Government Spending on Education and Labour Mobility

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1 Introduction

The purpose of this paper is to shed light on the relationship between education, taxation, and labour mobility. Today's tax revenues finance the formation of tomorrow's human capital through education policies. A benevolent government aims at maximizing social welfare, not the stock of human capital. High tax rates are not only conducive to a very high level of human capital but also to poor consumption standards and low levels of social welfare. In a closed economy the government faces a simple trade-off between current consumption and resources devoted to the formation of the skills that will serve to produce tomorrow.

When labour is mobile in a two-country world increasing tax rates to implement a more ambitious education policy leads to labour emigration and a shrinking tax base, and may ultimately result in lower levels of human capital and welfare. On the other hand, immigrants are taxpayers; immigration enhances human capital formation in the receiving country and is likely to improve its welfare. This paper is an attempt to clarify the tradeoffs at work when tax and education policies are linked internationally through labour mobility.

For that purpose I construct a very simple overlapping generations model in which individuals migrate to the country offering the most favourable net income. In each country labour income is taxed and tax revenues

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serve to finance public education expenditures. I allow myself a bunch of drastic simplifications: the migration decision is the only one faced by individuals; fertility is exogenous and labour mobility does not affect birth rates; labour supply is inelastic. Importantly, I assume that governments' behaviours are not strategic.

Much attention has been paid to the adverse consequences of labour emigration for the sending country. This stream of research known as the "brain drain" literature points out that those left behind may be worse off and eventually supports the idea of a brain tax levied on emigrants to compensate those left behind for the welfare loss (see Bhagwati and Hamada (1982)). Brain drain usually results in a double externality: negative for those left behind and positive for the receiving country. Unlike the brain drain approach the model developed in this paper assumes that all individuals are endowed with the same country-specific level of human capital. It thus relates to a recent stream of literature which emphasises the intertemporal aspects of human capital formation in the patterns of labour migration (e.g., Galor and Stark (1994), Frenkel and Razin (1996), Mountford (1997), Vidal (1998)).

The migration of persons raises conceptual issues related to the definition of each country's social welfare function. Who is going to count in the social welfare function of the sending country ? How to define the social welfare function of the receiving country ? My aim is not to examine different types of social welfare function. I shall take the view of temporary migration according to which emigrants are part of the social welfare calculus of their country of origin. The welfare gain of emigrants can thus compensate for the potential welfare loss of those left behind. This view is consistent with the demographic assumption of the model according to which a new generation is born in each country in each period, the size of which is not affected by the location choice of the previous period. My modelling does not distinguish migrants' consumption from potential remittances aimed at financing the consumption of temporary migrants' families (including offspring) who are left behind in their home country.

The focus of the paper is the public finance aspects of education policies. It is clearly related to the fiscal competition literature. Emigration brings about welfare gain through higher foreign wages but may result in a lower tax base, and therefore impinge on the sending country's education policy. According to the residence principle of taxation (see Frankel and Razin (1996)) emigrants pay taxes in their host country, not in their country of origin. Governments' tax policies affect both the location of labour and the formation of human capital. Since individuals can avoid heavy taxes by emigrating the shape of the government's revenue resembles a Laffer curve. Human capital formation exhibits decreasing returns to scale with respect to public spending on education in each country so that each economy converges to a steady-state level of human capital; this assumption is consistent with the empirical evidence for diminishing social returns to human capital investment (see Psacharopoulos (1985)). The analysis focuses on the role

that diminishing returns with respect to public spending on education play in determining the welfare consequences of labour mobility. Its main result is that emigration can improve the long-run welfare of the sending country when the elasticity of the education technology is low : the loss in human capital formation stemming from labour emigration is offset by the emigrants' welfare gain. Welfare improvement can not result when this elasticity is too high. As far as the receiving country is concerned, immigration provides higher tax revenues and results in a higher level of human capital than autarky. Immigration can nevertheless result in a level of welfare lower than autarky.

The paper proceeds as follows. Section 2 sets up the model. Section 3 assesses the effect of education policies on both human capital formation and welfare. Section 4 concludes.

2 The model

I consider a two-country overlapping generations world. In each country production occurs according to a linear technology using only one input, human capital. Technologies differ across countries and the world economy thus consists of a high and a low wage country ($w^* \geqslant w$). I first consider the benchmark case of a closed economy. Second, I deal with the migration decision faced by individuals under openness. Third, I examine human capital formation in both the receiving and the sending country and study the dynamics of the economy.

2.1 Benchmark case : closed economy

Individuals live two periods. When young they are educated; when adult they supply inelastically their accumulated human capital h_{t+1} on the labour market, and receive a net income $h_{t+1}w(1-\tau_{t+1})$ where w is the wage rate and τ_{t+1} the tax rate on labour income. Consumption occurs only during adulthood so that the individual's budget constraint is : $c_{t+1} = h_{t+1}w(1-\tau_{t+1})$. For simplicity I assume a linear utility function, $u(c) = c$, to get

$$u(c_{t+1}) = h_{t+1}w(1-\tau_{t+1})$$

The population consists of a continuum of identical individuals. A convenient normalisation is that the size of each generation is equal to 1.

