japan has been the largest investor, contributing 55 percent of the total since 1967. The United States' share averaged about 22 percent. However, in an effort to raise the level of foreign investment to $500 million per year in the 1982-1986 period, the government is planning to liberalize the nation's investment markets.

2.2 Debt Burden

As foreign debt obligations have had a tendency to rise, repayments of principle and interest on the debt have tended to increase. This trend has raised concerns over whether Korea's debt and debt service are manageable and acceptable to lenders. The "optimal" or acceptable level of debt and debt service is know to be difficult to evaluate precisely because of the inherent difficulty in measuring returns to and costs of foreign borrowings. As the measurement of the burden of debt, three types of indicators, which are the most widely used for measuring the burden of debt, are discussed. The first type, represented by the ratio of total debt and net debt outstanding to nominal GNP in U.S. dollars, indicates the utilization of foreign borrowings to yield income with which to pay back debts. Capital inflows are not exptected to produce output immediately. An increase in income, however, is expected to develop over time, as long as the capital inflows have been used for productive capital formation. In this case, it is anticipated that the indicator of the first type will rise at the time the capital borrowings are made and begin to decrease as the returns on such investments tend to exceed the costs of borrowings in late periods.

The ratio of total debt to nominal GNP has moved in a similar direction as that of ratio of net debt to nominal GNP, as shown in Table XI. The ratio of total debt to GNP reached a high level of 35 percent in 1972, after heavy borrowings were undertaken, and declined in the subsequent year. The capital borrowings associated with the first oil shock then caused the ratio to increase substantially in 1974 and 1975. Thereafter, the ratio decreased monotonically in the following three years. The ratio has since moved toward higher levels than previous years, as the impacts of the second oil shock and restrictive disinflationary monetary and fiscal policies have been felt on the world economy, starting in the early part of 1980. By the end of 1981, the ratios of gross debt and net debt to GNP had reached

Table X. Inflows of Foreign Capital, Outstanding Debts, and International Reserves

In millions of U.S. $	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Sources During Year										
Inflows of Long-Term Capital	806	1000	1518	1734	1948	2259	3410	4485	4390	6085
Inflows of Short-Term Capital	24	75	469	1112	662	368	-220	2430	4082	1210
Inflows of Direct Investment	61	158	163	69	106	102	101	127	97	106
External Debt Balance at End of	3549	4260	5938	8365	10445	12616	14782	20411	27276	32500
Long-Term	2949	3559	4699	6045	7488	8989	11016	13898	16754	20838
Short-Term	600	701	1239	2320	2957	3627	3766	6513	10522	11662
International Reserves at End of	739	1094	1055	1550	2960	4306	4937	5708	6571	6891

Source: The World Bank, World Debt Tables; Bank for International Settlements, The Maturity Distribution of International Bank Lending; Morgan Guaranty Company, World Financial Markets.

51 and 33 percent, respectively. The general trend in this type shows some sudden rise in the ratio, mainly due to uncontrollable external events. It also shows a tendency to level off in the periods following these events. Thus, the trend seems to indicate that foreign borrowings have been used productively. This, in turn, may suggest that Korea has learned how to overcome externally originated difficulties.

The indicators of the second type are represented by the ratios of long term debt service or total debt service to export of goods and services.[7] The former indicator only considers the country's burden over the long-run and does not account for the short-run financial burden. A substantial and increasing level of foreign borrowing, beginning in 1979, has been of a short-term nature. Thus, the indicator of total debt service seems to be more appropriate in ascertaining the financial burden of a borrowing country, under such situations, when the preference of lenders have been shifted from long-term claims toward short-term assets. As indicated in Table XI, the long-term debt service ratio of Korea was around the 12. percent level from 1972 to 1981, although the ratio decreased to 9 percent in 1976 and 1977. This suggests that no significant changes have developed in the long-run burden on the economy during the entire period. On the other hand, the total debt service ratio increased from 29.8 pecent in 1973 to 58.7 percent in 1981.

The total debt service ratio to export appears to suggest that, during 1980 and 1981 in particular, Korea's debt service payments increased at a more rapid rate than its exports were expanding. The increasing financial burden of Korea's debt in 1980 and 1981 did not result primarily from a shortening in the average years of maturity of its long-term debt but from substantial rise in the short-term debt relative to total debt, from an average 24.5 percent between 1972 and 1979 to an average of 37 percent in 1980 and 1981. Short-term debt is assumed to be trade-related and therefore short-term debt should not exceed an amount equivalent to approximately three months of merchandise imports.[8] However, as

shown in Table XII, Korea's short-term debt had exceeded three months of imports even though Korea did not have total debt in excess of the threshold ratio of 200% of exports.

