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A QUANTITATIVE MEASURE OF HOST COUNTRY FACTOR GAINS
FROM DIRECT FOREIGN INVESTMENTS: APPLICATIONS
TO (1) DEVELOPMENT PROJECT PLANNING AND
(2) GAINS FROM OVERSEAS U.S. INVESTMENTS

by

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I. Introduction

In the discussion of long term capital inflows to the less developed countries, much emphasis is made about the need to supplement inadequate savings of these (borrower) countries so as to increase their rates of development. In the process of development, the resources of the (borrower) country involved are employed, and the intensity of employment of these resources represent the domestic gains of the country.

However, with the exception of outright grants, all forms of capital inflows involve ^{*}a problem of repayment, the inevitable reverse long-term capital inflows. It has been the common consensus of the economics profession that loans, provided the terms of payments are reasonable and some degree of freedom on the borrower's part can be exercised, are unquestionably beneficial to the borrower country.

^{*}One form of long-term capital inflows for borrower nations to which this paper will be directed is foreign direct

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investment. There is a long literature about the merits of having foreign direct investments in other countries. Many studies have been made from the standpoint of the investing (lender) country, especially in relation to its balance of payments position.¹ Other studies, which essentially examine the effects of foreign investments on the host country, range from the political and noneconomic effects to special questions about international and national economic efficiency, monopoly power, and nationalism.²

This study is principally concerned with looking at the benefits of foreign investments from the host country's economic standpoint. It will be divided into three parts. The first proposes a method by which the host economy's direct factor gains may be compared with the gains of the foreign

¹See for instance, Norman S. Buchanan, *International Investment and Domestic Welfare* (1945) (New York); E.D. Domar, "The Effect of Foreign Investment on the Balance of Payments," (1950), reprinted in Domar, *Essays in the Theory of Economic Growth* (New York, Oxford University Press, 1957), pp. 129-153. More recent worries about the US balance of payments has again redirected attention to this problem.

²Typical of these studies would be, for instance, Donald T. Brash, *American Investments in Australian Industry* (Harvard University Press, 1966), Stephen Hymer (1966), "Direct Foreign Investment and the National Economic Interest," Peter Russel (ed.), *Nationalism in Canada* (McGraw Hill Co. of Canada Ltd.).

{Note: Please see appendix on brief comments to the literature on this subject.}

factors. The second generalizes the method and suggests applications to microeconomic project planning for planning the acceptance or rejection of alternative foreign investment projects. The third applies this measure by comparing American foreign investments, paying attention to the host country factor gains./

II. A Simple Quantitative Measure of Host Country Factor Gains from Foreign Investment

The income statement gives all the necessary information about the payments and sales that a firm transacts in a current period. It provides the basic raw material for national income accounting. It will also provide the basis for the measure of host country factor gains which will be demonstrated below.

A simple income (or profit and loss) statement is shown in Table 1. It has two components which balance each other: the allocation of the cost of goods which are sold into major expenditure components on one side and an accounting of all receipts through sales and other earnings (e.g., interest and dividends received from company lendings or equity investments in other companies) on the other side. For our purposes, we need only to concentrate on the allocation of

current receipts. We shall be interested in splitting the claimants to all the payments in the allocation side into foreign and domestic claimants. The major goal is to arrive at the components of gross value added, dividing this by nationality so that it is possible to establish the destination of the payment. Although this problem has long been recognized, to my knowledge no one has presented the case in the fashion suggested here, which is easily applicable to firm and even national income accounting.

The exposition can be simplified with the use of algebra. Moreover, for simplicity, we ignore problems connected with changes in inventory or the presence of subsidies. These can be integrated within the framework easily, should their importance arise.