In this very simple setting private individuals do not face any economic choice. The government decides on education policy. Human capital formation is financed through taxation. In period t the tax revenues, $T_t = wh_t\tau_t$, are spent on the education of the generation born at t. The education technology exhibits decreasing returns to scale with respect to public spending

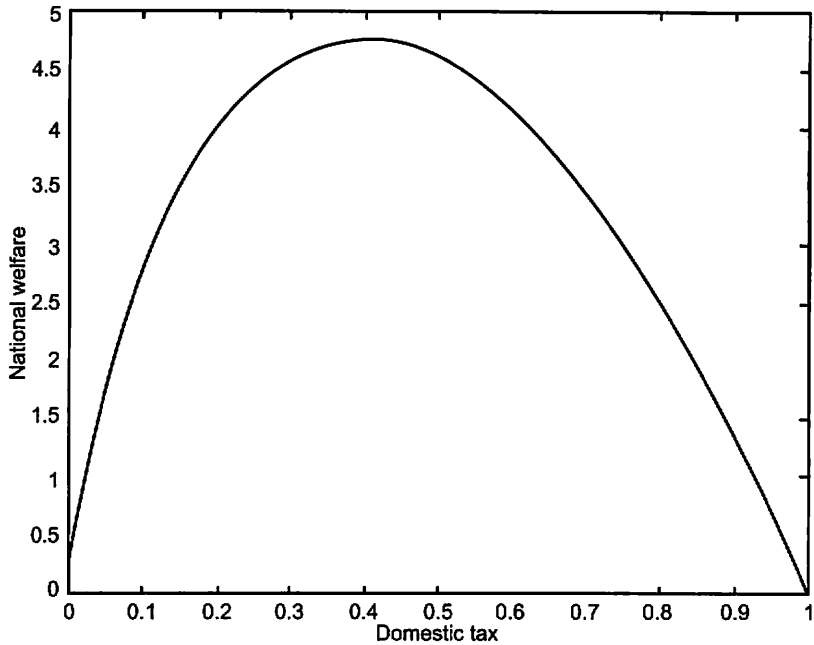

Figure 1 : *The closed economy ($w = 5; b = 0.4$)*

on education :

$$h_{t+1} = T_t^b$$

where $b \in]0,1[$ is the tax revenue elasticity of the education technology. The education technology exhibits diminishing returns with respect to tax revenues as in Glomm and Ravikumar (1992); this type of technology is in the spirit of Barro (1990)'s model of government spending. An equilibrium is a sequence (h_t, c_t, τ_t) that satisfies $c_t = w(1 - h_t)\tau_t$ and $h_{t+1} = (wh_t\tau_t)^b$, where the path of tax rates (τ_t) is exogenous. For a stationary level of taxation, τ, the long-run level of human capital is :

$$h = (w\tau)^{\frac{b}{1-b}} \tag{1}$$

I now characterise the optimal stationary path (see de la Croix and Michel (2000)) that maximises the stationary utility under the stationary resource constraint of the economy. This should be seen as a dynamic problem of allocating resources between consumption and human capital formation. The stationary level of welfare associated with a tax τ is :

$$W^A = hw(1 - \tau) = (1 - \tau)\,\tau^{\frac{b}{1-b}} w^{\frac{1}{1-b}}$$

The optimal stationary tax, $\widehat{\tau}$, is the solution to :

$$\frac{\partial \ln W^A}{\partial \tau} = -\frac{1}{1-\tau} + \frac{b}{1-b}\frac{1}{\tau} = 0$$

Hence:

$$\widehat{\tau} = b \text{ and } \widehat{W}^A = (1-b)b^{\frac{b}{1-b}} w^{\frac{1}{1-b}}$$

A tax increase always enhances human capital formation. However, the level of human capital is not the only variable according to which one has to appraise economic welfare. High taxes also result in a low share of consumption in GNP and hence lead to poor standards of living. There is a trade-off between resources devoted to human capital formation and private consumption. The steady-state level of welfare is maximised when the tax rate equals the tax revenue elasticity of the technology of education (see, for example, figure 1 where the optimal tax rate is 0.4).

2.2 The migration decision

I now turn to the two-country model. Throughout this paper I shall denote the variables of the receiving country with an asterisk. The return to human capital is higher in the receiving country: $\rho_t \equiv \frac{w(1-\tau_t)}{w^*(1-\tau_t^*)} \leqslant 1$. I assume that the sending country's tax rate is comprised between 0 and 1; the receiving country's tax rate can therefore vary between 0 and $1 - \frac{w}{w^*}(1-\tau_t) < 1$. This amounts to assume that the high (low) wage country is an immigration (emigration) country.

Individuals born in the low wage country can avoid taxation by emigrating. When adult individuals face the following choice: they can either work at home and earn a net income $h_{t+1}w(1-\tau_{t+1})$ or emigrate and earn $h_{t+1}w^*(1-\tau_{t+1}^*)$. The utility of an individual who decides to work in his country of origin is thus given by:

$$u(c_{t+1}) = h_{t+1}w(1-\tau_{t+1})$$

I assume that migrants incur a mobility cost. One unit of income abroad brings as much satisfaction as μ ($\mu \in [0,1]$) units of income at home (see Mirrlees (1982)). The utility of an emigrant is given by:

$$u(\widetilde{c}_{t+1}) = \mu h_{t+1}w^*(1-\tau_{t+1}^*)$$

I further assume that the psychological migration cost is uniformly distributed on $[0,1]$ among individuals in each generation. The individual i, characterised by a migration cost μ^i, emigrates if and only if:

$$u(\widetilde{c}_{t+1}^i) - u(c_{t+1}^i) \geqslant 0 \Leftrightarrow \mu^i \geqslant \rho_{t+1}$$

Hence the share of emigrants in the population is: $p_{t+1} = 1 - \rho_{t+1}$. It is straightforward to compute the impact of an increase in either the sending or the receiving country's tax rate on the flow of migrants. Lower taxes in the receiving country encourage labour migration as do higher taxes in the sending country.

