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Domestic labour, foreign capital and welfare

Abstract: A competitive allocation of labour across different sectors of a small open economy may not be socially optimal when one sector uses foreign specific capital. We argue that a suitably designed economic policy is required to maximize national welfare of the host country. In particular such a policy design has to take into account repatriation of factor income by multinational firms.

Keywords: specific capital, multinational firm, labour mobility, welfare.

JEL codes: F16, F21.

1. Introduction

The purpose of our paper is the following question. What should be the optimal labour inflow into a sector or an industry which is controlled by foreign specific capital (or multinational firms) in an open economy? Suppose a small open economy, endowed with local capital and labour, employs foreign specific capital to create a new product. Will free mobility of labour in the host country lead to the socially optimal outcome? Under the standard presumption of full-repatriation of foreign capital income, the answer to the above question is no. We shall attempt to develop this idea in detail and analyze the resultant economic policy implications.

It has been recognized in international trade theory that foreign capital inflow may directly or indirectly increase the extent of existing trade distortions and thus lead to a decline in national welfare in a standard competitive, neoclassical international trade model [Brecher and Diaz-Alejandro (1977), Brecher and Findlay (1983), Neary and Ruane (1988), Beladi and Marjit (1992)]. More recently, Marjit, Broll and Mitra (1997) have shown how the inflow of foreign capital in a tariff distorted industry can lead to a welfare gain even with the standard assumption of full repatriation of foreign capital income. Chao and Yu (1996), (1997) show the role of the intermediate good in this context. National welfare implications for host countries under asymmetric information between foreign and domestic firms are discussed in Mukherjee and Broll (2007). Broll and Wong (2006) examine the foreign direct investment and risk management of multinational firms under exchange rate risk. The economic impact of outsourcing by multinational firms on labour is shown in Feenstra (2007).

The issue of extra labour participation in foreign capital controlled sectors of a developing economy has not received much interest from international trade theorists, although such issues have been quite important in practice. Restrictions of labour inflow into the export processing zones of China, wage and employment implications of foreign investment in East and South East Asia, have been thoroughly discussed by Warr (1990). One question that we raise in this context is whether the host country government should pursue an economic policy, whereby the local capitalists and foreign capital owners should face different wage rates in the host country. 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 wage differential.

Jones and Marjit (1995) have argued that when the workers employed in a newly developed sector gradually reveal their skills, there is a case for a wage regulation in the foreign enclave. Without such intervention there is an internal terms of trade loss which is generated by the free labour 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 conventional specific factors model [Jones (1995)] where domestic labour moves between two sectors which use local and foreign specific capital. We explore the economic implications of repatriation and reinvestment of the foreign capital returns. A market outcome of wage equality across sectors could be socially optimal only in a borderline case, i.e. when the rate of reinvestment or the rate of repatriation equals a specific value (see section 2 and 3).

One must recognise that when foreign capital income is repatriated, labour inflow may generate a negative externality for welfare of the host country. The inflow of labour into the foreign sector may raise the return to foreign capital, thus worsening the internal terms of trade for the small open economy. Any economic policy that tends to restore the terms of trade loss must take into account the possible

adverse impact of such policies on the inflow of foreign capital. To the extent that the foreign capital income is reinvested in the host country, taxing foreign capital in one way or another may prove to be harmful for the local economy. The socially optimal employment allocation between the local and the foreign owned sectors 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 economic findings, we present in section 2 a model of real national income, foreign capital income, repatriation of profits, reinvestment and national welfare of the host country. In section 3 we provide a detailed analysis of the effects of a competitive allocation of labour across different industries of an economy where one of the industries uses foreign capital. We argue that suitably designed government intervention is required to restrict sectors to their optimal size in order to maximize national welfare of the host country. In this context we demonstrate the optimality of an intervention in the process of wage finding. Section 4 contains concluding remarks.

2. The model

Two sectors in a small economy produce good X and Y. Sector X uses local capital K and domestic labour L_X; sector Y uses foreign specific capital $K^\star$ and domestic labour L_Y. Markets are competitive and standard neoclassical technology in each sector is assumed. Both types of physical capital used in production are sector specific.

The stock of foreign specific capital (foreign direct investment), $K^\star$, is positively related to the domestic capital rental rate for foreign capital, $r^\star$, i.e. $K^\star = K^\star(r^\star)$. Since $r^\star$ itself depends on $K^\star$, as it is natural in the standard specific factors model, a decline in $r^\star$ due to some other reasons leads to an outflow of $K^\star$, raising $r^\star$ to some extent. With the stock of local capital K being independent of the interest rate $r^\star$, shifts in the marginal product of foreign capital will never affect the availability of the former.

We assume that a part $\lambda\, r^\star K^\star$ of the foreign capital income is added to the existing capital stock as reinvestment and that the remainder $\Pi^\star = (1 - \lambda)\, r^\star K^\star$ is repatriated to the foreign country. Hence $\lambda \in [0, 1]$ denotes the rate of investment which is decided on by multinational firms.

