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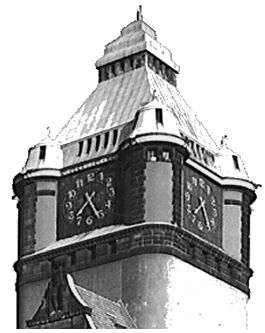
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**Domestic labor, foreign capital
and national welfare**

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Domestic labor, foreign capital and national welfare^{*}

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Abstract:

The competitive allocation of labor across different sectors of an economy may not be socially optimal when one sector uses foreign capital. We argue that a suitably designed government intervention is required to restrict the sectors to their optimal size and maximize national welfare. Such a policy internalizes the possibility of repatriation and reinvestment. We demonstrate the optimality of a minimum wage regulation.

JEL-Classification: F16, F21

Keywords: Foreign capital, factor mobility, national welfare, targeting

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1 Introduction

The purpose of this paper is to raise the following question. What should be the optimal labor inflow into a sector which exclusively uses foreign capital? Suppose a small open economy, hitherto endowed with local capital and labor, ushers in foreign capital to create a new product to be produced in the newly developed sector, will free mobility of labor then lead to the socially optimal outcome? Under the standard presumption of ‘full-repatriation’ of foreign capital income, the answer to the above question is a clear ‘no.’ We shall attempt to develop this idea in more detail and analyze the resultant policy implications.

It has been recognized in trade theory that foreign capital inflow may directly (Brecher and Diaz Alejandro (1977), Brecher and Findlay (1983), Neary and Ruane (1988) and others) or indirectly (Beladi and Marjit (1992)) increase the extent of existing trade distortions and thus lead to a decline in national welfare in a standard competitive, neo-classical trade model.

More recently, Marjit and Beladi (1996) and Marjit, Broll and Mitra (1997) have argued how the inflow of foreign capital in a tariff-distorted intermediate sector can lead to a welfare gain even with the standard assumption of full repatriation of foreign capital income. Marjit and Beladi (1996) exploit the conventional structure and highlight the role of the intermediate good in this context. Some of the recent notable contributions in this area are by Chao and Yu (1996), (1997).

The issue of extra labor participation in foreign capital controlled sectors of a developing economy has not recieved much interest from trade theorists although such issues have been quite important in practice. Restrictions of labor inflow into the export processing zones of China, wage and employment implications of foreign investment in East and South East Asia etc., have been thoroughly discussed in the work of Warr (1990). One possible policy question that we raise in this context is whether the local government should pursue a policy whereby the local capitalists and foreign capital owners should face different wage rates for labor. Apparently, such a distortionary intervention may have welfare reducing implications. However, the answer to this question may depend on several factors, although we cannot rule out the optimality of such a differential.

Jones and Marjit (1995) have argued that when the workers working in the newly developed sector gradually reveal their skills, there is a case for a minimum wage in the foreign enclave. Without such a wage there is a terms-of-trade loss which is generated by the free labor flow into the foreign

controlled sector. For an earlier analysis of enclave models one may refer to Jones and Dei (1983).

In this paper we take up a very conventional specific-factors model (Jones (1971)) where labor moves between two sectors which use local and foreign capital, respectively. In addition to the standard assumptions of competitive markets and neo-classical technology, i.e., constant returns to scale and diminishing marginal productivity, we explore the implications of an imperfect market for foreign capital, the possibility of reinvestment of the capital returns from it in sector-specific investments and its partial repatriation. A market outcome of wage equality across sectors could then be socially optimal only in a borderline case, i.e. when the rate of reinvestment equals a critical value.

One must recognise that when the foreign capital income is repatriated, labor inflow generate a negative externality for national welfare. The inflow of labor into the foreign sector may raise the return to foreign capital, thus worsening the sectoral terms-of-trade for the small economy. Any policy that tends to restore the terms-of-trade loss must also take into account the possible adverse impact of such policies on the inflow of capital. To the extent that the foreign capital income is reinvested in the country, ‘taxing’ foreign capital in one way or the other may prove to be harmful for the local economy. The socially optimal employment allocation between the local and the foreign owned sectors may differ from the standard competitive outcome when all the above mentioned factors are taken into account.