TABLE XI. Indicators of Debt Service Burdens (in percent)

	Total Debt	Net Debt	Long-Term Debt Service	Total Debt Service	Short-Term Debt
	Dollar Value of GNP	Dollar Value of GNP	Dollar Value of Export	Dollar Value of Export	Total Debt
1972	34.6	23.4			16.9
1973	32.4	20.3	14.1	29.8	16.5
1974	32.9	22.4	11.3	25.7	20.9
1975	41.3	29.7	11.9	34.9	27.7
1976	38.1	23.6	9.3	34.9	28.3
1977	35.9	18.9	9.4	32.5	28.7
1978	31.2	16.1	12.2	34.9	25.5
1979	34.0	19.9	13.5	35.5	31.9
1980	48.3	29.6	12.9	47.2	38.6
1981	51.3	33.1	13.9	58.7	35.9

Notes: Long-Term Debt Service = amortization and interest payments of long-term debts; Total Debt Service = amortization and interest payments of total debts; Export = export of goods and services. This table is made with data sources in table 2-1 and the data in International Financial Statistics yearbook, IMF.

The third type of debt burden is related to the cost of borrowing. The nominal cost of external borrowing changed from 5.6 percent in 1973 to 13.2 percent in 1981. The real interest rate has, on average, increased since 1974 and yet remained negative. Starting in 1980, however, the real cost of Korea's borrowings tended to rise drastically along with an appreciation in the U.S. dollar. The high real interest rates on Korea's debt in 1981, 3 percent, signaled the beginning of a period of high real interest rates on external debts.[9]

While these three ratios measure the capacity of an LDC to handle its international obligations, they generally fail to test the potential vulnerability of debtor countries to debt servicing difficulties. William J. Gasser and David L. Roberts of the Federal Reserve Bank of New York, developed recently a "vulnera bility index" to reflect mainly the erosion of liquidity among developing countries with substantial external debt. This indicator combines the effects of rising imports (including interest payments), increasing short-maturity bank debt, falling reserves, and weighted by exports of goods and services. The calculation of the indicator is as follows:

$$\text{Indicator} = \frac{M + A - R}{X} * 100$$

where

M = Imports of Goods and Services

A = Maturing bank debt

R = International Reserves (Excluding Gold)

X = Exports of Goods and Services

Larger values of the index indicate less liquidity and a greater degree of sensitivity to unexpected shocks.

Table XII. External debt, total and short-term in relation to trade (billions of dollars).

	Total external debt		Short-term debt[2]	
	end-1982	in excess of 200% of exports[1]	end-1982	in excess of 3-mo. imports[3]
21 major LDC borrowers	514.5	97.8	132.5	87.4
Latin America	288.1	80.7	75.7	59.2
Argentina	38.8	18.0	7.3	6.1
Brazil	86.3	34.3	16.7	11.9
Chile	17.2	4.9	3.2	2.3
Colombia	10.2	0.0	3.3	2.0
Ecuador	6.6	0.9	1.3	0.7
Mexico	84.6	20.4	25.8	22.2
Peru	11.2	2.2	3.2	2.3
Venezuela	33.2	0.0	15.0	11.7
Asia	108.8	2.7	29.0	10.6
Indonesia	21.9	0.0	2.9	0.0
KOREA	37.2	0.0	10.4	4.6
Malaysia	8.6	0.0	1.7	0.0
Philippines	20.7	2.7	7.8	5.8
Taiwan	9.3	0.0	4.0	0.0
Thailand	11.1	0.0	2.2	0.2
Middle East & Africa	117.6	14.4	27.8	17.6
Algeria	14.8	0.0	0.7	0.0
Egypt	21.8	3.3	3.2	1.2
Israel	28.0	4.1	13.5	12.3
Ivory Coast	8.4	2.1	2.0	1.5
Morocco	10.8	2.4	1.0	0.1
Nigeria	11.2	0.0	3.0	0.0
Turkey	22.6	2.5	4.4	2.5

[1]Based on average 1982 debt level in relation to exports of goods and services.
[2]Original maturity of one year or less.
[3]1982 merchandise imports.

Source: Morgan Guaranty Trust Company, World Financial Market, June 1983.

The index reveals that Korea is in a stable debt servicing position (Table XIII). The reason for this stability is most likely due to the improvement of current account position in recent years.

Table XIII. Selected Developing Countries "Vulnerability" Indicator

	1978	1980	1982
Argentina	73	121	200
Korea	108	142	140
Mexico	188	166	200
Poland	193	191	225
Turkey	238	263	150

Source: Gasser and Roberts, "Bank Lending to Developing Countries, Problems and Prospects", Quarterly Review, Federal Reserve Bank of New York, Autumn 1982, P. 26.

2.3 Summary

Foreign debt constitutes an obligation of the economy as a whole, which, if excessive, can severely retard development. If large trade deficits occur, borrowing will be required to finance merchandise purchase and debt service rather than capital investment, which will in turn undermine the country's debt management capability.

Foreign aid in the form of grants before 1963 had been used mainly for military defense and consumer goods, particularly food, during the Korean War and reconstruction periods. Since 1963, the growth-oriented new government has encouraged the influx of foreign capital. The amount of foreign capital has increased vastly in recent years, particularly since 1973. Although it is true that the rapid economic growth in recent years has been possible with the help of external debt, the latter resulted in the problem of debt-service payments.

