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Capital Imports in Economic Development:
The Korean Case, 1962-85*

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The resut of the computation with the estimates of the equations of the model of the Korean economy reveals that the gain from the foreign capital inflow during the period, 1962-85, is about three times of the cost of it, in two different concepts of the foreign capital.

Based on the inverse relationship between the domestic saving and the foreign capital inflow, the gain can be computed as the sum of the direct and the indirect effect and the multiplier effect of more consumption due to the capital imports, whereas the depreciation of the imported capital and the interest payment add up to the total cost of it.

I. Introduction

The Korean economy carries a huge sum of international debt relative to her economy. The burden of $46.8 billion (as of 1985) has been one of the focal points of major controversies about the economy. This thesis intends to estimate the actual "balance sheet" of the gain from and the cost for the foreign capital inflow during the period from 1962 to 1985.

Experiencing the disastrous Korean War following the period of the colonial rule by Japan, the Korean society had gone through a great change almost in every aspect during the fifties, which laid the basis of the economic growth in the following years. At the beginning of the sixties, the newly established

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point that the (lowered) marginal return on capital is equated to the (lowered) marginal utility of consumption, restoring equilibrium.

When domestic saving is regressed, on foreign capital and other variables, the coefficient may be positive or negative, if negative it may be less than or greater than -1. A positive coefficient means that the production pattern and consumption behavior are such that foreign capital inflow induces greater domestic saving. If the coefficient is less than -1, the host country will be better off without the foreign capital inflow.[2] Most of the results of major analyses summarized by Bhagwati and in others show coefficients between zero and -1 as shown in the Table 1. When a country has the coefficient closer to -1 in the Table, the foreign capital inflow is expected to increase more current consumption at the cost of the burden of the next generation of the country, whereas in the cases closer to zero, it allows more capacity in the production which enables economic growth.

The model constructed here encompasses largely the real sector of the economy.

It is assumed that the foreign capital inflow gives an effect on the domestic saving in the Korean economy during the period rather than the reverse holds. If the coefficient of our concern is indeed negative and less than one in its absolute value, it is equivalent to say that the amount of capital inflow is invested for production for output as originally intended, while the remaining is consumed outright. It is assumed that the ordering of preference by the people is lexicographic on the coordinate consisting of the future consumption and the present consumption. For present consumption gives a burden to the next generation, and it is not easy to have an exact estimation of the indifference curve between the two. And it is assumed that there exists no capital flight or it is negligible if any.

The foreign capital actually put into the production processes yields output by the amount of the marginal value product of capital. And it also enables more labor to be employed which gives the marginal value product of labor. To estimate the marginal value product of the factors of production, the Cobb-

[2] See Bhagwati.

Table 1 (continued)

Author	Cross-Country (C) Time Series (T) Pooled (C, T)	Number of Observations	Form of Equation	Deflated Variables (D) Nominal Variables (N)	Effect of Foreign Inflows on Saving
	C		$\frac{I_d}{Y} 100 = a + b\log Y + c(\log Y)^2$	D	-0.8892
Papanek	C	85	$S = a + bA + cI_p + dF_0 + dE_p + fE_0$	N	b c d -1.00 -0.65 -0.38
			$S = a + b\log\frac{Y}{N} + d\log N + eF + fE_P + gE_0$		-0.64
			$S = a + b\log\frac{Y}{N} + c\log N + dF$		-0.73
Clark	C,T	(33 countries)	$\frac{S}{Y} 100 = a + b\log\frac{Y}{N} - c\frac{F}{N} 100 + dP + eW + fD$	D	-0.58
Jhun	T	22	$\frac{S}{Y} = a + bF + ci + dE + eAid$	D	b e -0.149 -0.219
Shinn	T	17	$S_d = a + bY + cS_f$	D	-0.489

(*) 12 of 16 negative

List of Variables:

A = Net transfers received by government plus official long term borrowing
Aid = Foreign aid
B = Net government external borrowing
D = Dummy Variable: 0 pre-1955; 1 post-1955

Sources: Bhagwati, Jhun, Shinn.

E = Exports E_p Primary exports E_o = Other exports
F = Net Foreign Capital inflows F_0 = Other capital inflows
I = Investment I_p = Private i = interest rate
N = Population size P = Decadal rate of population growth
S, S_d = Domestic saving S_f = Foreign saving Y = GNP
W = War damage expressed as multiple of 1958 NNP at factor cost

Table 2

THE CAPITAL SERIES OF THE KOREAN ECONOMY

(in 1980 constant billion won)

Year	The Primary Sector	The Secondary Sector	The Tertiary Sector
1962	6,861.0	5,107.4	3,568.9
1963	6,965.9	5,347.0	4,235.5
1964	7,049.8	5,520.9	4,661.1
1965	7,131.1	5,716.9	5,086.6
1966	7,302.6	6,188.7	5,887.3
1967	7,439.4	6,621.8	6,943.3
1968	7,614.2	7,192.2	8,498.2
1969	7,823.7	7,912.5	10,947.2
1970	8,067.7	8,536.0	13,183.8
1971	8,347.5	9,243.8	15,718.5
1972	8,653.9	9,827.4	17,746.5
1973	9,026.5	10,750.7	20,241.1
1974	9,661.5	11,999.5	23,712.4
1975	10,162.7	13,241.5	27,525.6
1976	10,717.1	14,652.8	31,608.4
1977	11,391.1	16,197.5	36,888.2
1978	12,163.1	18,384.7	43,836.0
1979	12,962.1	20,963.3	52,370.7
1980	13,678.3	23,001.7	58,485.9
1981	14,379.3	25,009.1	64,890.4
1982	14,989.4	26,839.4	70,908.1
1983	15,777.9	28,777.9	78,465.1
1984	16,736.5	31,613.7	87,172.1

Source: Constructed here by the author based on the estimate of the capital for the year of 1968 shown in Chritensen and Cummings.

reveal the actual whole picture of the international debt of the Korean economy during the whole period are obtained from the Economic Planning Board of Korea and used for the estimation.