In order to have a benchmark for our main findings, we present in section 2 a simple model of capital income, repatriation and national welfare. In section 3 we provide a detailed analysis of the effects of a competitive allocation of labor across different sectors of an economy where one of the sectors uses foreign capital. We argue that suitably designed government intervention is required to restrict the sectors to their optimal size and maximize national welfare. In this context we demonstrate the optimality of a minimum wage regulation. section 4 concludes.

2 The model

Two sectors in a small economy produce good X and Y . Sector X uses local capital K and local labor L_X ; sector Y uses foreign capital K^* and local labor L_Y . Markets are competitive and standard neo-classical technology in each sector is assumed. However, it is assumed that the two types of capital

used in production are sector-specific. This is modeled by an imperfect world capital market.

An imperfect world capital market suggests that K^* , the stock of foreign capital, is positively related to the difference of rental rates, $r^* - r_w$, where r^* denotes the domestic real return to foreign capital and r_w defines the exogenous return in the rest of the world, i.e. $K^* = K^*(r^* - r_w)$. Since r^* itself depends on K^* , as it is natural in the standard specific-factors model, a decline in r^* due to some other factor leads to an outflow of K^* , raising r^* to some extent. The assumption of an imperfect capital market allows foreign capital supply to be affected by such changes. With the stock of local capital K being independent of the interest rate r^* , shifts in the marginal product of foreign capital K^* will never affect the availability of the former.

We assume that a part $\lambda r^* K^*(r^* - r_w)$ of the foreign capital income is added to the existing capital stock as reinvestment and that the remainder of $[1 - \lambda]r^* K^*(r^* - r_w)$ is repatriated to the foreign country. Hence $\lambda \in [0, 1]$ denotes the rate of investment which is decided on by the foreign capitalists. For simplicity we ignore investment in local capital.

Note that a competitive equilibrium with no intervention implies an allocation of labor across sectors such that the wage rates are equalized. We have a standard specific-factors model like Jones (1971) with the usual pattern of determination of equilibrium values.

Assuming the existence of a social welfare function which is maximized with costless income redistribution, our country's welfare level can be represented by a real GNP function Ω . The social planner maximizes real national income after accounting for repatriable income and investment. The real national income Ω is expressed as

$$\Omega = PX(L_X, K) + Y(L_Y, K^*[1 + \lambda r^*]) - [1 - \lambda]r^* K^*. \quad (1)$$

We assume that the relative commodity price $P = \frac{P_X}{P_Y}$ is constant, i.e. we abstract from a terms-of-trade effect; furthermore we take r_w to be a constant and suppress it as an argument.

The problem of the planner is to maximize Ω with respect to L_Y (or L_X)

subject to $L_X + L_Y = \bar{L}$. The first order condition reads

$$P \frac{\partial X}{\partial L_X} = \frac{\partial Y}{\partial L_Y} + \frac{\partial r^*}{\partial L_Y} \left[\lambda r^* \frac{\partial K^*}{\partial r^*} + \lambda K^* [1 + r^*] + \lambda r^{*2} \frac{\partial K^*}{\partial r^*} - K^* \right]. \quad (2)$$

Proposition 1. *Given a small open economy with foreign specific capital, repatriation of foreign capital income, and mobile domestic workers as described above, a competitive equilibrium will not necessarily maximize the host country's national welfare.*

Proof. From (2) we can write with $\partial r^* / \partial L_Y > 0$

$$P \frac{\partial X}{\partial L_X} \leq \frac{\partial Y}{\partial L_Y} \quad (3)$$

if and only if $\lambda \leq \frac{1}{(1+r^*)} \frac{1}{(1+\epsilon)}$, where $\epsilon \equiv \partial K^* / \partial r^* \cdot r^* / K^*$. ■

3 Labor mobility and national welfare

In this section, we will lay down a couple of observations which can be made from (2) and (3).

3.1 National welfare

First, suppose $\epsilon = 0$, i.e., we have a given stock of foreign capital K^* . If r^* goes up by a unit, investment augments the capital stock by λK^* . The contribution of this increment to real output is $\partial Y / \partial K^* \lambda K^* (= r^* \lambda K^*)$. However, $[1 - \lambda] K^*$ is repatriated. Hence, the net contribution to the small open economy's welfare is measured by $[\lambda [1 + r^*] - 1] K^*$.

