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Chapter 7

Foreign Capital and the Exchange Rate Regime

Beginning in 1965, the South Korean economy became increasingly dependent on foreign borrowing. Foreign loan arrivals rose from $183.0 million to $787.4 million between 1966 and 1971, or close to 10 percent of GNP in 1971.[1] In 1965, a heavy proportion of the loans came from public sources overseas. Between 1968 and 1971 more than two-thirds of all foreign loan arrivals were commercial, mainly suppliers' credits for import of capital equipment from the United States, Japan, France, the United Kingdom, and West Germany (tables 7–1 and 7–2). The sources of public loans also shifted markedly, from a heavy reliance in the early 1960s on United States AID grants and development loans on very soft terms to greater reliance in the later '60s on Japanese, IBRD, and Asian Development Bank loans on relatively hard terms. The increasing emphasis on commercial loans and the shift of sources of public loans has greatly increased the cost of foreign capital imports. All loans greater than one year are denominated in foreign currency, the dollar, the mark, the yen, the franc, or the pound.

OFFICIAL ENCOURAGEMENT OF FOREIGN CAPITAL IMPORTS

The rapid increase in foreign commercial loans and the shift to more expensive sources of public loans has recently become a matter of concern to Korean officials. Throughout most of the 1960s, however, the government had strongly encouraged the import of private foreign capital as a major policy tool in

TABLE 7-1

Arrivals of Foreign Capital and Official Grants, 1966 to 1971

(millions of dollars)

	1966	1967	1968	1969	1970	1971
A. Foreign capital arrivals[a]	197.3	296.0	562.1	697.4	709.8	830.3
1. Three years and longer	197.3	239.3	355.5	640.3	653.7	691.5
a. Govt. and multilateral institutions-loans	72.8	105.6	70.2	220.9	217.0	317.0
b. Private loans	110.2	124.0	268.4	403.5	371.5	331.6
c. Equity	14.3	9.7	16.9	15.9	65.2	42.9
2. One to three years	—	56.7	206.6	57.1	56.1	138.8
a. Trade credits	—	54.7	166.6	27.1	31.1	49.3
b. Bank loans	—	—	40.0	30.0	25.0	89.5
c. Cash loans	—	2.0	—	—	—	—
B. Official grants	164.9	157.4	150.7	178.7	121.2	103.9
1. AID supporting assistance	61.6	47.1	43.4	28.6	17.0	12.4
2. PL 480	68.3	56.7	63.8	100.7	55.6	47.7
3. Japan P.A.C.[b]	29.3	37.4	30.0	32.1	28.2	16.6
4. Technical assistance	3.7	5.5	7.5	3.9	3.9	5.2
5. Other	2.0	10.8	6.0	13.4	16.5	22.0
Total	362.2	453.4	712.8	876.1	831.0	934.2

NOTE: Subitems may not add exactly to totals because of rounding.

SOURCE: Economic Planning Board; USAID.

a. Gross basis.

b. Property and claim fund as provided in the Korea-Japan Diplomatic Normalization Agreement of June 1965.

dealing with the balance of payments. The Foreign Capital Inducement Law was promulgated in January 1960 at a time when the Development Loan Fund (DLF) of USAID was the only source of foreign loans to Korea.

In early 1962, the government selected 9 major five-year plan projects (involving 19 businesses) that required foreign capital. The government then sent an economic mission to the United States, West Germany, and other industrialized countries in Europe to negotiate financing for the selected projects.

In July 1962, the government enacted two supplements to the Foreign Capital Inducement Law. One provided procedures for imports of capital goods by using long-term export credits of capital exporting countries and the other established procedures for granting repayment guarantees on foreign loans. As a safeguard, all foreign loans, investment proposals, and repayment guarantees had to be approved by the Foreign Capital Inducement Delibera-

TABLE 7–2

Foreign Loan and Investment Agreements, 1959 to 1971

(millions of dollars)

	1959–62	1963	1964	1965	1966	1967	1968	1969	1970	1971
A. Public loans	73.5	9.1	35.4	76.7	153.5	73.8	61.9	233.2	159.2	398.8
1. U.S.A.	49.9	9.1	29.8	71.5	95.0	32.0	28.0	114.9	59.4	120.7
2. Japan	—	—	—	—	44.9	29.9	18.6	11.3	8.9	87.0
3. West Germany	9.6	—	4.4	5.2	13.6	—	—	—	13.3	18.2
4. IBRD, ADB	—	—	—	—	—	—	11.8	89.5	60.0	165.9
5. Others	14.0	—	1.2	—	—	11.9	3.5	17.5	17.4	7.0
B. Commercial loans	1.9	55.3	63.3	78.1	105.1	155.4	483.9	622.8	325.8	347.9
1. U.S.A.	—	33.8	6.3	3.3	3.4	21.0	153.5	217.3	179.7	143.5
2. Japan	—	—	0.4	70.8	67.1	36.2	110.0	71.9	56.2	126.9
3. West Germany	1.4	16.6	16.4	—	22.7	39.5	48.6	48.1	3.7	15.7
4. France	—	2.5	20.5	—	11.2	12.5	29.3	129.0	4.9	6.3
5. U.K.	0.5	—	—	—	0.7	1.8	53.5	56.2	68.2	22.0
6. Others	—	2.4	19.7	4.0	—	44.4	89.0	100.3	13.2	33.3
C. Direct Investment	2.1	5.4	0.8	21.8	2.0	20.9	32.0	48.7	86.3	55.9
1. U.S.A.	2.1	5.4	0.4	21.0	1.9	18.5	17.0	15.1	50.1	23.1
2. Japan	—	—	—	—	—	1.7	8.5	26.7	22.2	28.2
3. Others	—	—	0.4	0.7	0.1	0.7	6.5	6.9	14.0	4.6
Total	77.5	69.8	99.5	176.6	260.7	250.1	577.8	904.6	571.3	802.6

NOTE: IBRD—International Bank for Reconstruction and Development; ADB—Asian Development Bank. Loans are for terms of three years or more. Subitems may not add exactly to totals because of rounding.

SOURCE: Economic Planning Board, *Major Economic Indicators.*

tion Committee, which was chaired by the Minister of the Economic Planning Board.