Designate all the flows of payments appearing in the allocation side of the income statement as v_1, v_2, \dots, v_n . Assume that the last payment (v_n) is for raw materials and other subcontracted activities made out to other firms or suppliers. For any production period, the total value of output (sales), Q_t , is given by the simple accounting relation

$$Q_t = v_{1t} + v_{2t} + \dots + v_{nt}$$

FLows (ALLOCATION SIDE)
OF PAYMENTS

TOTAL VALUE
OF OUTPUT (SALES)
 Q_t

$$(1) \quad = \sum_{i=1}^n v_{it}.$$

Value added of the enterprise, V_t , is simply given by

$$V_t = Q_t - v_{nt}$$

VALUE ADDED
 V_t

$$(2) \quad = \sum_{i=1}^{n-1} v_{it}.$$

Now, let every v_i be divided into two claims, depending on the nationality of the claimants, foreign (x_{fi}) or domestic (x_{di}), so that, at anytime,

$$(3) \quad v_{it} = \underset{\text{DOM.}}{x_{dit}} + \underset{\text{FOREIGN}}{x_{fit}}.$$

VALUE ADDED
PER NATIONALITY
 V_t

For any i , x_d can be positive, zero, or negative. In the case of a negative x , a "loss" income of factor i with nationality d or f is recorded. Dividing value-added into its foreign and domestic claims yields

$$(4) \quad V_t = \sum_{i=1}^m x_{fit} + \sum_{i=1}^m x_{dit},$$

where $m = n-1$. From the standpoint of the host country of the foreign investment, proponents of foreign investment find it customary to emphasize arguments about the gains of domestic

factors. Opponents of foreign investments often worry much about the long term claims of foreigners arising from their investments. Each view is one-sided. For a sound appraisal, of course, the gains of domestic factors as well as claims of foreign factors are needed as data. The proposed measure consolidates these two sides of the argument into one.

Dividing (4) by V_t , we get

(5)

$$\textcircled{1} 1 = f + d,$$

where

$$f = \sum_{i=1}^m x_{fit}/V_t \quad \text{and} \quad d = \sum_{i=1}^m x_{dit}/V_t.$$

For operational use, it is better to look at the single ratio, which we shall call "domestic or host country factor gain index," R ,

HOST COUNTRY
FACTOR GAIN
INDEX

(6)

$$R = d/f.$$

/ Thus, if $R > 1$, domestic factor gains are larger than foreign factor claims. Rules of thumb may be applied concerning the use of R in planning. It is obvious that in a normal operation, R should not fall below 1, or else the balance of payments effect of a foreign investment will be more than the gains of domestic factors. Any investments which yields this

R will be ranking more than the gains of the host country. Perhaps for planning foreign investments, the index of domestic factor gain should have a lower limit of 2, or in terms of (5), f is at most 1/3 of total value added generated.

Special interest on any specific factor can be easily treated in this formulation. Suppose the country is more interested in the promotion of domestic employment as a major economic objective. Then, apparently the important variable that should be isolated is wage payments. Assuming that the wage bill is equivalent to the first payment, i.e., $v_{1t} = x_{d1t} + x_{f1t}$ = the wage bill allocated into domestic and foreign claimants. Letting $w_d = x_{d1t}$ and $w_f = x_{f1t}$, we have

$$(4a) \quad V_t = w_{dt} + \left(\sum_{i=2}^m x_{dit} \right) + \left(\sum_{i=2}^m x_{fit} + w_{ft} \right).$$

Dividing (4a) by V_t leads to

$$(7) \quad 1 = w + d' + f,$$

where $w = w_{dt}/V_t$ and $d' = d - w$. Thus, the domestic factor gain index per dollar of value added is simply

$$R = (w + d')/f$$

or

$$(8) \quad R = w/f + d'/f.$$

2
1/28 = 1/14

GMP

If the average wage rate in a specific country remains relatively stable, the higher is w/f , the more is the domestic employment gain from foreign investments. Therefore, if planners pay more weight to increasing domestic employment rather than to the gains of any other domestic factor, then they should adopt policies which increase the ratio w/f .

Using the same reasoning as above, it is possible to emphasize a third factor, say, the contribution of the foreign enterprise to taxes. By separating the tax and the wage flows from the other payments and following the same reasoning, the domestic factor gain index per value added is

$$R = (w + t + d'')/f$$

or

(9) $R = w/f + t/f + d''/f$

where $d'' = d - w - t$. It is now possible to compare the specific factor gains of the economy per dollar of value added for labor, the national government (tax revenue), and other domestic inputs.