Assuming the existence of a social welfare function which is maximized with costless income redistribution, our country's national welfare level can be represented by the real national product function. The social planner maximizes real national income, GNP, where income is expressed as

$$\text{GNP} = \text{GDP}\,(\cdot) - \Pi^\star \qquad (1)$$

while gross domestic product is $PX(L_X, K) + Y(L_Y, K^*(1 + \lambda r^*))$ and Π^* are profits repatriated by multinational firms. Labour endowment of the economy is $\bar{L}$ and foreign specific capital in industry Y is denoted by FDI $= K^*(1 + \lambda r^*)$. It is assumed that the relative commodity price $P = P_X/P_Y$ is constant, i.e., we abstract from an international terms of trade effect.

Observation. Given a small open economy with foreign specific capital, domestic labour mobility, repatriation of foreign capital income, and reinvestment of returns by multinational firms as described above. A competitive equilibrium, i.e. $P\partial X/\partial L_X = \partial Y/\partial L_Y$ will not necessarily maximize the host country's national welfare.

The decision problem of a social planner is to maximize real national income with respect to allocation of labour L_Y (or labour L_X) subject to the labour market constraint $L_X + L_Y = \bar{L}^2$. The first order condition reads

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

From the first order condition and $\partial r^*/\partial L_Y > 0$, we obtain

$$P\frac{\partial X}{\partial L_X} < \frac{\partial Y}{\partial L_Y} \qquad (3)$$

if $\lambda \leq \lambda_c = 1/(1 + r^*)(1 + \varepsilon^*)$, where $\varepsilon^* = (\partial K^*/\partial r^*)\, r^*/K^*$ is the elasticity of supply of foreign capital.

A competitive resource allocation fails to internalize the impact of labour inflow on the supply of foreign specific capital, repatriation of capital income and reinvestment possibilities by multinational firms. For the proof, see appendix.

3. Specific foreign capital and income

An economic reason for government intervention in the private market system arises whenever there are uncorrected market imperfections or distortions. In these circumstances the economy is characterized by the second best rather than first best equilibrium. In the best cases the host country government policy can correct the distortion completely. If the distortion is not corrected completely, then at least the

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[2]   In fact a social planner would like to maximize the indirect utility $V = V(P, \text{GNP})$. Since terms of trade are constant, social welfare is maximized if real gross national product is maximized.

new equilibrium conditions, altered by the presence of distortion, can all be satisfied. In either case an appropriate government policy can raise economic efficiency and improve national welfare. In this sense we will present a couple of observations which can be derived from section 2.

3.1. Factor income and welfare

First, suppose $\varepsilon^* = 0$, i.e. the stock of foreign specific capital K^* is given. If r^* goes up by a unit, investment augments the foreign 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 $\lambda > 1/(1 + r^*)$. The fraction of foreign capital return added to the foreign capital stock is high enough to make the host country better off.

On the other hand, if $\lambda > 1/(1 + r^*)$, there may be the case for immiserizing growth, i.e. the host country is worse off from attracting foreign specific capital instead of gaining from foreign investment. The planner will therefore prefer to prevent a rise in r^* by restricting labour inflow into sector Y. When $\lambda > 1/(1 + r^*)$, the local economy's competitive equilibrium will be socially optimal. Wages are equalized across the two sectors of the small open economy.

Second, we consider the case that $\varepsilon^* = 0$. A rise in r^* has the additional benefit of raising the foreign capital stock further by $\partial K^*/\partial r^* (1 + 1r^*)$, and at the same time leads to further leakage of $(1 - \lambda) r^* \partial K^*/\partial r^*$. Using the definition of ε^* and following from the first order condition, we can prove that for $P\partial X/\partial L_X = \partial Y/\partial L_Y$ to hold λ must satisfy $\lambda_c = 1/(1 + r^*)(1 + \varepsilon^*)$.

We can summarize the main findings of our study as follows:

Proposition. If the rate of repatriation of income of foreign capital of multinational firms is low (high), $\lambda < \lambda_c$, it is optimal to restrict domestic labour mobility in industry X. If the rate of reinvestment (repatriation) is high (low), $\lambda > \lambda_c$, it is optimal to control labour employment in industry Y.

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

Remark. In our static framework, λ is given. However, all of our main results remain valid if λ is endogenous. In a dynamic small open economy model instead, the rate of repatriation can be determined endogenously. The multinational firm's revenue R_1 can generally be stated as an explicit function of investment expenditure I_0, i.e. $R_1 = h(I_0)$. The multinational firm's management desires to maximize the present value of profit from foreign operation: $R_1/(1 + i) - I_0$, where i is the riskfree

interest rate. In the optimum the first order condition becomes $h'(I_0^*)/(1 + i) = 1$. With the definition of investment expenditure $I_0^* = \lambda\, r^* K^*$, we obtain the optimal investment and therefore an optimal repatriation rate $\lambda = r^* K^*/I_0^*$.