Tax concessions were also granted to stimulate foreign loans and technology imports, including full and partial exemptions from individual income or corporation income tax on the foreign lender's interest income accruing from approved foreign loans and from income tax on payments made to foreigners who provided technical services. Direct foreign investment was encouraged by full exemption from individual or corporation income tax of the foreign investor's income for the first 3 years, a 50 percent reduction in tax for the next 5 years, full exemption from customs duties on imported capital goods for approved foreign investment projects, and no capital gains taxes on foreign investment.

Because of the positive measures of the government to attract foreign capital, foreign loans and investments "finalized" increased sharply after 1962 and amounted to $222.7 million at the end of 1963 as shown in Table 7–3.[2] As already mentioned, foreign loans finalized at the end of 1960 were only about $18.8 million. At the end of 1963, commercial loans finalized amounted to $127.5 million, larger than the $84.4 million of finalized foreign public loans. Actual "arrivals" of the foreign loans and equity investment were, however, relatively small in 1961–63 as shown in Table 7–3, since finalized foreign loans and investment generally required a year or more before the goods and services financed by the foreign capital actually arrived.

In 1966 a new Foreign Capital Inducement Law revised and streamlined various past laws. The major changes were as follows:

(1) Restrictions on foreign direct investment were removed. First, foreign investors could invest without any floor on the amount; the old law had specified that domestic investors must own at least 25 percent of the equity in a given enterprise. Secondly, the maximum limit on annual profit repatriation of 20 percent of invested capital was removed completely.

(2) If foreign-financed firms threatened default on repayment of loans, the government was authorized to supervise their management and property and to take any measures necessary to achieve solvency.

(3) Enterprises benefiting from government-guaranteed loans were required to float authorized stock within 5 years from the date of approval of the government repayment guarantee.

(4) Government repayment guarantees were limited so that the annual debt service arising from such loans was not to exceed 9 percent of total annual foreign exchange receipts.

(5) Priority and special tax benefits were to be given to loan project applicants who used domestic capital goods for more than 50 percent of the loan amount contracted.

(6) Tax concessions given to enterprises with foreign equity were also

TABLE 7–3

Status of Foreign Capital Inducement, 1961 to 1963

(millions of dollars)

	Loans Finalized through 1963	Loan Arrivals			
		Before 1961	1962	1963	Cumulative through 1963
Public loans—Total (12 cases)	84.4	4.7	3.0	42.8	50.5
AID	61.6	4.7	3.0	27.8	35.5
IDA	14.0	—	—	12.4	12.4
West Germany	8.8	—	—	2.6	2.6
Commercial loans (24 cases)	127.5	—	3.5	18.0	21.5
West Germany	20.9	—	—	10.6	10.6
Italy & France	38.3	—	—	—	—
United States	17.3	—	3.5	6.6	10.1
Japan	38.7	—	—	—	—
Britain	0.6	—	—	0.6	0.6
Switzerland	9.3	—	—	0.3	0.3
Sweden	9.3	—	—	—	—
The Netherlands	2.1	—	—	—	—
Direct & joint investment (7 cases)	10.5	—	0.6	4.8	5.4
United States	6.6	—	0.6	4.8	5.4
West Germany	3.0	—	—	—	—
Japan	0.6	—	—	—	—
Hong Kong	0.3	—	—	—	—
Grand total	222.7	4.7	7.1	65.6	77.4

SOURCE: Bank of Korea, *Annual Report for 1963*, p. 132.

slightly changed in the new law. Foreign enterprises were fully exempted from the individual income tax, the corporation tax, and the property tax for the first 5 years, and given a 50 percent exemption for the next 3 years. Tariff and commodity tax exemptions on the import of capital goods by foreign investors remained unchanged.

The main rationale for the new Foreign Capital Inducement Law was to give more favorable treatment to foreign direct investment. The new law made no substantial changes affecting foreign loans. However, the inflow of foreign loans was greatly accelerated after 1965. The interest rate reform of 1965 increased incentives to borrow from abroad and the system of commercial bank guarantees on repayments of foreign loans authorized in 1966 stimulated

foreign lending. Since the interest rate reform of 1965 caused the rate on ordinary commercial bank loans to jump from 16 to 26 percent per annum, it greatly widened the interest rate gap between domestic bank and foreign loans.

The Korea-Japan Diplomatic Normalization Agreement of June 1965 was also important in increasing foreign capital inflows. According to the Agreement, South Korea was to receive the Property and Claims Fund from Japan, totalling $500 million ($300 million in grants and $200 million in public loans) over the next 10 years. In addition, the Japanese Government was to make available $300 million for commercial loans to South Korea. Initial grants and loans were received in 1966.

FOREIGN CAPITAL IN SOUTH KOREA'S ECONOMIC GROWTH

The inflow of foreign capital of all types (total foreign savings) was substantial between 1960 and 1972 (Table 7–4). In 1960, foreign saving accounted for almost 80 percent of total investment and 8.5 percent of GNP. Foreign

TABLE 7–4
Foreign Capital and Gross Investment, 1960 to 1972
(billion won, current prices)

Year	Foreign Transfers	Foreign Borrowing	Total Foreign Savings	Foreign Saving as Percent of Gross Investment	Foreign Saving as Percent of GNP
1960	22.06	−1.07	20.99	78.3	8.5
1961	29.51	−4.22	25.29	65.2	8.5
1962	30.73	7.22	37.95	83.4	10.9
1963	33.73	18.63	52.36	58.0	10.7
1964	44.03	5.10	49.13	48.1	7.0
1965	53.95	−2.42	51.53	42.2	6.4
1966	59.58	28.05	87.63	39.0	8.5
1967	60.94	51.92	112.86	40.2	9.2
1968	62.54	121.79	184.33	43.1	11.5
1969	70.86	158.16	229.02	36.9	11.0
1970	55.96	193.35	249.31	35.4	9.6
1971	59.32	294.68	354.00	44.0	11.2
1972[a]	66.71	148.32	215.03	26.7	5.6

SOURCE: Bank of Korea, *Economic Statistics Yearbook, 1973*, pp. 298–299.
a. Preliminary

saving as a percent of total investment declined substantially over the decade so that by 1972 it accounted for less than 35 percent of total investment. As a percentage of GNP, however, foreign savings had not shown any downward trend until 1972; previously they had fluctuated year-to-year around an average of about 10 percent of current price GNP. The average gross capital-output ratio from 1960 to 1970 was 2.5. Given this ratio, the average contribution to growth has been about 4 percentage points a year during the 1960s. Since the average rate of growth was about 10 percent over the decade, without foreign savings the growth rate might have been closer to 6 percent and total output in 1970 about 30 percent less than it actually was.

