

# Is Foreign Capital an Engine for Development?

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## I. Introduction

Controversies on the impact of foreign-capital imports on the economic development of less-developed countries have continued between the optimists<sup>1</sup> and the pessimists.<sup>2</sup> No reconciliation, however, has been made yet.

As an optimist for developing countries, Frankel argues that the inflow of foreign capital into developing countries tends to give more benefits to the importing country and affect adversely the exporting country. This is because private exporters of foreign capital take into account only the direct benefits of investment (income effect). However, the movement of foreign capital results in the international transfer of not only direct benefits of investment but also of indirect benefits (development effect)<sup>3</sup>. A similar optimistic view was demonstrated by R. J. Ball on the ground that the burden of the debt incurred by the capital-importing country can be shifted entirely to the capital-exporting country.<sup>4</sup> This argument assumes that the marginal output-capital ratio in the capital-importing country always exceeds the rate of interest or yield which is returned to the capital owners. The common points among these optimists are the assumptions that: (1) the inflow of foreign capital to developing countries is net additive to domestic savings of the country; (2) the whole savings are transformed into investment, assuming that the Harrod-Domar-like growth model is applicable to the capital-importing economy.

On the other hand, Hans Singer as a pessimist concluded that the movement of foreign capital from an advanced country to a

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1 Frankel (1965), p. 411, Ball (1962), p. 610, Hirschman (1968), p. 205, and Kemp (1962).

2 Singer (1950), Nurkse (1954), and Griffin (1970).

3 Frankel (1965).

4 Ball (1962), also see Massel (1964), p. 627.

developing country serves only for the benefit of the advanced country since the capital-exporting country exploits development effects or linkage effects from the capital importing country.<sup>5</sup> Singer's conclusion, just opposite to Frankel's, was based on the assumption of an enclave-type foreign capital. Griffin, another pessimist, goes so far as to maintain that imports of Foreign capital may even retard development.<sup>6</sup> The reason is that the inflow of foreign capital is essentially a substitute for domestic savings, not the pure addition to it, and tends to raise capital-output ratio. Griffin's growth equation is a good contrast to Frankel's equation.<sup>7</sup> Those pessimists generally believe that (1) imported capital is not purely additive to domestic capital, (2) full-employment growth models like the Harrod-Domar model are not properly applicable to developing countries, (3) foreign capital and domestic savings are not homogeneous in economic development, (4) structure-degenerating effects of foreign capital dominates structure-developing effects.

Why do they observe the same object in such an opposite way? This question reminds us of the well-known fable "The Blindmen and the Elephant". The problem, for this author, essentially comes from what we might call Mynt's failure; the failure in analysis due to the tendency to apply general facts found from heterogeneous populations to a special sample.<sup>8</sup> If we average the temperatures of summer and winter we find the temperature of spring which can explain neither summer nor winter!

In order to minimize this kind of analytical failure in evaluating the impact of foreign-capital imports on the economic development we need to classsify sample countries further into more homogene-

5 Singer (1950).

6 K. Griffin (1970).

7 a) Frankel equation:  $Y = ADK^{\beta} L^{\alpha}$ . This equation is the Cobb-Douglas function adding D which is called as development modifier of foreign capital, and which is assumed to be larger than one.

b) Griffin equation:  $g = \frac{s + (1-c)f}{k + k'} - \frac{s}{k}$

where:

g: the rate of income growth attributable to capital import

s: the original rate of domestic savings to GDP

c: the proportion of capital imports "consumed"

k: the original capital-output ratio

k': the amount by which the k rises due to capital imports.

f: % of capital imports to GDP.

See M. Frankel and K. Griffin.

8 Mynt (1965).

ous groups and to draw different hypotheses for each group. Existence of surplus labor in an agricultural sector is a good criterion for this purpose.

The accumulation model developed by Lewis-Fei-Ranis for labor-surplus economy deserves special attention in this respect.<sup>9</sup> Their celebrated analyses on the labor-surplus economy demonstrate the process and strategy of capital accumulation with surplus-labor. Their findings are theoretically sound and practically invaluable regardless of the argument of whether the marginal productivity of disguised unemployment is zero or positive.

There are, however, some questions waiting to be answered. Firstly, the Lewis-Fei-Ranis hypotheses assume that the capital necessary for initial investment in industry is given no matter how. If this assumption is not met, their model will not work. This problem does matter particularly due to the fact that labor-surplus countries are unlikely to have enough original accumulation of agricultural surplus before industrialization. Secondly, since they do not distinguish the role of foreign capital from that of domestic capital, both foreign capital and domestic capital are implicitly assumed to be homogeneous. Imported capital, however, is not homogeneous to domestic capital particularly in its role in economic development.<sup>10</sup> Thirdly, the countries without surplus-labor also have an abundant factor, i.e., natural resources (either land or natural raw-materials or both), which is comparable to labor in labor-surplus economies. We cannot say, therefore, where the inflow of foreign capital plays a more efficient role in economic development until both cases are analyzed and compared. This is why we need to demonstrate explicitly how labor-surplus countries and countries without labor-surplus differ in (1) the degree of need for foreign capital and (2) the impact of foreign-capital on the economic development.

