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# THE WELFARE EFFECTS OF A CAPITAL INCOME TAX IN AN OPEN ECONOMY

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## ABSTRACT

International capital mobility has typically been ignored in discussions of the welfare effects of the capital income tax. In the atypical analysis which does consider the open economy it is recognized that highly-elastic capital flows could significantly alter the usual conclusions.

While there have been strenuous debates about the elasticity of international capital flows, there can be little disagreement that international ownership of capital is an important and growing phenomenon. In this paper, we explore the welfare effects of changes in the capital income tax from a different perspective: that of a country in which foreign ownership of a portion of the capital stock and foreign owners' payment of taxes is a reality.

With this modification in emphasis, a simple graphical analysis is sufficient to indicate that international capital ownership could easily dominate other welfare effects of tax changes. At least, the arguments presented in this paper raise a caution about ignoring the openness of the economy simply because elasticities are believed small.

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# The Welfare Effects of a Capital Income Tax in an Open Economy

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In analyzing the impacts of capital income taxation, researchers have typically ignored the possibility of international capital movements. One major exception is the work of Goulder, Shoven, and Whalley (1983), in which U.S. investment abroad is explicitly incorporated in a large general equilibrium model. Goulder, et al. demonstrate that the welfare effects of a variety of possible tax changes can be strongly influenced by the presence of highly-elastic capital outflows. The few other discussions of capital taxation in an open economy take the same general approach: international capital mobility is viewed as merely a potential constraint on domestic policymaking. The constraint is seen as important only if the degree of capital mobility assumed in the analysis is relatively (some would say unrealistically) high.[1]

The elasticity of international capital flows has thus been taken as the determinant of whether our usual analysis of capital taxation must be altered in recognition of the openness of the U.S. economy.[2] As a consequence, public finance researchers have taken some comfort from the (admittedly controversial) findings of Feldstein and Horioka (1980) and Feldstein (1983) that capital apparently does not move readily across national boundaries. Providing further ammunition for those who prefer the traditional closed-economy analysis is the literature on multinational firms which generally concludes that taxes play at most a minor role in international investment decisions.[3]

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Since the U.S. economy appears destined for increased internationalization, and international capital inflows are at an unprecedented level, the effort to understand capital mobility and its implications for policy will almost certainly intensify. Rather than enter the debate on the extent of capital mobility, we seek here to confront directly the important issue of the welfare effects of capital income taxation when the capital stock to which the tax applies is partly foreign owned. Since the extent of foreign ownership is well-documented we will take that phenomenon as given and consider the implications of different degrees of capital mobility. Surprising in light of the conventional wisdom is our conclusion that international capital ownership could plausibly have implications for economic welfare that dwarf other considerations related to capital taxation, even if the perceived inelasticity of international capital flows turns out to be an accurate characterization. Specifically, a simple calculation demonstrates that even if capital is totally unresponsive to rates of return, the mere presence of a stock of foreign-owned capital is sufficient to reverse the direction of welfare effects arising from relatively major tax changes widely perceived as having important welfare consequences.

## I. Welfare Effects of the Capital Income Tax

A. It happens to be most convenient for our purposes if we focus on the welfare implications of the presence of a foreign-owned capital supply, taking the domestic distortions caused by taxes on capital income as given. In other words, we will be focusing on the welfare effects that would be left out of a

closed-economy analysis. To demonstrate the basic approach, Figure 1 illustrates a closed economy capital market equilibrium consisting of a capital stock of S = K, earning a rate of return $r_c$. Since our focus is on the grafting of a foreign sector onto the traditional model, little attention will be given to the specific assumptions and behavioral relations underlying the supply of savings, S(r), and demand for capital, K(r) schedules. An economy in which foreign investors supply K'-S' of capital when the world and open domestic economy rates of return are $r_0$, finds domestic savers supplying S' and domestic investment totaling K'.

Comparing the open economy equilibrium to that of the closed economy, we determine that the foreign capital made available to the domestic economy leads to extra domestic production, which can be measured as the area ACK'K. Using some rather loose but quite common terminology (as we will discuss in more detail below), we will describe AKS'B as the "value of the domestic savings" (S-S') made available for other uses by the foreign capital inflow. Foreign investors are paid only BCK'S' for the use of their capital, so the domestic economy is better off by an amount measured by ABC as a consequence of foreign investment.