Rough estimates of the contribution of foreign capital to Korea's growth were also made by another method. We assumed that the increment in output each year due to foreign capital was the same as the estimated increment in output due to total investment in that year. The incremental capital-output ratio in this method was not assumed to be constant, but an increasing function of total investment. The contribution of foreign capital is expressed by the difference in 1971 GNP had there been no foreign capital imports from 1966 to 1970. The calculations were made for total foreign savings, total foreign borrowing (foreign savings less transfers from the rest of the world), and total foreign commercial borrowing (excluding borrowing from public sources). The results are (in billions of current won) as follows:

Actual 1971 GNP	3,151.55
Estimated 1971 GNP without foreign savings, 1966 to 1970	2,759.99
Estimated 1971 GNP without foreign borrowing, 1966 to 1970	2,924.65
Estimated 1971 GNP without foreign commercial borrowing, 1966 to 1970	3,023.01

These calculations assumed that the relationship between output growth in the nonagricultural sectors of the economy and investment in those sectors could be estimated by an ordinary least squares regression of real GNP in nonagricultural sectors on previous year's GNP and the previous year's real gross investment (equation 8–2 in Chapter 8). The results show that without foreign savings (which include foreign aid in the form of transfers and loans) between 1966 and 1970, total output in 1971 would have been about 12.4 percent less than it actually was.[3] Without foreign commercial borrowing (which includes no foreign aid flows), the level of output would have been only about 4.1 percent less. The contributions of foreign capital in the late 1960s were relatively modest because the incremental capital-output ratio rose in those years. The marginal contributions of investment to output de-

clined. However, if one measures the contribution of foreign savings during the entire decade of the '60s, the difference in output is quite large. Output in 1971 would have been about a third less. That is, almost one-third of 1971 output can be attributed to foreign savings during the previous decade. Foreign borrowing, however, has not made nearly so substantial a contribution. Most foreign savings in the early 1960s took the form of aid transfers, while foreign borrowing only became large a few years later when capital productivity was considerably reduced.

COST OF CAPITAL IMPORTS

Although the contribution of foreign borrowing to South Korea's economic growth was modest, the costs of these capital imports incurred during the 1960s are making themselves felt a decade later in the form of debt service payments. As foreign debt accumulates, with more than $2 billion outstanding at the beginning of 1971 (including all debt with a maturity greater than one year), debt service payments have grown very rapidly, reaching $326.6 million in 1971 or about 28 percent of total export earnings.[4]

The expected high level of debt service payments in the remainder of the 1970s will introduce a good deal of inflexibility into Korea's balance of payments. With so much foreign exchange required to service loans, imports must bear a greater share of the burden of adjustment if foreign exchange earnings do not grow as rapidly as they have in the past.

Given the rapid rise in debt service and the experience of other countries burdened with large debt service payments, South Korea may find it necessary to renegotiate its outstanding debt. Projections by the Economic Planning Board and the aid donors show that by 1976 debt service including interest on contemplated borrowings should total about $650 million. However, exports have grown so rapidly since these projections were calculated that by 1976 the debt service ratio should be well below 20 percent. Although the costs of imported fuel and international loans have increased, they have been more than offset by the extremely rapid growth of South Korea's export earnings. Nevertheless, heavy debt service obligations may pose future difficulties. For according to the formula in Frank and Cline (1971), the critical ratio of debt service to export earnings in 1976 will be about 17.8 percent. If this figure should be exceeded by the actual debt service ratio, a rescheduling of the debt will be quite likely.[5]

REAL AND NOMINAL RATES OF INTEREST ON FOREIGN CAPITAL

We have seen how South Korea's rapidly increased borrowing from abroad and her shift to more costly sources of capital may make balance of payments adjustment more difficult and costly in the 1970s unless the foreign trade deficit is reduced. According to classical marginal economic analysis, however, the more relevant question is whether the rate of return on foreign financed investment has exceeded the rate of interest on foreign borrowing. If it has, then in theory foreign borrowing is profitable and should be encouraged.

But this approach ignores a number of macroeconomic factors that might determine the cost of foreign borrowing. First, there is the problem of reducing the trade deficit and of generating the trade surpluses eventually required to pay back principal and interest on foreign borrowing. Second, savings must increase rapidly enough not only to repay foreign loans, but also to finance sufficient domestic investment to maintain satisfactory rates of growth. Third, to the extent that foreign loans are the debts of government or defaulted by private investors under government guarantee, the government must have sufficient command over resources through taxation or local borrowing to pay its debts and finance its own domestic expenditures. Fourth, local firms that borrow large amounts abroad may be particularly vulnerable to credit squeezes and large devaluations. Finally, dependence on foreign borrowing and the debt servicing obligations that follow make balance of payments adjustment to short-run cyclic factors more costly and difficult.[6]

Even if these other factors are ignored, the classical view of foreign borrowing begs a number of questions in a world in which monetary, fiscal, and exchange rate policy can affect real rates of interest which do not necessarily reflect relative factor scarcities in different countries.[7] 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 borrowing.

Our argument assumes that the U.S. dollar is *the* international reserve currency and that the world economy is one in which a Fisherian "real interest" analysis applies, i.e., one in which rates of inflation may vary from country to country but remain fairly steady within each country where expectations adjust to steady rates. In this theoretical framework, we argue that the real social cost of foreign borrowing in a country like Korea is the nominal rate of interest on foreign-currency-denominated foreign loans *less* the 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 the price inflation. Symbolically, we write for the real social cost of foreign borrowing (r_s):

$$r_s = r_n - r_{ip} \tag{7-1}$$

where r_n is the nominal rate of interest on foreign loans and r_{ip} is the rate of price inflation of internationally traded goods.

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 *local* rate of price inflation *and* the 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 rate of exchange. As such, the real cost of repayment declines when the local price level increases and increases when the local currency is devalued. The formula, then, for the real private interest cost of the loan r_p is

$$r_p = r_n - r_{dp} + r_e \tag{7-2}$$

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

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 borrowing. This is illustrated by the marginal efficiency of investment schedule as shown in Figure 7–1. The optimal level of foreign borrowing is F_1 at which point the real social cost of foreign borrowing equals the rate of return on investment. 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 costs of foreign borrowing will thus only be equal if

$$r_e = r_{dp} - r_{ip} \tag{7-3}$$

or if the rate of local currency devaluation equals the rate of domestic price inflation less the rate of inflation of prices of internationally traded goods.