This study attempts to tackle these questions. For this purpose, two types of country groups are differentiated according to the relative degree of labor abundance; LSC (labor surplus country) and NLSC (non-labor-surplus country). It may be assumed that LSCs are natural resource hungry countries while NLSCs are natural resource abundant countries in a relative sense<sup>11</sup> Under these considerations, the purpose of this article is to test following hypothesis<sup>12</sup>:

9 Lewis (1964), Fei and Ranis (1964).

10 This is true particularly in that the inflow of foreign capital may empower the country to break in three bottlenecks simultaneously; investment-lumpiness bottleneck, technology bottleneck and foreign exchange bottleneck. This is why Chenery-Adelman called the inflow of foreign capital "virtually a separate factor of production". See Adelman and Chenery (1966).

"The development effect of foreign capital depends mainly on the degree of labor surplus, i.e., the contribution of foreign capital to economic development of developing countries is more dynamic and efficient in LSCs than in NLSCs. Natural resources as the abundant factor is more powerful for industrialization than the human factor, i.e., labor, in a closed economy without the flow of foreign capital. In an open economy with the flow of foreign capital, however, labor as the abundant factor is more powerful than natural resources. Therefore the pessimists' view on the role of foreign capital in economic development tends to fit in NLSCs while the optimists' view tends to be applicable to LSCs."

## II. Grouping of Sample Countries

Among developing countries which satisfy our data requirements, several countries having lopsided export surpluses (mainly oil producing countries) were excluded.<sup>13</sup> As a result our sample is composed of 41 countries as listed in Appendix A.

These sample countries are classified into two groups: LSCs and NLSCs, according to the relative degree of surplus-labor. The problem is how to measure the relative degree of surplus-labor. The most direct criterion may be population density per unit of arable land, or the difference in product per economically active population between industry and agriculture. This direct criterion, however, cannot be adopted for this analysis because the necessary data are either unavailable or inaccurate.

It was necessary therefore, to approach the problem using two indirect criteria: population density, and percentage of agricultural output in GDP. Since surplus-labor is preserved in the agricultural sector and a labor-surplus economy is likely to be an agriculturally

11 These assumptions are very likely to fit the reality. Non-labor-surplus countries are, by definition, land abundant countries in the relative sense of land per capita. Natural resources (other than land) per capita, however, may not necessarily be larger in non-labor-surplus countries than in labor-surplus countries because of unequal distribution of natural resources among countries. But to the extent that we may assume that natural resources other than land are equally endowed per unit of land over the world, non-labor-surplus countries have not only larger amounts of land per capita but also have more of other natural-resources per capita than do labor-surplus countries.

12 As for theoretical frameworks to derive this hypothesis, refer to Seung Park, "Development Effect of Foreign Capital in the Labor Surplus Economy". (Ph. D. diss., State University of New York at Albany, 1974).

13 This is because of the fact that causality may run from domestic savings to the capital flow rather than the other way around if the flow of capital is outward to a significant degree. For detail, see Weisskopf (1972).

dominated economy, it is quite natural to say that the greater the population density and the larger the share of agriculture in the GDP, the more surplus labor there will be in the agricultural sector. In other words, we may classify a country as a labor-surplus country if she satisfies these two basic criteria simultaneously. Based on this distinction, 41 sample countries are ranked on these criteria, and these two ranks are summed for each country. Finally, the degree of surplus-labor is ranked by the order of the sum of the ranks as shown in Appendix A. As seen in Appendix A, 19 of the 41 sample countries were classified as LSCs, and the other 22 countries were classified as NLSCs. The decision to divide the countries into two groups between ranks 19 and 20 was because of the large discontinuity at this point between the ranks of Tanzania and Greece.

This result also coincides with our common sense. All Asian countries, excluding Malaysia, are classified as LSCs and all South American countries belong to NLSCs. Countries in Africa and Central America split. We also see that the two characteristics of population density and share of agriculture in GDP are highly correlated. The extreme exceptional cases are Ethiopia and Puerto Rico. Ethiopia ranks twenty-fourth among the 41 countries in terms of population density, but ranks first in terms of the share of agriculture in GDP. As a result she is classified as a LSC. On the other hand, Puerto Rico, which is classified as a NLSC, ranks third in terms of population density but last in terms of the share of agriculture in GDP.

Spearman correlation test and regression analysis are examined for these two different groups separately and the results are compared. In order to reduce random factors as far as possible, three-year-average data are used for all variables. The basic data for sample countries are found in Appendix B.

