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THE GAINS FROM
FOREIGN INVESTMENT REVISITED*

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THE GAINS FROM FOREIGN INVESTMENT REVISITED

It is reasonable to assume that real capital movements between countries occur in response to differences in capital's after-tax rate of return. Abstracting from such problems as risk and transport costs, these movements would tend in the long run to equalize returns across countries. The issue of who gains and loses as a result of these movements has received considerable attention. For a capital-importing country there are two propositions entrenched in the subject's folklore. First, based on MacDougall's [1960] paper, is the notion that:

the chief source of gain to the borrowing country is the taxation it collects on the profits of foreign-owned enterprises.¹

The second proposition, stemming from Kemp's [1962] work is that:

a borrowing country can maximize its gain from foreign capital by taxing that capital's earnings at an optimal rate.²

Do these propositions provide a useful way of looking at the question of the gains from foreign investment? Are they compatible? In this paper I wish to review this early work, to restate it, and to present what seem to be some new results. In doing this I find it useful to start from the beginning with some basic, elementary propositions, and to work from these through the Kemp and MacDougall results, exploring further consequences of their approaches. The analysis is confined to the one-sector model these authors used.

Suppose two countries; a borrower (no superscript) and a lender (* superscript). Each owns a given supply of factors one of which is capital (K), and a single type of (aggregate) commodity is produced in both

countries under perfect competition. Further, if taxes (subsidies) are levied by the borrower they are paid from domestic capitalists' profits and/or the earnings of foreign capital resident in the borrowing country. Similarly the lender may levy a profits tax (subsidy) on all earnings of capital employed in that country and/or the earnings of capital owned by that country but resident abroad.³

First, examine the problem of finding the best distribution of capital from a world viewpoint, and later consider what is best for an individual country. In Figure 1 M^* is the marginal product of capital in the lending country measured from the origin O^* and M the borrower's marginal product of capital measured rightward from O . Total world capital is then O^*O , with K^* and K the amounts owned by the lender and borrower respectively. Measuring rightward from the origin O' depicts the amount of foreign lending (S). When there are no taxes on profits in either country free movement of world capital will equate marginal products at X and $O'A$ will be the amount lent and borrowed.

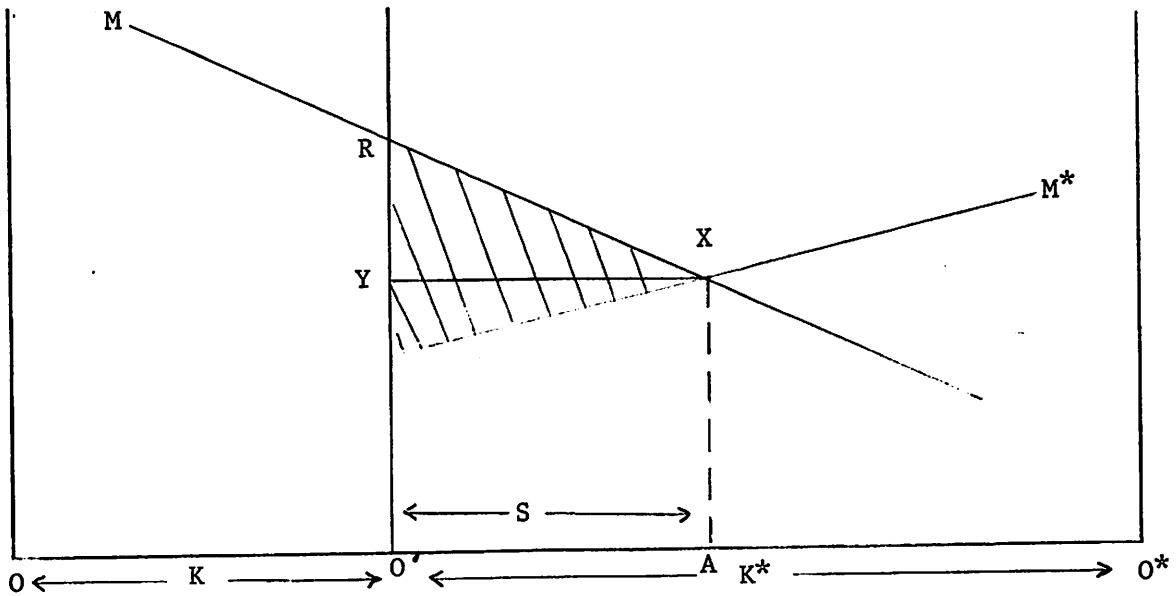


Figure 1

This is basically the diagram Kemp [1962b] used to analyze the effects of a tax on foreign earnings. MacDougall [1958] used one part of it (the M curve) to elucidate the costs and benefits of an increment in foreign capital, but did not explicitly make use of the supply curve of foreign capital (M^*).