Those who are familiar with the literature on the welfare effects of capital income taxation (especially Feldstein (1978) and the work which has built on its important insights) will recognize the difficulty in measuring welfare effects by the area under the savings supply function. To analyze welfare effects of distortions to savings, it is important to recognize that the actual economic distortion of a capital income tax on which one should

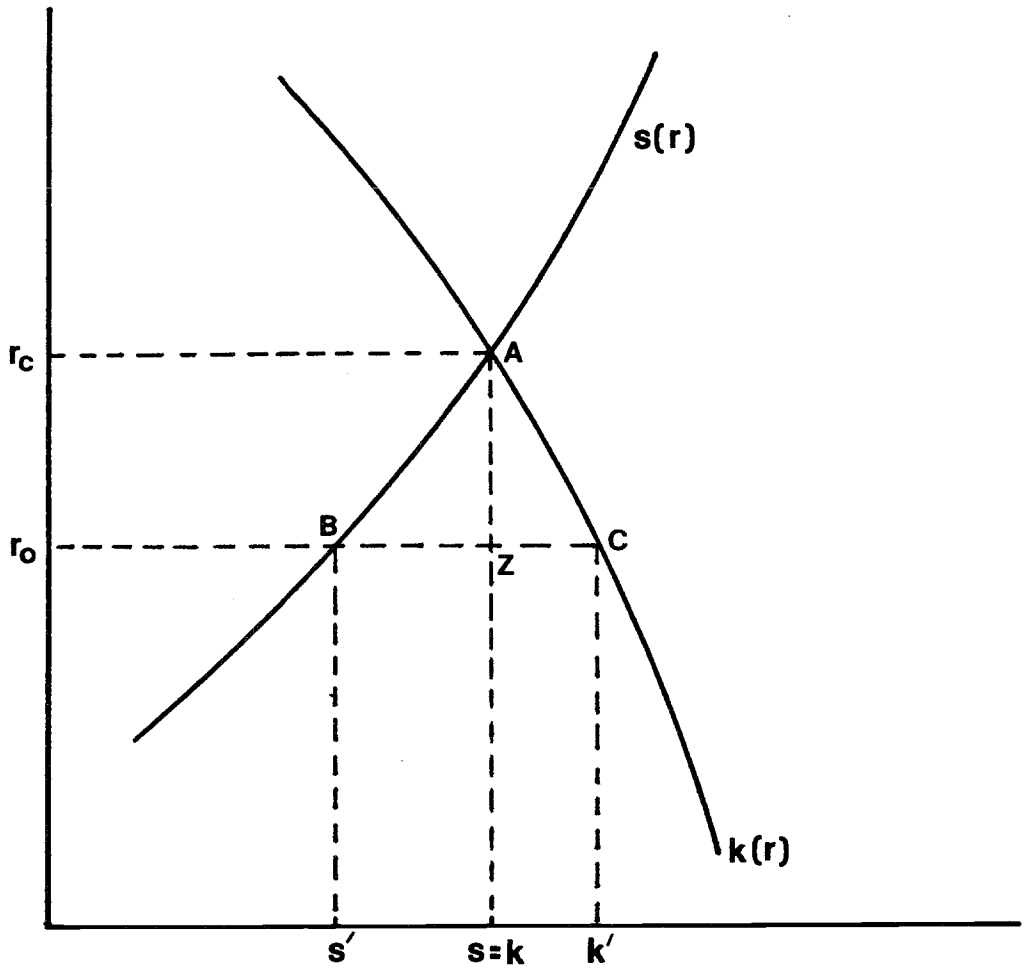


FIGURE 1

focus is that which alters the level of future consumption. After all, future consumption is the "good" for which demand is being distorted by the tax. There are several reasons for not paying a great deal of attention to this complication in the present context. First, and not of minor importance, is that the analysis is simplified considerably and clarified enormously by the use of graphs, as is common in discussions of open economies. It is not obvious how graphical analysis of international capital movements could be integrated with explicit consideration of the impact on future consumption. Furthermore, it does not seem necessary. Recall that we are not interested in the welfare effects of changes in the tax rate on capital income, but only on the portion of the welfare effects of tax changes arising because of the international ownership and mobility of capital. It is only under "special assumptions" that we will arrive at highly specific conclusions anyway and in those cases the results turn out not to be sensitive to our shorthand method of describing welfare changes in terms of the "savings elasticity." In any event, the implications for future consumption are generally quite clear; those instances in which conclusions drawn from a focus on the savings elasticity could be misleading will be highlighted. Otherwise, we will simply proceed as if the graphs were illustrating the curves with the conceptually-correct elasticities.

Suppose that, in addition to not being able to extract the total production we would attribute to the presence of their capital in the domestic economy, foreign investors are required to pay taxes to the host country's government on their returns. Then, the welfare differential is given by the

area ABC plus the tax revenue extracted from the foreigners' returns.

B. The Full Market Model

The extension of this analysis to incorporate the full workings of the market in the presence of taxes requires the complications included in Figure 2. The left-hand panel in Figure 2 begins with Figure 1 and adds schedules indicating the relationships of capital supply to gross rates of return when capital returns are taxed at an initial rate t, as well as a reduced rate t'. Obviously, the S(r(1-t)) schedule is simply the S(r) schedule displaced upward by rt in order that the given net rate of return produces the same level of saving under different tax schemes. The right-hand portion of the figure shows the net demand schedules for capital imports, $D_n$, derived from the relationships shown in the left-hand panel at the initial tax rate and at the reduced tax rate. The net foreign capital supply schedules, $S^*(\cdot)$, corresponding to different tax rates are drawn with moderate upward slope in Figure 2, but since their shape is obviously controversial, a range of alternatives will be examined.

