Does international mobility of high-skilled workers aggravate between-country inequality?

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ARTICLE INFO

ABSTRACT

This paper analyzes the interaction of international migration of high-skilled labor and relative wage income between source and destination economies of expatriates. We develop an overlapping-generations model with increasing returns which suggests that international integration of the market for skilled labor aggravates between-country inequality by harming those which are source economies to begin with while benefiting host economies. The result is robust to allowing governments to optimally adjust productivity-enhancing investments which could potentially attenuate brain drain. Optimal public investment tends to decrease in response to higher emigration.

1. Introduction

In the year 2000, 20.4 million tertiary educated immigrants lived in OECD countries, up from about 12.5 million in the year 1990 (Docquier and Marfouk, 2006). Half of the skilled migrants resided in the US and about a quarter in other Anglo-Saxon countries. Liberalization of international labor markets continues, particularly for high-skilled workers. New regulation in developed countries, such as the "blue card" scheme adopted by the Council of Europe in May 2009, tends to reduce immigration barriers for high-skilled labor. Thus, the outflow of skilled individuals from developing countries may further increase in the near future. The European Commission has also raised concerns, however, that high-skilled emigration could harm developing regions which are already suffering from brain drain such as the Caribbean, Central America and Sub-Saharan Africa.

This paper examines the impact of increasing mobility of high-skilled workers on international migration and relative wage income between source and destination economies of expatriates. At the same time, we account for the fact that cross-country differences in wages for skilled workers are an important determinant of high-skilled migration in the first place (e.g., Lucas, 2005; Grogger and Hanson, 2011). Thus, we focus on the dynamic interaction of between-country wage differences for the skilled and brain drain from poor to rich countries. We develop an overlapping-generations model with endogenous educational and locational choice of individuals, where brain drain has detrimental effects on total factor productivity (TFP) in an economy. Declining mobility costs for high-skilled workers lead to further emigration which reduces TFP in countries already facing brain drain. Consequently, and contrary to conventional wisdom from standard (one-sector) models, even skilled workers in source countries lose. Thus, our model suggests that income differences for skilled labor across countries and between-country income inequality widen in response to increased migration of skilled workers.

Source countries may respond with different policies to mitigate brain drain if advanced economies open up their labor markets for skilled migrants. In view of our focus on the effects of high-skilled migration on productivity differences across countries, we ask whether source countries should try to attenuate brain drain by raising public expenditure for productivity-enhancing measures, like publicly financed investments in infrastructure or basic education.[1]

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[1] Justman and Thisse (1997, 2000) examine the implications of increasing mobility of high-skilled labor on publicly financed higher education. They analyze a non-cooperative game between two symmetric, advanced countries. In contrast, we assume that (higher) education is private and focus on the perspective of a developing country which faces brain drain to a more advanced country.

Our analysis on the optimal policy response of source countries suggests that developing countries may not want to implement such a policy change to mitigate the brain drain problem. We argue that, from the perspective of non-migrants in source economies, it rather tends to be optimal that public investment expenditure is reduced if international labor markets for skilled workers further integrate. The result may hold true even if governments can run public deficits to finance public investment.[2] In any case, the analysis again suggests that declining mobility costs do not only trigger emigration in source economies. They also fuel future emigration pressure, by reducing wage income even for skilled non-migrants. Thus, our main result is robust to allowing for endogenous public investment responses.[3]

In line with seminal papers on brain drain like Bhagwati and Hamada (1974), we emphasize adverse effects of outward migration for the source economy. In contrast to this earlier literature, we focus on the dynamic interaction between emigration and between-country inequality through adverse productivity effects of brain drain. More recently, scholars pointed to potential brain gain effects for the sending country (e.g., Mountford, 1997; Stark et al., 1997, 1998; Beine et al., 2001). They show that if emigration prospects of skilled workers in developing countries are uncertain due to immigration quotas in advanced countries, a higher quota (better emigration prospect) fosters incentives to acquire education. The drain effect from higher outflows may then be dominated by an increase in the domestic skilled labor force. While not denying this possibility, our theoretical analysis does not emphasize such a mechanism.[4] We also abstract from potential gains for source economies from remittances since we are interested in first-order effects of migration flows of high-skilled workers on market incomes.

Our paper may be most closely related to Miyagiwa (1991) and Mountford and Rapoport (2011). Miyagiwa (1991) aims to explain why countries like the US can pay high wages to skilled professionals and therefore attract the best immigrants from abroad. He assumes that there are increasing returns to education, which implies that the wage level of educated workers rises with the amount of skilled labor. In contrast, we endogenously derive effects of migration on TFP by borrowing from increasing-return frameworks common in endogenous growth and new trade theory. Mountford and Rapoport (2011) analyze the interaction between migration flows, human capital formation in the presence of human capital externalities, and fertility. In their model population size increases in poor countries which suffer from brain drain due to fertility responses. Consequently, between-country inequality is predicted to rise in the longer run for a very different reason than in our model.