When we discuss the problem of debt-service payments with only long-term debt service ratio or total debt service ratio, the burden of debt service might not reach a danger point. But, the debt service ratio shows only one aspect of a short-run liquidity problem with respect to export earnings. Particularly, when a growth in exports is expected, the policy-makers are apt to be optimistic about future prospects. None the less, this problem will become severe as the grace period on some of the external debt ends and debt service accumulates in the future. Furthermore, substantial increase in short-term debt since 1979 will threaten the flexibility of policy decision unlike the increase of long-term debt. The Korean government should pay more attention to the consequences of rising external debt. In the event of a default, Korea could lose her international credit standing and jeopardize her future economic development planning, which still relies heavily on foreign capital.

CHAPTER 3 THE EFFECT OF EXTERNAL FACTORS ON NATIONAL INCOME

3.1 Inconsistency of Previous Studies

1) Theoretical Critics

Findings with regard to the relationship between the inflow of foreign capital and the rate of economic growth reported in various studies vary. Earlier cross-country studies largely suggested that foreign capital inflow had not led to higher rates of growth of GDP.[10]

The reason for the insignificant relationship between foreign capital and domestic growth could be found from various sources. Many previous studies had intended to view foreign capital as "aid". According to Chenery and Strout, the effectiveness of foreign aid in raising GDP in LDCs would ultimately depend on the policies pursued by the recipients and donors of aid.[11] The donors may not allow aid strictly according to economic criteria but may by their desire for the

maintenance of political stability in countries having special ties to the donors. If the aid recipients are either not able to secure an immediate increase in GDP (the aid might be used for building infrastructure in LDCs) or not able to utilize the increments in incomes effectively, the benefits of aid may not be forthcoming.

Furthermore, when we study the effectiveness of foreign capital by classifying the LDCs into two categories, the results were substantially different. Galbraith classified the 38 LDCs into two categories for the period of the 1960s by Model I countries (mostly in Asia including Korea) and Model II countries: Model I countries were the ones whose development, according to Galbraith, was hampered by the lack of sufficient investment funds, implying that it is only these countries which can use capital inflows to the best advantage.[12] Model II countries consisted of 21 countries from the African and Latin American continents, whose develop ment has been hampered by what Galbraith calls the "lack of minimum cultural base" as in Africa, or the lack of development oriented social structure as in Latin America.

Gulati (1975) estimated a model by the Galbraith's category and the results are shown in the following two equations for Model I and Model II countries;

Model I countries;

$Y^* = -.09 + .32\ AKI + .35S$

t-ratio (2.20) (2.36)

$R^2 = .29$ $t_{.05} = 2.15$

Model II countries;

$Y^* = 3.35 + .06\ AKI + .11S$

t-ratio (.46) (.89)

$R^2 = .08$ $t_{.05} = 2.10$

where Y* = rate of growth of GDP during the 1960s, AKI = ratio of all capital inflows to GDP, and S = ratio of domestic savings to GDP.[13]

In Model I countries, both the saving and foreign capital inflows significantly affected the rate of growth of incomes. But the same theory cannot be applied to Model II countries case. In this respect, Chenery and Strout had the same idea: they point out that the positive effect of foreign capital transfers will be realized only if the host countries make appropriate structural changes in their economies.

One other problem in the previous studies is that all foreign inflows are aggregated as one component. But to draw any conclusions about the effect of one component, such as aid, one needs to analyze it separately from other flows. Secondly, foreign resource inflows were calculated as the difference between current imports and exports of goods and services, but actual foreign inflows are greater than the difference.[14] Thirdly, the most serious question about a negative casual relationship between foreign inflows and savings is with respect to the existence of any casualty. There are clearly many cases where high foreign inflows are associated, among countries, with low savings and low growth rates. However, it is doubtful that low savings and growth are caused by high inflows. Rather, both are more likely to have been caused by third factors like a poor or deteriorating economic and/or political situation. In Korea's case, high inflows of aid and relatively low savings rates in the early 1950s, when she was recovering from war, were responsible. By the 1960s, however, savings were up and inflows were lower (Table XIV). From the low savings level in the 1950s and 1960s Korea has continuously increased the rates on savings, foreign capital flows, and economic growth in the 1970s.

Table XIV. Savings, Growth and Foreign Inflows in Some Countries Subject to Exogenous Shocks (All as percentage of national or domestic product)

	Growth		Gross savings			Total net resource inflows			Of which aid	
	50s	60s	50s	60s	64/65	50s	60s	64/65	50s	60s
Korea	5.7	6.3	-2.0	5.1	9.6	12.4	9.5	4.5		
Taiwan	7.0	9.4	6.4	12.0	15.6	5.0	2.5	-0.2		
Israel	9.1	7.5	9.4	13.9		20.3	15.3		10.3	5.8
Philippines	6.6	4.4	5.3	13.8		6.5	5.5		4.3	3.2

Source: U.N. Yearbook of National Accounts Statistics, 1966.