Equilibrium obtains under the original tax regime with $S^*$ (= K-S) of foreign capital supplied and capital earning gross return $r_G$. The presence of foreign investment provides an increment to national welfare of the area ABC (which, by construction, can be measured in either panel), plus the revenue collected from foreign investors BCJI. At the reduced tax rate t', the corresponding welfare effect is given by the sum of areas DEF and EFHG.[4] An analysis of the welfare change which ignores foreign investment will, thus, err

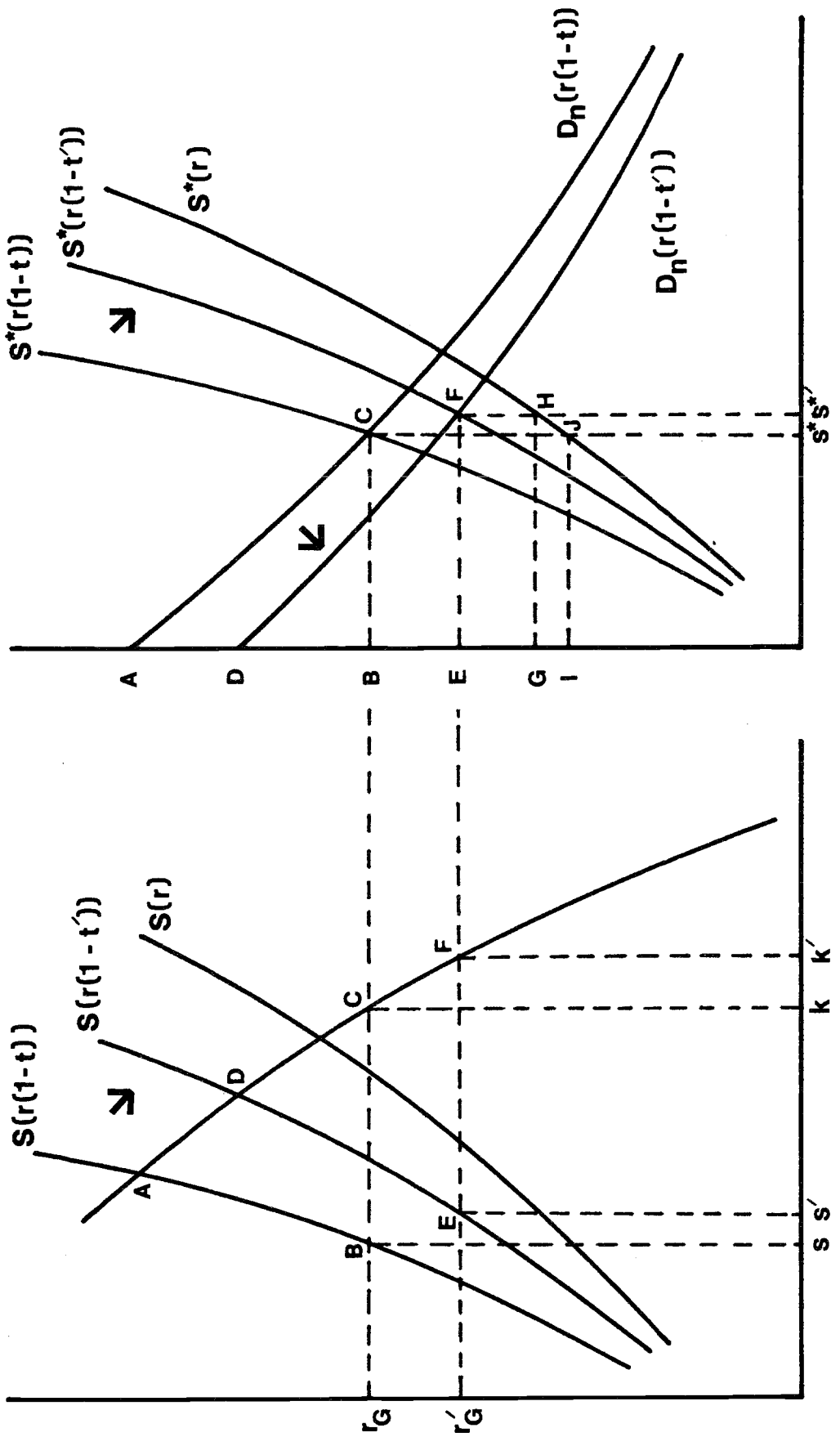
S*(r(1-t))
S*(r(1-t'))
S*(r)
$D_n(r(1-t))$
$D_n(r(1-t'))$
A
D
B
E
G
I
C
F
H
J
S*S*'
S(r(1-t))
S(r(1-t'))
S(r)
k
k'
s
s'
$r_G$
$r'_G$

FIGURE 2

by an amount (DEF - ABC) + (EFHG - BCJI). It should again by emphasized that we are describing only the extra welfare effect arising from the economy's openness to foreign investment, not the total welfare effect of the tax. In other words, we are examining "how incorrect" the closed economy analysis would be.