There is a large literature on potential wage effects of immigration (surveys are provided by Borjas, 1994, and Card, 2009). The effects seem generally to be negative and of small magnitude if all immigrants are considered. According to Borjas (2003), immigrants with college degree, contrary to conventional wisdom, may have a positive, albeit again a small impact on wages for college-educated natives in the US. Dustmann et al. (2005) report for the UK that the effects of high-skilled immigration on wages are, if anything, positive. In a similar vein, Friedberg (2001) shows that native wages rise when immigrants enter high-skilled occupations in the Israeli labor market.

Our theory is consistent with such empirical evidence on wage effects of high-skilled migration.

The remainder of this paper is organized as follows. Section 2 presents the basic model. Section 3 analyzes the relationship between emigration and relative wage income between source and destination. Section 4 extends the basic model to account for an optimal adjustment of public investment. Section 5 provides concluding remarks.

2. The basic model

Consider a small overlapping-generations economy. Individuals live two periods and are endowed with one unit of time. Each period, a unit mass of individuals is born. In the first period of life, each individual decides whether to become high-skilled, which requires $e \in (0, 1)$ units of time, or to remain low-skilled. High-skilled individuals may emigrate at some cost which may differ among individuals. In order to focus on migration patterns of high-skilled workers, we assume that low-skilled labor is immobile.[5] Time not used for education is inelastically supplied to a perfect labor market. Individuals may also save (or borrow) freely in an international financial market at an exogenous world market interest rate, r. In the second period of life, individuals retire and live off their savings.

Let $c_{t,y}(i)$ and $c_{t+1,o}(i)$ denote the consumption level of a homogenous final good of individual i in period $t = 1, 2, ...$ (when young) and $t + 1$ (when old), respectively. Preferences are represented by the intertemporal utility function

$$U_t(i) = log\, \tilde{c}_{t,y}(i) + \rho log\, \tilde{c}_{t+1,o}(i), \tag{1}$$

with discount factor $\rho \in (0, 1)$, where

$$\tilde{c}_y(i) = \begin{cases} c_y(i) & \text{if } i \text{ does not migrate}, \\ \dfrac{c_y(i)}{1 + \theta(i)} & \text{if } i \text{ migrates};\end{cases} \tag{2}$$

the definition for $\tilde{c}_o(i)$ is analogous.[6] That is, if an individual chooses to work abroad, the consumption level is discounted in both periods.[7] Parameter $\theta(i)$ captures, for instance, individual-specific costs of living in a foreign social environment and the treatment of foreigners by administrative bodies. It is known to individuals ex-ante. It is distributed according to a continuous p.d.f. $\varphi(\theta)$, with support Θ, where inf $\Theta \geq 0$. The c.d.f. of θ is denoted by $\Phi(\theta)$. It turns out that in order to avoid the possibility of multiple long run equilibria, it is sufficient (but not necessary) to assume that

$$\varphi'(\theta) \geq 0 \text{ for all } \theta \in \Theta. \tag{A1}$$

When deciding whether or not to become skilled, individuals take both migration incentives and costs into account. The disposable wage income in t of a skilled migrant abroad (net of possible taxes in the destination country and a possible emigration tax) is exogenously given by $\overline{y}_t$.

The final good is chosen as numeraire. In t, output Y_t is produced under perfect competition, according to the technology

$$Y_t = (X_t)^\alpha \left(A_t H_{Y,t}\right)^\beta \left(A_t L_{Y,t}\right)^{1-\alpha-\beta}; \tag{3}$$

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[2] The result is not due to a decrease in the tax base stemming from additional outflows. It also holds if individuals are forced to pay taxes in their country of birth, irrespective of their residency. In the present paper, we examine the optimal government response as a robustness check for our main results.

[3] Grossmann and Stadelmann (2009) provide empirical evidence for a negative impact of higher emigration rates of skilled workers on public investment.

[4] In our model, migration possibilities are known ex-ante to individuals and taken into account in the education decision. However, there is no explicit immigration quota, albeit there exist migration costs. In fact, the empirical relevance of a potential brain gain mechanism seems to be confined to poor countries with rather low levels of human capital and low emigration rates of the skilled (Beine et al., 2001, 2008).

[5] This can be motivated by the fact that migration costs are higher for people with lower education as they are more likely to have difficulties in finding a job, learning a foreign language and integrating in the foreign society. Furthermore, institutional barriers in potential host economies may prevent migration of low-skilled workers.

[6] Time index t is omitted whenever this does not lead to confusion.

[7] For a similar way of modelling migration costs, see Stark et al. (1997).