The net contribution will be positive if $\lambda > 1/(1 + r^*)$, condition (3). The fraction of foreign capital return added to the foreign capital stock is high enough to make the local economy better off.

On the other hand, if $\lambda < 1/[1 + r^*]$, the critical value of λ is fallen short of. There may be the case for immiserizing growth, i.e. the local economy gets worse off from attracting foreign capital instead of benefitting from it.

The planner will therefore like to prevent a rise in r^* by restricting labor inflow into sector Y .

When $\lambda = 1/[1 + r^*]$, the local economy's competitive equilibrium will be socially optimal. The rate of reinvestment is sufficient not to harm the local economy. Wages are equalized across the two sectors.

Now consider the case that $\epsilon > 0$. A rise in r^* now has the additional benefit of raising the foreign capital stock further by $\partial K^*/\partial r^* [1 + \lambda r^*]$, and at the same time leads to further leakage of $[1 - \lambda]r^* \partial K^*/\partial r^*$. Using the definition of ϵ and following (2), we can prove that for $P\partial X/\partial L_X = \partial Y/\partial L_Y$ to hold λ must satisfy $\lambda = [[1 + r^*][1 + \epsilon]]^{-1}$.

We can summarize the above findings as follows:

Proposition 2. If the rate of investment λ is low, it is optimal to restrict labor mobility in Y . If λ is fairly high, it is optimal to reduce employment in X .

With a low investment ratio λ , the restriction of labor inflow into sector Y will be justified since the workers will not internalize the resultant loss to the national economy. On the other hand, with a high investment ratio it is optimal to reduce employment in X relative to the competitive market solution.

3.2 Policy implication

The implementation of such a policy scheme of restricted labor inflow will require explicit sector-specific employment subsidies. Another way to achieve a similar outcome is to impose a minimum wage in one of the sectors and let the wage adjust in the other sector. Consider the case where $\epsilon = 0$ and $\lambda = 0$, i.e., the stock of capital is fixed and the entire capital income is repatriated. Let W be the wage rate. Condition (2) tells us that

$$W_X = MPL_Y - \frac{\partial r^*}{\partial L_Y} K^* = \overline{W}_Y. \quad (4)$$

Since $\partial r^*/\partial L_Y > 0$, the optimal national wide employment is determined where $MPL_Y - \partial r^*/\partial L_Y K^*$ intersects with the MPL_X curve, as demonstrated in figure 1. Segment $0_Y L_Y$ is the national welfare maximizing employment for the foreign sector. Note that one can implement this by setting a minimum wage $\overline{W}_Y$ in sector Y and letting the residual supply $0_X L_X$ be cleared at the wage W_X . Full repatriation of foreign capital income prevents the marginal

product of labor in X and Y from equalizing as they would in the standard specific factor model. Here, in contrast, domestic labor is not the winner of the general increase in the foreign capital stock. The national welfare loss consists precisely in the amount of repatriated capital income $\frac{\partial r^*}{\partial L_Y} K^*$.