Because of the particular way in which Figure 2 has been drawn, the tax's extra welfare effect due to the foreign investor is clearly negative, arising largely because the tax cut radically reduces the tax revenue obtained from foreign owners of the capital stock. The revenue impact is our crucial point of departure from the conventional model of the welfare effects of the corporate income tax: unlike a redistribution between parties within the system, which need not be considered in a context of total welfare, a tax cut on the foreign investor's return redistributes income toward those outside the system and is accompanied by a potentially large welfare loss. Some notion of the possible order to magnitude of this factor will be obtained below; but, first, some special cases will be examined to shed further light on the workings of the model.

C. "Small" Foreign Investment

As an extreme case, suppose that foreign investment is "small" relative to the size of the total domestic capital market. In the context of our model, this situation is defined as one in which the level of foreign investment has a negligible impact on the domestic rate of return. The net domestic demand and foreign supply schedules are altered as shown in Figure 3. Clearly,

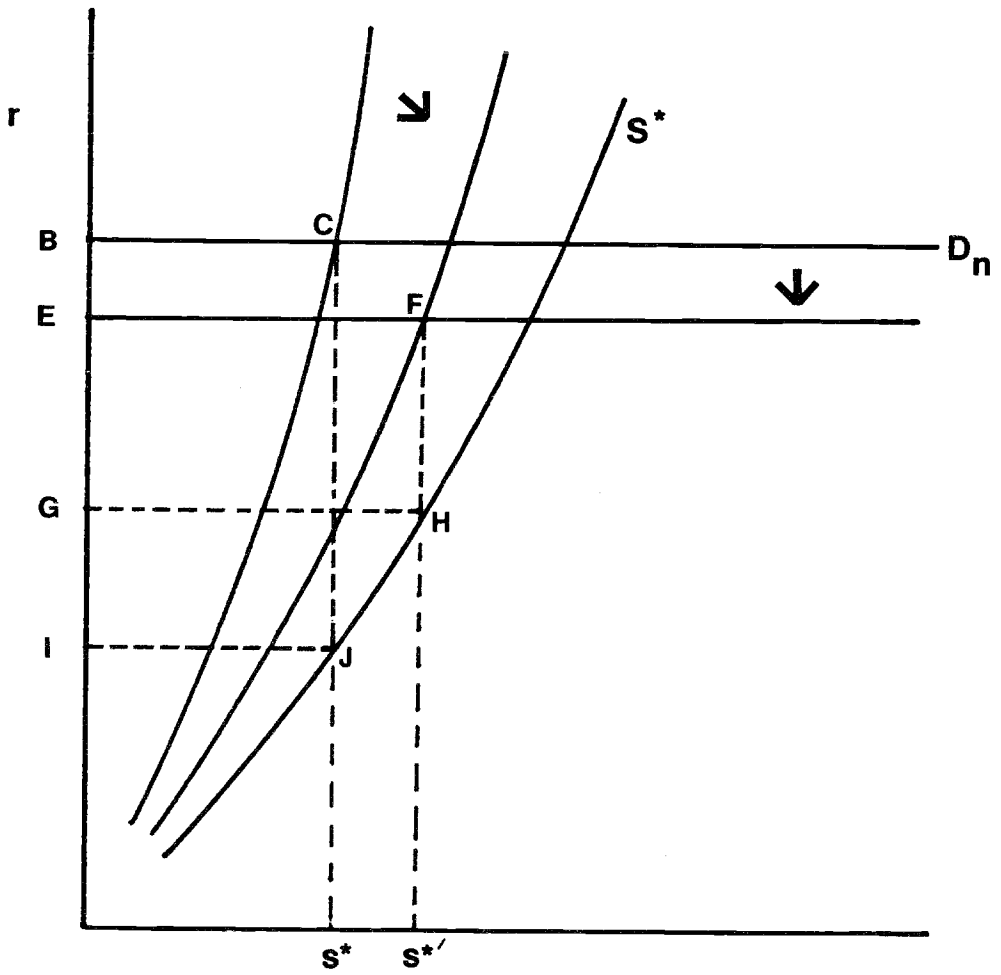


FIGURE 3

the domestic capital market conditions alone dictate the extent to which the net rate of return paid to foreign investors increases in response to a tax cut.

