Foreign investment incentives and international cross-hauling of capital

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Foreign investment incentives and international cross-hauling of capital

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Abstract. This note shows how international tax competition can give rise to special tax breaks for foreign investment. Discriminatory tax treatment of outside investment can give rise to socially harmful cross-flows of international investment. Paradoxically an increase in the costs associated with foreign investment can increase welfare.

Encouragements à l'investissement étranger et flux internationaux de capital. Cette note montre comment la concurrence internationale au plan de la fiscalité peut donner naissance à des encouragements fiscaux pour l'investissement étranger. Un traitement fiscal discriminatoire de l'investissement en provenance de l'étranger peut engendrer des courants d'investissements internationaux qui sont socialement nocifs. Paradoxalement, un accroissement dans les coûts associés à l'investissement étranger peut accroitre le niveau de bien être.

I. INTRODUCTION

International capital mobility is commonly understood to be the one-way movement of capital from capital-rich to capital-poor countries so as to equalize the marginal return to capital. Feldstein and Horioka (1980) and Feldstein (1983), however, have shown that there are substantial cross-flows of international investment between countries with rather small net flows. Cross-flows of financial investment may lead to a beneficial, risk-reducing portfolio diversification. Cross-flows of physical investment, however, are less desirable to the extent that they reflect international differences in taxes and investment subsidies rather than some underlying technological rationale. Countries frequently compete with each other for foreign investment by way of tax breaks, location subsidies, grants, etc., and such competition can give rise to futile cross-flows of physical investment. This note presents a concise model which explains how tax competition between authorities that raise taxes

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in order to finance public goods can give rise to discriminatory taxation of foreign investment and cross-hauling of investment goods. The model abstracts from the terms of trade effects that have previously been advanced as a reason for a different tax treatment of foreign investment (see Ruffin 1984 for discussion).

The argument is similar in spirit to Brander and Krugman (1983), who show that competition among firms can lead to reciprocal dumping of goods in the firms' home markets. Cross-hauling of investment, however, results from the tax rivalry among governments, and can occur even if capital markets are perfectly competitive. In other contexts, Zodrow and Mieszkowski (1986) and Wilson (1986) and (1987), among others, have shown that tax competition can lead to socially inefficient outcomes. Helpman and Razin (1983) have further shown that capital mobility can be socially harmful in the presence of increasing returns to scale with monopolistic competition, as it is in the present case of international tax competition.

Foreign investment incentives can take a number of forms. According to a study published by the Commission of the European Communities (1975), an investment incentive is 'any measure conditional on new investment taking place which is designed to increase the net-of-tax return from the investment relative to its cost at the time of the investment decision.' This broad definition includes rules for accelerated depreciation, investment tax credits or deductions, concessionary tax rates and loans, as well as direct grants. At least in Europe, these measures appear more often than not intended to sway company or plant location decisions rather than to increase the total international pool of investment. Especially in Europe's smallest economies, domestic investment may be more influenced by the net-of-tax rate of return offered to international businesses than by the domestic supply of savings.

The particular form that foreign investment incentives take largely depends on how cost effective they are in attracting foreign investment. For foreign investment incentives to be cost effective, ideally they should apply only to new foreign investors rather than to already present domestic investors. One way to ensure this is to grant tax reductions only to newly incorporated firms, thereby excluding established firms. As foreign companies are more likely to produce for exports markets and to make heavy use of international means of transportation, tax relief for export firms and subsidization of international ports and airports also are commonly used methods of discriminating between foreign and domestic prospective investors. As an example of the above, Ireland started granting a full exemption from export-related trading profits for a period of twenty-five years to firms operating in the Shannon Airport area starting in 1959.[1]

To date, there has been little impetus to limit international public bidding for investment by way of low tax rates and other incentives. Perhaps international coordination on foreign investment policies has been weak because domestic tax policy, unlike trade policy, is considered too much the prerogative of sovereign states. Some