The variables used in the regression analysis are as follows:

- 1) D: Development effect which represents structural changes in production toward industrialization. D is measured by percentage points for 3 years such that;

$$D = \left( \frac{Y_m}{Y} \right)_t - \left( \frac{Y_m}{Y} \right)_{t-3}$$

where;

D: development effect

Y: GDP

$Y_m$ : GDP in modern sector which includes manufacturing, construction, electricity, transportation and communications industries

t: 1970

All data are in constant market prices if data are available

- 2)  $\frac{S}{Y}$ : The annual average percentage of domestic savings to GDP in current market prices for 3 years, 1968-70.
- 3)  $\frac{F}{Y}$ : The annual average percentage of net inflow of foreign capital to GDP in current market prices for 3 years, 1968-70. The net inflow of foreign capital, F, is defined as the deficit on the current account of the balance of payment. The negative sign refers to the net outflow of foreign capital.
- 4)  $\frac{\Delta E}{E}$ : Annual average percentage of increase in exports of goods and services valued in U.S. dollars for the 3 years, 1968-70.

The following symbols will also be used for the regression analysis:

$R_1$ : Partial correlation coefficient

SE: Standard Error

T : T-value.

### III. Results of the Test: Cross Section Analysis for 41 Sample Countries

#### (1) Foreign Capital and Development Effect

Spearman coefficient of rank correlation between foreign capital ( $F/Y$ ) and development effect (D) for the labor-surplus countries (sample 19) and non-labor-surplus countries (sample 22) are found as follows.<sup>14</sup>

LSCs : +0.809

NLSCs : -0.342

<sup>14</sup> Almost the same results are found if we take GDP growth rates instead of development effect. The rank correlation coefficient between annual average growth rate of GDP for 3 years (1968-70) and  $F/Y$  for that period is found to be +0.671 for LSCs, and -0.193 for NLSCs. However, the gap in rank correlations between LSCs and NLSCs is greater in terms of the development effect than in terms of GDP growth, as is shown. This seems to imply that the difference between LSCs and NLSCs in the impact of foreign-capital inflow on economic development are greater in terms of structural changes than in terms of income growth.

On the other hand, the Spearman correlation coefficients between domestic savings ( $S/Y$ ) and development effect ( $D$ ) are:

$$\text{LSCs: } +0.154$$

$$\text{NLSCs: } +0.550$$

Similar results are obtainable by regression analysis.<sup>15</sup>

$$\text{LSCs: } D = 0.229 + 0.611 \frac{F}{Y}$$

(T) (4.34)

$$\text{NLSCs: } D = 1.501 - 0.073 \frac{F}{Y}$$

(T) (-1.81)

These equations show that a one percentage point increase in average  $F/Y$  results in 0.6 percentage point increase in  $D$  over 3 years in LSCs, while in NLSCs it results in a decrease in  $D$  of 0.07 percentage points. The T-test shows that the coefficient of  $F/Y$  is significant at the 1% level in LSCs, and at the 10% level in NLSCs.<sup>16</sup> The regressions of  $D$  on  $S/Y$  are:

$$\text{LSCs: } D = 0.155 + 0.140 \frac{S}{Y}$$

(T) (0.95)

$$\text{NLSCs: } D = -0.581 + 0.106 \frac{S}{Y}$$

(T) (3.31)

<sup>15</sup> Compare our results with Griffin's equation, i.e.,

$$\dot{Y} = 4.8 + 0.18 \frac{F}{Y} \quad R^2 = 0.33$$

(SE) (0.26)

where  $\dot{Y}$  is the average rate of growth of GNP and  $F/Y$  is the same as ours. He obtained this equation from 12 sample countries for the period 1962-64. From this equation he concluded that there is no close relationship between the amount of foreign capital and the rate of growth of GNP, particularly in view of the high standard error. (K. B. Griffin and J. L. Enos, "Foreign Assistance: Objectives and Consequences". *Economic Development and Cultural Change*, January, 1970.) His conclusion, in this author's opinion, is the result of the fact that his sample is composed of heterogenous countries, i.e., both LSCs and NLSCs.

<sup>16</sup> T-tests are all two-tailed.

The signs of the coefficients of  $S/Y$  are all positive. However, the coefficient is not significant in LSCs even at the 20% level, while it is significant, in NLSCs, at the 1% level.

Neither foreign resources nor domestic resources are the only variable to determine the development effect,  $D$ . Therefore,  $D$  is regressed on both variables,  $F/Y$  as the representative of foreign resources and  $S/Y$  as the representative of domestic resources. The results follow:

$$\begin{array}{l} \text{LSCs: } D = -0.377 + 0.042 \frac{S}{Y} + 0.598 \frac{F}{Y} \\ \quad (R_1) \quad (0.10) \quad (0.71) \\ \quad (T) \quad (0.39) \quad (4.04) \end{array}$$

$$\begin{array}{l} \text{NSCs: } D = -0.991 + 0.124 \frac{S}{Y} + 0.027 \frac{F}{Y} \\ \quad (R_1) \quad (0.51) \quad (0.11) \\ \quad (T) \quad (2.57) \quad (0.52) \end{array}$$

All coefficients of independent variables are positive. But the coefficients show that the development effect depends more heavily on foreign capital than on domestic savings in LSCs and vice versa for NLSCs. T-tests illustrate that, in LSCs, the coefficient of foreign capital is significant at the 1% level while the coefficient of domestic savings is not significant even at the 50% level. The opposite is true for NLSCs. The coefficient of foreign capital in NLSCs is not significant even at the 50% level while that of domestic savings is significant at the 2% level.