More importantly, the welfare implications of adding the foreign sector to the standard model can be described by examining only the change in tax revenue received from foreign investors (EFHG - BCJI).[5] The incremental welfare effect could obviously be positive or negative depending on the elasticity of the international capital supply. Surprisingly, the case of a completely inelastic supply, which has been dismissed as uninteresting in prior studies, produces the highest net welfare loss, with the error produced by ignoring foreign investment being equal to the change in the tax rate times the level of the foreign capital invested. Of course, the effect may not be of great significance if foreign investment is literally "small" in the sense of having negligible effects on capital returns. However, what the example shows is that there could be implications worthy of analysis even (or especially) in cases in which capital flows are perfectly inelastic.

D. Perfectly Inelastic Capital Flows

We therefore turn to the more general situation of a non-negligible level of foreign capital which is perfectly inelastic in supply. This case is of obvious interest, since it is the extreme version of the situation cited to justify the use of closed economy models of capital income taxation.

As Figure 4 demonstrates, and as the reader has undoubtedly inferred from the discussion in Section C, such a conclusion could quite possibly be

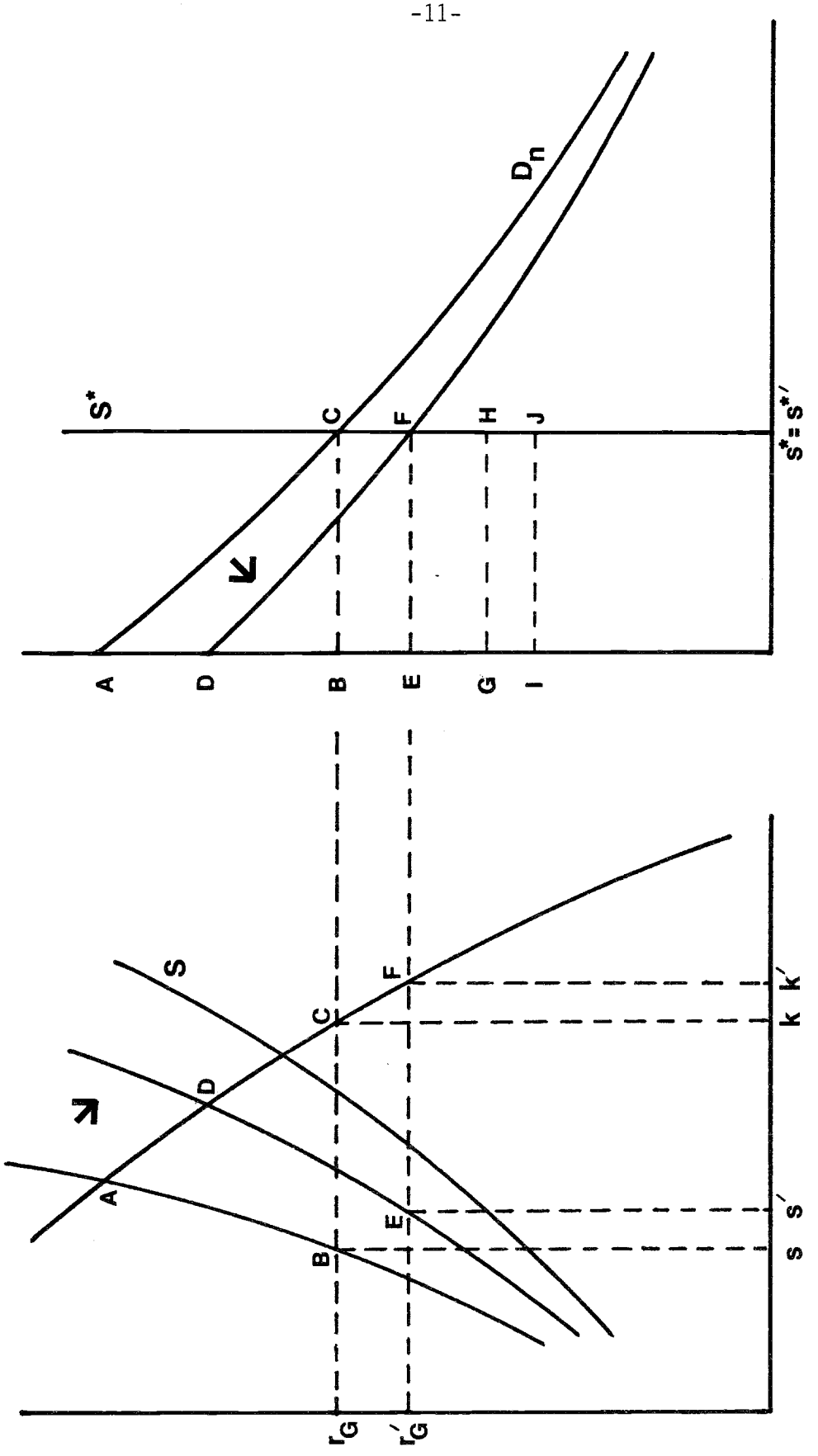


FIGURE 4

erroneous. A fixed foreign capital supply, S*-S*', produces a fixed differential, K-S = K'-S', between domestic supply and demand, as the tax changes shift the supply schedule. First, it is important to recognize that the welfare impact of a tax cut in this special case is influenced by the presence of foreign capital in a manner not fundamentally different from the general situation shown in Figure 2. Specifically, it consists of both a "surplus" term (DEF - ABC) and a "revenue" term (EFGH - BCJI). That is, contrary to the intuition of most researchers, the nature of the domestic demand and supply relations determine the extent of any additional welfare effect, even in this limiting case of a completely inelastic supply of capital from abroad.