In the following section, a more general version of the measure as proposed here will be considered.

III. Application to Microeconomic Project Planning

* Many problems of assessing foreign investment project proposals arise before national economic development planning boards. In such situations the government planners are faced with the problem of protecting the national economic interest. In addition to other considerations, such as economic efficiency and other noneconomic considerations, a recasting of the foreign investment project proposal in terms of the estimates of host country factor gains should be very valuable. In turn, a private project planning evaluator will also find it easier to gain government acceptance for a foreign investment proposal if the same considerations, viewed from a private viewpoint, are also explicitly stated. In the following, we shall look at the situation largely from the standpoint of the national economic development planner.

Streams of Payments

For microeconomic project planning, it is desirable to apply this technique to streams of payments flows over time. In fact, * investments are always evaluated over their expected lifetime. In applying this measure of host country gains, the basic data inputs are those already assumed to be computed from standard project evaluation and feasibility studies. For our purposes, we may assume a lifetime equiva-

lent to \underline{T} ($\infty > T \geq 0$). We shall discuss the discrete case, but of course this can easily be extended to the continuous.

Summing up expected value added streams over time from (2), we get

$$(10) \quad V_t^* = \sum_{t=0}^T V_t = \sum_{t=0}^T \sum_{i=1}^m v_{it}.$$

In other words, V_t^* is the total stream of values added directly generated by the project during its lifetime. To take proper account of time, V_t^* must be discounted, so that its components, as defined in (3), are given by

$$(12) \quad V_t^* = \sum_{t=0}^T \sum_{i=1}^m x_{dit}^* + \sum_{t=0}^T \sum_{i=1}^m x_{fit}^*,$$

where the x^* 's correspond to the discounted value of the x time streams. Thus, making no distinction for the moment between foreign and domestic factor claims on the value added, for all i ($i=1, \dots, m$)

$$(13) \quad \sum_{t=0}^T x_{it}^* = \sum_t x_{it} / (1+r_i)^t$$

where r_i is the discount rate applicable to income stream i .

It is possible to utilize a single discount rate for all of the flows. Such a method, however, is inappropriate from the standpoint of the national development planner which is faced with pricing resources in the present in terms of the future correctly. Domestic and foreign resources have different alternative uses. ✓ From the economic standpoint of the host country, the scarcer factors should be discounted at a higher rate. Moreover, a development planning agency may have a different set of priorities about the objectives of economic policy. If the development planning agency sets as a major goal of policy a high rate of employment absorption in view of a high population growth rate and a high rate of unemployment, then the wage streams -- assuming that they are directly related to labor absorption -- should have a low rate of discount, perhaps zero.

Table 2 lists rules of thumb concerning the discount factor for any specific payments stream.

Profits probably illustrate the case for differential discounting rates depending on the nationality of the owner. From the standpoint of national development, profits accruing to domestic factors are more desirable than profits going to foreigners. Thus, in a corporation in which the host country's nationals own an equity share, profits of

Table 2. DISCOUNT RATES TO USE: PROPOSED RULES
OF THUMB FOR "NATIONAL" DEVELOPMENT PLANNERS

Items included in the Gross Value Added of Enterprise	Suggested Discount Rate	
	x_{di} Claims of Domestic Factor	x_{fi} Claims of Foreign Factor
Wage bill (It is desirable to convert this into many years of labor for some purposes).	Treat labor as current factor, so discount rate is zero, if employment is a major goal and unemployment rates are high. When unemployment is expected to be less of a problem, a positive rate of discount may be chosen.	Prime world rate for capital-cost.
Interest bill on borrowed capital	This bill is already based on amortization formulas so that it already takes into account discount factor. Thus, almost tantamount to treatment as zero.	This bill is already based on amortization formulas so that it already takes into account discount factor. Thus, almost tantamount to treatment as zero.
Rentals on other capital goods	Discount at current domestic cost of capital, less a small factor to account for nationality	Prime world rate for capital-cost
Royalties for use of natural resources, per physical unit	Depends on whether resource is perpetual or depletable; if perpetual, zero or small; if depletable, computations should be related to degree of exploitation of known reserves	