EFFICIENCY OF FOREIGN BORROWING

The effect of a divergence between the real social and real private interest costs of a foreign loan on efficiency of investment can be shown in terms of a Fisherian analysis of consumption, investment and interest rates. For purposes of this analysis, we assume a single commodity world and two discrete time periods. The analysis may be generalized to multiple time periods, but the basic results should remain the same.

FIGURE 7–1
Marginal Efficiency of Investment Schedule

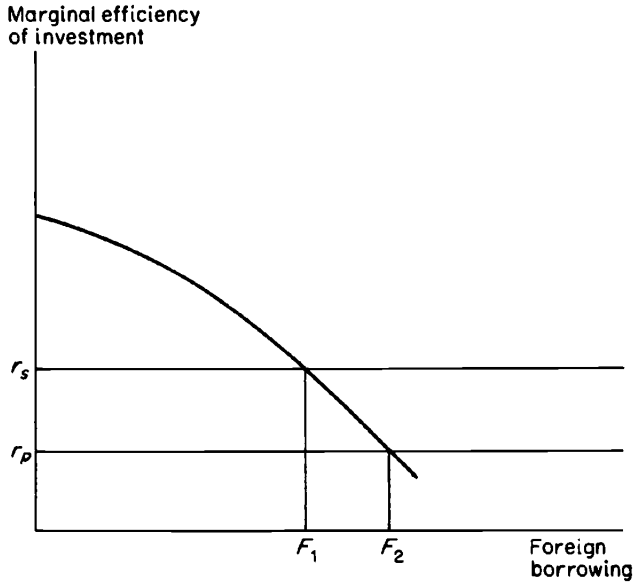


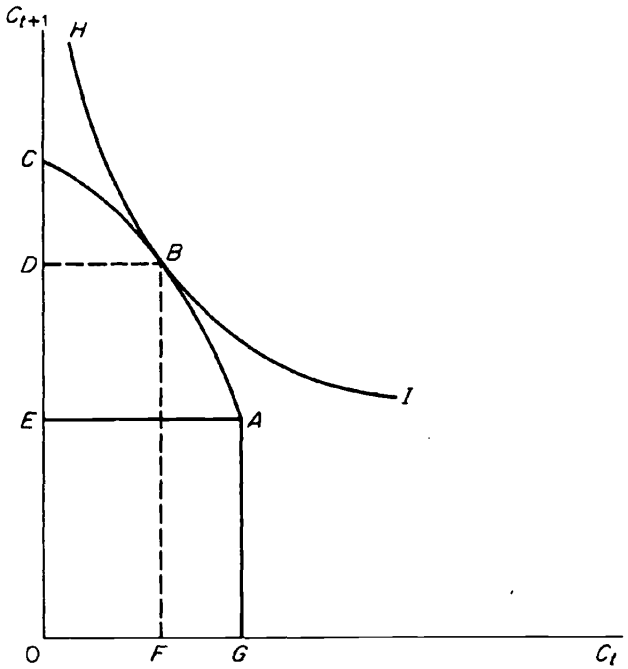
Figure 7–2 shows a Fisherian diagram with consumption in period t on the horizontal axis and consumption in period $t + 1$ on the vertical axis. If there is no saving and no investment, output in period t is OG, and output in period $t + 1$ is OE. Output in both periods is equal ($OG = OE$), and consumption in both periods is the same and equal to output.

The curve ABC is a transformation curve, the slope of which is one plus the single period rate of return on capital. The curve HI is a social indifference curve, the slope of which is the marginal rate of substitution between consumption in period t and period $t + 1$ or one plus the rate of time preference. The optimal distribution of consumption between period t and period $t + 1$ is shown by the point B. The optimal level of savings and investment in period t is given by the distance FG. Total output in period $t + 1$ is the same as total consumption in period $t + 1$ and equal to OD. The equilibrium or optimal interest rate is the same as the optimal rate of return on capital and the optimal rate of time preference. All are equal to the slope of the transformation curve ABC at B minus unity (or the slope of the indifference curve HI at B minus unity).

The analysis so far assumes that there is no foreign borrowing. If foreign capital is available *at a rate of interest less than the equilibrium interest rate* as shown in Figure 7–2, foreign borrowing can increase consumption in *both*

FIGURE 7–2

Optimal Consumption Allocation over Time: No Foreign Borrowing



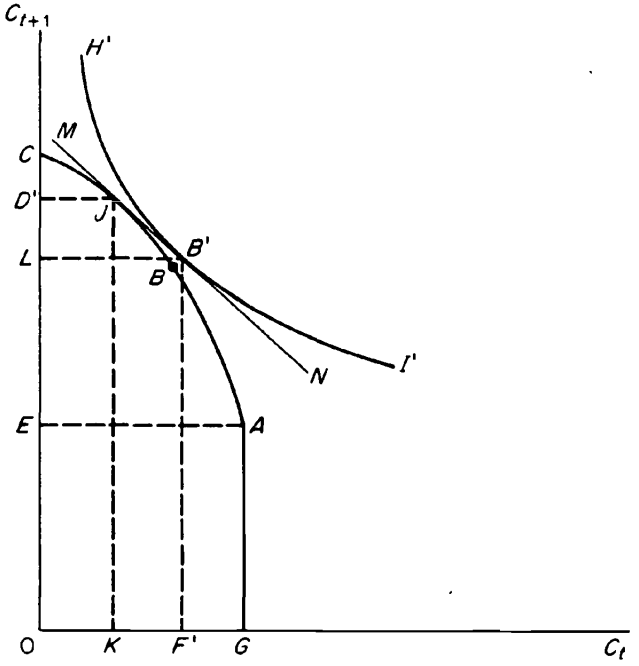
periods t and $t + 1$ and increase the level of social welfare. The possibility is depicted in Figure 7–3.

In Figure 7–3, the slope of the line MN is one plus the rate of interest on a foreign loan (i.e., foreign capital import). The availability of foreign loans allows for any combination of consumption in periods t and $t + 1$ along the line MN which is tangent to the transformation curve ABC. The optimal combination of consumption in periods t and $t + 1$ is represented by point B' which lies above and to the right of B, indicating that it is possible to achieve greater consumption in both periods when foreign borrowing is permitted.