From the analyses above, it is clear that the net inflow of foreign capital in LSCs plays a very positive role in economic development while in NLSCs it may even be inimical to economic development. The analysis also shows that foreign capital is a more dominating factor than domestic savings in the economic development of LSCs, and vice versa for NLSCs. Our analyses support both the hypotheses of the foreign-capital optimists and of the pessimists; the case of LSCs for the optimists, and the case of NLSCs for the pessimists.

## (2) Foreign Capital and Export

The rate of increase in export is highly correlated in LSCs with the rate of foreign-capital inflow. However, the rate of export increase in NLSCs is independent of the inflow of foreign capital. The Spearman correlation coefficients between the average rate of increase in exports for 3 years (1968-1970),  $\Delta E/E$ , and the average rate of net inflow of foreign capital to GDP for the same period,  $F/Y$ , are:

LSCs: +0.602

NLSCs: -0.031



There are very weak relationships between export and domestic savings for both LSCs and NLSCs. The Spearman correlation coefficients between average rate of export increase,  $\Delta E/E$ , and average rate of domestic savings to GDP,  $S/Y$ , for the 3 years (1968-70) are:

$$\text{LSCs: } +0.263$$

$$\text{NLSCs: } +0.327$$

These results are again confirmed by regression analyses. The relationship between increases in export and the amount of foreign capital is shown as follows:

$$\text{LSCs: } \frac{\Delta E}{E} = 2.061 + 2.032 \frac{F}{Y}$$

(T) (4.54)

$$\text{NLSCs: } \frac{\Delta E}{E} = 10.439 - 0.061 \frac{F}{Y}$$

(T) (-0.56)

The coefficient of foreign-capital inflow is significant at the 1% level in LSCs, but is not significant in NLSCs even at the 50% level.

The regressions of the increase in export on both the inflow of foreign capital and domestic savings, again as the representative of domestic resources, are shown below:

$$\text{LSCs: } \frac{\Delta E}{E} = -4.930 + 0.494 \frac{S}{Y} + 1.885 \frac{F}{Y}$$

(R<sub>1</sub>) (0.35) (0.73)  
(T) (1.51) (4.26)

$$\text{NLSCs: } \frac{\Delta E}{E} = 8.382 + 0.102 \frac{S}{Y} + 0.022 \frac{F}{Y}$$

(R<sub>1</sub>) (0.16) (0.03)  
(T) (0.68) (0.13)

For LSCs in above equation, a single point in the percentage of foreign-capital inflow to GDP results in a 1.9 percent increase in exports. This coefficient is significant at the 1 percent level. On the other hand, the coefficient of domestic savings in the same equation is not significant even at the 10 percent level. In the case of NLSCs, on the other hand, neither domestic savings nor foreign-capital inflow has a significant relation with exports even at the 20 percent level. We may conclude, therefore, that the increase of exports is highly and positively correlated with the inflow of foreign capital in LSCs while it is independent of either the inflow of foreign capital or domestic savings in NLSCs.

### (3) Foreign Capital and Domestic Savings

Before going into our empirical test, it may be necessary to re-

view very briefly the literature on the impact of foreign-capital imports on domestic savings. It has been argued that the net inflow of foreign capital substitutes domestic savings so that the greater the amount of foreign capital imported the less will be the rate of domestic savings relative to GDP. Their findings by cross-section studies are summarized here:

- Y: GDP or GNP  
 S: Domestic savings  
 E: Export  
 F: Net inflow of foreign capital  
 P: Population

$$\text{Griffin}^{17} \quad \frac{S}{Y} = 11.2 - 0.73 \frac{F}{Y} \quad R^2 = 0.54$$

(SE)                      (0.11)

$$\text{Rahman}^{18} \quad \frac{S}{Y} = 0.14 - 0.25 \frac{F}{Y}$$

(T)                      (2.57)

$$\text{Weisskopf}^{19} \quad S = a + 0.18Y - 0.23F + 0.18E$$

(T)      (65.9)    (-5.3)    (4.6)

$$\text{Landau}^{20} \quad \frac{S}{Y} = a + 0.05 \log \frac{Y}{P} - 0.53 \frac{F}{Y}$$

$$\text{I.B.R.D.}^{21} \quad S = a + 0.14Y - 0.72F + 0.36E$$

Apparently these findings seem to be clear and a natural conclusion for every country since domestic saving is measured by deducting consumption from GNP. In other words, the inflow of foreign capital is not a part of the GNP of the country but, rather, constitutes disposable income of the country, thereby increasing consumption. This may be true at a given moment of time. However, it is not necessarily true if we allow for the flow of time. First of all, we should not get mixed up between the amount of domestic savings and the percentage rate of domestic savings to GNP. Even though the inflow of foreign capital results in a decrease in the rate of domestic savings

17 32 sample countries for 1962-64, Griffin (1970). Also see Griffin and Enos (1970). For the comments for Griffin, see Kennedy and Thirlwall, Stewart and Eshag (1971).