The revenue term is naturally very simple when S* is completely inelastic, equaling the decline in the tax rate times the previous total return to foreign capital. The surplus term, however, cannot be signed without further investigation.[6]

Take, for example, the case of domestic capital being perfectly elastic in demand. The level of domestic savings (and future consumption) is unaffected by the presence of foreign capital.[7] As a consequence, there is no extra welfare effect except that measured by the decline in tax revenue collected from foreign investors.

On the other hand, if the domestic demand is completely inelastic, the level of domestic savings is unaffected by the tax, as is the net return to savers, regardless of the presence or absence of foreign investment. So, not only is the level of future consumption unaltered by the tax change, as is well known from the previous literature, but also it is unaffected by the presence

of foreign investment. Again, therefore, the only welfare implications of foreign investment arise from changes in tax revenue.

For intermediate cases, a variety of results could conceivably be obtained, but it seems plausible that any "extra" welfare terms will be relatively minor, as we will describe below.

To carry this exercise only one step further, we will make no extreme demand assumption but note that the argument is often made for a completely inelastic domestic savings schedule. Under such circumstances, domestic savings is, of course, unaffected by the tax. Thus, future consumption is reduced by the capital tax, which means that the tax is distortionary. However, the percentage reduction in future consumption being unrelated to the presence of foreign investment implies that, once again, the "extra surplus term" is zero. Hence, the welfare change attributable to the economy's openness is simply the tax revenue change. The same conclusion holds for the case of perfectly elastic domestic savings, this time because the level of future consumption is unaffected by the tax, regardless of the presence of foreign investment.

For intermediate cases, the results could vary qualitatively depending upon the exact nature of the behavioral relations, but it seems plausible that any welfare effects attributable to foreign investment (other than the loss in tax revenue) will be relatively minor. From the standpoint of economic welfare, the presence of a fixed level of foreign investment is identical to a leftward parallel shift in the domestic capital demand schedule. Such a shift will, in general, affect the welfare calculation, as one can

intuitively see from Figure 4. The reason, clearly, is that the elasticities of the domestic supply and demand schedules could be different in the presence of foreign capital than those in its absence. Nevertheless, it is difficult to imagine in "normal" circumstances the effect being sufficiently large to divert major attention away from the tax revenue effect. In fact, the usual discussion of welfare effects of the capital income tax would rely on observation of a market equilibrium in the presence of foreign investment and would already be capturing the "extra surplus term."

In conclusion, we have considered the case of perfectly inelastic international capital flows under a variety of (extreme) domestic circumstances. This case is the one widely believed to leave intact our closed economy welfare calculations. In each instance, the net welfare gain to the economy from lowering the tax on capital income was shown to be overestimated by exactly the fall in tax revenue collected from foreign investors when that foreign ownership is ignored. In a later section, an argument will be made for this effect being large, but first the case of perfectly elastic international capital flows will be considered, to indicate the manner in which alternative assumptions change our story.

E. Perfectly Elastic Capital Flows

Consider, then, the other extreme of international capital flows being perfectly elastic, as many international economists would argue is the most realistic assumption. A proportional tax cut can do nothing but reduce the gross rate of return to capital to exactly offset the tax change. Domestic

savings, thus, remain constant, while the capital stock and the capital supplied from abroad increase by an amount determined by the elasticity of the domestic investment demand schedule. The constancy of the after-tax rate of return implies that future domestic consumption is, likewise, undistorted. As Figure 5 and this verbal argument indicate, the presence of perfectly elastic flows of foreign investment implies that the welfare gains to savers from lowering the tax, which would have been predicted from a closed economy model, are not realized. At the same time, lowering the tax induces a higher level of foreign investment and foreign investors are paid less than the total product of the additional capital, even ignoring, for the moment, the tax burden borne by the foreign investor. This extra gain tends to offset the mistake a closed-economy model would make on the savings side. Since the part of the actual welfare effect of the tax change which is attributable to the phenomenon of foreign investment is measured by netting two welfare terms, each depending on elasticities of demand and supply schedules at different points, it is not surprising that it depends on the particular parameters of behavioral relationships. That is, the surplus term (DEF - ABC), or, more accurately, its equivalent in terms of future consumption, is of indeterminate sign. Clearly, as the domestic demand for capital elasticity declines, the surplus term must at some point become negative. Similarly, as savings becomes less elastic, the surplus term must turn positive at some point, since the "phantom" welfare gain calculated by the closed economy model would have disappeared even in the closed economy model. In summary, the non-revenue welfare effect due to foreign investment is difficult to assess in general.