Total foreign borrowing in period t is given by the distance KF' while domestic saving is $F'G$. Total income in period t is OG and consumption OF'. In period $t + 1$, total product (domestic) is OD', and LD' represents domestic savings. Foreign savings is negative and also equal to LD' which represents payments of principal and interest on the original loan KF'. The foreign borrowing is efficient when the rate of interest on the foreign borrowing is less than the domestic equilibrium rate without foreign borrowing.

FIGURE 7–3

Optimal Consumption Allocation over Time with Foreign Borrowing



Suppose, however, we complicate our analysis by allowing a local money supply and price inflation. We assume a simple quantity theory. The government through its central bank determines a money supply and this in turn determines the price level for our single commodity. The foreign price of the commodity is assumed to be the *numeraire* so that the foreign price of one unit of the good is always unity. Suppose the existence of an exchange bank that exchanges local currency for foreign currency and vice versa at a rate determined by the government. To keep matters simple, suppose also that the exchange bank acts as an export and import agent. When it receives local currency, it purchases the domestic good and sells it abroad to obtain foreign currency to make payments abroad. When it receives foreign currency, it imports goods from abroad and sells them domestically to obtain local currency.

We assume that the exchange bank carries no reserves from period to period. Therefore, payments and receipts of foreign currency must balance. If local currency proceeds are not sufficient to make payments equal receipts, the government taxes local entrepreneurs in kind and turns the proceeds over to the exchange bank which then exports the commodities to obtain foreign

currency to make payments. If payments are less than receipts, the exchange bank imports commodities with the excess receipts and the goods are distributed as subsidies to private individuals.

Given this simple model, suppose the price level rises from period t to period $t + 1$. Let p_{t+1}/p_t be the ratio of prices in the two periods. On the other hand, suppose the exchange rate between the foreign and domestic currency remains the same. If foreign loans are denominated in the foreign currency and the rate of interest on the foreign loans is r, the *real* value of the loan receipt in terms of local currency is L/p_t and the *real* value of the *local* currency repayments is $L(1+r)/p_{t+1}$ where L is the amount of the loan in terms of local currency. The ratio of payments to the original amount of the loan in real terms is

$$(1+r)\frac{p_t}{p_{t+1}} = (1+r-\frac{\Delta p}{p_t}) + (\Delta p/p_{t+1})(\Delta p/p_{t+1} - r) \quad (7\text{–}4)$$

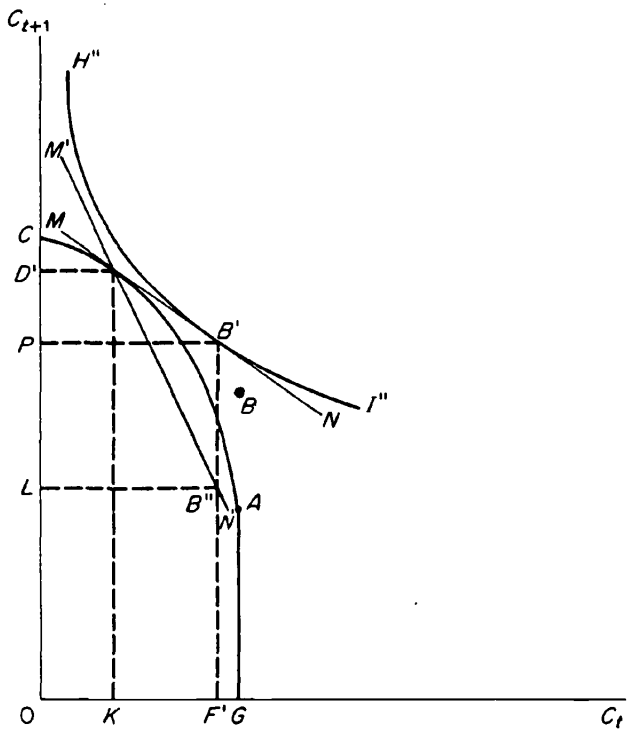
$$\approx (1+r-\frac{\Delta p}{p_t})$$

where $\Delta p = p_{t+1} - p_t$. The approximation indicates that the *real* rate of interest to the domestic borrower is nearly equal to the rate of interest r on the foreign loan less the rate of inflation $\Delta p/p_t$. This situation is depicted in Figure 7–4 where the slope of the line MN is the ratio of repayment in real terms to the original amount of the loan in real terms or approximately equal to $(1 + r - \Delta p/p_t)$.

Private entrepreneurs, acting on the basis of the private real rate of interest (assuming that they anticipate the inflation), borrow an amount KF' from abroad, expecting to reach the consumption point B'. The actual interest rate in terms of the *good* (the rate which the exchange bank must pay abroad), however, is represented by the slope $(1 + r)$ of the line $M'N'$. The local currency proceeds of the exchange bank are not enough to purchase the amounts of goods required to pay the foreign loan. The local currency proceeds are $D'P$ in terms of goods. In order to repay the loan, the government taxes local borrowers by an amount PL to meet the full repayment represented by $D'L$. The actual consumption point is B'' rather than B'. The actual consumption point B'' represents less consumption in both periods than could be achieved if private entrepreneurs acted on the basis of the real foreign rate of interest. For example, the point B which lies above and to the right of B'' could be achieved if the entrepreneurs acted under the correct assumption as to the interest rate.

The only way to reach the optimal point B, given the rate of price inflation, is to devalue the local currency at a rate equal to the rate of inflation. The real value of the local currency receipts of the loan are $L \cdot e_t/p_t$ and the real value of the local currency repayments is $L(1 + r) \cdot e_{t+1}/p_{t+1}$ where

FIGURE 7–4
Inefficiency in Consumption over Time



e_t is the exchange rate. The ratio of the two is equal to $(1 + r)$ if and only if $e_t/p_t = e_{t+1}/p_{t+1}$ or $1 + \Delta p/p_t$ is equal to $1 + \Delta e/e_t$.

In this model, when the rate of devaluation equals the rate of inflation, an efficient investment pattern is achieved. The analysis assumes that the international price is the *numeraire* and it can easily be generalized to a situation in which international prices increase. In that case, efficient investment occurs only when the local currency devalues at a rate equal to the difference between the rate of domestic inflation and the rate of inflation of international prices—that is, when the real private and social interest rates are equal.