2.3 Dynamics of human capital formation and steady state

Human capital formation is financed through a tax on labour income. Emigrants thus contribute to the formation of human capital in their host country, not in their country of origin.

The sending country: Per capita human capital evolves according to:

$$h_{t+1} = ((1 - p_t)\, h_t w \tau_t)^b = (\rho_t \tau_t h_t w)^b \tag{2}$$

The receiving country: The receiving country levies taxes both on its own citizens and immigrants. Per capita human capital evolves according to:

$$h^*_{t+1} = ((h^*_t + p_t h_t)\, w^* \tau^*_t)^b = ((h^*_t + (1 - \rho_t) h_t)\, w^* \tau^*_t)^b \tag{3}$$

Consider now that tax rates are constant across time ($\tau_t = \tau$, $\tau^*_t = \tau^*$; $\rho_t = \rho$). (2) and (3) define a two-dimensional first order dynamical system.

Definition A steady state equilibrium of this economy is a pair of levels of human capital (h, h^*) solving (2) and (3) with $h^*_{t+1} = h^*_t$ and $h_{t+1} = h_t$.

Proposition *The economy converges towards a unique steady* (h, h^*).

Proof: Let me denote with D_t the ratio of both countries' levels of human capital, h^*_t/h_t. I Divide (3) by (2) to obtain the law of motion of D_t:

$$D_{t+1} = \left[(D_t + 1 - \rho)\left(\frac{w^*\tau^*}{w\tau}\frac{1}{\rho}\right)\right]^b \tag{4}$$

A steady-state ratio of both countries' levels of human capital solves:

$$G(D) \equiv D^{1/b} - (D + 1 - \rho)\left(\frac{w^*\tau^*}{w\tau}\frac{1}{\rho}\right) = 0 \tag{5}$$

where, by assumption, $\tau \in]0, 1[$ and $\tau^* \in \left]0, 1 - \frac{w}{w^*}(1 - \tau)\right[$. I have:

$$G'(D) = \frac{1}{b} D^{1/b-1} - \left(\frac{w^*\tau^*}{w\tau}\frac{1}{\rho}\right)$$

$$G''(D) = \frac{1}{b}\left(\frac{1}{b} - 1\right) D^{1/b-2} > 0$$

Since $G'(0) < 0$ and $G'(+\infty) > 0$ there exists a unique $\widetilde{D} \in]0, +\infty[$ such that: $D < \widetilde{D} \Leftrightarrow G'(D) < 0$. Hence G is a decreasing function of D on $\left]0, \widetilde{D}\right[$ and an increasing function of D on $\left]\widetilde{D}, +\infty\right[$.

Since $G(0) < 0$ and $\lim_{D \to +\infty} G(D) = +\infty$, there exists a unique $\widehat{D} \in]0, +\infty[$ such that $G(\widehat{D}) = 0$. According to (2) the steady-state level of human capital in the sending country is

$$h = (\rho \tau w)^{\frac{b}{1-b}} \tag{6}$$

and the level of human capital in the receiving country is : $h^* = \widehat{D}h$.

Moreover, D_t and h_t monotonically converges towards their steady-state levels :

$$\left.\frac{dD_{t+1}}{dD_t}\right|_{\widehat{D}} = b\frac{\widehat{D}}{\widehat{D} + 1 - \rho} \in]0, 1[$$

$$\left.\frac{dh_{t+1}}{dh_t}\right|_{h} = b \in]0, 1[$$

□

3 Assessing the impact of education policies

What are the effects of education policies on both the sending and the receiving country ? Are the adverse effects of high taxes dominated by the benefits of government spending on education ? The level of human capital is not the yardstick of welfare. Governments have to balance the positive effects of human capital formation with the negative effects that heavy taxes have on consumption. In this model there is an intergenerational trade-off since those who pay taxes are different from those who benefit from education expenditures. I nevertheless allow myself a drastic simplification by only considering steady-state welfare.

First, I characterise the impact of labour mobility on human capital formation. Second, I assess the steady-state welfare consequences of labour mobility.

3.1 Effect on human capital formation

3.1.1 The sending country

Let me first assess the short and long-run impacts of an increase in the domestic tax on human capital formation. This results in two opposing effects. On the one hand, higher taxes increase the amount of resources devoted to human capital formation. On the other hand, higher taxes result in higher emigration. I obtain :

$$\frac{\partial h_{t+1}}{\partial \tau_t} = b\frac{h_{t+1}}{\tau_t(1 - \tau_t)}(1 - 2\tau_t) \text{ and } \frac{\partial h}{\partial \tau} = \frac{b}{1-b}\frac{1 - 2\tau}{\tau(1-\tau)}h$$

Increasing taxes enhances human capital formation in the short and the long run if the tax rate is less than 1/2. The short and long-run effects of an increase in the foreign tax on domestic human capital are positive:

$$\frac{\partial h_{t+1}}{\partial \tau_t^*} = b\frac{h_{t+1}}{1-\tau_t^*} > 0 \text{ and } \frac{\partial h}{\partial \tau^*} = \frac{b}{1-b}\frac{1}{1-\tau^*}h > 0$$

The prospect of paying higher taxes abroad discourages natives to emigrate and thus increases the domestic tax base.