2) Some Analyses

Besides the above theoretical critics, there are some analyses which have weakness in the method used and instability and low level of significance in their results. In contrast to the importance of international trade and foreign capital to economic growth as assumed in the two gap model,[15] E.E. Hagen and Oli Hawrylyshy in a 1969 study concluded that export levels and foreign capital inflows had little significance in explaining the economic growth of a sample of thirty-three developing countries during the 1955-60 and 1960-65 periods studies.[16]

Gustav Papanek in a 1973 study, did a cross-country analysis of the growth rates of thirty-four developing countries during the 1950s and those of fifty-one countries during the 1960s. He concluded that foreign capital inflows helped explain the economic growth but that exports did not. However, the failure of exports to show any direct importance in explaining growth probably was due to the inclusion of national savings as one of the independent variables and the fact that there was a strong intercorrelation between savings and export revenues. In fact, Papanek recognized this with the statements that "some of the effects of exports on growth is probably picked up by savings", and "exports are highly correlated with savings, most probably because such exports often produce highly concentrated incomes."[17]

In contrast to the conslusions of Hagen and Hawrylyshyn and of Papanek, Constantin Voivodas emphasized the positive and significant contribution of exports in explaining economic growth and the still greater direct importance of exports in explaining capital goods imports, which are in turn of major importance to the growth process according to the two gap model. At the same time, he concluded that the total of all capital inflows had a negative and statistically insignificant relationship to economic growth.[18] This finding tended to contradict that of Chenery and Papanek. However, it seems that this weak relationship may be the results of ignoring a time lag between foreign capital inflows and economic growth. In fact, foreign capital inflows in comparison with exports might affect GDP much more indirectly and with a greater lag.

This brief review of some of the recent major statistical studies dealing with the role of exports and foreign capital in the growth of developing countries reveals some confusions in the findings and some weaknesses in the methods used.

3.2 Empirical Evidence

1) The Models and The Data

This study assumes that the operation of the Korean economy is to some extent conditioned by external factors, which in turn determines income. The systematical structure of the model is composed of two parts: the first part is an income mechanism and the second part is an monetary mechannism, which operate in response to external factors. Then the question to be answered is whether one mechanism is dominant and, if so, which. The relationships which are expressed in the two alternative models are depicted in Figure III. In general, the lower portion of the diagram represents the monetary model, while the upper portion represents the real process. Both mechanism operate in response to external disturbances, that is, foreign factors (LT, X) in the model studied.[19]

The regression models presented below are not intended to provide a definitive study of the application of theoretical models to the Korean economy. It is entirely probable that a more intensive study of the monetary structure, payments data, and income multiplier mechanism for Korea would lead to refinements that would improve the results. In the monetary model, for example, the exact connection between monetary inflows and reserve base of the money supply must be traced through the institutional arrangements of the Korean monetary system.[20]

The purpose of the presentation is rather to assess the general effect of foreign factors on changes in the national income by presenting the simple structural equations.

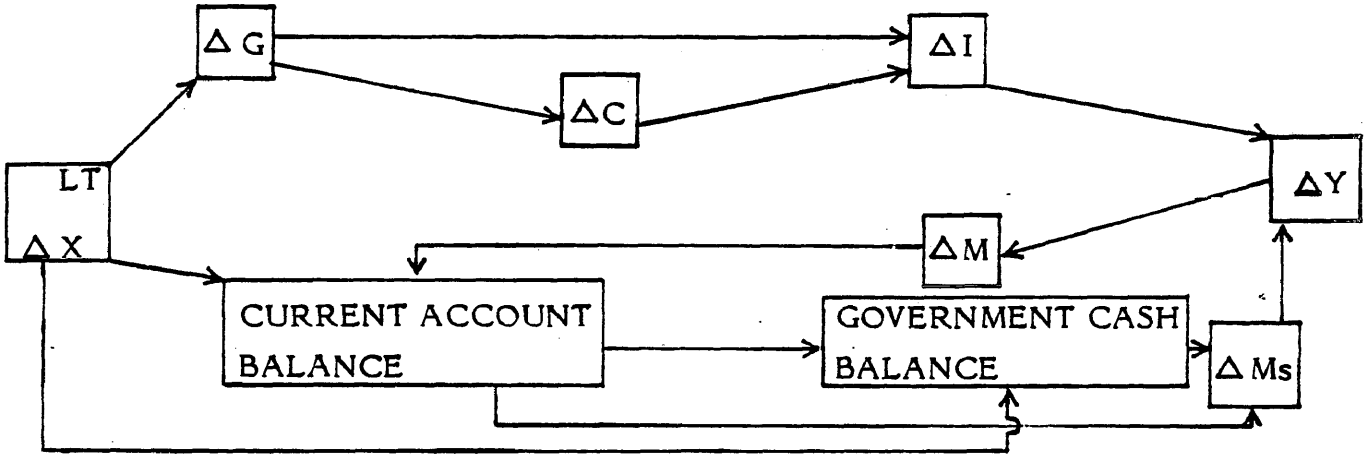

Figure III. Response of System to Exogenous Changes in Exports and Capital Inflows.