18 31 sample countries for 1962. See Rahman (1968).

19 He pooled time series data for 17 sample countries for, in general, 1953-66 into a single set of observations and obtained this result. Weisskopf (1972).

20 Sample of 18 Latin American Countries. Landau (1971).

21 Pooled sample of 592 observations for 36 countries. See Chenery and Carter (I.B.R.D.)

to GNP, it does not automatically mean a decrease in the amount of domestic savings. Secondly, even in terms of the percentage rate of domestic savings to GNP, the result depends on the strength of income effect and domestic-saving-substitution effect (or consumption inducing effect) of foreign capital. According to Griffin, the inflow of foreign capital results, necessarily, in a decrease of percentage rate of domestic-savings to GNP. His equations are:<sup>22</sup>

$$C = \alpha(Y + F) \text{ and } S = Y - \alpha(Y + F)$$

$$\text{so that } S/Y = (1 - \alpha) - \alpha F/Y$$

where; C: Total consumption

$\alpha$ : Average propensity to consume disposable income

Y: GNP

F: Net foreign resources

S: Domestic savings

In his equation, he was wrong in that foreign-capital inflow affects only consumptions without any income-creating effect. This fact is easily demonstrated by simple algebraic relations.

Suppose a country which did not import foreign capital at all at time zero ( $t_0$ ) imports a certain amount of foreign capital ( $\Delta F$ ) at time one ( $t_1$ ). Then equations 1 and 2 below, immediately follow:

$$S = Y - C \dots \dots \dots (1)$$

$$S' = Y' - C' \dots \dots \dots (2)$$

S, Y, and C stand for domestic savings, GDP, and total consumption at  $t_1$  without foreign-capital imports; and, S', Y', and C' stand for the same things at  $t_1$  with foreign-capital imports. Then:

$$Y' = Y + \Delta Y \dots \dots \dots (3)$$

$$C' = C'_d + C'_f \dots \dots \dots (4)$$

$$C'_d = C + \alpha \Delta Y - \beta \Delta F \dots \dots \dots (5)$$

$$C'_f = \delta \Delta F \dots \dots \dots (6)$$

$C'_d$  and  $C'_f$  refer to consumption financed by domestic resources (GNP) and foreign resources ( $\Delta F$ ) each, under the imports of foreign-capital at  $t_1$ . The letter  $\alpha$  represents marginal propensity to consume and  $\beta$  is the coefficient representing the degree to which imported foreign-capital substitutes for domestic resources in consumption. This  $\beta$  is meaningful because imported foreign

<sup>22</sup> Griffin (1971).

capital substitutes not only for domestic savings but also for domestic consumption. For example, imported rice financed by foreign-capital may decrease the consumption of domestically produced rice. So that we may call  $\beta$  the "consumption-substitution effect" of foreign-capital. The letter  $\delta$  stands for the rate of that portion of imported foreign-capital which goes for consumption.

Now our purpose is to compare  $S$  with  $S'$ , and  $S/Y$  with  $S'/Y'$ . Substituting equations (5) and (6) in (4), and again (3) and (4) in (2), the net changes in domestic savings due to foreign-capital inflow,  $\Delta S$ , can be calculated.

$$\Delta S = S' - S = \Delta Y(1 - \alpha) - \Delta F(\delta - \beta) \dots\dots\dots (7)$$

where  $\Delta Y(1 - \alpha)$  represents income effects and  $\Delta F(\delta - \beta)$  represents consumption-inducing effects of foreign-capital. Equation (7) is rewritten as:

$$f_s = s\sigma - (\delta - \beta) \dots\dots\dots (8)$$

where,  $f_s$ : marginal net effect of foreign capital on domestic saving;

i.e.,  $\frac{\Delta S}{\Delta F}$

$s$  : Marginal propensity to save

$\sigma$  : marginal productivity of foreign capital; i.e.,  $\sigma = \frac{\Delta Y}{\Delta F}$

Assuming that the marginal propensity to consume,  $\alpha$  is constant, the impact of foreign-capital inflow on the amount of domestic savings depends on three factors: the productivity of foreign-capital,  $\sigma$ ; the domestic-savings substitution effect,  $\delta$ ; and the domestic-consumption substitution effect,  $\beta$ . If  $s\sigma > \delta - \beta$ , the net effect is positive.