3.1.2 The receiving country

What is the short-run impact of an increase in either the domestic or the foreign tax rate on the formation of human capital in the receiving country? In the short run an increase in the sending country's tax rate enhances human capital formation in the receiving country. Immigrants pay taxes in their host country but are educated in their country of origin; higher taxes in the sending country both encourage emigration and improve emigrants' level of human capital. Differentiating equation (3) gives:

$$\frac{\partial h_{t+1}^*}{\partial \tau_t} = b\left(h_{t+1}^*\right)^{\frac{b-1}{b}}\frac{w}{w^*}\frac{h_t w^* \tau_t^*}{1-\tau_t^*} > 0$$

In the short run an increase in the domestic tax rate results in two opposing effects. On the one hand, workers pay higher taxes; on the other hand, the number of taxpayers shrinks since higher taxes render the country less attractive for potential migrants:

$$\frac{\partial h_{t+1}^*}{\partial \tau_t^*} = bh_t w^*\left(h_{t+1}^*\right)^{\frac{b-1}{b}}\left(\frac{h_t^*}{h_t} + 1 - \frac{w}{w^*}\frac{1-\tau_t}{1-\tau_t^*} - \frac{w}{w^*}\frac{(1-\tau_t)\tau_t^*}{\left(1-\tau_t^*\right)^2}\right)$$

Can the tax base effect dominate the tax level effect? The tax level effect dominates whenever

$$\frac{h_t^*}{h_t} \geqslant \frac{w}{w^*}\frac{1-\tau_t}{1-\tau_t^*} + \frac{w}{w^*}\frac{(1-\tau_t)\tau_t^*}{\left(1-\tau_t^*\right)^2} - 1 \equiv F\left(\tau_t^*\right)$$

Let me recall that $\tau_t^* \in \left]0, 1-\frac{w}{w^*}(1-\tau_t)\right]$. I have:

$$F'\left(\tau_t^*\right) = \frac{2w}{w^*}\left(\frac{(1-\tau_t)}{\left(1-\tau_t^*\right)^2} + \frac{(1-\tau_t)\tau_t^*}{\left(1-\tau_t^*\right)^3}\right) > 0$$

$$F(0) = \frac{w}{w^*}(1-\tau_t) - 1 < 0$$

$$F\left(1-\frac{w}{w^*}(1-\tau_t)\right) = \frac{w^*}{w(1-\tau_t)} - 1 \geqslant 0$$

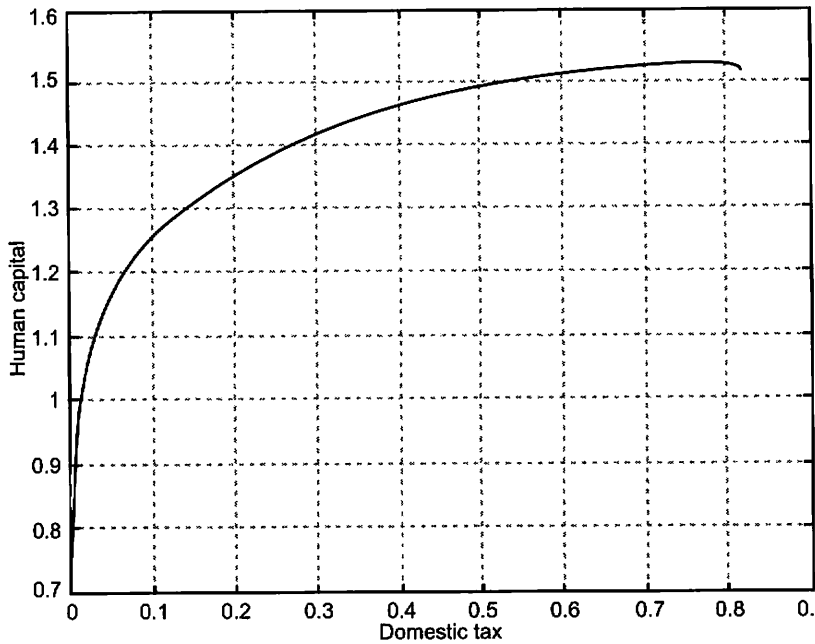

Figure 2 : $b = 0.1; w^* = 50; w = 10; \tau = 0.1$

Therefore there exists a threshold $\widetilde{\tau}_t^* \in \left]0, 1 - \frac{w}{w^*}(1-\tau_t)\right]$ above which F is positive. The short-run effect of an increase in the domestic tax depends on both the prevailing domestic tax rate and the current levels of human capital in both countries. When the domestic tax rate is sufficiently low ($\tau_t^* < \widetilde{\tau}_t^*$) a marginal tax increase always fosters human capital formation in the receiving country : the tax level effect dominates the tax base effect regardless of the current levels of human capital. When the domestic tax rate is sufficiently high ($\tau_t^* \geqslant \widetilde{\tau}_t^*$) the tax base effect dominates whenever the sending country level of human capital is sufficiently high ($h_t > F(\tau_t^*) h_t^*$).