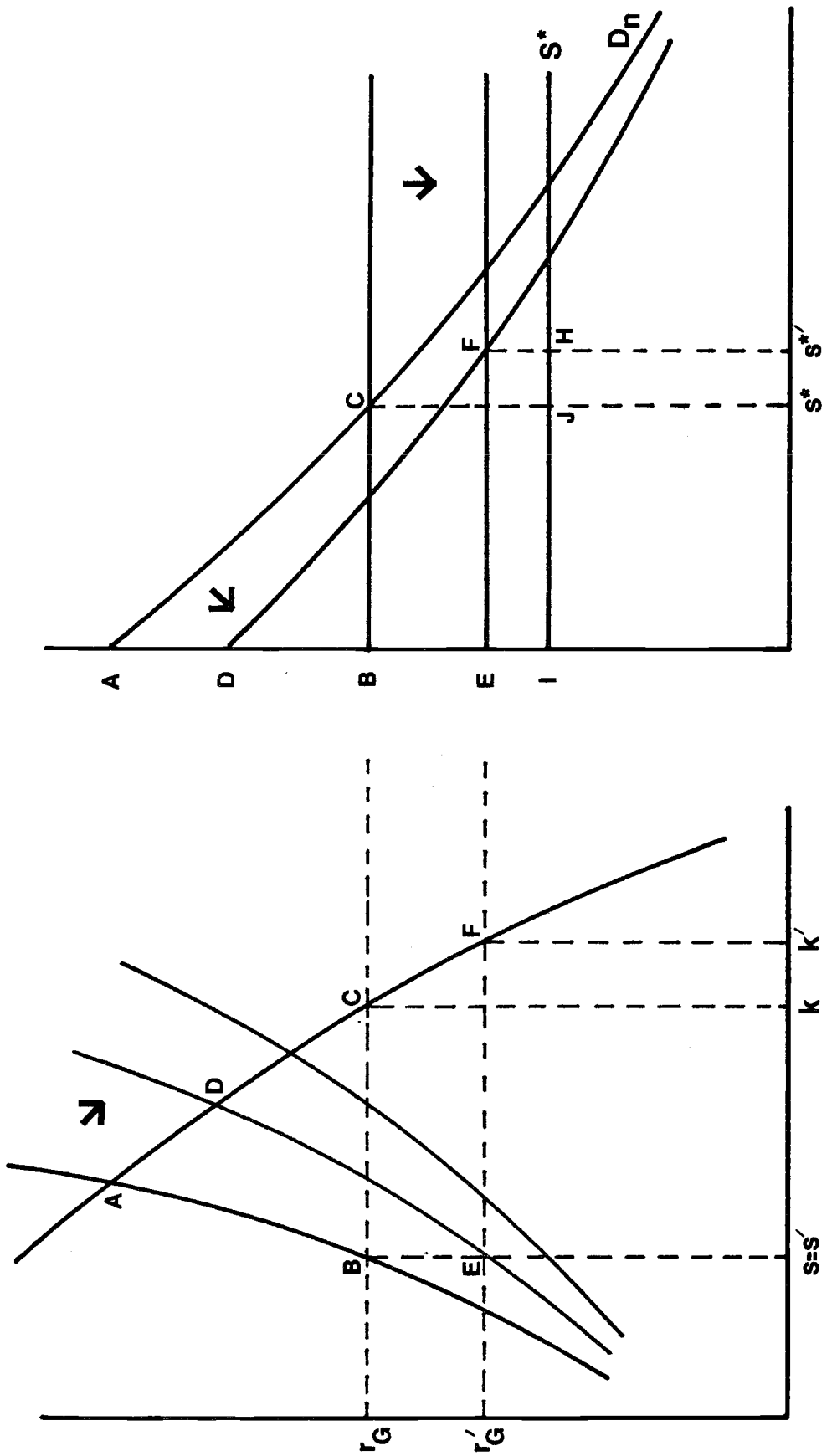


FIGURE 5

Furthermore, unlike the case of perfectly inelastic international flows, the revenue change can also be either positive or negative, depending on the elasticity of the net domestic demand for capital.

As a result of this examination of the perfectly elastic case, then, we must conclude that one might need to know a great deal about the domestic capital market in order to determine even the direction of the bias produced by ignoring the openness of the economy.

F. General Conclusions

Some idea of the potential magnitude of some of these welfare effects will be the subject of a concluding section, but, before addressing that question, we review the general results. First, the size of the foreign investment inflow is crucial. If it is small relative to the total of domestic investment, its degree of influence on the welfare effect of a tax can be measured by the tax revenue foregone by the domestic government. If the amount of foreign capital supplied to the domestic economy is large, but the supply is relatively inelastic, the welfare loss can probably still be approximated by the revenue loss, which can be estimated as the tax reduction times the level of foreign investment. However, from the standpoint of capturing all of the welfare effects of a tax change, it is important to recognize that the presence of even a perfectly inelastic supply of foreign capital has further implications for the welfare effects of tax changes, as we have shown.