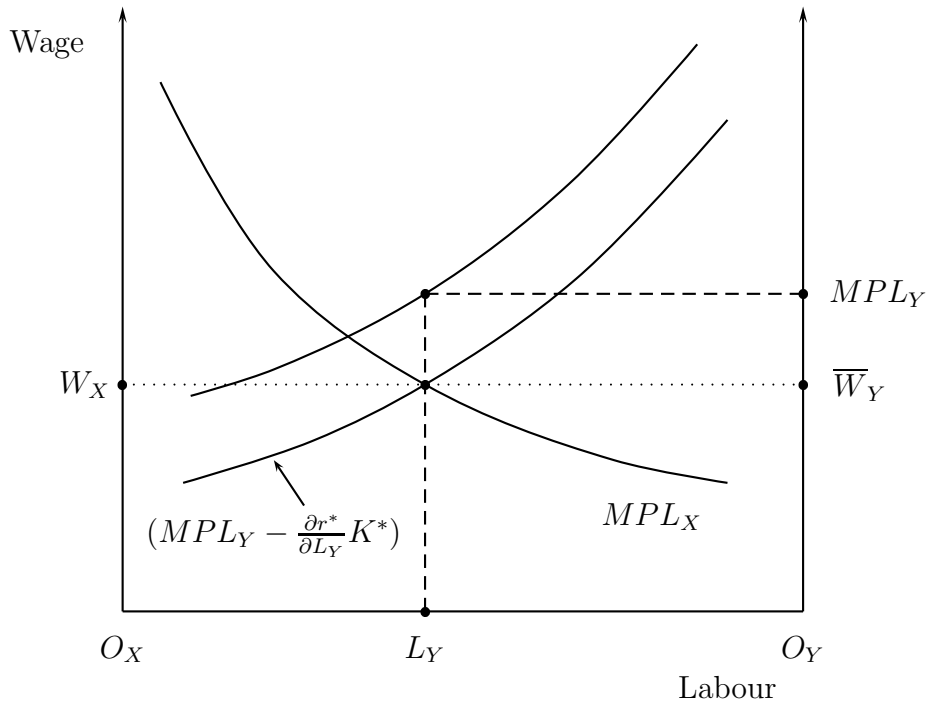


Figure 1: Wages with full repatriation

It is straightforward to argue that the investment propensity of the local capitalists should also feature in our analysis. The way we have set up the problem makes the local sector a passive element. Our purpose has been to highlight a particular case. One can also work out the general condition by endogenising the behavior of the local capital owners.

4 Concluding remarks

The unrestricted movement of labor across all sectors of an economy whereby marginal productivity of labor is equalized is usually a desirable efficiency

requirement. Greater inflow of labor in a sector that uses foreign capital may not be desirable from the point of view of national welfare. Competitive allocation fails to internalize the impact of labor inflow on the supply of foreign capital, repatriation of capital income and reinvestment possibilities. We have shown the existence of optimal policy intervention in this context which calls for targeting allocation of employment in each sector.

We have left out the issue of investment of local capital and also the endogenous determination of the share of income repatriation. These could be explored in a dynamic model. However, as long as there are certain leakages or inflows associated with the size of a particular sector, competitive allocations will not be socially optimal and will call for government action. However, given the structure of the model, one can compute appropriate shadow prices for policy evaluation purposes.

Appendix

We derive the solution to the maximization problem of equation (1) ignoring a terms of trade effect. The economy's real GNP is given by:

$$\Omega = PX(\bar{L} - L_Y, K) + Y(L_Y, K^*[1 + \lambda r^*]) - [1 - \lambda]r^*K^*.$$

We define $\tilde{K}^* = K^*[r^*](1 + \lambda r^*)$. Therefore $\partial\Omega/\partial L_Y = 0$,

$$\begin{aligned} P \frac{\partial X}{\partial L_X} &= \frac{\partial Y}{\partial L_Y} + \frac{\partial Y}{\partial \tilde{K}^*} \frac{\partial K^*}{\partial r^*} \frac{\partial r^*}{\partial L_Y} [1 + \lambda r^*] + \frac{\partial Y}{\partial \tilde{K}^*} K^* \lambda \frac{\partial r^*}{\partial L_Y} \\ &\quad - [1 - \lambda] \frac{\partial r^*}{\partial L_Y} K^* - [1 - \lambda] r^* \frac{\partial K^*}{\partial r^*} \frac{\partial r^*}{\partial L_Y}. \end{aligned}$$

Note that $\partial Y/\partial \tilde{K}^* = r^*$. Thus, we obtain:

$$\begin{aligned} P \frac{\partial X}{\partial L_X} &= \frac{\partial Y}{\partial L_Y} + \frac{\partial r^*}{\partial L_Y} \left[r^* \frac{\partial K^*}{\partial r^*} [1 + \lambda r^*] + r^* K^* \lambda \right. \\ &\quad \left. - [1 - \lambda] K^* - [1 - \lambda] r^* \frac{\partial K^*}{\partial r^*} \right]. \end{aligned}$$

Hence,

$$P \frac{\partial X}{\partial L_X} \leq \frac{\partial Y}{\partial L_Y},$$

if and only if

$$\lambda r^* \frac{\partial K^*}{\partial r^*} [1 + r^*] + K^* [\lambda [1 + r^*] - 1] \leq 0.$$

Rearranging terms and dividing by K^* we get the investment ratio

$$\lambda \leq \frac{1}{[1 + r^*][1 + \epsilon]},$$

where $\epsilon = \frac{\partial K^*}{\partial r^*} \frac{r^*}{K^*}$ is the elasticity of foreign capital supply.

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