The long-run level of human capital, h^*, solves (3) with $h_{t+1}^* = h_t^*$ and $h_t = h$ given by (6) :

$$h^* = \left(w^* \tau^* \left(h^* + \left(1 - \frac{w(1-\tau)}{w^*(1-\tau^*)} \right) \left(\frac{w(1-\tau)}{w^*(1-\tau^*)} \tau w \right)^{\frac{b}{1-b}} \right) \right)^b \qquad (7)$$

As shown in section 2.3 the solution to this equation is unique. The long-run effect of an increase in the domestic tax rate is given by :

$$\left(1 - \tau^* b h^{*\frac{b-1}{b}}\right) \frac{dh^*}{d\tau^*} =$$

$$b h^{*\frac{b-1}{b}} h w^* \left(\frac{h^*}{h} - \frac{w}{w^*} \frac{1-\tau}{(1-\tau^*)^2} \tau^* + 1 - \frac{w}{w^*} \frac{1-\tau}{1-\tau^*} + \left(1 - \frac{w}{w^*} \frac{1-\tau}{1-\tau^*} \right) \frac{\tau^*}{h} \frac{\partial h}{\partial \tau^*} \right)$$

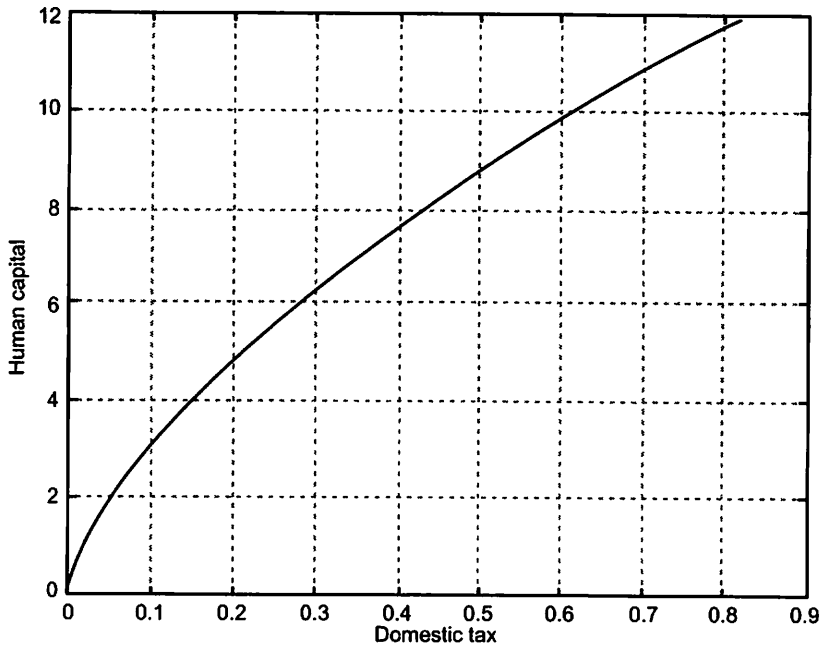

Figure 3 : $b = 0.4; w^* = 50; w = 10; \tau = 0.1$

A marginal increase in the receiving country's tax rate results in two positive and one negative effect on human capital formation :

- A higher tax rate results, all other things being equal, in higher tax revenues (positive)
- A higher tax rate results in an increase in the level of human capital of immigrants (positive)
- Increasing taxes reduces the number of immigrants (negative)

In this simple economy with a uniform distribution of migration costs numerical simulations show that increasing taxes can result in either an increase or a decrease in the receiving country's level of human capital. Figure (2) proves the possibility of a negative overall effect on human capital; this happens when the tax rate is very high and the elasticity of the education technology is low. Figure (3) illustrates the case of a positive effect.

However, the receiving country's level of human capital is always higher under openness than under autarky. This result holds at any level of taxation. This can be shown by differentiating (3) in steady state with respect to the inflow of human capital $\theta = (1 - \rho) h$:

$$\frac{dh^*}{d\theta} = \frac{bh^*}{\theta + (1 - b) h^*} > 0 \tag{8}$$

3.2 Effect on steady-state national welfare

How to define national welfare when individuals migrate internationally ? Whose welfare is going to count ? These questions raise both ethical and political issues. For welfare analysis Razin and Sadka (1995) distinguish between labour mobility and migration. Under labour mobility migrants are considered as guest workers rather than potential citizens of the destination country, and hence remains an element of the welfare calculus of the source country. Under labour migration migrants are destined to become full-fledged citizens of the destination country, and should therefore be part of the welfare calculus of that country. Clearly the upshot of welfare analysis much depends on who is included into the social welfare function (e.g., Hämäläinen (1997) and Michel, Pestieau and Vidal (1998)). Here we take the view of labour mobility or temporary migration and assume that the set of people over which the social welfare function is defined does not change as a result of international labour mobility.