An almost similar conclusion is applicable to the case of the percentage rate of domestic savings to GNP instead of the amount of domestic savings. Again, from previous equations:

$$\frac{S'}{Y'} - \frac{S}{Y} = \frac{\Delta Y(C - \alpha Y) - \Delta F Y(\delta - \beta)}{Y(Y + \Delta Y)} \dots\dots\dots (9)$$

Since  $C = \alpha^* Y$ , where  $\alpha^*$  is the average propensity to consume:

$$\frac{S'}{Y'} - \frac{S}{Y} = \frac{\Delta Y(\alpha^* - \alpha) - \Delta F(\delta - \beta)}{Y'} \dots\dots\dots (10)$$

Because we may assume that  $\alpha^* > \alpha$ , and  $\delta > \beta$ ,  $\Delta Y(\alpha^* - \alpha)$  is always positive and  $-\Delta F(\delta - \beta)$  is always negative under the assumed conditions. The net impact of foreign-capital imports on the rate of domestic

savings to GNP, therefore, depends also on the income effect,  $\Delta Y$ , the domestic-savings substitution effect,  $\delta$ , and the domestic-consumption substitution effect,  $\beta$ ; assuming that the propensities to consume, both average and marginal, are constant.

Now we arrive at the stage to show our analysis. The Spearman correlation coefficients between the average percentage rate of foreign-capital imports of GDP,  $F/Y$ , and the average percentage rate of domestic savings to GDP,  $S/Y$ , for the 3 years (1968-70) are found below:

$$\text{LSCs: } +0.249$$

$$\text{NLSCs: } -0.485$$

The results of simple regression analyses are:

$$\text{LSCs: } \frac{S}{Y} = 14.151 + 0.298 \frac{F}{Y}$$

(T)                      (0.92)

$$\text{NLSCs: } \frac{S}{Y} = 20.124 - 0.811 \frac{F}{Y}$$

(T)                      (-4.91)

The coefficient of foreign-capital is significant in NLSCs at the 1 percent level, but is not significant in LSCs even at the 20 percent level. The above analysis illustrates that the relation between the inflow of foreign capital and the rate of domestic savings to GDP is negative with high correlation in NLSCs. On the other hand, there is a positive, although weak, correlation in LSCs. The reason is explainable on 3 grounds. Firstly, the inflow of foreign capital in LSCs tends to have more efficient income creating effects than in NLSCs as we have already seen. Secondly, the inflow of foreign capital in LSCs tends to increase agricultural surplus more rapidly than in NLSCs by providing jobs for surplus labor. Thirdly, the imports of foreign capital in LSCs tend to develop export activities more effectively than in NLSCs as we have demonstrated.<sup>23</sup>

#### IV. Conclusion

The analyses in this study lead us to the conclusion that the development effect of foreign capital imported into developing coun-

<sup>23</sup> The important roles of exports in increasing domestic savings are found in many places. For example, see Chenery and Eckstein (1970). Baldwin (1966). For historical aspects on this matter, see, among others, Knowles (1968), Lockwood (1968).

tries depends on the degree of labor-surplus and is independent of the degree of natural-resources abundance. That is, foreign capital plays a more efficient role for economic development in LSCs than in NLSCs. The imports of foreign capital in NLSCs may even be inimical to industrialization. In an open economy with international movement of capital LSCs are in a better condition than are NLSCs for industrialization, while in a closed economy, the opposite is true. This is so because while labor is a domestic good, other natural resources (with the exception of land) are international goods and land is a relevant factor only to the agricultural sector. In a closed economy, therefore, natural resources including land as the abundant factor are more powerful assets for industrialization than labor. In an open economy, however, labor as the abundant factor is a more powerful and effective asset for industrialization than are natural resources. Surplus labor is a major liability for industrialization without foreign capital, but it is the most important asset if foreign capital flows into the country. Thus we find a reconciliation between the optimists and the pessimists on the effectiveness of foreign capital for developing countries; LSC is the case for the optimists and NLSC is the case for the pessimists.

The reasons for the conclusion above can be summarized as follows:

1) In NLSCs, there are still better opportunities for accumulating agricultural surplus before industrialization. NLSCs also have the advantage of larger domestic markets because farmers do not need to share their products with surplus-labor for consumption. As a result, the need for foreign-capital is a matter of choice between more rapid, or less rapid, industrialization. In LSCs, however, it is a matter of choice between industrialization with foreign capital and stagnation without foreign capital. LSCs need foreign capital more seriously than do NLSCs.

2) The exploitation of scale-economy advantages is the most important and the most dynamic factor in economic development. The most prominent role of foreign capital is to allow the economy to exploit scale-economy advantages. This role of foreign capital can be done efficiently in LSCs because scale economies are exploited at lower cost. In NLSCs, however, scale economies can be exploited only at a higher cost in the long-run due to higher and rising labor-cost curves. Decreasing long-run cost curves tend to dominate the modern industry sector of LSCs while, in NLSCs, increasing long-run cost curves tend to dominate due to rising factor prices.