LT = Long-Term Capital Inflows

X = Export of Goods

G = Government Consumption Expenditures

C = Private Consumption Expenditures

I = Gross Domestic Investment

M = Imports of Goods

Y = Nominal GNP

Ms = Money Supply

△ = Change in each variable

The principal assumptions of the model which will be presented below are: (a) a constant income velocity of circulation of money, (b) a constant relationship between money imports and money income or a constant marginal propensity to import in terms of money, (c) an assumption that the increase in the quantity of money (which stems from the current account balance, foreign capital inflows, and government cash balance) enters immediately into national income, and (d) an assumption that export foreign capital inflows, and government cash balance may be taken as exogeneous variables and imports as endogeneous variables.[21] Therefore, if income velocity of money is constant, the income of the next period will equal the current period's income plus the increase in the quantity of money, that is,

$$Y(t+1) = Y(t) + \Delta Ms * V$$

$$Y(t+1) - Y(t) = \Delta Ms * V \text{ then}$$

$$\Delta Y = \Delta Ms * V \quad \text{where V is the income velocity of money } \left(\frac{Y}{Ms}\right)$$

To assess the monetary effect of foreign factors, the first equation to be estimated is:

$$\Delta Ms = \alpha_0 + \alpha_1 B + \alpha_2 LT + \alpha_3 D$$

where

ΔMs = The Change in The Stock of Money

B = The Balance on Current Account, Export less Imports

LT = Long-term Capital Inflows

D = Government Deficit

Initial changes in the money stock is brought about by the balance on current account, long-term capital inflows, and/or the size of the government cash balance (deficit or surplus).[22]

This equation points out the casual force for changes in the money stock comes either from foreign sources (the current account balance and long-term

capital inflows) or from the domestic sources (government deficit or surplus in this equation).

To estimate the effect of exogenous variables on income in this monetary mode, the second equation is established, that is,

$$\Delta Y = \beta_0 + \beta_1 B = \beta_2 LT + \beta_3 D \text{----------(2)}$$

In contrast to the monetary model, where the major determinant of changes in income is a change in the stock of money through the current balance, long-term capital inflows, and government cash balance, a simple income model is presented below. In this model, it is assumed that fluctuations in export, investment, and government consumption expenditure directly affect the income through the multiplier mechanism. The income model which is compared and contrasted with the monetary model is a simple Keynesian multiplier model, where income is defined as

$$Y = C + I + G + X - M$$

These symbols have the same meanings as in the earlier Figure. This model has three structural and three definitional equations. The definitional equations are,

$$I = I_0 (t)$$

$$G = G_0 (t)$$

$$X = X_0 (t)$$

The structural equations in the model are,

$$\Delta T = t\Delta Y \text{ ----------(3)}$$

$$\Delta M = m\Delta Y \text{ ----------(4)}$$

$$\Delta C = c\Delta Yd \text{ ----------(5)}$$

where

T = Taxes

Yd = Y-T (Disposable income)

M = Imports of Goods

C = Private Consumption Expenditure

Δ = Change in each variable

where investment, government consumption expenditure, and exports are exogenous, while private consumption, taxes, and imports are constant fractions of income. This system can be solved for income to yield the multiplier for changes in any of the exogenous variables.[23]

Casualty in this model begins with a change in the exogenous variables which increase income by an impact multiplier of the change, which in turn creates a change in the endogenous variable.

The model is

$$\Delta Y = \frac{1}{1-c(1-g)+m} * (\Delta I + \Delta X + \Delta G) \text{-----(6)}$$

which is the formulation that will be estimated to test the explanatory power of real factors in the Korean economy.[24]

All of the data (Table XV) used to estimate both models are in billions of current WON.[25] (As of 1982; official rate W/732 = $1) The time period is from 1962 to 1982.

2) The Regression Results

This section will estimate the parameters of the two models in current prices using ordinary least squares techniques. The parameter coefficient estimates are presented below. The figures in parentheses are t-statistics. The durbin-Watson statistic is presented in order to determine if the error terms are auto-correlated.

(1.1) $\Delta Ms = 59.42 + 0.08B + 2.05LT + 0.41D$

(0.30) (0.19) (2.46) (0.34)

$\bar{R}^2 = 0.76$, $F = 20.04$, $DW = 2.39$

Table XV. Original Data Used to Estimate Models of Korea, 1962-82 All in Nominal Values in billions of Korean WON (current price)