3.2.1 The sending country

The national welfare of the sending country consists of the sum of the welfare of emigrants and that of those left behind :

$$\begin{aligned} W^S &= \int_{\rho}^{1} xhw^* (1-\tau^*)\, dx + \int_{0}^{\rho} hw (1-\tau)\, dx \\ &= \left(w^* (1-\tau^*) \left[\frac{1-\rho^2}{2} \right] + w (1-\tau) \rho \right) h \\ &= w^* (1-\tau^*) \left(\left[\frac{1-\rho^2}{2} \right] + \rho^2 \right) h \\ &= \frac{(1-\tau^*) w^*}{2} (1+\rho^2) (\rho w \tau)^{\frac{b}{1-b}} \end{aligned}$$

Does emigration improve or deteriorate steady-state national welfare ? By revealed preferences emigrants are better off; since they still count in the source country's welfare calculus, the answer to this question is not trivial. Let me consider the difference between the levels of steady-state welfare under autarky and under openness :

$$W^A - W^S = w (1-\tau) (w\tau)^{\frac{b}{1-b}} \left\{ 1 - \frac{1}{2} \rho^{\frac{2b-1}{1-b}} (1+\rho^2) \right\}$$

To determine the sign of $W^A - W^S$ one has to study the following function :

$$M(\rho) = 1 - \frac{\rho^{\frac{2b-1}{1-b}}}{2} (1+\rho^2)$$

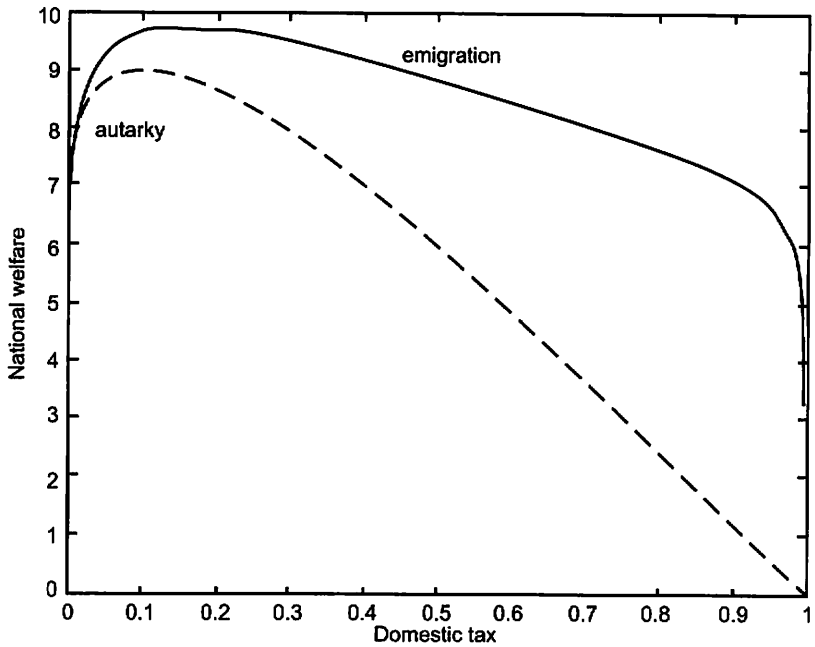

Figure 4 : $b = 0.10; w = 10; w^* = 20; \tau^* = 0.25$

One has :

$$M(1) = 0, \ \lim \rho \to 0 M(\rho) = \begin{cases} 1 & \text{if } b \geqslant \frac{1}{2} \\ -\infty & \text{if} b < \frac{1}{2} \end{cases} \text{ and}$$

$$M'(\rho) = -\frac{\rho^{\frac{3b-1}{1-b}}}{2(1-b)} \left(\rho^2 + 2b - 1\right)$$

When the elasticity of the education technology is smaller than $\frac{1}{2}$ ($b < \frac{1}{2}$), there exists a threshold $\overline{\rho}$ such that : $M(\rho) > 0 \Leftrightarrow \rho > \overline{\rho}$. The sending country faces a trade-off between the opportunity offered by high foreign wages and the loss in tax revenues resulting from emigration. If the difference between the domestic net income and the foreign net income is sufficiently high, the sending country benefits from emigration.

Figure 4 illustrates a case in which the opportunity of emigration is almost always welcome by the sending country's government. A low elasticity means that the loss of one unit of revenue results in a small decrease in the level of human capital. On the other hand, emigration to a high wage country enhances the steady-state welfare of the emigrants who benefit from higher wages in the host country.

When the elasticity is closer to one half (see figure 5), the steady-state welfare under autarky is higher than under emigration for low tax rates, and lower for high tax rates. The difference in net incomes across