Proposition 1. The free movement of capital maximizes world income.

This is easily seen when it is realized that the output of each country is the area under the marginal product curve. At point X and only at that point is world income maximized. The gain from this process is clearly seen to be the shaded "triangle," for this measures the extra output available because the lending country is able to invest in a more productive region than at home. The distribution of the gain is also simply determined, for the lender earns at a rate XA on its lending and hence receives that part of the shaded triangle below the line XY, with the remainder going to the borrower. Domestic capital does not share in this gain in the borrowing nation; instead other factors reap the benefits. These would be domestic labour and/or resource owners, unless the resources concerned had been sold or leased to the lending country. In this case the lender could gain part of the upper triangle if the price at which the resource was sold or leased was less than could have been obtained if domestic ownership was retained.

One extreme case occurs if all the labour to work with foreign capital comes in from the "lending" country and the resources with which they work are acquired for nothing by the lender.⁴ Then all gains go to the lender. At the other extreme, nationalization without compensation of foreign capital gives all gains (at least in the present) to the borrower.

Precisely where the trapezium is maximized can be deduced by constructing a line representing the marginal cost of foreign capital (MCK) which is given by $M^* + \Delta M^* S$, where S is the supply of foreign capital. The analysis is exactly that of a monopsonist user of a factor, with the home country's government equating the marginal product of capital to its marginal cost.

Proposition 3. With no profits tax in either country the lender can increase his gain by levying a differential tax on earnings from foreign lenders, provided no retaliatory action is taken by lending country.

This is shown in Figure 3. By taxing their own lenders' earnings the

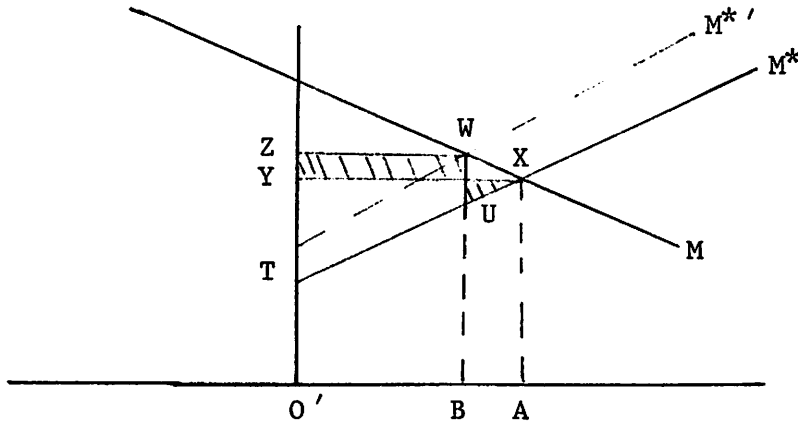


Figure 3

lending country raises the schedule of what they are prepared to lend for from M^* to $M^{* '}$. Analogous statements to those for Proposition 2 can be made about the optimal tax and the distribution of gains. The trapezium UWZT is now maximized and that part of it which lies between $M^{* '}$ and M^* accrues to the lender's government.

Proposition 4. A profits tax in the borrowing country can produce the same optimal situation and distribution of gains from foreign investment as a differential tax on foreign earnings. However, a profits subsidy in the lending country would be needed to produce the results of Proposition 3.

This effect of the profits tax in the borrowing country follows from inspection of Figure 2, when it is realized that such a tax lowers the schedule of private returns to investors. For the lending country the differential tax of Proposition 3 has the effect of raising the rate of return needed by potential lenders to equalize the return, at the margin of lending between capital used domestically and that lent abroad. With a profits tax the rate of return is lowered in the lending country, so an optimal solution requires a profits subsidy throughout the lending country to raise rates of return from M^* to M^{*} ' and so to reduce foreign lending.

The establishment of this equivalence for our results between some rate of profits tax (subsidy) and a differential tax on foreign earnings enables an illustration of the MacDougall and Kemp analyses to be presented here.