YEAR	LT	Y	G	D	I	M	MS	YD	C	X	TAX	B
1962	7	356	50	-10	49	55	52	293	294	7	32	-48
1963	11	503	55	0	68	73	55	438	404	11	38	-62
1964	10	716	61	1	81	86	64	645	593	25	45	-61
1965	27	806	75	-1	119	123	97	716	671	47	62	-76
1966	59	1037	103	-6	210	194	157	872	811	68	134	-126
1967	58	1281	130	-7	275	269	254	1067	1055	87	190	-182
1968	117	1653	173	6	414	405	437	1335	1231	126	282	-279
1969	164	2155	221	-44	556	526	705	1750	1529	179	383	-347
1970	131	2684	280	-21	654	616	898	2236	1939	259	419	-357
1971	192	3295	353	-10	742	834	1085	2757	2436	372	514	-462
1972	163	4029	439	-161	829	991	1452	3444	2957	638	558	-353
1973	196	5238	481	-27	1256	1689	1981	4544	3523	1285	679	-404
1974	379	7333	744	-164	1871	2743	2457	6294	5086	1786	1026	-957
1975	625	9793	1025	-202	2544	3521	3150	8229	6945	2459	1549	-1062
1976	607	13273	1499	-192	3152	4247	4205	10946	8711	3734	2325	-513
1977	642	17021	1989	-316	4421	5233	5874	14063	10754	4863	2958	-370
1978	972	22928	2635	-300	7023	7246	7929	18810	14239	6152	4107	-1094
1979	1475	29072	3237	-545	9458	9844	9878	23627	18106	7287	5445	-2557
1980	1198	34321	4447	-849	11240	13544	12535	27488	23042	10633	6833	-2911
1981	2399	42397	5553	-1585	12087	17796	15671	33792	28533	14484	8605	-3312
1982	1360	48268	6385	-667	14102	17780	19904	38285	31258	15910	10481	-1870

Source: International Financial statistics (IFS), IMF and World Tables, World Bank.

In regression of (1.1) only the t value for the long-term capital inflows is significantly different from zero at the 5 percent level.

When determinants of the increase in the quantity of money are regressed directly to change in national income, the coefficient estimates are

$$(2.1)\ \Delta Y = 129.29 + 0.15B + 5.91LT + 3.11D$$
$$(0.64)\quad (0.36)\quad (7.08)\quad (2.55)$$
$$\bar{R}^2 = 0.94,\ F = 108.59,\ DW = 2.33$$

In each case, the t-test of the coefficient of long-term capital inflows is significantly different from zero at the 5 percent level. The directly estimated form of the monetary model explains nearly 94 percent of the variations in GNP in Korea.

In order to test the explanatory power of the simple income model presented above, the structural equations (3), (4), and (5) are estimated, so that the values for the parameters for the multiplier equation (6) may be determined. This model is also estimated by OLS. These estimates are

$$(3.1)\ \Delta T = -53.703 + 0.240\Delta Y$$
$$(-1.08)\quad (16.79)$$
$$(4.1)\ \Delta M = -85.83 + 0.400\Delta Y$$
$$(-0.37)\quad (6.04)$$
$$\bar{R}^2 = 0.67,\ F = 36.59,\ DW = 1.45$$
$$(5.1)\ \Delta C = -12.29 + 0.82\Delta Yd$$
$$(-0.07)\quad (13.45)$$
$$\bar{R}^2 = 0.910,\ F = 180.95,\ DW = 1.63$$

In all the functions, all parameters are significant at the 5 percent level.[26] To form the multiplier for changes in income in response to changes in any of the exogeneous factors, I, G, or X, the marginal propensity to tax g in equation (3), the

marginal propensity to import **m** in equation (4), and the marginal propensity to consumption **c** in equation (5) are utilized in equation (6). The calculation yields

$$(6.1)\Delta Y = \frac{1}{1-0.82\,(1-0.24) + 0.40} * (\Delta I + \Delta G + \Delta X)$$

$$\Delta Y = 1.29 * (\Delta I + \Delta G + \Delta X)$$

where 1.29 is the value of the income multiplier for changes in national income in response to changes in any of the exogeneous factors, I, G, or X.

When the changes in the exogeneous variables are directly regressed against the change in income according to equation (6) yields

$$(7.2)\Delta Y = 241.57 + 1.52\Delta I + 0.24\Delta G + 1.27\Delta X$$

$$(1.10) \quad (3.44) \quad (0.09) \quad (1.97)$$

$$\bar{R}^2 = 0.92,\ F = 72.77,\ DW = 2.79$$

Of the three estimated parameters, two variables (the change in investment and the change in export) are significantly different from zero at the 5 percent level in explaining the change in income. The coefficients of both variables are nearly equal to the value of the multiplier but the variable of government consumption expenditure is not.[27]

To test the multi-collinearity problem, which may exist among the explanatory variables in the regression, the correlation coefficients between variables are presented in Table XVI.

Table XVI. Simple Correlation Coefficients for Independent Variables

	ΔG	ΔI	ΔX
ΔG		0.77	0.95
ΔI	0.77		0.59
ΔX	0.95	0.59	

Attention might be drawn to the strong relationship between changes in government consumption expenditure and changes in exports. The relatively strong relationship between changes in government consumption expenditure and changes in investment exists. In a typical developing nation, one might expect that much government consumption would be in the nature of what Rostow calls "social overhead".