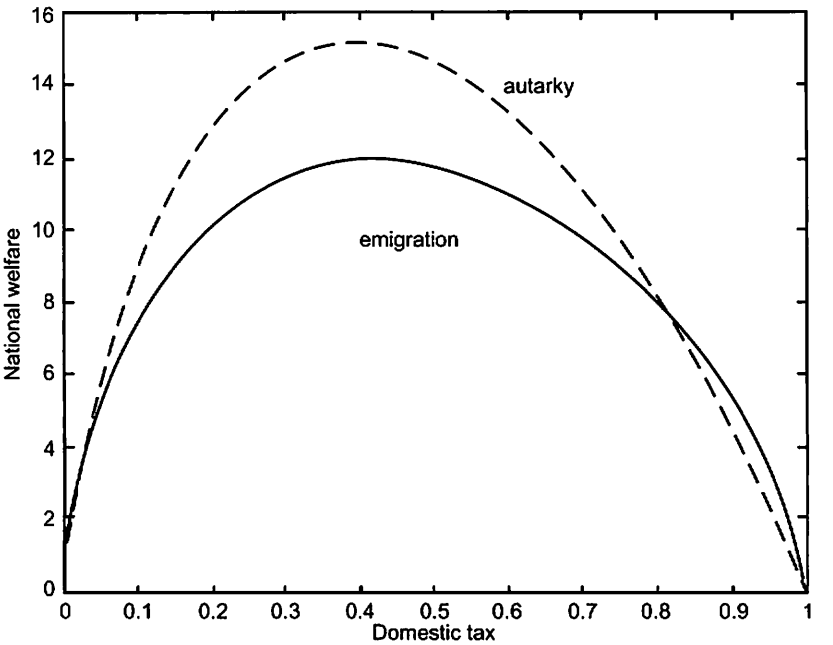

Figure 5 : $b = 0.40; w = 10; w^* = 20; \tau^* = 0.25$

countries does matter. The loss in human capital stemming from the loss of one unit of revenue is now substantial. Autarky can yield a higher level of steady-state welfare than emigration. Nevertheless, for very high tax rates this loss is far from being negligible, and autarky is no longer preferable to emigration : high tax rates are conducive to large migration flows to the high wage country; emigrants benefit from higher incomes abroad and one should bear in mind that excessive tax rates are inefficient under autarky.

When the elasticity of the education technology b is larger than $\frac{1}{2}$ the steady state level of welfare is always higher under autarky than under emigration ($M(\rho) \geqslant 0$, $\forall \rho \in]0,1]$). A high elasticity means that a loss of one unit of revenue results in a sharp decrease in human capital formation. The emigrants' welfare gain stemming from higher incomes abroad can not compensate the source country for the loss in human capital formation. In that case autarky proves to be quite attractive (see figure 6).

The sending country's social welfare function includes both the emigrants and those left behind. This assumption departs from a substantial stream of literature that focuses on the fate of those left behind. My analysis nevertheless suggests that transfer payments can fully compensate those who suffer from labour mobility when the elasticity of human capital is low. This is not the case when the elasticity is high. The welfare loss of those left behind outweighs the welfare gain of emigrants.

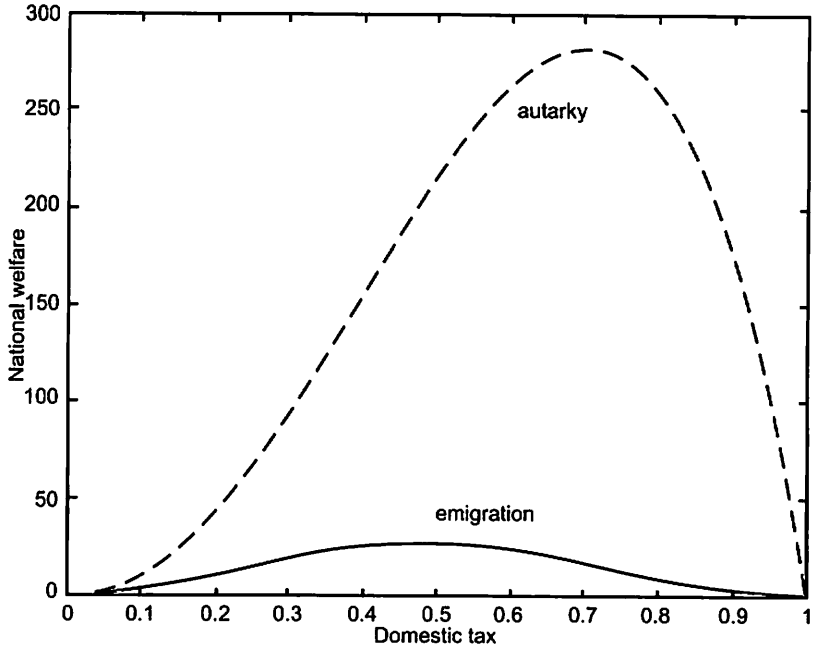

Figure 6 : $b = 0.70; w = 10; w^* = 20; \tau^* = 0.25$

3.2.2 The receiving country

The receiving country's national welfare does not take into account the immigrants' well-being. Immigrants count only in the welfare calculus of their country of origin. The receiving country's national welfare is given by :

$$W^* = h^* w^* (1 - \tau^*)$$

where the long-run level of human capital, h^*, is the solution to (7). From (8) I know that the receiving country's level of human capital is higher under openness than under autarky at any level of taxation. Should its government try to attract foreign labour by setting low tax rates ? The answer to this question again depends on the elasticity of the education technology. Here I resort to a numerical simulation.

When the elasticity of the education technology is low (see figure 7), the receiving country welcomes immigrants. It is better off than under autarky since it benefits from an increase in its tax base as a result of immigration; this additional tax revenues foster human capital formation.