B. Estimate of the Equations

1. Domestic Saving and Foreign Capital Inflow

The estimation to find the relationship between the domestic

market and the money market. At any rate, the decrease in the domestic saving due to the total capital inflow is less than that due to the short and long-term capital inflow alone.

In the following section IV, the comparison between the gain and the cost of the foreign capital is made in two different categories.

2. *The Production Function*

The estimates of the production functions in the form of the Cobb-Douglas production function are as follows for the primary, the secondary, and the tertiary sector.

In the secondary and the tertiary industrial sector, serial correlation was found to be substantial. To escape from this difficulty, assuming the first order serial correlation, and ARIMA method was employed to compute the production function in those sectors.

$$\ln Y^A = \underset{(-0.76)}{-2.509} \underset{(-3.01)}{-0.0835\,D} + \underset{(2.15)}{0.356} \ln L^A + \underset{(3.51)}{0.430} \ln K^A + \underset{(2.78)}{0.400} \ln Y^A(-1)$$

$$\bar{R}^2 = 92.4$$
$$d = 2.35$$

$$\ln Y^M = -54.184 + 0.73927 \ln L^M + 0.91311 \ln K^M$$

$$\bar{R}^2 = 99.4$$

$$\ln Y^S = 25.384 + 0.38852 \ln L^S + 0.38689 \ln K^S$$

$$\bar{R}^2 = 97.7$$

where Y^A, Y^M, Y^S : output of each industrial sector
L^A, L^M, L^S : labor of each industrial sector
K^A, K^M, K^S : capital of each industrial sector
superscripts *A*, *M*, *S*, stand for the primary industry, the secondary industry and the tertiary industry respectively.
D: dummy variable (1 = the year of poor crops; 0 = others)

about 2 to have a conservative measure.[5]

On the other hand the Korean economy must pay for the foreign capital imports. The cost for it consists of the amount of the depreciation of the physical capital imported and the interest payments.

The 'balance sheet' of the gain and the cost resulting from the foreign capital inflow is shown in the Table 3. The data include the short-term capital as well as the long-term capital imports.

The straight line method is taken to compute the depreciation of the imported capital for simplicity.

The increment of output from the direct effect due to more capital imported is appeared to be 12,056 billion in 1980 won,

Table 3

CUMULATIVE GAIN AND COST OF LONG AND SHORT-TERM CAPITAL IMPORTS BETWEEN 1962-85

(in 1980 constant billion won)

Gain	Primary Industry	Secondary Industry	Tertiary Industry	Total
Direct Effect				
Capital	1,032.78	2,733.98	8,290.41	12,056.27
Labor	652.52	3,081.31	5,995.93	9,740.31
Indirect Effect				
Capital	81.35	252.07	693.41	1,026.83
Labor	52.19	284.23	501.50	837.92
Multiplier Effect of more Consumption				12,461.87
		Total Output Increment		36,123.20
Cost				
Depreciation		5,164.99		
Interest Payment		7,724.29		
			Total Cost	12,839.28

[5] See Crouch, 1972, pp. 353-360.

won. Therefore, the total cost arising from the depreciation of the capital and the interest payment for the borrowed capital amounts to 12,839 billion won.

Consequently, the output increase due to the foreign capital inflow is about three times higher than the amount of the total cost for it during the period.

One may argue that the rate of depreciation computed here is too low. Unable to obtain more realistic rate of depreciation because of the lack of sufficient data, one way of escaping from this difficulty is artificially increasing the rate to find the change in the gain and the cost in the computation. By doing this, it is found that the net gain disappears when the rate goes higher than 15 percent per annum. This implies that however high the rate of capital depreciation might be in reality, it cannot reverse the result of the net gain from the foreign capital inflow from positive to negative.

To encompass the whole foreign capital inflow, physical or monetary, the variable of the international interbank borrowing is included. The computation based on this gives about the same pattern of the net gain. As the Table 4 reveals the total amount of output increase due to the effects explained above is about three times of the total cost due to depreciation and interest payments. And the breakeven point found with increasing depreciation rate is about 15 percent as in the case of excluding bank borrowing shown above.

V. Conclusion

It is concluded that the foreign capital imports during the period, 1962-85, have been beneficial to the Korean economy. The result of the computation with the estimates of the equations of the model reveals that the gain from the foreign capital inflow during the period is about three times of the cost for it in both cases of the concept of the foreign capital. As the rate of depreciation is increased artificially, the breakeven point of the gain and cost of the foreign capital imports during the period is reached at the rate of about 15 per cent per annum, assuming other estimates of the equations of the model are fairly good.

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