While the revenue effect can be established conclusively as the major component of the additional welfare loss only in one of several "special cir-

cumstances" we have examined, the situations normally described in the public finance literature are ones in which the change in the foreign investors' tax liability could well provide a reasonable first approximation.

At the same time, a highly elastic supply of foreign capital does open a much wider range of possibilities including, of course, the "foreign tax revenue effect" of a tax rate cut being positive. In general, the domestic and foreign capital market conditions will determine whether the openness of the economy is an important factor in welfare analysis. Of particular interest is the result that an inelasticity of international capital flows is not sufficient to determine the conclusion.

II. Some Evidence of Magnitudes

After having detailed the complications introduced in a variety of cases, let us return to where we began this paper: with the situation which many would view as consistent with the "conventional wisdom." That is, suppose that foreign investment is quite inelastic. Suppose, further that the net domestic demand for capital, compared to foreign investment, is either relatively elastic, because foreign investment is "small" or because of the nature of the domestic capital market conditions themselves. Whether one needs to be cautious about ignoring foreign investment when examining welfare effects of a capital income tax change then depends, for all practical purposes, on whether the tax rate change produces a change in the revenue derived from foreign investors which is large relative to the other welfare effects being considered.

Table 1 shows estimates of the revenue collected from foreign direct investors under the U.S. corporate income tax for several recent years. Comparing these figures with recent estimates of the welfare cost of the corporate income tax, should give pause to those who emphasize the welfare cost numbers in calling for major reforms. For example, Fullerton, et al. (1983) estimates the welfare cost of the corporation tax at 2.8 percent of revenue under the 1980 law or about 2.4 billion 1980 dollars. In 1980, corporate income taxes raised over $7 billion from foreign investors, and through the period for which data are available, revenues were growing rapidly as was the level of foreign investment. Under our assumptions, the welfare effect of eliminating the corporate income tax in 1980 could have been, not a gain of $2.8

Table 1

Taxes Paid and Income Received by Foreign Investors

| Year | U.S. Income Tax* | Net Income | Data Source | Notes |
|---|---|---|---|---|
| 1974 | $2.339 b | $2.482 b | U.S. Commerce Department, Survey of Current Business, 5/76 | Does not include Middle East |
| 1977 | $3.290 b | $2.876 b | U.S. Commerce Department, Survey of Current Business, 5/81 | |
| 1978 | $3.530 b | $4.731 b | U.S. Commerce Department, Survey of Current Business, 5/81 | |
| 1979 | $5.111 b | $7.271 b | U.S. Commerce Department, Survey of Current Business, 5/81 | |
| 1980 | $7.066 b | $8.917 b | U.S. Commerce Department, Foreign Direct Investment in the United States, 1980, 10/83 | |

*Includes state and local corporate income taxes.

billion, but a loss of $4.6 billion. This calculation is, naturally, intended to be only illustrative of how important the treatment of foreign investment earnings could be in a welfare calculation. Our assumptions do not provide an upper bound in any sense since we are simply neglecting a portion of the welfare effect. On the other hand, higher estimates of the welfare cost of the system have been made: Auerbach (1983), for example, obtains an estimate of about $5 billion for 1981 for the cost of distortions produced by the misallocation of the capital stock alone. Nevertheless, the treatment of foreign investment under any reform designed to reduce the welfare cost of the system could be an important determinant of the reform's overall welfare effect. From the perspective of this paper, an important insight is that the importance of foreign investment is not dependent on that investment being highly elastic.

## Footnotes

1. For a discussion of the degree of capital mobility implict in the GSW analysis, see Hartman (1983).

2. See, for example, Boadway (1979), Shoven (1984), and Kotlikoff (1984).

3. Vernon (1977).

4. At this point, we drop the unnecessary "sum of the areas" DEF and EFGH and refer simply to "DEF + EFGH."

5. Of course, since neither domestic savings nor the rate of return received by savers is affected by the behavior of foreign investors, this is a degenerate case with respect to the concerns about using the "savings elasticity" rather than the "elasticity of future consumption" raised in Section I.B above.

6. It is obviously important at this point to recall the caution of Section I.B above that DEF and ABC are not actually the appropriate representations. However, since we cannot sign (DEF-ABC) anyway, we will discuss the matter only in the context of special cases.

7. Obviously, the tax change will affect future consumption, with the gross rate of return fixed. So, the analysis of the tax cut itself would provide an extreme example in which the distinction between a distortion to savings and to future consumption is crucial. However, the presence of a fixed level of foreign investment in the context of a perfectly elastic domestic capital demand has no separate influence on either domestic savings or future consumption.

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