The strong intercorrelations between government consumption and export, or between government consumption and investment suggest that government consumption is not unimportant in determining the level of income, although the impact appears to proceed primarily through investment and export as estimated in (3.1).[28]

3) Summary

Since the real world is complex, with many interdependencies, one can seldom present a sole cause for a chain of events. The economic structure of Korea, like that of any developing economy, is intricate, and it could be extremely misleading to infer a single causal chain from these findings. Nevertheless, it appears that both monetary and income mechanisms operate to effect changes in income in Korea through the fact that substantial portions of the variance of income are explained by both models.

It is of interest that foreign factors (long-term capital inflows and export) played a great role in Korean economies during the estimation period as they were expected to do. In the monetary mechanism it is the long-term capital inflows and the government deficit that are significant. In the income mechanism it is the changes in gross domestic investment and the changes in export. In both mechanisms the foreign factors play an important role.

An important remark to be drawn from ths study is that the role of the government sector in the Korean economy is found to be not as important, at least in direct sense, particularly in the income mechanism. However, as it is shown that the strong intercorrelations exist between the government sector and the private sector, it can be surmised that both export and investment sectors do operate through intermediary effects of the level of government consumption expenditures.

One thing to be noted is that the role of the export is not as great in explaining the change of investment as has been anticipated when investment and savings were explained in Chapter 1.[29] Rather, changes in export have significantly influenced changes in government consumption, which in turn, stimulated changes in investment.[30]

To summarize and conclude, this study makes three observations concerning the Korean economy. First, both the monetary and income mechanisms operate with a similar level, at least statistically. Second, the role of the foreign sector in determining changes in income was found to be important as has been expected. Third, the role of the government sector was found to be not so important to determine changes in income in direct sense, but it seemed that the government sector guided the private sector throught its intermediary role particularly in the income mechanism.

CONCLUSION

By the late 1960s and into the 1970s, Korea had emerged as perhaps the most successful of all developing countries in transforming and modernizing its economy. It has been observed in the study that a comparison of Korea with other developing countries over the whole range of developmental indicators showed Korea's performance in savings and investment, capital efficiency, manufacturing, and exports to be consistantly among the world's best.

Korea's economic expansion was accompanied by a deficit in its current account balance, which was significantly affected by changing world conditions. The high level of capital formation was necessitated to facilitate rapid economic expansion and structural adjustment in the face of the oil-price-induced world conditions and was accomplished by continuous borrowing of foreign capital during the 1970s.

A significant improvement of debt burden which stemmed mainly from the reduction in current account deficit shows that Korea's debt burden and status are managable and stable. However, we have to realize that the major forces behind this improvement are the relatively small change in raw material import prices and concurrently reasonably high levels of growth in real exports, through exchange rate adjustments, compared to the rate of growth in world exports. Additionally, the concern over increasing short-term debt in very recent years suggests that the long-term debt service ratio is inadequate to assess the overall debt burden. The relatively stable situation in the current debt burden should be regarded as transitional in nature. The risk associated with uncertainty in the future calls for a careful reevaluation of policies which attempt to achieve economic growth with a high external borrowing. More importantly, in order to avoid excessive burden on the economy in its adjustment to changing external developments, policies should be sought to enhance the diversity of the economy.

Through model estimation, it has been observed that foreign factors strongly stimulated the Korean economy through both the monetary mechanisms mainly via the long-term capital inflows and the strong multiplier impact in real economic procedures. The government sector played a great role as an assistant to export-oriented industries, to the stimulation of investment, and to the inducement of foreign capitals, which resulted in promoting economic development effectively.

In view of the openness of the Korean economy which highly relies on import, export, and foreign capital inflows, the plausible conclusion to be drawn from the study is that consistant expansion in world trade is essential for continuing economic growth and decreasing economic and financial costs of external debt in Korea.

-NOTES-

1. The source of aid was exclusively from the United States.

2. Nevertheless, the attribution of the imports of intermediate goods to manufacturing growth seemed to be great. David C. Cole and Princeton N. Lyman studied the cause of manufacturing growth for the years of 1958 through 1968. Their results of the least squares regression of manufacturing value added (V^m) against net fixed capital stock in manufacturing (K^m), imports of intermediate goods (M^I), and exports of manufactured goods (E^m) are as follows;

$$\dot{V}^m = 6.49 + 0.601K^m_{t-1} + 0.241\ M^i + 0.68\ E^m$$
$$(0.043) \qquad (0.09) \qquad (0.182) \qquad R^2 = 0.994$$

(The regression standard error of estimate adjusted for degrees of freedom = 3.85)

When capital stock, intermediate imports, and manufactured exports are employed as explanatory variables in a least squares regression, they seem to explain much of the growth of manufacturing.

3. American government, as a major donor, was much concerned about the inflationary effect of aid. They worried about the additional investment without savings would simply cause inflation.

4. Persistantly overvalued domestic currency throughout 1953-1963 effectively eliminated the export potential of the economy. But after 1964, the exchange rate system was, for all practical purpose, unified. That change undoubtedly resulted in considerable improvement in the efficiency of the exchange rate regime compared to the 1950s.