When the elasticity of the education technology is high openness can prevent the high wage country from implementing its optimal autarkic education policy. Figure 8 shows than the receiving country's optimal tax rate under openness equalises foreign and home incomes ($\tau^* = 1 - \frac{w}{w^*}(1 - \tau) = 0.625$). Nobody has an incentive to migrate. The high wage country could,

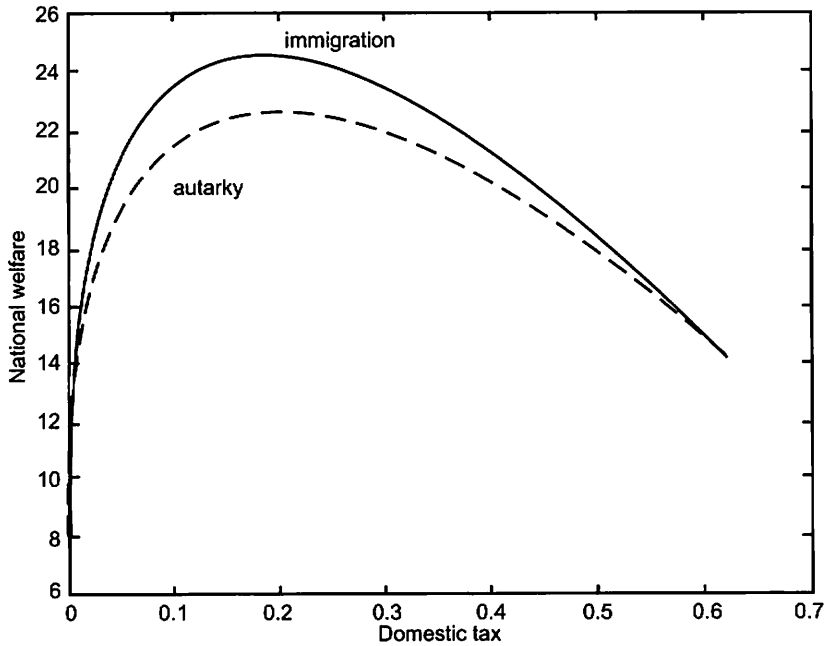

Figure 7 : $b = 0.2; w^* = 20; w = 10; \tau^* = 0.25$

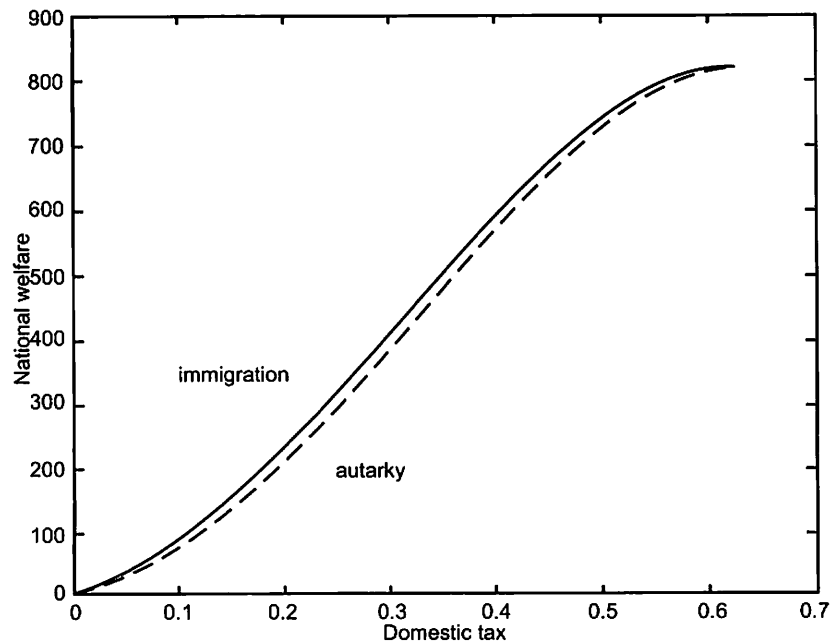

Figure 8 : $b = 0.65; w^* = 20; w = 10; \tau^* = 0.25$

however, achieve a higher level of welfare under autarky (its optimal autarkic tax rate is $\widehat{\tau}^* = b = 0.65$). In this case it would be in the receiving country's interest to close its borders to labour immigration and implement its optimal autarkic education policy.

4 Conclusion

This paper analyses the global linkage of education policies in a two-country dynamic migration model. It explores how labour mobility affects steady-state welfare. The model's key assumption is that labour mobility affects human capital formation in both the sending and the receiving country. Individuals are sensitive to differences in fiscal policy across countries and migrate accordingly. Education is financed by a tax on labour income. Migrants pay taxes in their host country, not in their country of origin. A country's fiscal and education policy thus creates an externality through the channel of labour mobility.

It has been shown that the welfare consequences of labour mobility depend on the elasticity of the education technology. This elasticity measures the impact of a loss of one unit of revenue on human capital formation. When the elasticity of the education technology is high (here larger than $\frac{1}{2}$) the sending country is better off under autarky. The loss in human capital is so dramatic that it outweighs the emigrants' welfare gain. When it is smaller than $\frac{1}{2}$, the income differential does matter and the emigrants' welfare gain can be sufficient to compensate for the decrease in human capital. Numerical examples suggest that the receiving country prefers openness when the elasticity of the education technology is low; immigrants pay taxes that are used to finance human capital formation. Openness can nevertheless put a constraint on the high wage country's education policy when the elasticity of the education technology is high. This country's government could achieve a higher level of welfare under autarky; it would be in its interest to restrict labour migration and implement its optimal autarkic policy.

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