1 For details concerning Irish foreign investment policy, see the chapter on Ireland in the study by the commission (1975).

attempts to limit international competition for foreign investment, however, have been made in Europe. Within the European Community, the Commission for the European Communities has the power to oversee the investment policies of the EEC member states. In the early 1970s it imposed an effective investment incentive ceiling equivalent to a net grant of 20 per cent of total initial investment costs, but Europe's 'peripheral' or less-developed regions in France, Italy, and West Germany were exempted (see *International Tax Strategy* 1977). As an example of this policy, the commission vetoed a Belgian incentive package for Exxon and Shell to build new refineries in September 1973. The incentive plan included a 2 to 3 per cent interest subsidy on loans and a three-year exemption of property taxes (ibid). Despite the commission's efforts, however, countries such as Ireland and West Berlin have continued to outbid others.

II. THE MODEL

This section develops a concise two-country model of international competition for foreign investment which shows how such competition can lead to two-way international flows of investment capital. The model, which assumes symmetry throughout, abstracts from the many investment incentives offered to foreign investors in practice, and instead simply supposes that different rates of tax apply to domestic and foreign capital.

Investors in country $i (i = 1, 2)$ start out with a stock k_i of investment capital to be deployed either at home or abroad. Investment at home is assumed to be costless, but investment abroad entails some expenses. The costs of foreign investment include transportation outlays, the task of learning the other country's rules and regulations, and the increasing difficulty of locating foreign investment opportunities and personnel that can profitably be integrated into the home country's businesses. Let i_i^j be the investment from country i to country j and let $c(i_i^j)$ be the function relating the volume of foreign investment to its costs, where $c(0) = 0, c' > 0$, and $c'' > 0$. We shall assume that countries tax only the proceeds of capital located within their borders. This assumption is approximately true for the states and provinces within individual countries and corresponds to the 'territorial' tax system of, for example, Belgium, France, the Netherlands, and Norway in Europe.[2] Let τ_i^j be the tax rate levied by country j on the return to capital originating from country i. Let us assume the countries have a linear and common technology requiring only capital, and that r is the universal gross rate of return to capital.

The representative investor, who owns all the capital within a country, consumes the net proceeds of his capital, N_i, which are given by the sum of his domestic and foreign net-of-tax investment income minus the costs associated with foreign investment, or, in symbols,

$$N_i = (1 - \tau_i^i) r(k_i - i_i^j) + (1 - \tau_i^j) r i_i^j - c(i_i^j). \tag{1}$$

2 The United States, however, taxes its companies on a 'residence' basis, which means that foreign source income is subject to tax.

Income maximization by the investor requires the equalization of the net returns to capital in both countries. This implies the following arbitrage equation, which is found by differentiating (1) with respect to i_i^j:

$$r(\tau_i^i - \tau_i^j) = c'(i_i^j). \tag{2}$$

The convexity of the cost function c implies that investment from country i towards country j is a function of the difference between the domestic and foreign tax rates applicable to capital originating from the home country. Specifically, $i_i^{j'}(\tau_i^i - \tau_i^j) > 0$ for $\tau_i^i - \tau_i^j \geqq 0$ and $i_j^i(0) = 0$.

Country i's tax authorities impose taxes in order to finance the provision of the pure public good P_i in country i.[3] Let us assume that tax revenues can be converted into the public good P_i one-for-one for simplicity. The tax rates τ_i^i and τ_j^i are set so as to maximize the representative consumer's welfare U_i, which satisies the Inada conditions. Formally the government faces the following maximization problem:

$$\max U_i(N_i, P_i) \tag{3}$$

such that

$$\tau_i^i r(k_i - i_i^j) + \tau_j^i r i_j^i \geqq P_i. \tag{4}$$

As (4) always holds with equality at an optimum, we can substitute for N_i and P_i from (1) and (4) into (3). Now straightforward differentiation of (3) with respect to τ_i^i and τ_j^i yields the following optimality conditions:

$$\frac{\delta U_i}{\delta N_i}\{-r(k_i - i_i^j) + \frac{\delta i_i^j}{\delta \tau_i^i}[-(1-\tau_i^j)r - c'(i_i^j) + r(1-\tau_i^j)]\} + \frac{\delta U_i}{\delta P_i}\left[r(k - i_i^j) - \tau_i^i r \frac{\delta i_i^j}{\delta \tau_i^i}\right] = 0 \tag{5}$$

$$\frac{\delta U_i}{\delta P_i}\left[r i_j^i + r\tau_j^i \frac{\delta i_j^i}{\delta \tau_j^i}\right] = 0. \tag{6}$$

In (5) and (6) $\tau_i^i = \tau_j^j, \tau_j^i = \tau_i^j$ and $i_i^j = i_j^i$ because of the symmetry of the model.

Note from (2) that the expression within square brackets in the first term of equation (5) equals zero. Now we can solve (5) and (6) for the tax rates τ_i^i and τ_j^i as follows:

$$\tau_i^i = \frac{\left(\frac{\delta U_i}{\delta P_i} - \frac{\delta U_i}{\delta N_i}\right)(k - i_i^j)}{\frac{\delta U_i}{\delta P_i} \cdot \frac{\delta i_i^j}{\delta \tau_i^i}} \tag{7}$$

3 If the public good were impure, congestion would – other things being equal – reduce the desired tax rates. The model abstracts from such congestion.

$$\tau_j^i = \frac{-i_j^i}{\delta i_j^i/\delta \tau_j^i}. \tag{8}$$

It can be shown that $\tau_i^i > 0$, since $\delta U_i/\delta P_i > \delta U_i/\delta N_i$ in (7).[4] By symmetry this means that $\tau_j^i = \tau_i^j > 0$. Then (8) implies that $0 < \tau_j^i < \tau_j^j$ and that i_j^i thus is positive.[5] This together with the symmetry of the model establish that there is cross-hauling of investment.

It is straightforward to see that cross-flows of investment are harmful and that the governments can improve the representative investor's welfare by impeding the

4 To see this, first write (5) as

$$\frac{\delta U_i}{\delta N_i} \cdot \frac{\delta N_i}{\delta \tau_i^i} + \frac{\delta U_i}{\delta P_i} \cdot \frac{\delta P_i}{\delta \tau_i^i} = 0. \tag{5'}$$

Since in (5') we have

$$\frac{\delta U_i}{\delta N} > 0, \quad \frac{\delta N_i}{\delta \tau_i^i} = -r(k_i - i_i^i) < 0, \text{ and } \frac{\delta U_i}{\delta P_i} > 0,$$

we have $\delta P_i/\delta \tau_i^i > 0$. Note from the private sector and government budget constraints (1) and (4) that

$$\frac{\delta N_i}{\delta \tau_i^i} + \frac{\delta P_i}{\delta \tau_i^i} = -c'(i_i^i)\frac{\delta i_i^i}{\delta \tau_i^i} < 0$$

which together with $\delta P_i/\delta \tau_i^i > 0$ implies

$$\frac{\delta N_i}{\delta \tau_i^i} \Big/ \frac{\delta P_i}{\delta \tau_i^i} < -1.$$

Combining this inequality with (5') yields

$$\frac{\delta U_i}{\delta N_i} \Big/ \frac{\delta U}{\delta P_i} < 1 \text{ or } \frac{\delta U}{\delta N_i} < \frac{\delta U}{\delta P_i},$$

which show that $\tau_i^i > 0$ in (7).