Of the various points which MacDougall made, the one mentioned above as having received most attention is that a major source of gain to the borrower from additional foreign investment is the higher tax revenue from foreign profits. In Figure 4 this is the shaded region whose base is of length

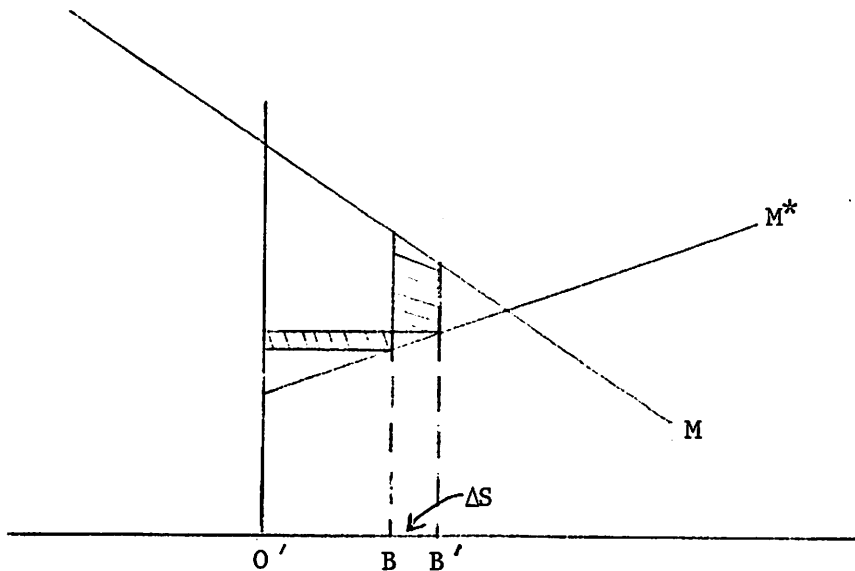


Figure 4

$B'B = \Delta S$ (assuming a tax t creates a differential between domestic and foreign pre-tax returns). This region is approximately equal to $tM\Delta S$ (where t is the rate of profits tax); for the equilibrium condition for capital flows is $M(1-t) = M^*$ so that $M - M^* = M(1-t) - M = tM$. Kemp's contribution was to point out that the movement from B to B' also involved a loss (indicated in Figure 4 by the shaded rectangle whose base has length $O'B$).⁵ The loss arises because the supply curve of foreign capital M^* is upward sloping, so that more foreign investment can only be secured if the rate of return to foreign capital rises. These two magnitudes are equated at the margin for an optimum.

Proposition 5. With zero differential taxes on the earnings of foreign investment in both countries, world income is maximized when profits taxes are the same in each country.

This is obvious from Figure 5 where both M and M^* shift downwards in the same proportion.

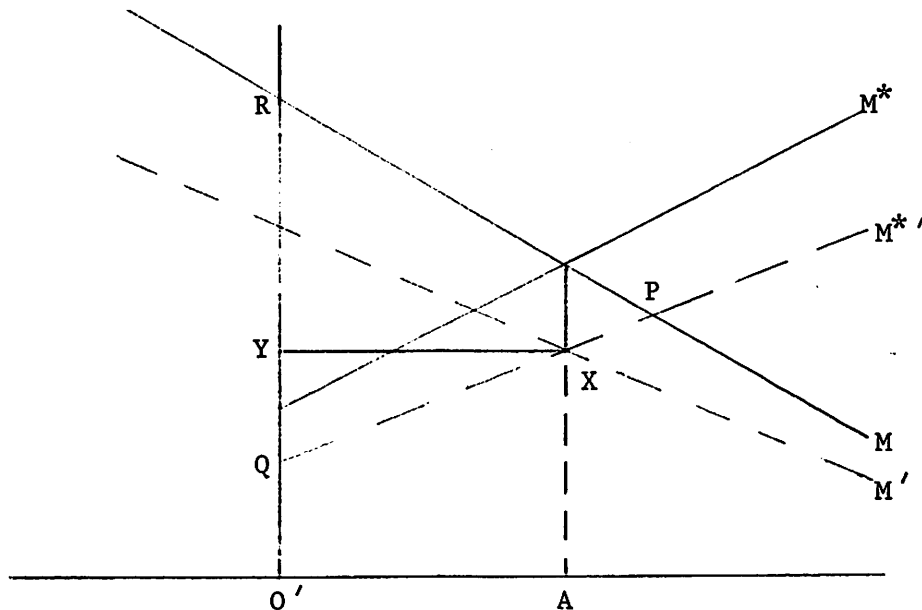


Figure 5

Proposition 6. With no differential taxes on foreign capital's earnings in both countries, a lower (higher) profits tax in the borrowing country increases (decreases) the supply of foreign investment to that country.