3) Due to the differences in long-run cost curves between LSCs and NLSCs, cost-oriented foreign capital tends to flow into LSCs, and to concentrate in the industrial sector which produces exportable goods. In NLSCs, on the other hand, either market-oriented or resources-oriented foreign capital tends to dominate, and tends to split

into the industrial sector which produces goods for the domestic market only and the extracting industries which produces exportables. As a result, foreign capital in LSCs builds import-substitution first and transforms import-substitution to exports, thereby providing the country with competitive power in the world market. In NLSCs, foreign-capital invested in the industrial sector tends to direct the economy toward an autarky, necessitating protection even after import-substitution is finished. Thus the inflow of foreign capital ushers LSCs into an export-led growth and NLSCs into an export-lagging growth.

4) The opportunity cost of additional employment induced by the inflow of foreign capital is lower for LSCs than for NLSCs. Due to higher and rising labor cost, the inflow of foreign capital in NLSCs has a strong pressure to increase the capital-labor ratio. As a result, the imports of foreign capital in NLSCs tend to induce the country to use more capital-intensive skill and to employ labor less. This implies that the same amount of foreign capital has a greater income and employment effect in LSCs than in NLSCs.

5) In a closed economy, the development of the agricultural sector is clearly more pessimistic in LSCs than in NLSCs. If foreign capital is imported for the industrial sector, however, the agricultural sector in LSCs is subject to more dynamic structural changes in terms of average product and agricultural savings than in NLSCs.

6) There is a strong tendency in NLSCs to substitute foreign-capital imports for domestic savings. This results in a decrease in the rate of domestic savings in relation to GDP. In LSCs, however, such adverse tendencies do not exist. The facts show that the inflow of foreign capital in LSCs tends to even increase the rate of domestic savings in relation to the GDP even though the relationship is weak.

7) Lastly, the inflow of foreign capital in NLSCs is more likely to induce stronger inflation effects than in LSCs. This is because of the fact that foreign-capital imports in NLSCs not only increase demand pressure but also raise factor price (wage) more strongly. Therefore, inflation in NLSCs tends to be characterized by cost-push, compared with inflation in LSCs.

Our conclusions shed light on some policy implications in the open economies of today's world.

Firstly, for capital importing countries, it is to be recommended that LSCs import as much foreign capital as possible within the limitation of their absorptive and debt-bearing capacities; and that they invest this imported capital in the industrial sector. It is also recommended that LSCs put their best efforts toward linking their domestic industrial production with foreign trade. Exploitation of domestic surplus-labor must be the first target for their effort and the exploitation of domestic natural resources may be the next target.

The agricultural sector, therefore, may be considered temporarily as a status-quo sector in the strategy of industrialization.

For NLSCs, on the other hand, it is recommended that the first effort should be centered on the exploitation of domestic natural resources instead of labor and on increasing domestic savings. Therefore the imports of foreign capital may be considered as nothing more than a second-best tool. Foreign trade also is not so urgent a condition of industrialization. If a NLSC wants to develop domestic industry into export industry, removing technological gap between the country and world market is the key factor. Agricultural development deserves receiving at least as much attention as the industrial sector.

Secondly, for capital-exporting countries, it is recommended that capital should go first, and in greatest supply, to LSCs, if the criteria are to maximize the welfare (or income) of the world. For the benefits of NLSCs, exports of technologies rather than capital are necessary.

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### Appendix A

#### Grouping of Developing Countries by the Rank of Labor-Surplus

	Population density in 1971 <sup>(a)</sup> (per square kilomètre)		Share of Agriculture in GDP <sup>(b)</sup> (1967)		Sum of ranks	The rank of labor surplus
	Density	Rank	Share (%)	Rank		
1. Labor-Surplus Countries						
Korea (South)	324	2	35.8	5	7	1
India	168	7	44.5	2	9	2
Ceylon	191	4	35.4	7	11	3
Pakistan	121	9	42.1	3	12	4
Thailand	69	12	34.5	9	21	5
Ethiopia	21	24	59.4	1	25	6
Philippines	126	8	27.8	18	26	7
Taiwan	390	1	21.8	26	27	8
Turkey	46	14	30.8	13	27	9
Burma	41	15	31.7	12	27	10
El Salvador	170	6	27.1	21	27	11
Honduras	23	23	35.8	6	29	12
Dominican Rep.	86	10	26.4	22	32	13

## Appendix A (Continued)

Sierra Leone	36	16	28.7	16	32	14
Fiji	29	19	30.5	14	33	15
Syria	35	17	27.9	17	34	16
Cyprus	69	11	22.4	25	36	17
Kenya	20	26	34.5	10	36	18
Tanzania	14	32	38.6	4	36	19