5 From fn 4 it is established that country i sets $\tau_i^i > 0$. What we wish to show is that equation (8) in the text implies $0 < \tau_j^i < \tau_i^i$. Once this is shown, it has to be true that $0 < \tau_i^i < \tau_j^j$, since from the symmetry of the model we have $\tau_i^i = \tau_j^j$ and $\tau_j^i = \tau_i^j$ in equilibrium. Now define g as a function of τ_j^i such that

$$g(\tau_j^i) = \tau_j^i + \frac{i_j^i(\tau_j^i - \tau_j^i)}{\delta i_j^i/\delta \tau_j^i}$$

for any given $\tau_j^i > 0$. As $\tau_i^i = \tau_j^i > 0$, we know that τ_j^i in the above expression is positive. The first-order condition (8) requires that $g(\tau_j^i) = 0$. We cannot have $\tau_j^i = 0$ in equilibrium, since

$$g(0) = 0 + \frac{i_j^i(\tau_j^i)}{\delta i_j^i/\delta \tau_j^i} < 0,$$

since $i_j^i(\tau_j^i) > 0$ and $\delta i_j^i/\delta \tau_j^i < 0$. Similarly, $\tau_j^i = \tau_j^j$ cannot be true in equilibrium, since $g(\tau_j^i) = \tau_j^i + 0 > 0$, since $i_j^i(\tau_j^i - \tau_j^i)$ now is $i_j^i(0) = 0$. As the g function is continuous, there has to be some value of τ_j^i between 0 and τ_j^i such that $g(\tau_j^i) = 0$. Thus we have shown $0 < \tau_j^i < \tau_j^j$.

cross-hauling of capital. Imagine the authorities prohibit capital flows and impose a uniform domestic tax rate τ equal to the domestic and foreign investment weighted tax rate $\tau_i^i - (\tau_i^i - \tau_j^i)(i_j^i/k_i)$ which is imposed in the case of international capital mobility. Now the provision of public goods has remained unchanged, but private consumption increases by $c(i_j^i)$, and the change is welfare improving.

Without further specifying either the utility function in (3) or the foreign investment cost function c, it is not possible to say how the tax rates τ_i^i and τ_j^i and the private income and public goods variables N_i and P_i in the case of international capital mobility compare with the case of autarky. Homotheticity of the utility function is sufficient to conclude that tax competition, which increases the social cost of public goods, reduces the provision of public goods P_i or equivalently lowers the domestic and foreign investment weighted tax rate on capital given by $\tau_i^i - (\tau_i^i - \tau_j^i)(i_j^i/k_i)$. Wilson (1986) and Zodrow and Mieszkowski (1986) have previously shown how tax competition can engender an underprovision of public goods.

With a quadratic foreign investment cost function given by

$$c_i(i_i^j) = \frac{\alpha}{2}(i_i^j)^2, \tag{9}$$

it is possible to calculate explicitly how the tax rates τ_i^i and τ_j^i are optimally related to each other and what are the implied costs of cross-hauling of investment. Now equation (2) implies

$$i_i^j = \frac{r(\tau_i^i - \tau_i^j)}{\alpha}. \tag{10}$$

Noting from (10) that $\delta i_i^j/\delta \tau_i^j = -r/\alpha$ and recognizing that $\tau_i^j = \tau_j^i$, we can use (8) to arrive at the optimal relationship between τ_j^i and τ_i^i:

$$\tau_j^i = \frac{1}{2}\tau_i^i. \tag{11}$$

It is now straightforward to calculate the cost c_i and public goods P_i as a function of τ_i^i above:

$$c_i = \frac{r^2(\tau_i^i)^2}{8\alpha} \tag{12}$$

$$P_i = \tau_i^i K_i - \frac{r(\tau_i^i)^2}{4\alpha}. \tag{13}$$

Private income N_i can be found by noting the resource constraint $N_i = rK_i - P_i - c_i$. Again, without specifying the utility function more precisely, one can not see what tax rate τ_i^i will be chosen.

However, it is clear from (12) and (13) that paradoxically an increase in the cost parameter α reduces the social cost associated with any given level of public goods P_i. Thus measures that increases the cost of foreign investment may be socially beneficial, since they reduce the scope for harmful cross-flows of foreign investment which result from international tax competition.

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