Figure 6 illustrates this for the case in which the borrowing country has the lower tax. The proposition is not so straightforward as may appear at first sight because the lending country's capital invested abroad will conventionally pay the higher of the two rates of tax. Thus in Figure 2 the lending country will pay tM^* in the borrowing country and $(t^*-t)M^*$ at home. Hence the lower rate of tax in the borrowing country is not enjoyed by the foreign investors, but the smaller percentage downward shift in the marginal product curve means a relatively higher than otherwise return to foreign capital and so induces them to invest more abroad. The loss of world income and the distribution of gains can be deduced in the same manner as in previous cases.

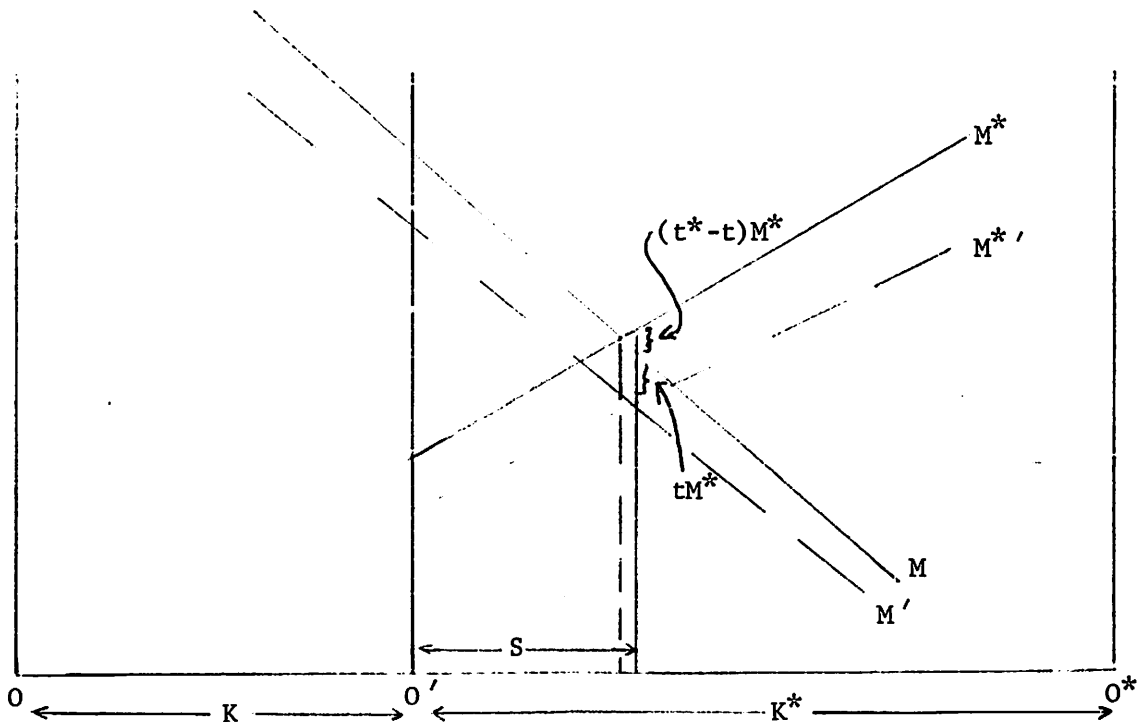


Figure 6

Proposition 7. If the borrowing country has a profits tax it is not clear without knowing the size of the relevant magnitudes whether it is optimal for it differentially to tax or subsidize the earnings of foreign capital.

Consider Figure 5. From the viewpoint of the borrower's government the triangle in which it has to find the maximizing trapezium is PQR, for M^{*} ' is the lender's supply curve of foreign capital and M the government's demand curve. Depending on the shapes and positions of the curves and the levels of profit taxes the optimum amount of borrowing could be greater or less than that determined by the intersection of M^{*} ' and M'. Thus Proposition 7 is true even for the case in which profits tax rates are the same in both countries. However the sum of profits and differential tax must be positive.⁶ These matters are proved mathematically in the Appendix.

Now profits taxes are usually determined with respect to domestic economic issues, and it is therefore unlikely that they will be changed so as to affect foreign investment. The literature on the simple model treated here certainly gives the impression that a differential tax should be imposed on foreign investment, but given the existence of profits taxes it is not clear whether a differential tax or a subsidy is relevant.