5. This means that post Keynesian growth theories developed shortly after World War II, particularly those of Roy F. Harrod and Evsey D. Dormar cannot be panacea for all kinds of countries. These theories have been quite useful in explaining the optimum growth rate of productive capacity in the developed countries. But when economists applied these analytical tools to the developing countries, their conclusions were sometimes very misleading.

6. The optimum level is regarded as equal to a three-month value of imports of goods and services.

7. The long-term debt service ratio has been commonly made available by organizations such as the World Bank and used in the analysis of debt servicing issues in literature.

8. Morgan Guaranty Trust Company, World Financial Market, June 1983, pg. 5

9. For further discussion, see Sung Y. Kwack, "Developments in and Prospects for External Debt Position and Burden of Developing Countries; The Case of Korea", Journal of Policy Modeling, 1983, p. 001-007.

10. But it has to be acknowledged that these studies are largely concerned on aid and studied in a cross-country analyses.

11. See Chenery, H.B. and A. Strout, "Foreign Assistance and Economic Development." American Economic Review, September 1966 pp. 724-29.

12. Galbraith, J.K. "Economics, Peace and Laughter" Boston: Houghton Mifflin Company, 1971 pp 229-242, The Causes of Poverty; A Classification.

13. Umesh C. Gulati, "Effect of Capital Imports on Savings and Growth in LDCs" Economic Inquiry Vol XVI, Oct, 1978 pp 563-69.

14. When I gathered the Korean data of foreign capital inflows, foreign capital inflows always excessed the deficit in current account.

15. See Chenery and Strout. 1966 pp 679-733.

16. See Hagen, Everett E, and Oli Hawrylyshyn, "Analysis of World Income and Growth, 1955-1965." Economic Development and Cultural Change, October 1969, Part II, 1-96.

17. See Papanek, Gustav F., "Aid, Foreign Private Investment, Savings, and Growth in LDCs." Journal of Political Economy, January/February, 1973, pp 120-30.

18. See Voivodas, Constantine S., "Exports, Foreign Capital Inflows and Economic Growth." Journal of International Economics, Vol. 3, 1973, pp 337-49.

19. The model construction in this study is basically followed the basic models developed by J.J. Polak and Charles Schotta Jr. They studied Latin American economy in which the effect of external factors on income is studied.

20. As it was mentioned in Chapter 2, Korea had relatively strong reserve base. It is also important to note that estimates in the monetary model does not consider the effect of compensatory short-term capital inflows from abroad.

21. Of course the demand for exports and the demand for imports are assumed of unit elasticity with respect to price.

22. A narrow definition of money is used through regression models. This is the definition used in the Fund's publication, International Financial Statistics (IFS): time or savings deposits are not included.

23. This income multiplier equation system is brought from William H. Branson, Macroeconomic Theory and Policy, 2nd Edition, 1979. p 33-48.

24. Substitute (3), (4), and (5), in definition equation $Y = C + T + G + X - M$:

$$Y = cYd + I + G - mY + X$$
$$Y = c(Y-T) + I + G - mY + X$$
$$Y = c(Y-gY) + I + G - mY + X$$
$$Y = c(1-g)Y - mY + I + G + X$$
$$Y = c(1-g)Y - mY = I + G + X$$

$$Y = \frac{1}{1-c(1-g) + m} * (I + G + X)$$

In process of developing the multiplier, Δ in equation (3), (4), and (5) is omitted. Then

$$\Delta Y = \frac{1}{1-c(1-g) + m} * (\Delta I + \Delta G + \Delta X)$$

25. All datas are basically from International Financial Statistics (Washingston, International Monetary Fund), but the data of long-term capital inflows are selected from IFS and World Tables (World Bank).

26. The first time each variable was tested with level base, but the Durbin Watson statistics were very poor. When the second estimation was tested with a first differential form, the Durbin-Watson statistics were improved significantly - as still keeping the coefficient of each independent variable almost the same except for the intercept terms.

27. When the exogeneous variables are regressed against income (all in first difference form), one should expect that the regression coefficients would each be equal to the value of the multiplier and to each other. When

    Ho: $j_1 \neq j_2 \neq j_3 \neq 1.29$ in equation

    $Y = a + j_1\Delta I\ 2 + j_2\Delta G + j_3\Delta X$

    was tested, it was rejected at the 5 percent level. Hence, it is concluded that the estimates do not differ from the calculated multiplier value of 1.29.

28. To know the partial coefficient of the variable of government consumption expenditure, the single equation is estimated. The result is

$$\Delta Y = 410.60 + \underset{(11.32)}{6.27\Delta G}$$
$$\bar{R}^2 = 0.88,\ F = 128.15,\ DW = 2.41$$

29. All other possible combination between investment and export were estimated but none of equations explained well the significance between them.

30. The result of estimation is

$$\Delta G = 50.78 + \underset{(12.85)}{0.33\Delta X}$$
$$\bar{R}^2 = 0.90,\ F = 165.23,\ DW = 1.83$$

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