REAL PRIVATE AND SOCIAL COSTS OF FOREIGN BORROWING

In Table 7–5, we have estimated the private and social real interest costs for Korea from 1965 to 1970. They indicate that, if the appropriate domestic

TABLE 7–5

Private and Social Real Interest Costs, 1965 to 1970

	1965	1966	1967	1968	1969	1970
Nominal interest rate on foreign loans[a]	5.6	5.7	6.1	5.9	7.1	7.0
Less: rate of inflation of prices of internationally traded goods[b]	−2.3	−2.3	−2.3	−2.3	−2.3	−2.3
Equals: estimated real social interest cost of foreign loans	3.3	3.4	3.8	3.6	4.8	4.7
Nominal interest rate on foreign loans	5.6	5.7	6.1	5.9	7.1	7.0
Less: rate of domestic price inflation[c]	−11.3 (−8.5)	−11.3 (−8.5)	−11.3 (−8.5)	−11.3 (−8.5)	−11.3 (−8.5)	−11.3 (−8.5)
Plus: rate of devaluation[d]	3.2	3.2	3.2	3.2	3.2	3.2
Equals: estimated real private cost of foreign loans	−2.5 (0.3)	−2.4 (0.4)	−2.0 (0.8)	−2.2 (0.6)	−1.0 (1.8)	−1.1 (1.7)

a. Weighted annual average rate of interest on foreign loan agreements.

b. Rate of inflation from 1965 to 1970 of wholesale prices of major trading partners, using wholesale price indexes weighted by trade volume.

c. Rate of inflation of GNP deflator of Korea, 1965 to 1970. Figures in parentheses are rate of inflation of wholesale price index over the same period.

d. Average rate of devaluation exchange rate, 1965 to 1970.

price index is the GNP deflator, the private real interest cost has been 5.8 percentage points lower than the social real interest cost and that there has been a powerful incentive to import foreign capital at an excessive rate. In fact, the real private interest cost of foreign loans has been substantially negative. If the wholesale price index is used, however, the divergence between private and social costs is smaller, but still 3 percentage points.

The price index used for prices of internationally traded goods was a weighted average of U.S. and Japanese wholesale prices. This is probably a slight overestimate of the rate of price increase for South Korea's traded goods. Japanese export prices have tended to increase less rapidly than the wholesale price index while U.S. export prices have probably increased slightly more rapidly than wholesale prices. The difference, however, between growth in Japanese export prices and wholesale prices has probably been somewhat greater than the difference in growth of U.S. export prices and wholesale prices.[8] If South Korean export and import prices indexes were available,

they would probably show somewhat more divergence between private and social real interest costs than those shown in Table 7–5 and thus somewhat more of an incentive to borrow abroad beyond the optimal level.

The rate of devaluation used in the computations in Table 7–5 was the average rate of devaluation between 1965 and 1970. This includes a period from August 1965 to the end of 1967 when the exchange rate was pegged at about 270 won to the dollar and rapid growth of foreign commercial borrowing began. Interviews with businessmen suggest that at that time, there was no expectation that the exchange rate would change as much as it did during the late 1960s. If this is true, the large influx of foreign capital may have been due in part to an underestimate of the real private costs because of an expectation of a stable exchange rate. The value of the won, however, gradually fell between the beginning of 1968 and mid-1971, at which time there was a sharp devaluation. Nevertheless, during 1968 and 1969, foreign commercial borrowing continued to grow rapidly. In 1970, however, the demand for foreign loans was reduced sharply. Perhaps by 1970, it had become clear to businessmen that movement in the value of the won was not temporary and that the true cost of foreign borrowing was likely to be greater than they had originally expected, although government ceilings on foreign borrowing may have been chiefly responsible for the slow growth of foreign borrowing in 1970.

In 1971 and 1972 also, the demand for foreign commercial borrowing seems to have slackened. According to businessmen interviewed, their desire for foreign loans was curbed by the devaluation of June 1971 and by the reintroduction of the rapidly gliding peg in early 1972.

FOREIGN BORROWING AND SECTORAL RESOURCE ALLOCATION

We have shown how a failure to devalue at a sufficient rate, given domestic price inflation, is likely to lead to excessive foreign borrowing and investment. We now note also that, because of the institutional nature of capital markets, low real private interest rates on foreign loans may distort the sectoral allocation of resources.

In particular, foreign commercial loans are often most easily available in the form of supplier credits. Thus, loans are often tied to purchases of capital equipment abroad. Of course, this is often true for public loans as well. This has two effects: First, low-cost foreign loans favor those sectors that are relatively heavy users of foreign capital equipment. Second, low-cost foreign loans relative to local commercial loans may be a form of negative protection to the local capital goods industries.

TABLE 7–6

Comparative Real Interest Costs of Domestic and Foreign Loans, 1965 to 1970

	1965	1966	1967	1968	1969	1970
Nominal local interest rates:						
Commercial bank prime rate	18.5	26.0	26.0	25.8	24.0	24.0
Korea Development Bank rate on equipment loans	9.5	11.0	11.0	11.0	12.0	12.0
Real local interest rates equals nominal rate less rate of inflation of 8.5 percent for wholesale price index (11.3 percent for GNP deflator) for 1965–70						
Commercial bank prime rate	10.0 (7.2)	17.5 (14.7)	17.5 (14.7)	17.3 (14.5)	15.5 (12.7)	15.5 (12.7)
Korea Development Bank equipment rate	1.0 (−1.8)	2.5 (−0.3)	2.5 (−0.3)	2.5 (−0.3)	3.5 (0.7)	3.5 (0.7)
Real private interest cost of foreign loans	0.3 (−2.3)	0.4 (−2.4)	0.8 (−2.0)	0.6 (−2.2)	1.8 (−1.0)	1.7 (−1.1)

NOTE: Figures in parentheses are based on use of the GNP deflator. All other real interest rates are based on the wholesale price index.

SOURCE: Bank of Korea, *Economic Statistics Yearbook, 1971*, pp. 133–135.