3.2. Economic policy implications

The implementation of a domestic policy scheme to restrict labour inflow in industry X or Y will require explicit industry or sector specific employment subsidies. Another way to achieve a similar outcome is to impose an effective wage ceiling at the level $\overline{W}$ in one of the sectors and let the wage adjust in the other sector. Consider the case where the stock of foreign capital is fixed and the entire capital income is repatriated. The first order condition tells us that

$$W_X = \text{MPL}_Y - K^* \partial r^*/\partial L_Y = \overline{W}_Y, \tag{4}$$

where the marginal product of labour in sector Y is denoted by MPL_Y. Since $\partial r^*/\partial L_Y = 0$, the optimal nation wide employment is determined where $\text{MPL}_Y - K^* \partial r^*/L_Y$ intersects with the MPL_X curve. Note that one can implement this by setting a ceiling
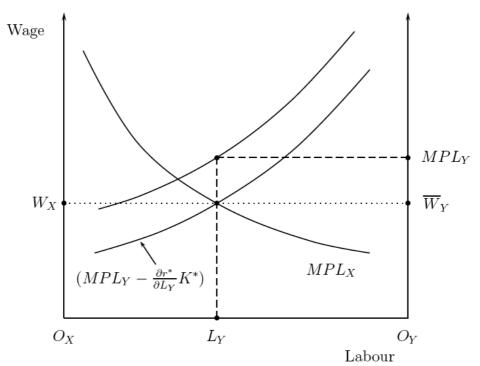

Figure 1. Wages with full repatriation

wage at $\overline{W}_Y$ in sector Y and letting the residual supply of labour be cleared at the wage W_X (as demonstrated in Figure 1).

The segment $0_Y L_Y$ is the national welfare maximizing employment in industry Y. Note that one can implement this by setting a wage 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 labour in X and Y from equalizing as they would in the standard trade model. Here, in contrast, domestic labour 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 $K^* \, \partial r^*/\partial L_Y$.

One can argue that the investment propensity of the local capitalists should also be considered in the analysis. The way we have set up the problem makes the local sector a passive element. However, our purpose has been to highlight a particular case.

4. Concluding remarks

The unrestricted movement of labour across all sectors of a small open economy whereby marginal productivity of labour is equalized is usually a desirable efficiency requirement. Greater inflow of labour in a sector that uses foreign capital may not be desirable from the point of view of national welfare of the host country. A competitive allocation fails to internalize the impact of labour inflow on the supply of foreign specific 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 one of the two sections of the small open economy.

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 small open economy 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 a government action. However, given the structure of the trade model, one can compute appropriate shadow prices for policy evaluation purposes.

5. Appendix

We derive the solution to the maximization problem of a social planner ignoring a terms of trade effect, which means P is constant. The host country's real gross national product is given by:

$$\text{GNP} = PX\,(\bar{L} - L_Y,\, K) + Y\,(L_Y,\, \tilde{K}^*) - (1 - \lambda)\, r^* K^* \qquad (5)$$

where $\tilde{K}^* = K^*\,(1 + \lambda\, r^*)$. Maximization with respect to L_Y leads to

$$P\frac{\partial X}{\partial L_X} = \frac{\partial Y}{\partial L_Y} + \frac{\partial Y}{\partial \tilde{K}^*}\frac{\partial K^*}{\partial r^*}\frac{\partial r^*}{\partial L_Y}(1+\lambda r^*) + \frac{\partial Y}{\partial \tilde{K}^*}K^*\lambda\frac{\partial r^*}{\partial L_Y} - (1-\lambda)\frac{\partial r^*}{\partial L_Y}K^*$$

$$- (1-\lambda)r^*\frac{\partial K^*}{\partial r^*}\frac{\partial r^*}{\partial L_Y}, \qquad (6)$$

with $\partial Y/\partial \tilde{K}^* = r^*$. We obtain

$$P\frac{\partial X}{\partial L_X} = \frac{\partial Y}{\partial L_Y} + \frac{\partial r^*}{\partial L_Y}\left[r^*\frac{\partial K^*}{\partial r^*}(1+\lambda r^*) + r^* K^* \lambda - (1-\lambda)K^* - (1-\lambda)r^*\frac{\partial K^*}{\partial r^*} \right]. \qquad (7)$$

Hence,

$$P\frac{\partial X}{\partial L_X} \le \frac{\partial Y}{\partial L_Y} \qquad (8)$$

if

$$\lambda r^*\frac{\partial K^*}{\partial r^*}(1+r^*) + K^*\big(\lambda(1+r^*)-1\big) \le 0. \qquad (9)$$

Rearranging terms we get the investment ratio

$$\lambda \le \lambda_c \equiv \frac{1}{(1+r^*)(1+\varepsilon^*)} \qquad (10)$$

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

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