2. Non-Labor-Surplus  
Countries

Greece	67	13	19.1	28	41	20
Costa Rica	35	18	23.3	24	42	21
Columbia	19	27	29.7	15	42	22
Jamaica	173	5	9.8	38	43	23
Puerto Rico	310	3	5.6	41	44	24
Sudan	6	38	35.4	8	46	25
Paraguay	4	40	32.9	11	51	26
Panama	20	25	21.3	27	52	27
Jordan	24	22	16.1	31	53	28
Nicaragua	15	30	25.8	23	53	29
Malaysia	9	36	27.7	19	55	30
Mexico	26	21	13.1	34	55	31
Tunisia	28	20	12.5	36	56	32
Iran	18	28	18.7	29	57	33
Bolivia	5	39	27.6	20	59	34
S. Rhodesia	14	31	18.6	30	61	35
Uruguay	16	29	12.9	35	64	36
Brazil	11	34	15.2	32	66	37
Argentina	8	37	14.3	33	70	38
Chile	12	33	10.5	37	70	39
Venezuela	11	35	6.7	40	75	40
Australia	2	41	7.5	39	80	41

(a) *Statistical Yearbook, 1972, United Nations.*

(b) Constant market prices. For some countries where constant market prices are unavailable, current market price series are used. Source: *Yearbook of National Accounts Statistics, 1971, United Nations.* And, *Economic Statistics Yearbook of Korea, 1973, The Bank of Korea.*

## Appendix B

## Basic Data for Sample Countries

	Develop- ment effect <sup>(a)</sup> (D)  (% point)	Rate of domestic savings <sup>(b)</sup> (S/Y)  (%)	Net rate of foreign-cap- ital inflow to GDP <sup>(c)</sup> (F/Y)  (%)	Average rate of export increase <sup>(d)</sup> ( $\Delta E/E$ )  (%)
1. Labor-Surplus Countries				
Korea (South)	8.8	14.7	12.1	29.6
India	0.0	14.4	1.0	4.4
Ceylon	0.8	15.4	1.5	-0.3
Pakistan	1.0	11.4	2.9	5.3
Thailand	1.9	20.1	3.6	3.1
Ethiopia	2.0	12.7	1.8	6.5
Philippines	-0.8	18.5	2.3	3.7
Taiwan	7.1	23.3	5.2	29.4
Turkey	0.7	16.5	2.3	11.4
Burma	0.7	7.9	-2.3	-1.5
El Salvador	0.8	11.1	1.6	3.4
Honduras	3.0	16.3	3.1	5.2
Dominican Rep.	2.8	9.3	6.0	12.3
Sierra Leone	-0.3	12.8	1.4	6.8
Fiji	3.8	21.9	2.8	13.5
Syria	6.0	11.3	4.1	9.7
Cyprus	2.4	16.4	8.3	9.3
Kenya	1.0	17.3	2.9	11.2
Tanzania	1.5	16.5	3.0	5.4
2. Non-Labor Surplus Countries				
Greece	3.2	17.4	11.6	9.7

## Appendix B (Continued)

Costa Rica	0.6	18.4	5.5	17.5
Columbia	1.0	19.7	1.3	12.7
Jamaica	0.7	21.6	4.9	7.5
Puerto Rico				
Sudan	-1.9	11.8	2.6	8.9
Paraguay	0.6	13.1	3.0	12.8
Panama	2.1	21.9	1.6	13.7
Jordan	-1.5	-7.9	29.0	6.7
Nicaragua	3.4	15.0	2.4	6.0
Malaysia	2.2	19.6	-4.2	10.5
Mexico	1.7	17.8	1.1	11.0
Tunisia	1.0	17.5	4.7	13.8
Iran	4.6	38.5	-5.1	13.3
Bolivia	0.5	12.0	4.0	7.8
S. Rhodesia	2.9	13.8	0.3	5.6
Uruguay	0.7	10.4	-0.7	8.9
Brazil	0.6	16.1	0.0	19.3
Argentina	2.7	22.0	-1.4	9.2
Chile	-0.7	17.4	-1.2	9.1
Venezuela	1.1	28.7	-6.7	2.2
Australia	1.3	28.4	0.5	11.3

Source: United Nations, *Yearbook of National Accounts Statistics 1971*.  
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$$(a) \quad D = \left(\frac{Y_m}{Y}\right)_t - \left(\frac{Y_m}{Y}\right)_{t-3}$$

where;

D: Development effect

Y: GDP

$Y_m$ : GDP in modern industry sector which includes manufacturing,  
construction, electricity, transportation and communication

t: 1970

All data are in constant market prices as long as data are available.

(b) The annual average rate of domestic savings to GDP in current market prices for 3 years, 1968-70.

- (c) 1968-70 three year average. Positive sign refers to the net inflow of foreign capital. F is defined by the deficit (or surplus) on the current account of the balance of payments and therefore equals net import on the expenditure of GDP. Current market prices are taken in general, however if current market price series are not available or if there were clear distortions in the exchange rate for the relevant years, constant market price series are taken.
- (d) The annual average rate of increase in exports of goods and services valued in U.S. dollars for the three year period 1960-70.