Table 7–6 compares local real interest rates with the real private interest costs of foreign borrowing. Local real interest rates tend to be much higher, particularly those on commercial bank loans. Local capital equipment suppliers are thus at a disadvantage in that available sources of financing carry higher real interest costs than financial sources for purchase of foreign equipment. This disadvantage can be viewed as an effective tax on local equipment producers. This effective tax can be quantitatively assessed by measuring the difference in present value of a stream of repayments required to service two types of loan, a loan to purchase foreign equipment and a loan to purchase domestic equipment. (See the appendix to this chapter for mathematical details.)

Table 7–7 gives the percentage subsidy implicit in the purchase of 1,000 won of foreign machinery financed by a foreign loan instead of 1,000 won of domestic equipment financed by a domestic loan. Both KDB equipment and commercial bank loans in two different years, 1965 and 1970, are considered.[9]

TABLE 7–7
Present Value of Repayments on 1,000 Won Loan

	1965	1970
Foreign loan	775.4	813.4
Commercial bank loan	917.4	1,009.9
KDB equipment loan	765.9	808.8

NOTE: Terms are 5 years repayment, 20 percent down. Discount rate is 15 percent.

For KDB equipment loans, the cost of financing capital goods purchases whether locally or by foreign loan is about the same. For bank loans, however, the difference in cost is very great. The cost (present value of repayments) of financing a 1,000 won loan was 917.4 for a commercial bank loan, or 18 percent greater than the cost of a foreign loan. In 1970, the difference had grown to 24 percent. This means that local sellers were subject to an implicit tax of 18 to 24 percent when competing against foreign capital goods financed abroad when commercial bank loans were the source of local finance.

These estimates do not take into account the government's special loan fund instituted in 1967 for financing purchases of domestic machinery. Very little credit was provided at first under this program, and there were administrative difficulties at the outset. After a couple of years, however, this special loan fund grew in importance and offset some of the interest rate distortions that had favored foreign-made machinery purchases.

DISCONTINUOUS DEVALUATION AND GLIDING PARITY

We have not yet distinguished between discontinuous devaluations and gradual changes in the exchange rate. In South Korea, discontinuous devaluations occurred in February 1960, January and February 1961, May 1964, and June 1971. The rate was allowed to float for a while in the spring of 1965, between 1968 and June 1971, and again beginning in early 1972 until June of that year. Thus, Korea has alternated between a policy of gradual devaluation and an adjustable exchange rate peg. Both policies have been aimed at maintaining the purchasing power parity of the won by adjusting for the effects of domestic and international price inflation.

Whatever the effects of the two policies on commodity exports and imports might be, the effect of pegged rates with discontinuous devaluations on

the capital side of the balance of payments is likely to be destabilizing under conditions of rapid domestic inflation. First, if borrowers of foreign capital come to expect fixed rates accompanied by occasional large devaluations, they will set a very high premium on guessing when the next devaluation will take place. If no devaluation is expected for a few years, the demand for foreign capital will be very great. Borrowers will attempt to borrow as much capital as possible when the exchange risk is believed to be low and conversely the demand for foreign loans may fall off sharply when expectations of an imminent devaluation are high. Thus, the demand for foreign loans will be very unstable and will fluctuate in response to rumors of devaluation. This effect, of course, occurs on the commodity side, but to a much lesser degree. When domestic producers expect a devaluation in the near future, the current demand for imports will be high and the short-run supply of exports will fall off. But the extent to which imports can be accelerated and exports held back may be limited by transportation and storage facilities. The cost of investing in transport and storage facilities to handle large short-run fluctuations in stocks as a hedge against devaluation may be very high. There is no comparable cost on the capital side. Increasing one's portfolio of foreign loans involves only the interest charges on the loans.

Second, pegged exchange rates with discontinuous devaluations distort the term structure of foreign loans. There is an increased premium on short-term credits in preference to long term. When credits are denominated in foreign currency, short-term credits with frequent roll-over substantially reduce the exchange risk to the borrower when large devaluations may take place. On the other hand, if borrowers expect devaluations to be gradual, continuous, and in line with the divergence between domestic and international price inflation, they have no reason to shift foreign loan portfolios to short-term loans as a hedge against devaluation.

Finally, pegged rates with discontinuous devaluations cause large and discontinuous changes in the value of foreign loan liabilities. In other words, producers and traders who have guessed incorrectly and find themselves holding large foreign loan liabilities may suffer large losses in their *net* real asset positions. Whenever large amounts of foreign loans are outstanding, abrupt and large devaluations can substantially affect the asset positions of firms and individuals. Those who suffer such losses are likely to resist further devaluations, as they have in Korea, and thus devaluation becomes a politically dangerous and increasingly difficult measure to implement. As a result, domestic inflation quickly erodes the purchasing power parity of the exchange rate and corrective action becomes longer delayed and more problematical.

As an alternative to gradual devaluation or to pegged exchange rates with discontinuous devaluation, a flat surtax on imports could be imposed together with the same flat subsidy on exports. This would be equivalent to a

devaluation for commodity transactions. Since capital transactions and transfer payments would continue to take place on the basis of the nondevalued official exchange rate, the political problem that would otherwise arise from deterioration of the net asset position of borrowers of foreign capital could be avoided. The objection, however, to this approach is that real interest rates in terms of won would remain low and the social opportunity cost of foreign loans would continue to be greater than the private real interest cost of foreign loans. While flat surcharges and subsidies on commodity transactions may help maintain a realistic exchange rate for exports and imports, the demand for foreign loans would continue to exceed equilibrium.

To achieve an efficient level of foreign capital inflow and efficient use of foreign loans, a gliding parity approach to exchange rate adjustment has in our view a good deal of merit. Since a gliding parity offers no excessive incentives to borrow abroad, capital movement stability is more likely to be achieved. Real domestic interest rates, however, may exceed the real rate on foreign loans even if purchasing power parity is maintained. Thus, if purchases of domestic equipment are usually financed through domestic loans and imported equipment through foreign loans, the domestic machinery industry may remain at a disadvantage. If, however, the same real domestic interest rate had been maintained during the 1960s, while the official exchange rate was adjusted to maintain parity, then at least the disincentive to domestic machinery purchase would have been reduced, since the divergence between real interest rates on foreign and domestic loans would have been narrowed.