Given this analysis what relevance do the "MacDougall" and "Kemp" propositions possess? With profits tax rates close to 50% in many countries it is clear that a large part of the gain to the borrower from foreign capital will be captured by taxation. Figure 2 (interpreted in the light of Proposition 6) illustrates this. However, MacDougall's result is basically misleading. The gain to the borrower arises essentially because of differences between the rates of return in the lending and borrowing countries. Specifically, suppose the supply curve of foreign capital is perfectly elastic, then RY in Figure 1 identifies the source of the gain to the borrowing

country. If the supply curve of foreign capital has less than infinite elasticity, then Kemp's point that the borrowing country can increase its gain by some taxing of earnings is certainly valid. Nevertheless, it follows from Proposition 7 that an arbitrary rate of profits tax must, in general, restrict foreign capital inflow too much or too little.

In brief it appears that the MacDougall and Kemp propositions for the one-sector foreign investment model should be replaced by

- (i) The benefit to the borrowing country from foreign capital arises because the marginal product of capital in the borrowing country exceeds the supply price of foreign capital. The supply price of foreign capital in the long run is determined by the equation of the after-tax returns to capital in both countries;
- (ii) If the borrowing country faces a rising supply curve of foreign capital it may be able to act as a monopsonist user of the factor, designing an appropriate differential tax or subsidy to restrict the inflow of such capital below the competitive level;
- (iii) If a borrowing country has a profits tax it is not clear, without detailed knowledge of the supply curve of foreign capital, whether a borrower should tax or subsidize foreign profits in order to use its monopsony power to an optimal degree.

Finally, it should be reiterated that only the simple static one-sector model has been treated here. Some of the results could and do differ in a two-sector and/or dynamic framework.⁷ Further the introduction of fixed rates of profit tax into these more elaborate models may well cause changes in their conclusions.

APPENDIX

Suppose each country taxes profits at the fixed rates t and t^* , ≥ 0 ; and the borrowing country imposes an optimal differential tax or subsidy at rate $\tau \geq 0$. Assume f and f^* are the (differentiable) production functions for each country. It is required to $\max_{S, \tau} f(K+S) - S(1-t-\tau) f'(K+S)$ subject to $f'(1-t-\tau) = f^{*'}(1-t^*)$.⁸

Define the Lagrangian

$$L = f(K+S) - S(1-t-\tau) f'(K+S) \\ + \lambda [f'(K+S)(1-t-\tau) - f^{*'}(K^* - S)(1-t^*)] .$$

Then necessary conditions for a maximum are

$$(1) \quad \frac{\partial L}{\partial S} = f' - S(1-t-\tau) f'' - (1-t-\tau) f' + \lambda [f^{*''}(1-t^*) + f''(1-t-\tau)] = 0$$

$$(2) \quad \frac{\partial L}{\partial \tau} = S f' - \lambda f' = 0$$

Combining (1) and (2)

$$(3) \quad (t+\tau) f' + S f^{*''}(1-t^*) = 0$$

The first term in (3) is analogous to MacDougall's extra revenue from additional foreign investment whilst the second term (which is negative) is the loss arising from the higher cost of borrowing. From (3)

$$(4) \quad t + \tau = \frac{-S f^{*''}(1-t^*)}{f'} > 0 .$$

Although $t+\tau$ is positive there will always be some t for which an optimum requires that τ is negative, i.e., that a differential subsidy is required.

FOOTNOTES

^{1,2}These are not quotes, but seem to the present author to reflect the way in which MacDougall and Kemp, respectively, have been interpreted.

³There are no pure profits in the model, and the term "profits tax" is taken to refer to a tax on the earnings of capital. Note that it will be assumed that, consistent with the common convention, foreign capital pays the higher of the two rates of profits tax.

⁴The transfer of labour involved will shift the marginal product of capital curves in each country. I assume away the resulting complications by supposing that the transfer is small, but there is no great difficulty in working out the results without this assumption.

⁵Kemp [1962b] seems to be referring to a differential tax on foreign earnings rather than a profits tax.

⁶A similar point is made by Kemp [1962a] with respect to tariffs. If the lender levies a tariff the optimal differential tax imposed by lender on earnings of foreign investment may be positive or negative. However, the sum of differential tax (or subsidy) and tariff rate is positive.

⁷See for instance Kemp [1966], Jones [1967], Pearce and Rowan [1966], Bardhan [1967], Bade [1972], Manning [1972].

⁸Other ways of formulating the imposition of the differential tax are possible, but lead to the same conclusions.

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