ECONOMIC POLICY AND FOREIGN LOANS

Exchange rate policy in South Korea has facilitated the inflow of foreign loans, perhaps excessively, and has resulted in a net disincentive to local machinery producers. In fact, a local guarantee program favors imported machinery. Domestic borrowers of foreign loans can obtain Korea Development Bank or commercial bank guarantees on repayment (both amortization and interest payments) in accordance with the Foreign Capital Inducement Law. This system greatly facilitates the import of foreign loans since foreign lenders are guaranteed repayment regardless of the domestic borrower's credit standing.

Second best solutions in place of gliding parity include either an interest equalization tax or quantitative restrictions on capital flows. The main rationale for an interest equalization tax would not be the common notion that it would equalize domestic and foreign loan interest rates, but rather that it would equalize the real interest cost in terms of won and the real interest cost in terms of dollars. A differential between foreign and domestic interest rates may reflect real differences in opportunity costs of foreign and domestic cap-

ital. The differential between real dollar and real won interest cost of foreign loans, however, represents a divergency between social and private costs.

Controls on foreign borrowing have been in effect since 1962 when the Foreign Capital Inducement Deliberation Committee was set up in the Economic Planning Board. In practice, however, foreign loan applications were generally encouraged if they could meet minimal criteria and no strict limits on foreign borrowing were enforced. Recently, however, an IMF standby agreement has required the Korean government to issue letters of intent to strictly limit foreign capital movements by loan categories based on the term of the loan. The strictest limitations were placed on one- to three-year loans, while very long term loans were given liberal treatment. The effect of IMF pressure can be seen in the 1970 figures for loan arrivals and agreements (tables 7–1 and 7–2). After increasing more than three and a half times between 1966 and 1969, foreign capital arrivals increased by less than 2 percent in 1970. Foreign commercial loan agreements, which increased almost ten times between 1964 and 1969, actually decreased in 1970. These restrictions on foreign capital imports may not be applied in the most evenhanded or efficient way, but they have virtually stopped the extremely rapid growth in foreign capital imports.

As part of the revision of economic policies in August 1972, domestic interest rates were lowered. At the same time, foreign interest rates had begun to creep up with the net result that the incentive to borrow abroad has been reduced. Furthermore, since South Korea's exports continue to grow very rapidly, and since imports in the early 1970s have on the average grown much less rapidly, the need to borrow abroad to finance a trade deficit has abated. The domestic machinery industry has begun to develop and special government-sponsored credit programs have spurred sales. Thus, the need to finance capital goods purchases abroad has become relatively less important. The days of very heavy foreign borrowing, excessively encouraged by distortions in interest rates, will probably come to an end in this decade. During the 1960s, however, the high degree of reliance on capital imports made important contributions to South Korean growth.

APPENDIX: CALCULATION OF IMPLICIT SUBSIDIES ON FOREIGN LOANS

For the purchaser of foreign equipment, the present value per won of a loan can be expressed in the following way: Let

$A_o \equiv$ down payment required on the purchase of equipment, expressed as a fraction per dollar lent

$A_t \equiv$ amortization payment in year t, expressed as a fraction per dollar lent, for $t = 1, \ldots, T$, where T is the maturity of the loan.

If e_t is the exchange rate (won per dollar) and p_t is the domestic price index, then

$$A_o^* = \frac{A_o \cdot e_o}{p_o}, \tag{7–5}$$

and

$$A_t^* = \frac{A_t \cdot e_t}{p_t} \tag{7–6}$$

are the down payment and amortization payment, respectively, in real won terms. The present value per won of a loan to purchase the foreign equipment is

$$PV_f = \sum_{t=0}^{T} A_t^* / (1+\rho)^t + r_p \sum_{t=1}^{T} (1 - \sum_{\tau=0}^{t-1} A_\tau^*) / (1+\rho)^t \tag{7–7}$$

where r_p is the real private rate of interest given in equation (7–2). The discount rate ρ is the real opportunity cost of domestic capital.

The present value per won of a loan used to finance the purchase of domestic equipment is

$$PV_d = \sum_{t=0}^{T} B_t / (1+\rho)^t + r_d \sum_{t=1}^{T} (1 - \sum_{\tau=0}^{t-1} B_\tau) / (1+\rho)^t \tag{7–8}$$

where B_o is the down payment ratio and B_t for $t = 1, \ldots, T$ the amortization rate, respectively, in real won terms. r_d is the real rate of interest on domestic loans.

The differential between the present value per won of a loan used to purchase domestic equipment (7–8) and a loan used to purchase foreign equipment (7–7) is the implicit subsidy rate to the purchases of the foreign equipment or the implicit tax rate on purchases of domestic equipment.

$$\text{Implicit tax rate on domestic producers of capital equipment} = PV_d - PV_f. \tag{7–9}$$

Even if the price of domestic equipment is lower than the price of foreign equipment and the domestic and foreign equipment are equal in quality, the effect of the real interest rate differential may make it profitable to purchase the foreign equipment. That is, the implicit tax rate in (7–9) could more than make up for the difference in price.

These implicit tax rates or subsidy rates can be incorporated into a sectoral analysis of effective protection in much the same way as other taxes and subsidies are (see the previous chapter).

NOTES

1. This includes arrivals of loans of maturity greater than one year. Foreign loan arrivals are shown in Table 7–1 and include all the items under row A except for equity (direct) investment which came to be important only in 1970. "Arrivals" indicates the amount of credit actually drawn by local importers as distinct from the amount of borrowing based on completed loan agreements. Separate statistics are kept for arrivals and for agreements.

2. A loan is "finalized" when an agreement is signed, while loan arrivals may be delayed for several years after finalization.

3. This estimate is smaller than it would be if we assumed a constant incremental capital-output ratio.

4. USAID, Korea Mission.

5. Among 145 observations taken elsewhere during the 1950s and '60s, the critical debt service indicator was correct more than 90 percent of the time in predicting rescheduling. See Frank and Cline (1971).

6. For a more detailed discussion of these and other factors see Frank (1970).

7. For references to the literature about differential rates of price inflation under fixed exchange rates and how they may stimulate capital movements which are not necessarily in the direction of higher marginal efficiency of capital, see Willet (1970).

8. See McKinnon (1971). The price indexes used by McKinnon are taken from unpublished estimates by the U.S. Department of Labor. Export and import price indexes are not generally available for the major world-trading economies. Unit-value indexes, which are sometimes used as price indexes of traded goods, are usually quite unreliable.

9. Present value of 1970 loan is in terms of 1965 present value, using 1970 relative interest rates.